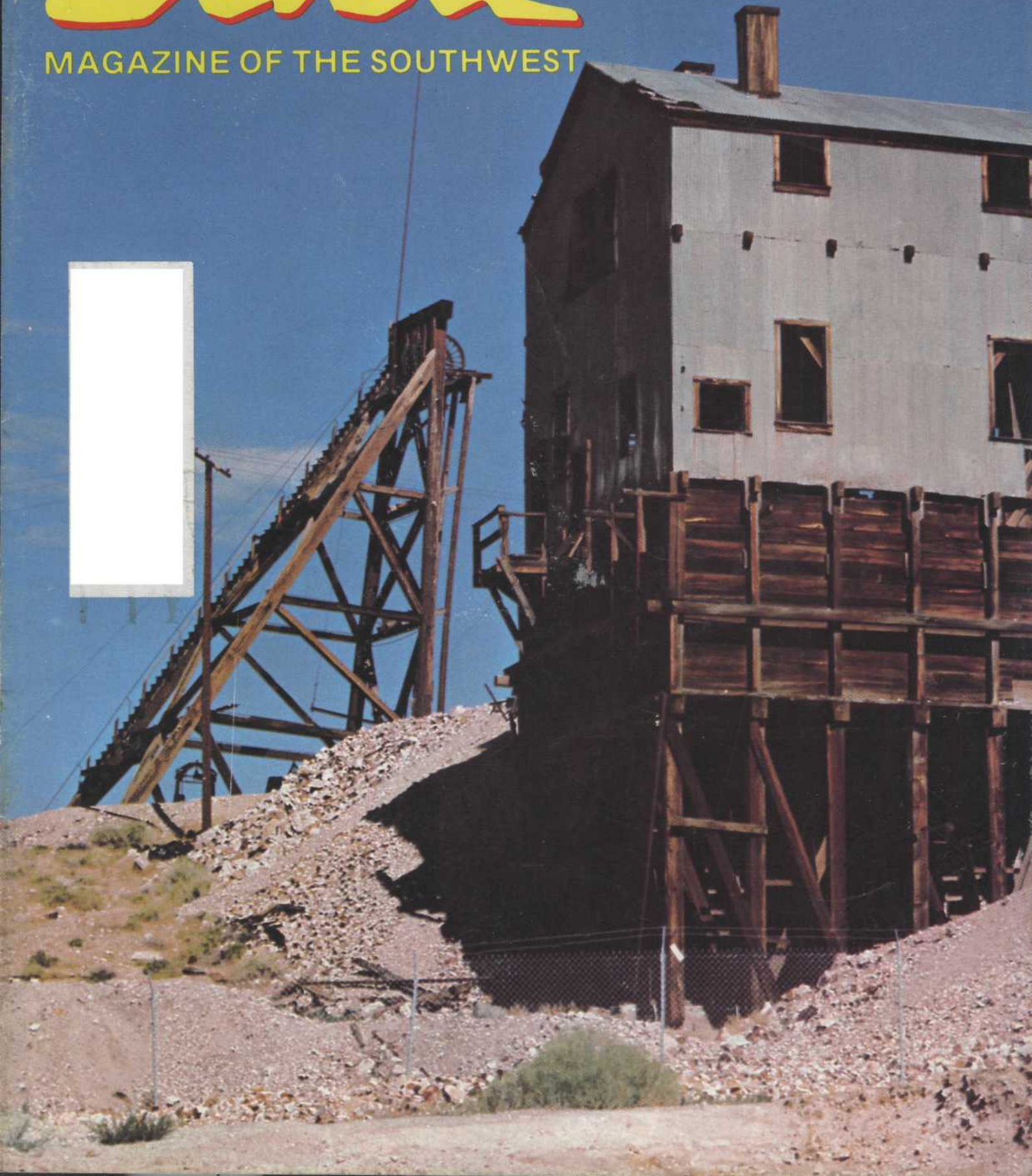


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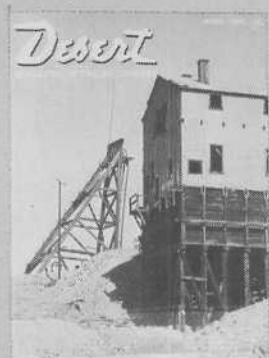
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THE COVER:
The headframe of the Mizpah Mine in Tonopah, Nevada. See article on Jim Butler Days on Page 28. Photo by Howard Neal, Arcadia, California.

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A Peek in the Publisher's Poke

FOR THOSE who love the desert, with its wide variety of flora and fauna, it is most disheartening to learn that "cactus rustlers" are creating a real crisis by plowing into the California desert and hauling away cactus by the tons. Although it is illegal to take cactus off public or private land without permission, the cactus napper must be caught in the act in order to be prosecuted.

Actually, the cactus crisis was touched off about a year and a half ago when Arizona passed laws protecting cactus in that state. As a result, cactus stealers started slipping over the border into California, and the eastern portions of Riverside, Imperial and San Bernardino counties are being hard hit. Most of that land is under the authority of the Federal Bureau of Land Management (BLM) and, although patrolled, they estimate that at least 50,000 plants annually are lost on public lands.

Although the desert looks barren enough to be indestructible, actually the ecology is delicate, and BLM officials say the wholesale removal of plants could break up the topsoil crust. The desert winds could then do decades of damage to the soil.

Assemblyman Jerry Lewis has introduced emergency and long range legislation to help protect California desert plants. To date, his emergency Assembly Bill 131 has received tremendous response from fellow legislators.

Everyone can do their share by reporting shipments of cacti to legal law enforcement officials, and take down the license numbers of trucks hauling poached cacti. This action by the public could play a crucial role in enforcing the new legislation, and in saving this beautiful southwestern desert.

William Kuyper

Anza Conquers the Desert

Commissioned by James S. Copley
Written by Richard F. Pourade



The colonization of California in the 1770's received its greatest impetus with the opening of an overland route from northern Mexico. The man who opened it was Juan Bautista de Anza. This book is the story of his conquest of the Great Desert which for two hundred years had impeded the northern advance of the Spanish Empire. The colonists who were led into California by Anza founded the presidio of San Francisco; other colonists who came over the road opened by Anza helped found the city of Los Angeles.

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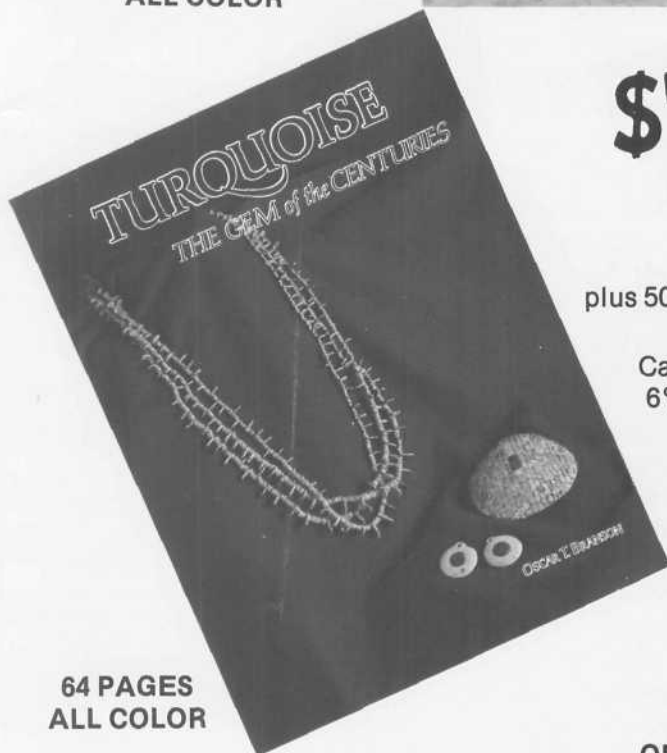
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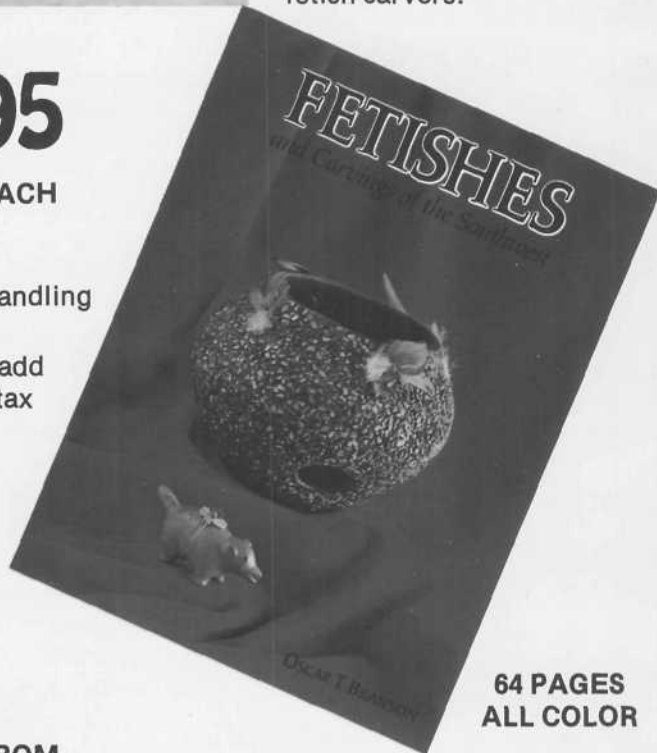
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OREGON'S GOLDEN YEARS

By Miles F. Potter

A single handful of shiny nuggets changed Oregon from the a quiet settlement in the Willamette Valley to a brawling frontier that stretched from the Rockies to the Pacific Ocean. At the first cry of gold, thousands of prospectors swarmed into the state and headed for the mines with pick, pan and burro. Wise merchants and farmers followed.

Settlements sprang up overnight, first in southern Oregon and then in the wilderness east of the Cascades. Hillsides were pocked with mines, large and small—the Columbia, Greenback, Bon-

anza, Red Boy, Virtue and the famed Cornucopia. Author Miles Potter, with his interesting text and fabulous collection of old photos, wanders in and out of the lives and events of those golden years with authority. Potter isn't just a visitor to this country. He is the elected mayor of Greenhorn City, a gold-rush boomtown of the 1880s. A miner once uncovered a nugget worth \$14,000 near Greenhorn. The author says the town has a "ghost under every boulder."

The amount of yesterday's gold—or tomorrow's—is not the paramount factor, however. The thing to remember is this: It was the prospector who blazed the trail; gold was the keystone of Oregon's economy. A reminder of this is the miner's pick in the Oregon State Seal. Men in search of treasure opened the gates to the wilderness. *Oregon's Golden years*, with affection and good humor, honors these men and their imperishable lust for gold.

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INDIAN JEWELRY MAKING

By Oscar T. Branson

Southwestern Indian jewelry has probably become the foremost American craft. It has not only become a monetary investment for millions of Americans but an investment in beauty they can enjoy every minute of the day. We think of it as truly American, and it really is. The squash blossom necklace is composed of three main components all of foreign origins. They are put together in a very unique and original manner. Possibly nowhere else in the world has such a beautiful piece of jewelry been evolved which uniquely belongs to a single people, the Navajo Indians.

The concha belt is another example of the foreign elements of design which the Navajo adopted, changed and developed into a very unique piece of jewelry and a symbol of the Navajo nation. The bracer-



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ets that have been designed and made by the Indians, especially the Navajo but also all the Indians of the Southwest, are again unique creations, indigenous to the Southwest even if some of the original ideas are borrowed. They combine the elements of beautiful white silver and lovely blue turquoise, which to them symbolizes the beautiful Western skies.

There has been no drastic change in Indian jewelry design during the last fifty years, although styles are constantly changing under social and economic pressures. There has been a trend by some silversmiths to add numerous elements such as leaves, feathers, flowers, but this has not really altered the design.

This book is intended as a step-by-step how-to-do-it method of making jewelry. Not only Indian jewelry but any kind of jewelry. Where only one method or technique has been illustrated, there could be several different ways to do the same thing. Information is given as to how to set up a work bench, gauge wire, know the weight of silver for various jewelry pieces, and so on. There are instructions for making buttons, chains, rings, bracelets, squash blossoms, the Navajo concha, earrings, chokers, bolos, watchbands, Hopi style overlay, silver casting and more.

The most important thing this book is intended to provide is the basic knowledge of how jewelry is made so one can judge if it is well made and basically good design.

This intriguing all-color book is an asset to the consumer as well as to the producer of Indian jewelry today.

Beautifully presented in the same large four-color format as Branson's *TURQUOISE, The Gem of the Centuries* and *FETISHES And Carvings of the Southwest*, \$7.95.

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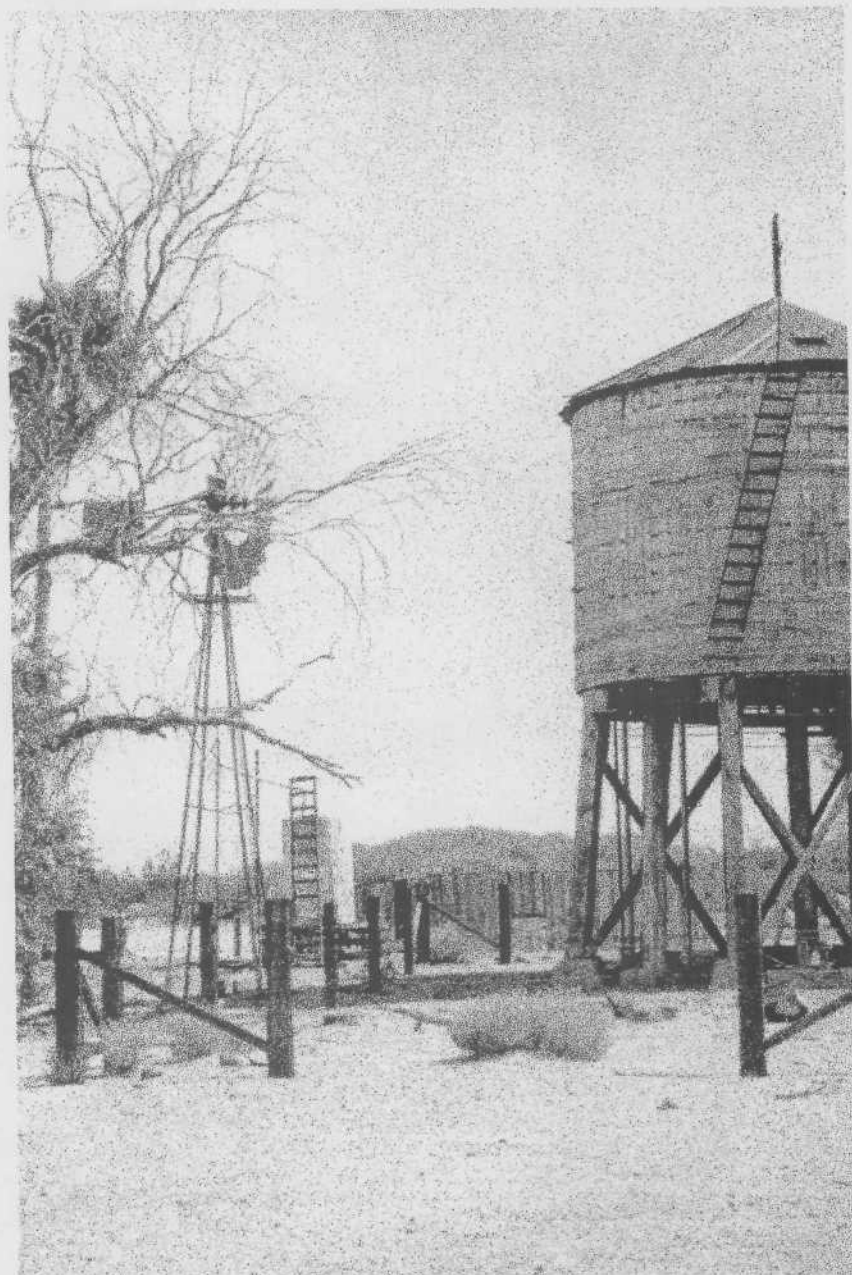


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CRUCERO

A HIGH DESERT CROSSING

HISTORIC TRAIL AND RAIL JUNCTION
HAS LASTING LURE FOR OFF-ROADERS



Ancient steam engine water tank at Rasor siding, just north of Crucero, is a Mojave Desert landmark, now part of a private ranch. Rasor was named for Pacific Coast Borax's chief engineer. Photo by Walter E. Frisbie.

by BILL JENNINGS

OUT IN the high desert region centered by Death Valley are a half-dozen abandoned mining railroads dating to the 1890s and early 1900s, ready made and legal routes for off-roaders.

The longest lasting, and probably the most ambitious, was the famous Tonopah and Tidewater, which never got near either goal in the corporate title but still ran 170 miles from Ludlow to Beatty, with weekly Death Valley Pullman service into the early 1930s. It was a victim of the World War II scrap metal drive.

Forty miles north of the Ludlow junction with the Santa Fe Railway is the old crossing with the Salt Lake Route — the San Pedro, Los Angeles and Salt Lake Railroad originally, now the Union Pacific. T&T rails were removed in 1934, nearly four years after formal abandonment.

Crucero, which means crossing in Spanish, was named for the railroad junction, established in 1907. However, the region around the X-shaped trackage had been part of a much earlier transportation system.

Crucero is nine miles southwest of Soda Lake, a landmark on the old trails linking Arizona and Southern California for many centuries. Used first by the Mojave and Piute Indians as a trade route to the Pacific coast for barter with the Chumash, the old trails via the huge salt marsh and sink of the Mojave River eventually became part of the Government Road, established in 1859 and used until construction of the Atlantic and Pacific Railroad, now Santa Fe, some 25 years later.

(Note: the spelling of Mohave with a "j" is a California-ism. The Indians, plus everyone east of the Colorado River, use the "h" because the word is Indian in origin and drew a "j" when translated into Spanish 200 years ago. Both versions are pronounced the same.)

Many of the still existing tracks across the sink and the visible and viable right-of-way of the T&T qualify as "existing trails" in the parlance of the U.S. Bureau of Land Management. This is important because of restrictions of the BLM Desert Plan, which dictates use of public domain lands throughout undeveloped portions of the Southern California desert.

Much of the land along the old T&T is in restricted categories due to natural and man-made wonders found there.

The area from Ludlow north through Crucero to Baker, where the railroad crossed what is now Interstate 15, is designated "Restricted" either as "Special Design" or "Existing Routes" in the Desert Plan.

In either category, vehicular traffic is permitted only along routes that were in general use prior to November 1, 1973. Unless posted otherwise, motorists may use a corridor 300 feet wide on each side of whatever trail, track, path or road they are using. Use includes picnicking, rock-hounding, camping or just poking around. This restriction may seem confusing, particularly when all around you vehicles are running the dunes, but maybe you had better make a stop in Barstow before you reach Ludlow or Baker, the two generally used gateways to the Crucero region.

BLM maintains a handsome way station just off the freeway at Barstow. Here you can draw accurate, up-to-the-minute information as well as current maps of the area. The section south of the Union Pacific is within the "existing vehicle routes" category and not likely to change.

North of Crucero, however, public lands are listed as "special design," which is a catch-all temporary category used where BLM plans a coordinated approach to camping or other less-restrictive uses. In the planning period, however, access is restricted to existing routes.

The special design area around Crucero is a huge one, encompassing Soda Lake, the Devil's Playground, a network of dunes, washes, public utility routes and old mines. It includes Afton Canyon on the west and stops abruptly on the east when it runs into the Kelso Dune closed area.

All of which means Crucero is the center of a huge, ancient recreational area that off-roaders have been using since World War II. Many rockhound sites are within the so-called Eastern Mojave triangle, a region bounded by Barstow at the western apex, the two interstates, I-15 on the north and I-40 on the south, and the Colorado River and Nevada boundary on the east.

It also contains Mitchell Caverns State Recreation Area, two BLM campgrounds, at Mid-Hills and Hole-in-the-Wall, both near the caverns, several so-called ghost towns, remnants of two other mining railroads, a half-dozen des-



Razor-Crucero dune system is extensive, accessible within 300 feet of long-used public roads, hence are considerable legal for limited use under the Bureau of Land Management Desert Plan regulations. Photo by author.

ert mountain ranges and many outstanding off-road areas.

Ghost towns are getting to be so-called because of the revival in mining activity. Vanderbilt, for example, for many years semi-abandoned except for caretakers, is again active, complete with "private property" and "keep out" signs. Others, such as Ivanpah, Broadwell, Barnwell and Providence exist primarily on topographic maps.

The other abandoned rail lines include the California Eastern, which ran from Goffs, on the Santa Fe, northward through Barnwell, Vanderbilt, Leastalk (now listed as Ivanpah on Union Pacific timetables) and "old" Ivanpah.

At Barnwell, another short line staggered eastward to Searchlight, under the aegis of the Santa Fe. It was the Barnwell and Searchlight, wonder of wonders, a railroad that reached the two

All that remains of Crucero siding on the long-abandoned Tonopah & Tidewater Railroad north of Ludlow. Cut between two mesquite dunes in the background led trains toward Death Valley, nearly 90 miles to the north. Desert has nearly reclaimed the 1907-vintage line. Photo by Walter E. Frisbie, Jr.





The late Bud Jackson of Hemet, a pioneering jeepster, pauses on a Crucero trip with the Hemet Jeep Club. Abandoned Tonopah & Tidewater railroad right-of-way in middle of picture. Devil's Playground dunes are in the distance. Photo by Walter E. Frisbie—Valley Studios.

towns named in its corporate title.

The railroads and their principal stations are listed because in the recent past, bottle hunters and other souvenir seekers found old station sites rich lodes of miscellany, ranging from telegraph keys to insulators and old baking soda cans.

Unfortunately, much of the T&T's south end, from Baker to Crucero and Ludlow, was inundated by the Mojave in the great floods of 1938, which led directly to the railroad's demise. Most of the track disappeared from Baker through Soda to Crucero, along with buildings and other fixtures. The writer found some rusted rail, spikes and an insulator or two near Crucero several years ago, after another near-record winter storm.

Campsites are plentiful from Ludlow north. The first six miles of a graded country road are on top of the old T&T

grade to the south shore of Broadwell Dry Lake. Just two miles south of the lake a poor-quality dirt road trails off to the right, northeast. On the Broadwell topo, and most San Bernardino County editions of Auto Club maps, a natural arch is marked near the upper end of this road, about five miles into the Bristol Mountains. The road reaches several abandoned mines in addition to the trailhead for the arch, which is at the head of an unnamed canyon. This is bighorn sheep country also.

The long, slender dry lake is the north-south low point between the Cady Mountains on the west and the Bristols to the east. Both are pocked with many abandoned mines and one, the Old Dominion, to the west of the lake bed, appeared semi-active a year or two ago. All mining claims are subject to trespass laws if posted.

North of the lakebed the road and rail-

road resume the same graded right-of-way intermittently all the way to Crucero. One problem along the T & T in this 13-mile stretch is the presence of cross ties, most of them partially buried in the sand and windblown earth. Driving is hazardous, particularly at night.

Half way from the lake to Crucero another dimly marked road heads easterly across an unnamed dry lake to link up with the power line easement road that eventually reaches the UP line midway between Crucero and Kelso. Warning! This is blowsand country and many travelers have spent more time digging out than driving along this lonely stretch.

The power line roads across the eastern Mojave represent a doubtful prospect much of the time. Some are posted; some are not, most are not well-maintained and therefore are not recommended for non-four-wheel-drive. Roads paralleling the "big inch" natural gas lines are even less promising because they follow the contour of the ground and many 30 percent grades lurk along the way. One road particularly, from the Kelso area east over Foshay Pass into the Providence-Lanfair Valley country, has steep grades over clay and caliche terrain, twice as slippery in occasional wet weather.

Back to the Ludlow-Baker "highway" along the T&T. The sand dunes around Crucero, most of them covered with mesquite, offer inviting campsites, although the presence of dunes is a sure sign the wind can blow in that country, but usually it gives ample warning to head for the freeway before it settles down to blow.

Dunes around the Mojave usually teem with wildlife, ranging in size from lizards, antelope ground squirrels up to kit fox. Coyotes are more often heard than seen in this region and there are infrequent signs of burros, particularly west toward Afton Canyon and Cave Mountain.

Midway between Crucero and Soda Lake is the old railroad watering stop of Rasor, named for Clarence Rasor, longtime chief engineer of the Pacific Coast Borax Company. Rasor was the father of Boron, the town and open pit borax



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quarry that led to the abandonment of the T & T. Ironically, Rasor's discovery came at a time when the little railroad seemed set for generations as the prime mover of thousands of tons of borate ore from the Death Valley area.

Rasor, the siding, has the greatest remaining concentration of T & T memorabilia extant. A huge water tower, section houses, several corrals made of old ties and trestle timbers and other buildings attest to the importance the little station site had during railroad days. Most of it in recent years has been a private cattle ranch, with an airstrip, so visitors are cautioned against trespass.

To the west of Rasor are several inviting box canyons that offer wind-free campsites. The ever-present supply of old cross ties assures campfire wood but all travelers are warned to bring their own water supply. Underground wells at Rasor and Soda Lake produce potable but poor-tasting water, fit for the old steam engines and your automobile radiator but not much else.

Zzyzx Springs reverted to BLM control three years ago when the mining claim on which the extensive buildings were installed was voided because, in part, the federal government indicated no meaningful mining activity had occurred.

At present, the two-story main building and big pools of somewhat brackish water are being converted into a biological field station and study site for the California State University system, not the University of California. California State College at San Bernardino has put together a consortium of Southern California colleges and university branches with the BLM's support. Travel through the area is still open to the general public but heed the signs indicating research study sites.

From the springs northeast to Baker the old right-of-way is sandblown, occasionally marshy and usually impassable to all but high-clearance four-wheel-drive. Many motorists double back to Rasor and enter I-15 at the Beacon on-ramp to make the short, 10-mile run to Baker which has fuel, food and lodging.

Baker also is the jumping-off point for many other Eastern Mojave areas. The Baker-Kelso-Amboy road, known locally as the Kelbaker, is a paved shortcut between the two east-west freeways and also gives you a closer look at the 1859-vintage Government or Mojave Road. It



Old Tonopah and Tidewater railroad ties are still in use as cattle pen fencing and for other needs of Mojave Desert ranchers. Pen above is near Rasor, midway between Baker and Crucero, along old right-of-way. Photo by Walter E. Frisbie, Jr.

crosses the Kelbaker at Seventeen-Mile Point, so named because it was a frequent overnight rest stop for the old freight wagons which made 16-17 miles or so in an average day.

It was 17 miles from Soda Springs, more or less, and about the same distance from Marl Spring, the next watering point to the east. The old track can be seen very plainly across the long fan from Seventeen-Mile east to Marl Spring and even further to the east toward Cedar Canyon.

Kelso is worth a visit. The old Salt Lake Route helper point is at the foot of the 20-mile, 2,000-foot climb to Cima and all freight trains during steam days took a helper engine here. All that's left of the old terminal is a 100-foot high smoke stack that served the small roundhouse and the two-story Kelso station hotel. Until a few years ago the traveler could stay overnight and eat in the commodious lunchroom downstairs, but now the UP reserves service for its own employees.

There is little else to see at Kelso but the sight of the expansive green lawn and landscaping around the old Salt Lake station hotel is inviting in midsummer. The little one-room school has closed and the Trail's End, a small beer bar, also is locked up.

From Kelso, a paved road leads up hill to Cima, Lanfair Valley and eventually to

Las Vegas. The Kelbaker continues south through the Granite Pass to I-40 and eventually Old 66 near Amboy. If the railroad is still favorable, you can return to Crucero along the graded dirt service road paralleling the railroad. If not, another less negotiable road spans the 30-mile distance through the Devil's Playground. This road, however, is not maintained and is frequently impassable to two-wheel-drive due to sand and washes.

Or, you can assay the Government Road. Under the determined leadership of Dennis Casebier, semi-official historian for the historic route, a movement is now seeking restoration or at least commemoration of the old road over much of its Mojave route, from Camp Cady, near Yermo, 130 miles east to the Colorado River at Ft. Mojave north of Needles.

Portions of the old road are passable, and form part of the San Bernardino County road system through Cedar Canyon. Other links, Casebier suggests, might be utilized as a hiking and equestrian trail. BLM controls most of the route and favors Casebier's plan, but such things take time to weave their way through Washington bureaucracy.

Crucero, meanwhile, languishes midway between Ludlow and Baker. There's no movement afoot to memorialize the 70-year-old Tonopah and Tidewater, the railroad borax built — and abandoned. □

YELLOW BELLIED MARMOT

by K. L. BOYNTON

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SPOTLIGHTED IN scientific investigation today is a certain grizzled-faced small-eared, short-legged, fat little rodent, given to loud and shrill whistling. An important member of the Marmot tribe, he, and widely known as the western woodchuck. Also, since Nature, in a Picasso mood, tinted the fur on his underside a gorgeous orangish-yellow, he is appropriately called the yellow bellied marmot; and finally, *Marmota flaviventris* by those who wish to be technical.

Unlike their eastern woodchuck counterparts who by and large don't care for heights, yellow bellied marmots are mountain folk at heart. A wide variety of montane meadows in southern Cascades, the Sierras, the southern Rockies on down into the drier pinyon-juniper wilderness of Utah, New Mexico, even Nevada's desert ranges can be home for these chubby rodents. The story of how they meet the rigors of their up-in-the-world homes is gradually unfolding through the hard and persistent work of such biologists as Andersen, Armitage, Barash, Downhower, Hoffman, Kilgore and Svendsen. The tale is a strange one, a saga of animals whose social behavior forms an integral part of their biology and in which the individual differences in temperament and personality of these plump little creatures plays a surprisingly important role.

Quite unlike the unsociable eastern woodchucks who live solitary lives with only a brief seasonal interest in their fellows, members of the western end of the marmot clan have turned to colonial living of a very special kind with a character and flavor all its own. The ideal setting for such a colony is a big rocky area with rocks piled in great

dumps or flung down helter skelter in long slides from sheared-off cliff faces. The more tumbled about the rocks, the better, seemingly for a good selection of safe and snug underground homesites. And then, for a handy source of green groceries, a meadow nearby is the thing. Naturally enough, mountain real estate being what it is, the ideal is not always to be had, particularly in the more arid regions, and it is surprising what the marmots can get along with or without.

A yellow bellied marmot colony itself is no hodgepodge collection of burrows, nor can just anybody wander in and set up housekeeping. A typical colony is made up of one or more males, each with his own territory which he defends vigorously and in which there resides a harem of one or more females with yearling youngsters and this year's offspring. The adult population is apt to remain fairly stable, but the colony's overall numbers change with the addition of young, and the dispersal of the yearlings. On the periphery of such a colony there may be a satellite group, usually made up either of the more subordinate males, or conversely the more aggressive who feel the need for more elbow room. Usually the satellite location is not as favorable, there being fewer desirable homesites and a greater distance to travel for food.

Among certain mammals with harems such as the sea lion, for instance, the male actively rounds up additions and forcibly, if necessary, keeps the females he already has from straying. The yellow bellied marmot, on the other hand, while not discouraging prospective recruits and in fact indicating that he's open to the idea, does not go out after new brides, nor does he stop the departure of present ones. The thing that determines the size of a given harem is the temperament of the ladies making it up.

If they are of the sociable type, and if after looking a candidate over she seems o.k. to them, she's in, and the harem may be augmented from time to time. However, there are indeed harems consisting of but one. Need it be said that such may well be graced by a lady with definite ideas of keeping it that way?

The timetable of the colony is run by the harsh mountain environment and basically by the length of the growing season, roughly from the first snow melt of spring and the first heavy snow of fall. At altitudes favored by the marmots, this means that they can be active only about five or so months of the year, the remaining six or seven being spent in hibernation. Along about the early part of May in Colorado, for instance, there's a stir and the animals emerge from hiber-

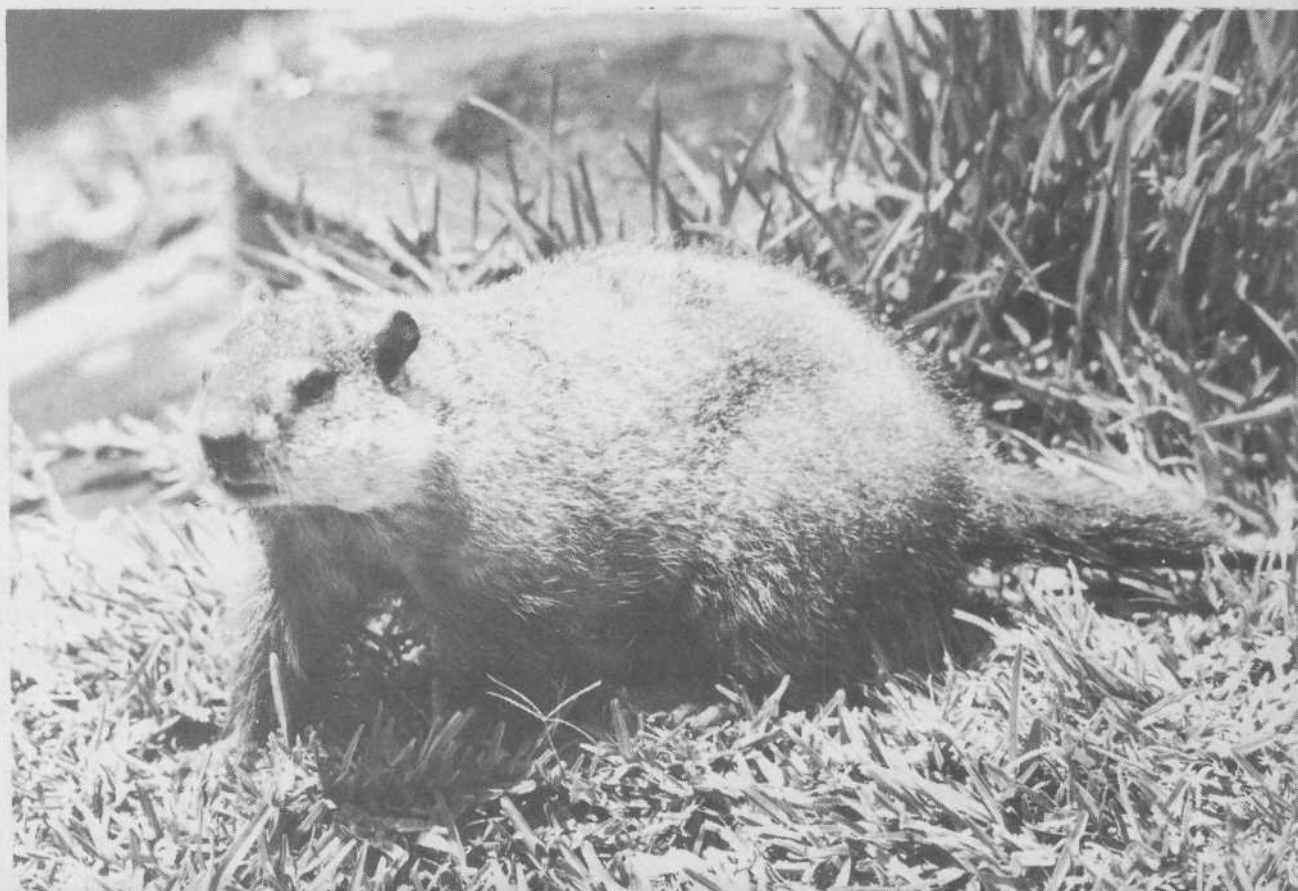
nation. By middle or late September, they have gone underground once more not to come out again until the following spring.

Now this is a very short time indeed for the business of making a personal living, building up new fat reserves for next winter's long hibernation, to say nothing of getting that all-important job of family raising done. But the marmots have developed a strategy to get on with it, and just as early as possible.

Waking from hibernation, they dig their way up through the snow, popping out at last in the spring sunshine. Everybody greets everybody, nose to nose, getting acquainted all over again, and what with the warm sun shining and the steep slopes bare now and green with tasty *Potentilla gracilis* sprouts for the eating, everybody is in a very friendly frame of mind, indeed. The females congregate about the male's burrow, and things proceed apace.

Gestation takes about 30 days. Food becomes more plentiful all the time with the advance of the growing season and the pregnant females eat well. In dry years or under other unfavorable conditions, they may have to depend on body fat left over from hibernation, if any, a situation cutting down on offspring numbers. Reproductively, the temperament of the females makes a big difference in

Opposite page: The Sierra Marmot [*marmota flaviventris*] is on the alert and his light-colored belly is clearly seen.
Right: His woodchuck cousin [*marmota monax*] is on the prowl for some tasty tidbits.
San Diego Zoo photos.



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their success, too. The aggressive females over the years produce about two times as many litters as the socially minded ones. The "avoiders" produce the least.

The youngsters appear above ground during the first half of July. For these little fellows time is short, for they must not only grow during the next month or so, but also somehow put on enough fat to see them through the coming winter. No wonder they just can't do it, since as zoologist Barash's big study showed, they only achieve less than 25 percent of adult weight. The chances would be very poor for their survival if they were shoved out on their own at this tender age as are their cousins the eastern woodchucks who live in easier habitats.

But again the yellow bellied marmots have the answer, evolving a system that protects the young against their harsh mountain environment: this year's batch simply remains in the colony, thanks to the tolerance of the adults. Dispersal time does not come until they are yearlings, then about 60 percent mature and their chances of survival are very much better. At this time, too, differences in temperament play a part. Some yearlings, under pressure of females now with new young to care for, depart. They go into the satellite communities, or wander off to found colonies of their own in favorable locations. Other yearlings resist the pressure and stay, establishing themselves in burrows of their own. Others, oddly enough, remain because no pressure is put on them to get out.

At all times during the period of activity above ground, food is important in the growth of the young and the welfare of the colony, and under normal conditions, sufficient is around. Zoologist Kilgore points out that a colony usually eats only about 20 percent of the available plant resources, the West and Southwest providing a good table of drought-resistant plants to take care of the dry years. Eating involves keeping an eye out for trouble, the marmots stopping often to sit up and look around, with again differences in temperament being apparent. Some, perhaps self-appointed sentinels, seem to seek out what looks like very exposed sites to eat in but which actually have very commanding views. At the first inkling of danger they set up a shrill whistling and don't dash for cover, but seem to climb up on higher rocks and continue the racket. Other

marmots always seem to feed in the heavier and more protective vegetation and when the alarm sounds, tear off for their home burrows.

To the individual, a burrow is essential. It is a home and place of safety, a nursery for offspring. To the species, the number of occupied burrows in a male's territory is an indication of his success, and a key to future colony numbers. Interested in marmot residential architecture, Zoologist Gerald Svendsen pitched in to dig out a burrow to see how it was put together from entrance to next location. The first thing he learned was that the marmots had already thought of the possibility of such an exploration being conducted by predatory neighbors of the badger and coyote ilk. Hence they locate their home sweet homes where boulders and slabs and rock chunks are always in the way, with the entrances squeezed into narrow fissures in thick rocks, or up a cliff face. All this makes digging out a burrow exceedingly discouraging if not practically impossible. However, by dint of great perseverance Svendsen succeeded in excavating five over a period of time. And here is what he learned.

First of all, it seems that most marmots favor a northeast or southwestern exposure and like a slope with an average angle of around 27 degrees which, what with the porous sandy loam soil and big and little rocks provides good drainage for surface water. The main entrance generally goes into the hillside about two feet before angling off to run parallel with the surface, and the tunnel then goes on back some nine to 11 feet. Rocks keep the soil from collapsing into it and into the various lateral tunnels that branch off from the main one. The boudoir is at the end of the main passageway in a hollowed-out chamber, generally under a big rock, and in this, the temperature remains about a constant 50 degrees F. from June to October. The angle of the slope is also important on the outside since it allows a good view of the surroundings for keeping an eye out for both land-based and airborne enemies. Lastly, and very important, such a slope gives good exposure to the sun.

The marmot's day starts early. Sun lovers they are, up and out when the first rays hit the colony. For the next half hour or so, they sit about neating up their fur and sunning themselves. The

mountain sun's strong ultraviolet radiation, incidentally, kills off fungus and bacteria that might be on their skin and fur, and may be one reason why these little rodents are by and large such a healthy lot. Their period of greatest activity runs from about 7 to 11 a.m. with middays spent in the burrow. They are out again in late afternoon for another feeding and new nose to nose greetings, play fights, chases and more lolling about in the sun.

But no matter how successful the summer may be, the welfare of the colony, and in the long run of the species itself, depends on how many of the residents survive the winter's heavy mortality rate. In determining this, the hibernating burrow is the decisive factor. If it isn't a good one, the occupant won't be around to answer roll call come spring. Hence they are always located where a heavy snow fall will provide good insulation.

Furthermore, to marmots togetherness is a fine way to make the most of the hibernating conditions. Several may occupy the same burrow — the male with a couple of females and maybe some youngsters, or females with their young and odds and ends of yearlings. Clumped, the warmth of each keeps the others warm and cuts down on the amount of energy each has to expend to keep alive the six or seven months.

Heavy fat is demanded for so long a period and indeed during their time above ground they stuff themselves. That is, up until perhaps the last three weeks or so when the amount eaten tapers off. This is a prudent move, since if too much is taken aboard just prior to entering hibernation, the build-up of body wastes and kidney function would lead to arousal too soon. As it is, their hibernation is a deep one, the team of anatomists Goodrich and Lyman finding that in an air temperature of 42 degrees F. the body temperature of the marmot is about 51.8 degrees F. — an o.k. situation as indicated by the slow, evenly-spaced breathing.

So, rolled up into a ball, forepaws over their eyes, they are snug and safe while Old Man Winter does his stuff, and when at last it is time, they burst up through the snow, topside once more. Time now to check up on who's around, soak up the warm sunshine, and rejoice in being a yellow bellied marmot in the spring. □

MANY MOONS

By RUSS & NORMA McDONALD



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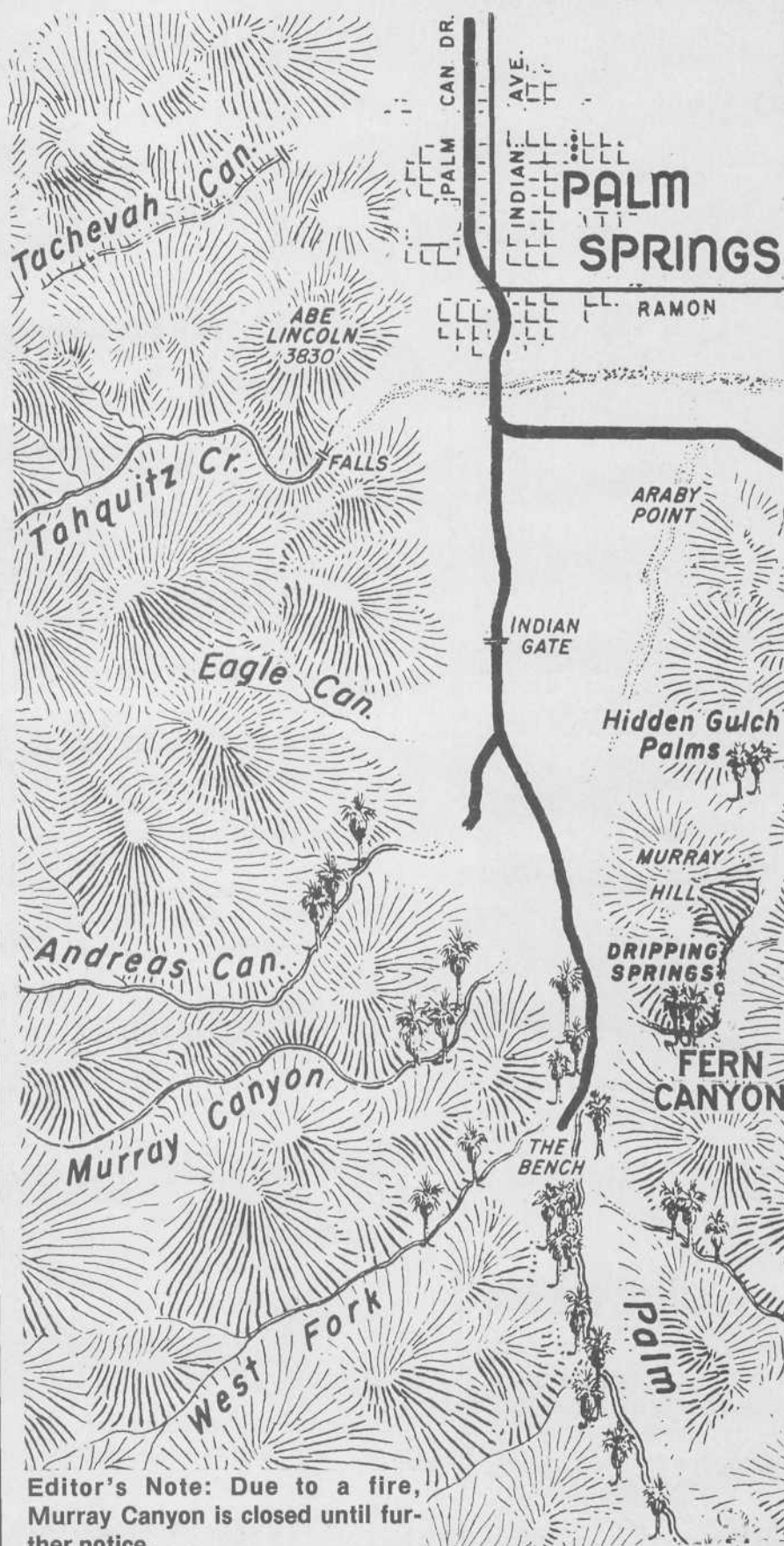
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PALM OASES OF THE CALIFORNIA DESERTS



Editor's Note: Due to a fire, Murray Canyon is closed until further notice.

PALM CANYON, one mile south of Murray, is the patriarch of California's palm oases. More than 3,000 Washingtonias crowd its floor and lower slopes as it courses south to north between the lofty San Jacinto and Santa Rosa ranges. No other oasis in the California deserts can remotely rival this total. From the Hermit's Bench trading post the palms extend upstream for about six miles; the canyon penetrates the mountains for an even greater distance. Indeed, it is possible to hike the entire length of Palm Canyon and eventually strike the Palms-to-Pines Highway (State Highway 74) 14 miles south of the Bench. A 60-foot waterfall sparkles in the sunshine seven miles upstream from the trading post.

The road to Hermit's Bench passes within sight of Andreas and Murray canyons, squeezes through a rocky cleft, crosses the West Fork of Palm Canyon (which also contains palms), then climbs steeply to the trading post, with its commanding view of the lower canyon. From there a trail descends to dense stands of palms watered by a shallow stream.

HERMIT'S BENCH overlooking Palm Canyon is also the trailhead for the hike to nearby Fern (Wentworth) Canyon. The route leads down Palm Canyon for a very short distance, then crests a low saddle on the right and continues on a straight course into steep-sided Fern Canyon. Palm litter marks the dry stream bed like a signpost, telling the observant hiker that a living oasis lies not far ahead. Just as the old-time burro prospector found silver and gold by examining the arroyos for "float," that is, chunks of rock washed down from distant outcrops, so the modern-day palm hunter relies on storm-borne fronds and trunks to point the way to hidden groves of Washingtonias.

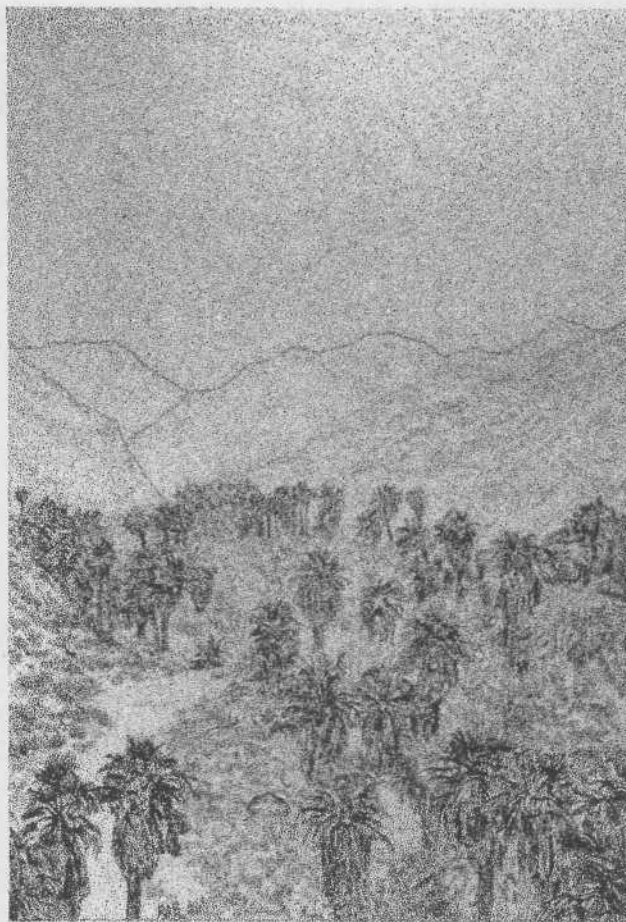
A half-hour's hike from Hermit's Bench brought me to the first wild palm, a youngster two and one-half feet tall. (A few paces below this tree, a precipitous horse trail had started working its way up the right-hand slope of the gorge, but I had stayed in the creek bed.) Mature palms made their first appearance at a low, dry waterfall a little way farther upstream. Very soon a second and much

Willows, cottonwoods, mesquite, and moisture-loving undergrowth complement the Washingtonias, creating a jungle-like atmosphere in places.

Some of the palms attain a height of 60 feet, a trunk diameter of three feet, and an age of 200 to 250 years. Countless young trees are thriving alongside the adults. In 1939 a fire burned the palms just below Hermit's Bench; the trees lived, but even today their trunks are black and their skirts are short.

I hiked up the canyon for nearly a mile, following a trail along the lower right-hand slope for much of this distance. Along the way I passed a deep Cahuilla grinding hole or mortero, the only sign of former Indian habitation I saw in the gorge. Palm Canyon finally swung abruptly to the right, but the hiking route continued straight ahead into the dry bed of the East Fork. A state game refuge sign helped to identify the confluence.

*Palm Canyon,
largest oasis of
Washingtonia palms
in the California
deserts.*



Palm and Fern Canyons

by DICK BLOOMQUIST



*View down Fern
Canyon from the site
of Dripping Springs.
San Jacinto Peak
in background.*

*Pencil sketches
by the author.*

higher dry fall with a tiny seep near its base blocked the arroyo. Bees droned heavily about this thin film of moisture, the only surface water in the entire canyon.

From this second fall I backtracked to



Beautiful
Palm
Canyon,
California's
largest
palm
oasis.

Although filled with *Washingtonias*, the lower East Fork was completely lacking in surface water. The stream in Palm Canyon itself was low — very low, in fact, compared with the flow in Andreas and Murray canyons. The month was February, and the two latter gorges,

Mileage Log

- 0.0 Junction of State Highway 111 and South Palm Canyon Drive in Palm Springs. Drive south on the latter road.
- 1.6 Junction. Bear right.
- 2.7 Agua Caliente Indian Reservation tollgate.
- 2.8 Junction. Bear left. (Right fork leads to Andreas Canyon.)
- 4.9 Cross West Fork of Palm Canyon.
- 5.0 Road ends at Hermit's Bench trading post overlooking Palm Canyon. Elevation at Bench slightly over 800 feet.

running west to east, were evidently gathering moisture from the wet upper reaches of the San Jacinto Mountains. Palm Canyon, on the other hand, originates in drier country to the south. Fault lines probably have much to do with the quantity of surface water, also.

the horse trail, built so riders might bypass the two rocky barriers on the floor of the gorge. I tallied 42 palms in lower Fern, and downstream from the upper fall I could see a knot of *Washingtonias* in Palm Canyon's West Fork. The horse trail climbed steeply before leveling off and returning to the creek bed a fraction of a mile above the dry waterfall. Three dozen palms packed the wash at this point, and quail rustled in sheltering growths of arrow-weed; desert Indians used the grey-white branches of this tall shrub for making arrow shafts. There is another cluster of some 70 palms downstream to the left, also.

A 10-minute hike upstream brought me to the site of Dripping Springs, where water once oozed from an overhanging, fern-covered cliff. This bank of maidenhair ferns gave the canyon its name, but today, after several years of drought, both the ferns and the springs have vanished, leaving only a bare, water-streaked scarp along the right side of the arroyo. Nearly 100 feet long and 35 to 40 feet high, the bluff was formerly lush with greenery for the first eight or 10 feet above the canyon floor, judging

by the water stains and traces of dead vegetation.

Despite the disappearance of Dripping Springs, this spot is still an attractive one. More than 50 palms line the wash here, framing a lovely vista of canyon walls and the snowy summit of Mount San Jacinto. Some of the trees equal the cliff in height. The "springs" mark the upper limit of *Washingtonia filifera*; beyond, rifted palisades give way to open uplands dotted with jojoba and yucca.

For the present, at least, Fern Canyon is a dying oasis in which dozens of standing dead palms mingle with their living companions. All told I counted 205 live trees, but many appeared withered and sickly. The cottonwoods which in years gone by added flashing foliage to the gorge have all died, and the little creek which moistened portions of the oasis has sunk into the sands. A few wet years, however, or an increase in the water supply through fault line movement, could revive Fern Canyon. Soon, perhaps, the palms will prosper once again, and the arching cliff will be lush with ferns and falling water. □

Mileage Log

- 0.0 Junction of State Highway 111 and South Palm Canyon Drive in Palm Springs. Drive south on the latter road.
- 1.6 Junction. Bear right.
- 2.7 Agua Caliente Indian Reservation tollgate.
- 2.8 Junction. Bear left. (Right fork leads to Andreas Canyon.)
- 4.9 Cross West Fork of Palm Canyon.
- 5.0 Road ends at Hermit's Bench trading post overlooking Palm Canyon. From the Bench hike **down** Palm Canyon for several hundred yards before climbing out via the first low saddle on the right. Drop into a dry wash on the far side of the saddle and continue straight on ahead into Fern Canyon, with its scattered palm debris. A short distance below the first *Washingtonia*, a steep horse trail leaves the canyon on the right, bypassing two dry waterfalls before returning to the floor of the gorge. From the point where this trail rejoins Fern Canyon it is a 10-minute hike upstream to the final palm group at the site of Dripping Springs. Hiking distance from the Bench to the last palms about two and one-quarter miles each way. Elevation at last cluster roughly 1100 feet.

The hills and mountains bordering the Coachella Valley hold the greatest concentration of Washingtonias in the United States, and in number of trees Palm Canyon is the unquestioned king of the American desert oases. At least one grove in the Baja California deserts does outstrip Palm Canyon, however. This is Tajo Canyon in the Sierra Juarez not far below the border. Tajo — meaning a cut or opening in a mountain — probably contains between 4,000 and 5,000 palms, with many more in its tributaries, but the great majority are the blue palm (*Erythea armata*), a shorter Mexican species with a bluish cast to its leaves. Consequently, while Tajo surpasses Palm Canyon in total trees, the Alta California oasis maintains the distinction of having more Washingtonias than its Mexican rival.

From Palm Canyon our path leads northeastward to Fern Canyon, which will be our fourth and final stop near Palm Springs. Although the ferns have withered and died, over 200 Washingtonias still line this rugged defile in the Santa Rosa Mountains. □

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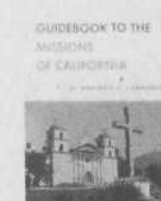
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New Life on Ghost Mountain

by ERNIE COWAN



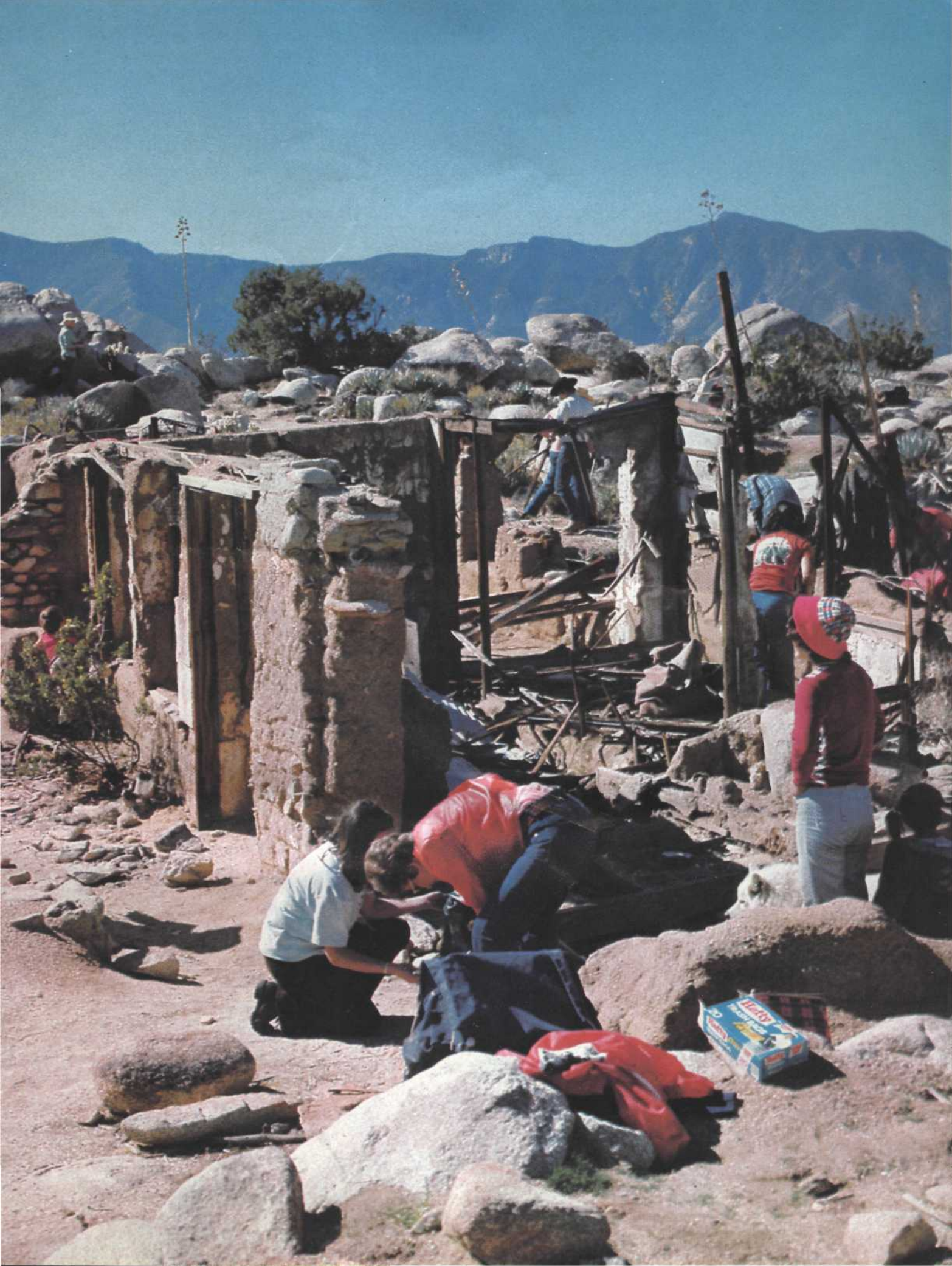
THEY HAD to walk to get there, but that didn't stop a group of dedicated off-roaders from doing their part to help preserve a fascinating bit of desert history.

The Orange County Chapter of Associated Blazers of Southern California rounded up 57 of its members and made two trips into a remote corner of Anza-Borrego Desert State Park to do their part for conservation.

They could only drive part of the way. The last mile was a steep climb along a rough, rocky trail. But this didn't deter them from hauling up more than 300 pounds of building materials and cement

Left: Framed by an arched doorway, a Blazer member rakes debris. Right: With the tin roof removed, the partial walls presented a challenge to put them in a state of "arrested decay."





and bringing down almost that much debris.

Their destination — Ghost Mountain, a lonely, wind-swept desert peak in the southern corner of California's largest state park.

Their mission — to clean up the crumbling ruins once called home by a modern family who lived a pioneer life for 15 years on the mountaintop.

Known as Yaquitepec, these ruins are what remain of the unusual story of a family seeking closer contact with the earth and its creatures. Yaquitepec, or "home of the Yaqui Tribe," was named

by Marshal South, a man who sought life as the Yaqui Indians had lived in this arid environment.

South and his wife, Tanya, came to Ghost Mountain in 1932, turning aside a comfortable life in the city for a life of struggle in the harsh, arid desert. During the next 15 years, Marshal and Tanya would build their home and their family at Yaquitepec. Three children would be born to the couple, and raised as children of the wilderness, learning the ways of survival in their remote location.

Although the South family existence

was remote from the world in distance and style, it was not remote in understanding. For several years, starting in 1940, South would send a story each month to *Desert Magazine*. Tanya, a teacher, would also submit poems to the magazine for publication. The articles by South were often a strong statement of his wilderness philosophy in addition to an account of events at Yaquitepec. And the sensitive poetry of Tanya South gave one insight into a woman at peace with the wilderness and in love with her God.

Randall Handerson, the late editor, publisher and founder of *Desert Magazine*, visited the Souths on occasion and wrote about their primitive desert life.

When they came to the mountain, "they had no shelter but a tarpaulin. But there they have remained, and through the years have been able to collect enough rain water to build a modest adobe cottage," Handerson wrote.

Indeed, their wilderness life was becoming more comfortable. Their white-washed adobe home contained several rooms, a fireplace heating system, adobe oven, and tin roof that not only sheltered the family from the rain, but acted as a collector for rainwater and drained it into huge tar-lined storage tanks.

Except for a few occasional trips into Julian or Escondido for needed supplies, the family lived a primitive life. Their clothing often consisted of breech cloth and sandals. Their food was mostly what they could collect in the wild or grow in small terraced gardens around their home.

The days at Yaquitepec were filled with making candles, gathering firewood or food, teaching children, milking their two goats, making pottery or adding to their house.

The Souths left the mountain for good in 1947; a year later, Marshal died. The reason the family left is not clear, and Tanya, who still lives in San Diego, does not wish to talk about her years on the 3,000-foot desert peak.

So, since 1947, the humble little South cottage has begun to return to the soil.

According to Bud Getty, manager of the half-million-acre Anza-Borrego Desert State Park, the ruins were nothing more than an opportunity for vandalism for many hikers to the mountain top.

"Because the ruins could not be called historic in nature, there were no funds

Left: This is how Yaquitepec appeared before the preservation project began.

The old cistern for water storage can be seen on the left.

Below: Two husky members carry the roof for the memorial plaque up the mountainside.



*Right: Marshall South's old sundial gets cemented on a new base.
Center: Good old American ingenuity came to the fore when it was necessary to transport long-handled tools. Lashed together, they became a lot easier to maneuver.*

Bottom: Everything for the day's needs, supplies, food and water, had to be carried up the trail. Here a group begins the climb while the base camp, with their multi-purpose Blazers, appears in the background.

available for restoration," Getty said.

It was this plight of Yaquitepec, mentioned in a May 1975 *Desert Magazine* article, that spurred the Associated Blazers into action. According to the past President Tom Hartman, members of the off-road vehicle group decided Yaquitepec would be a worthwhile project.

"Since there wasn't much the state could do, we decided we'd do what we could to at least preserve a little bit of this interesting story," Hartman said.

His group spent their first weekend on Ghost Mountain removing the dangerous old roof and cleaning the area of debris. Then they returned to put up plaques showing a picture of the original South home, a plot plan of the area, a brief history of Yaquitepec and a picture of Marshall South.

For their efforts, members of the Blazers club received a special conservation award from the California Off-Road Vehicle Association (CORVA).

Park Manager Getty said the work done by the Blazers group will do a lot to preserve the history of the area.

"Now hikers to Yaquitepec can learn a little of the history of the area, and perhaps respect the ruins a little more," said Getty.

Although funds for further restoration are still limited, he hopes soon to have money for some trail maintenance to the mountain top.

"Those tremendous rains we had last fall just about wiped out the trail," he said.

The Yaquitepec project shows what can be done by a few interested people. About \$200 out-of-pocket dollars were spent on the project, but what accomplished the job was the thousands of children, woman and man hours that went into the task of putting a little life back onto Ghost Mountain. □



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Watercolor
20"x30"



LYLE V. BALL began his career in the midst of the Depression, and never dreaming he could ever become an artist, he gave up his ambition to become an architect, and opened his one-room sign shop.

Sometime between then and now he fell in love with the shacks and shanties of the ghost towns, and is today retired and happily painting the homey, everyday life of early ranchers and still-life of their tools and accessories, thus preserving a record for posterity.

His mother, widowed when Lyle was only nine months old, became a cook in the mining towns of Nevada. It was in this environment he learned to love his state, especially the historic element.

He first started painting in oil, but after studying with Edgar Whitney in

New York, felt that watercolor was his forte. However, the climate of the New England states is a far cry from the dry heat of the desert, and after his watercolor paper curled up and dried too quickly outdoors, he decided that sketches and slides would be more rewarding. He now prefers to paint in the calm of his own studio, with all his materials at hand. This enables him to control the illusive watercolor medium which is so impressive in his work.

While his paintings seem to be realistic at first glance, careful study will show the depth of thought which he focuses upon the essence of a subject in order to eliminate detail into a cleaner composition. It is his thought that all good work relates to the abstract.

Avoiding the spectacular in both color

and subject, Lyle prefers his work to quietly invite the viewer back to examine again what was previously overlooked.

Besides the barns, shacks and Americana, he is a devotee of the Virginia and Truckee Railroad which ran between Reno, Carson City and Virginia City during the Bonanza Days of the Comstock. On the occasion of its Centennial, Ball drew sketches depicting the trains at different depots and had them made into notepaper. They were also reproduced in a portfolio suitable for framing. The Nevada National Bank of Reno purchased the entire supply for premiums. They also purchased a painting of a train crossing the Crown Point trestle which has been reproduced on their checks, and bank statements.

He has presented many speeches to



"Restless,"
Watercolor
20"x28"

Service Clubs on the history of the V&T. When a new city hall was built in Reno, Ball made a drawing of the old one which now hangs in the reception room, together with a painting by C.B. McClellan of "Lake's Crossing," Reno's first Inn, which is now occupied by The Riverside Hotel. This old painting was refurbished and repaired by Mr. Ball.

Lyle loves the ghost towns and deeply regrets the vandalism and progress which is fast destroying them. One spring day he decided to take a close look at Ophir, in Washoe Valley, between Reno and Carson City. This old mill site was in the middle of a field and on

private property. He secured permission from the owner, climbed over fences, shooed horses and cattle out of the way, and wading in about six inches of water, took some nice slides of the superintendent's two-story wooden home.

Some years later, the route of the freeway was to go by and Lyle thought how nice it would be to have the road pass this old millsite. It would make a nice tourist attraction. Imagine his chagrin one day on returning from Carson City to see the old house in flames. The Highway Department burned it, and the freeway goes right over the spot. All that is left is a few brick ruins.

Lyle has been very active in art circles; he served two terms on the Nevada State Council of the Arts, is an Invitational Artist in the 49ers Encampment in Death Valley, where he has won prizes five out of seven years he has participated, and is one of the founders and Past President of The Artists Co-Operative Gallery of Reno.

Every artist has a secret dream of having his own gallery, but often finds when he has it that it is so confining he then has little time for painting. Knowing this to be true, in 1966 some of Reno's more serious artists joined in a Co-Op, and they will celebrate their 10th birthday



"Berlin Mill,"
Watercolor
20"x30"

this year. It has been hard work, but most successful and rewarding. His work has been purchased by art lovers from Florida to Pennsylvania, Hawaii, Canada, Japan and Australia. He has taught, judged, given demonstrations and critiques, and is ever willing to share his knowledge with the younger artists coming up.

He was recently invited to join the AICA, (American Indian and Cowboy Artists Society), who have dedicated themselves to the appreciation of their heritage through the visual portrayal of the life styles, ideologies and courage of the peoples of the American West, both Indian and Caucasian.

Through their united efforts it is the purpose of this Society to demonstrate and promote the benefits and potentials of good will and trust between men of good faith and character. The majority of their work will typify Indian or Western Art tradition. Every effort is being made that the traditions and beliefs of each ethnic group will be shared and promoted. At a recent Show held at the Brand Library and Gallery in Glendale, California, these purposes were demonstrated.

Ball has had works accepted several times for shows of The Society of Western Artists of California and The Artists Professional League of New York. □



"It's Home,"
Watercolor
24"x17"



"Retirees,"
Watercolor
20"x30"
Courtesy
H. C. Burns,
Los Angeles,
California.

TONOPAH BOOMS



by VALERIE J. JORALEMON

CENTRAL NEVADA is a region apart, a law unto itself. With its high mountains, long sweeping valleys, clear dry air and pungent sagebrush, it might be called the last western frontier where people are independent and the distance between towns is measured in hours, not miles.

In the middle of this rugged high desert, Tonopah, "The Queen of the Silver Camps," clings to the steep sides of Mt. Oddie and Mt. Brouher at 6,050 feet. Hand-hewn stone buildings line most of Main Street and the hills are dotted with weathered gray wood and aging headframes. Except for some modern buildings and a smaller popula-



Upper left: The original Mizpah claim that started it all. Arrow points to pile of rock locating the famous silver strike. From left: Tasker Oddie, Jenkins, Belle and Jim Butler. Left: the 1976 black powder shoot attracted many women as well as men, and fine guns were to be seen.

ON "BUTLER DAYS"



tion, the town looks much the same as it did in the first years following Jim Butler's discovery of silver.

Jim was a transplanted Californian, a rancher in Monitor Valley who was much more taken with prospecting than staying home with Belle, his part-Shoshone wife. In May of 1900, Jim and his burro were making a trip to Klondike Wells about 15 miles south of the present site of Tonopah. According to legend, the burro wandered off in just the right place and the rock Jim chose to throw at him was heavy with silver. More likely that Jim had both eyes open, as prospectors are wont to do.

Jim showed his samples to assayer Frank Higgs, but Frank wanted no part of it without payment which Jim didn't have. However, Tasker Oddie, a young attorney from New Jersey who would later become Nevada Governor and State Senator, had more faith and better sense. He showed the rock to his friend Walter Gayhart, a science teacher in Austin who ran a backyard assay outfit. The results were incredibly rich and in August, Jim, Tasker and Wilse Brougher set about staking claims.

Jim's original claim was named The Mizpah, an ancient Hebrew word meaning, "The Lord watch between me and

Butler Days 1975. The Tonopah Fire Department and the Gabbs Fire Department stage a water fight in front of the Mizpah Hotel.

thee while we are absent one from another." The choice may have been Belle's touch.

Pah is a Shoshone word for water, or spring. Hence Tonopah, literally translated, means something like water bush, 'though the site was bone dry and early residents used to pay between one and two dollars a gallon for water from a water wagon.

The names proved confusing to at least one person who arrived in Tonopah and saw the word Mizpah. "You know," he said later, "for the longest time I thought it must mean the spring of the Miz."

Soon Mizpah Hill was crawling with people anxious to get in on the action. Jim and his partners quickly adopted a leasing system that was notably short on paperwork and a lot of people, including Frank Higgs, became wealthy from the original strike. Later, the claims were sold to the Tonopah Mining Company.

These events produced a cartoon by Arthur Buel in the *Tonopah Sun* showing a gleeful burro kicking up his heels with a caption that read in part, "Me and Jim found Tonopah." The slogan stuck.

In spite of a pneumonia epidemic that claimed 50 lives during the fierce win-

ter of 1901, Tonopah grew in wild, glorious leaps. By the following year the tents and makeshift buildings had turned into a more permanent town. One sign over the board sidewalk advertised, "A Nice New Bed \$7.50 a Month or 50 cents a Night."

The first railroad into town was built by the Tonopah Mining Company at a cost of nearly one million dollars, thereby doing away with the need to haul everything including laundry in and out by the 20-mule teams. The line was completed July 25, 1904, and the three-day Railroad Days was one of the grandest celebrations ever seen. Jim Butler's burro marched in the parade draped with a sheet bearing the "Me and Jim found Tonopah" slogan.

Twenty-six miles to the south Goldfield, first known as Grandpa, was doing its share of booming. It had been discovered shortly after Tonopah by those too late to get rich from the silver strike and for years was a leading producer of gold.

To the north in Smoky Valley both Manhattan and Belmont had peaked and were fading. By 1905, the county seat was moved from Belmont's \$25,000 courthouse to Tonopah. Only Round Mountain was a new comer with gold being discovered in 1905.

Perhaps the isolation, the dust and grit and the nearly treeless desert environment made the citizens of Tonopah all the more determined to enjoy themselves. Whatever the reason there were many parades in the early days. Bunting whipped in the wind, ladies wore their best dresses, and fine floats were created from little material.

Just as the curve of Main Street remains unchanged Tonopah still puts on a good parade. One of the biggest events is the annual Jim Butler Days celebration, a four-day western spree first held over Memorial Day weekend in May of 1971 in honor of Jim and his burro.

Like the early Railroad Days the "Me and Jim" slogan can be seen everywhere during Butler Days. Although the program varies slightly from year to year, some of the standard events such as mucking and drilling contests are unique to mining camps. The result is

Antique hose cart races were a part of the 1976 Butler Days and a favorite with the youngsters.

four days of free-wheeling entertainment that is remarkably similar to its early day counterpart.

First to appear are the buttons and garters with Jim Butler Days, the year, and Jim's burro pictured in the center. It is a matter of pride to wear a button from each year and many a weathered face will be topped by a hat covered with buttons and garters around both arms for good measure. Woe to the unwary visitor who appears without this badge for he is likely to be made to do time in the Kangaroo Court on Main Street until he bails himself out by buying a button.

Nights are cool in the high desert in May and the black sky is lit by a blanket of stars for the street dance that marks the beginning of most Butler Days. A small band plays on a platform bathed in the yellow light from the saloons that line the street and the party goes on until the small hours of the morning.

Crowds gather early for the parade the following day and by 10 in the morning both sides of the street are lined with townspeople and visitors. Many Nevada officials have ridden down Main Street and Governor Mike O'Callaghan participated when Tonopah combined its Diamond Jubilee with Butler Days in 1975.



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Float cars are no longer decorated with sagebrush as they were for one parade in 1918, however, there are plenty of entires. The Ely Antique Car Club, mounted units, school groups, The Shriners and Junior and Senior Butler Days Queens are but a few who have participated in these parades. In 1976, Mrs. Elizabeth Titlow, who reigned as Senior Queen, remarked, "I came to Tonopah in 1903. There was no water, no lights or anything." An accurate description of the young camp.

When the parade is over there is something for everyone to do. The antique bottle show and sale has grown each year and is one of the highlights of the weekend.

The mucking contest is strictly mining camp fare. Rock from the Belmont Mine is hauled in and dumped in a huge pile on one of the vacant lots in town. The muckers shovel it into an ore car in the old time tradition with a timer keeping watch, no easy task with the sun hot and the rock heavy. Kids are welcome to try their hand in the junior mucking contest.

Drilling contests are part of Nevada history and date back to the earliest celebrations in Tonopah. They are taken seriously in mining camps and a champion driller is a respected man.

A huge block of granite is hauled in from the nearby hills and set on a stand at the vacant lot. In the double jack contest one man crouches, turning the steel drill while the other hammers it into the rock. They may change places as often as they wish and it is done with such precision that they seldom miss a stroke.

In the single jack contest one man hammers and turns the drill with his other hand. When the time keeper calls 10 minutes the hole is measured and the deepest hole is the winner.

It requires technique and endurance. If a stroke is off a man's hand can be badly hurt. The crowd cheers, calling encouragement. "They must have got a real hard rock this year!" "If you win we'll give you the rock!" "Hey Terry, get some powder." There is a red stain where the hammer has missed. "Go Terry, go. We got beer to replace that blood!" "Oh, there goes that knuckle again." The crowd groans if the hammer misses its mark, but no man ever gives up.

When the hard work is done there is food and drink available at a western-style barbecue. A grand ball is given in one of the halls in town and is an affair that calls to mind the old days of dances and gala evenings. A woman in 1890's dress smiles. "I wish more people would wear period costumes," she sighs.

The famous water fight is looked forward to by everyone, especially youngsters. It is probably the grandest scale water fight ever held in the middle of the desert. The Tonopah Fire Department gives an opposing town's fire department a good hosing, or vice versa, with the target being an empty drum strung high above the crowd. In warm weather the resulting showers are welcome.

1976 saw the first antique fire hose cart races. One person pulls the cart while the other rushes to connect the hose and be ready to turn on the water. "Water!" came the call while the cart was only halfway up the street and the hose spurted over a surprised team and crew alike. "Didn't you guys yell for water?" shouted the crew at the hydrant. "No!" came the reply. There was a repressed oath and much laughter, and after this escapade it was standard practice for everyone to yell for water before the teams reached the point of readiness.

Continued on Page 38

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MOJAVE DESERT TURQUOISE

by **MARY FRANCES STRONG**

photos by **Jerry Strong**

■ IN RECENT YEARS, the gemstone of turquoise has risen to unprecedented popularity throughout the United States and possibly the world. Such acclaim is not new to turquoise. It has been treasured by man since prehistoric aborigines used it as an adornment and valuable trading commodity. They also believed the "stone of many blues" possessed mystical qualities which would protect them from evil spirits.

The early Egyptians, Persians, Chinese and Aztecs revered turquoise. Their talented craftsmen produced magnifi-

cent carvings — bowls, vases and other ornamental pieces — as well as beautiful jewelry. Some of these priceless old pieces are still in existence today.

As is to be expected, the current interest in turquoise has led to the publications of several excellent books on the subject. Most of them contain outstanding color photographs of jewelry and rough material from important locales around the world.

Deposits in the United States are well represented by Nevada, Arizona, New Mexico and Colorado. However, not one of the books or magazine articles I have seen discusses or contains photographs of turquoise from the Mojave Desert Region. Not only have these locales produced some top-quality gem material, but they also have proved to be of considerable archeological value.

Left: The Toltec Mine was developed on the site of an aboriginal workings and produced considerable turquoise from 1898 to 1903. Long idle, its massive dump has been a happy hunting ground for rock collectors. Right: This 1963 photo of the Toltec's glory hole could have been taken on my first trip in 1951 or the most recent trip in November 1976. There has been little change during the past quarter century. Tunnels in old mines are dangerous and should not be entered.

The question of "why" the Mojave Desert turquoise was not included along with all the other southwestern locales has bothered me. Certainly, they are well known. My personal knowledge of the region has been obtained through many, many collecting trips. Initially, I had noted reference to the prehistoric workings in a California Bureau of Mines bulletin. I decided to visit the area with the idea of preparing a paper for one of my college courses. A rewrite, two years later, launched me on a writing career.

Though it had been several years since my last visit to the Turquoise Mountains, I knew the deposits were not worked out. For one thing, the collecting is not easy and often only a small piece of turquoise is the reward for hours of screening on the dumps. It is necessary to dig down several feet into the old dumps to find fresh material. There is still some good seam turquoise in the Toltec glory hole. This area is dangerous and the tunnels should not be entered. Even a nice chunk of turquoise is not worth being buried alive in a cave-in.

"How about spending a few days at the turquoise mines?" I queried Jerry when we were planning our fall trip. "Not again!" was his response. Like me, he prefers to explore new places. I explained, "With all this interest in turquoise, it wouldn't surprise me to find some of the old mines under commercial production. I would like to have a look." Jerry concurred.

The Mojave Desert Turquoise District, as it is now called, encompasses a narrow, east-west belt approximately 15 miles long and three to four miles wide. The region is largely volcanic and covered by basaltic flows which radiate in all directions from a central group of craters. These flows are several miles in length and appear as long, low ridges

separating alluvial slopes and steep, rugged canyons. In the valleys and among the basaltic flows are rounded hills consisting of decomposed sandstones and porphyries traversed by ledges of harder crystalline rocks, schists and quartzites. It is in these canyons and hillsides that most of the aboriginal workings will be found.

There are dozens of ancient diggings which appear as saucer-like pits up to 30 feet across. Generally, the surrounding debris will contain small chips of turquoise. The pits are overgrown with brush and it takes a great deal of "shank's mare" to locate them.

Turquoise is believed to have been one of the first minerals used by prehistoric Indians. There is considerable evidence that the Mojave Desert deposits were initially worked over 10,000 years ago. Vast number of artifacts — along with smoke-blackened cave shelters and hundreds of petroglyphs—have been found in the region. They seem to indicate sea-

A 5½-ounce chunk of gem quality, blue-green turquoise found by the author at the Toltec Mine.

sonal use over long periods of time. There is also substantial evidence these deposits were still being exploited as recently as a thousand years ago.

Most authorities feel the turquoise mining was not the work of simple desert Indians, although they probably made the original discovery. Distinct types of artifacts were found associated with the pits — painted pottery, grooved hammers and axes, picks and tortoise carapace "shovels" for excavating crushed rock — all of which were of the higher Puebloan Culture. It is believed these people regularly made the long,





Somehow, it seemed more exciting and venturesome when a hike was required to collect at the Toltec Mine. The arrow points to the author on the trail and gives an idea of the vastness of this wild and rugged terrain.

hazardous journey from the territory that is now New Mexico and Arizona. In view of this, it seems safe to conclude Mojave Desert turquoise may have been found among their artifacts, but its source escaped recognition.

In 1897, T.C. Basset was prospecting north of Halloran Springs and observed "blue-stained rocks" in a white talcose material. A little digging disclosed nodules and small masses of turquoise. Fine, gem material was located some 20 feet below the surface. Basset also uncovered two stone hammers — the first evidence of prehistoric miners! Fittingly, Basset named his claim the Stone Hammer Mine.

News of the archeological find aroused great interest, particularly in San Francisco, California. This resulted in an elaborate expedition to investigate the aboriginal sites. Headed by Gustave Eisen of the California Academy of Science, his account of the findings was published in the March 18, 1898 issue of the *San Francisco Call*. In 1929, the San Diego Museum published the results of a modern archeological reconnaissance of the old workings and associated remains.

Turquoise proved to be abundant and the well-known Toltec and Himalaya Mines were developed. Gem material occurred in minute to 1½-inch veins, as well as nodules disseminated in alteration zones within granite rock. The deposits were shallow with no turquoise being found deeper than 100 feet. Mining was extensive from 1898 to 1903 but

halted when the larger veins appeared to be exhausted. Production was reportedly large though I have been unable to find any record of the amount. Of particular interest is the report of a single, blue stone which cut into a perfect oval weighing 203 carats.

The district has been divided into three sections called "West Camp" (Toltec), "Middle Camp" (Stone Hammer) and "East Camp" (Himalaya). A map, after M.J. Rogers, 1929, and information on the Turquoise District was published in Bulletin 136, Minerals of California, 1948, by the California Division of Mines. A quarter of a century later, a report in Bulletin 189 states that H.E. Pemberton (C.D.M.) had retraced the route and suggests the names of the mines were confused on Roger's original map. This would make the mine names on the map in Bulletin 136 in error.

The mine at West Camp, known as the Toltec, may be the Himalaya. The East Camp Mine may be the Toltec. Confusing? No problem. While it is good to know a mine's proper name, you will find they often have several if they were operated during different periods under various leasees. The Toltec has been known as such for nearly 50 years and probably will continue to be called "Toltec" by long-time desert enthusiasts.

On our recent trip to the Turquoise District, we had chosen a centrally located base campsite and made East Camp our first point of exploration. We

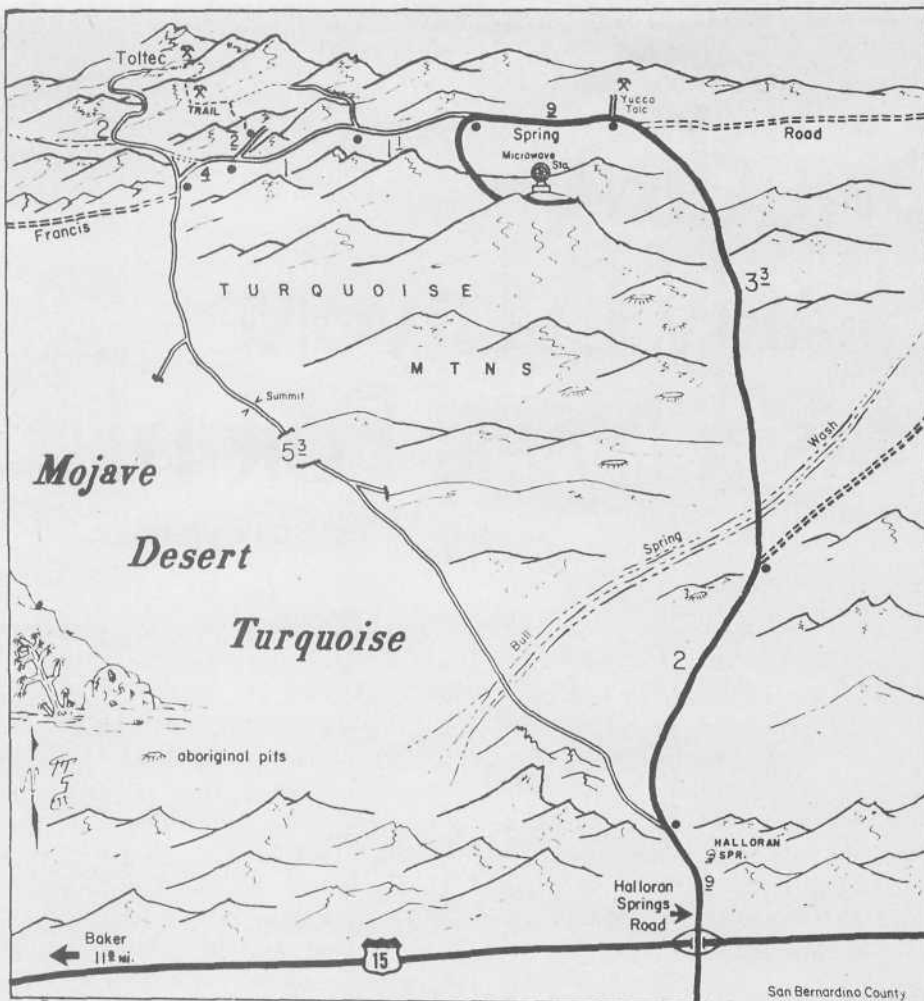
found my 25-year-old map still valid, even though travel is now via a freeway. We followed the old route, passed the Yucca Grove Talc Mine to East Camp. Rather, I should say, to a gate across the road just prior to the camp. There were dire warnings to trespassers, some large "Keep Out" signs and another stating this was the Stone Hammer Mine. Certainly not the original mine but an old name now given to East Camp.

We couldn't find anyone around but it was obvious turquoise was being mined and assumed a new claim has been filed on the old property. We had planned to follow the road west to Halloran Springs but didn't, since the signs indicated hostility. We were sorry there wasn't an opportunity to talk with the occupants. However, it seems doubtful the road could be legally closed. It has served as a connecting link between the three main camps since 1899, as well as giving access to other mines in the locale. Only BLM has been granted the power to close long established roads.

Our next objective was West Camp (Toltec Mine). We elected to make the "loop trip" and headed north on Halloran Springs Road. This seven miles of paving is courtesy of the Microwave Relay Station on Turquoise Mountain and eliminates some sandy sections along the former graded road. Our route skirted the Yucca Talc Mine — not to be confused with Yucca Grove Talc Mine. This deposit is worth looking over as some good, carvable talc has been collected here.

Leaving the paving, we continued on Francis Spring Road (dirt tracks) southwesterly along a wash through the mountains. In about a mile of travel, a new road was encountered on the right. "We better check this road out. It may be a new road to the Toltec since it is heading in the right direction," Jerry advised. We soon found it ended on the side of a peak well above and east of the mine. A new trail appeared to be more difficult than the old one, as it had a steep climb up to the car on the return trip. The old trail was all downslope from mine to car!

Back on Francis Spring Road, another mile of travel brought us to the turnoff and in short order we were parked at the old mine campsite. Nothing remains. Even the tin shack—long a landmark for the trail and shelter on a stormy night—was gone.



We hiked up to the mine and found a new road from the west leads right to the base of the dump! Pickups shouldn't have any problems. The road is graded and has a few steep sections. However, we noted several places where cars had spun their wheels. If this continues and the road is not maintained, four-wheel-drive will become necessary.

Who has graded the new roads and for what reasons, we have not learned. The mine is not posted and there had not been any changes since our previous visit. With the public's considerable interest in turquoise and the high price it now commands, there is always the possibility the Toltec may be reactivated. In the past, it has produced some excellent turquoise of pale blue to bluish-green color.

Rock collectors have been trying their luck at the Toltec for over a quarter of a century. Many have found some nice gem material. If you wonder whether turquoise is still being found today — the answer is yes. Small, but good quality pieces are regularly collected. Are any sizable chunks found? Yes, they are.

A few years ago, I noted a bluish

coating on the south wall of the Toltec's glory hole. I almost didn't check it out, since others I had seen proved to only be paper-thin coatings. Much to my joy, this one was a seam of gem-quality turquoise. It appeared to be an isolated seam running back into the wall. I managed to dig out a number of cabochon-sized pieces and one good-sized chunk. The latter weighed 5½ ounces. There is no matrix and it would probably cut into a dozen lovely, blue-green slabs.

I eventually traded by smaller pieces for other gem material and intended to use the larger specimen in jewelry. The problem now is that I cannot bring myself to cut it. It is not every day I find a beautiful mineral specimen that is also a valuable gem. I feel I have enjoyed it in the rough much more than if it were cut into jewelry.

So — I can personally say — there is still good turquoise at the Toltec. If you have any doubts, drop by and see my specimen. Eventually, someone will uncover another small seam or pocket. When they do, I hope they enjoy as I have — "Mojave Desert turquoise, the stone of many blues." □

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EPHEDRA— NEARLY EVERYONE HAS A NAME FOR IT!

by LUCILE WEIGHT

THE MANY common names used for species of Ephedra is a clue to its wide use. Ephedra has been used by Indians, Spaniards and Mexicans, Mormons and other pioneers, as well as later freighters and prospectors.

The name Joint Fir refers to the grooved and jointed stems. Other names are Mexican Tea or Canutilla, Poptillo, Squaw Tea, Desert Tea.

Among Indian names is Co-oosti or

Kvopat (a newer name) of the Pimas in Arizona, referring to "stick tea," the whole plant appearing like a bundle of sticks, as the leaves are scale-like.

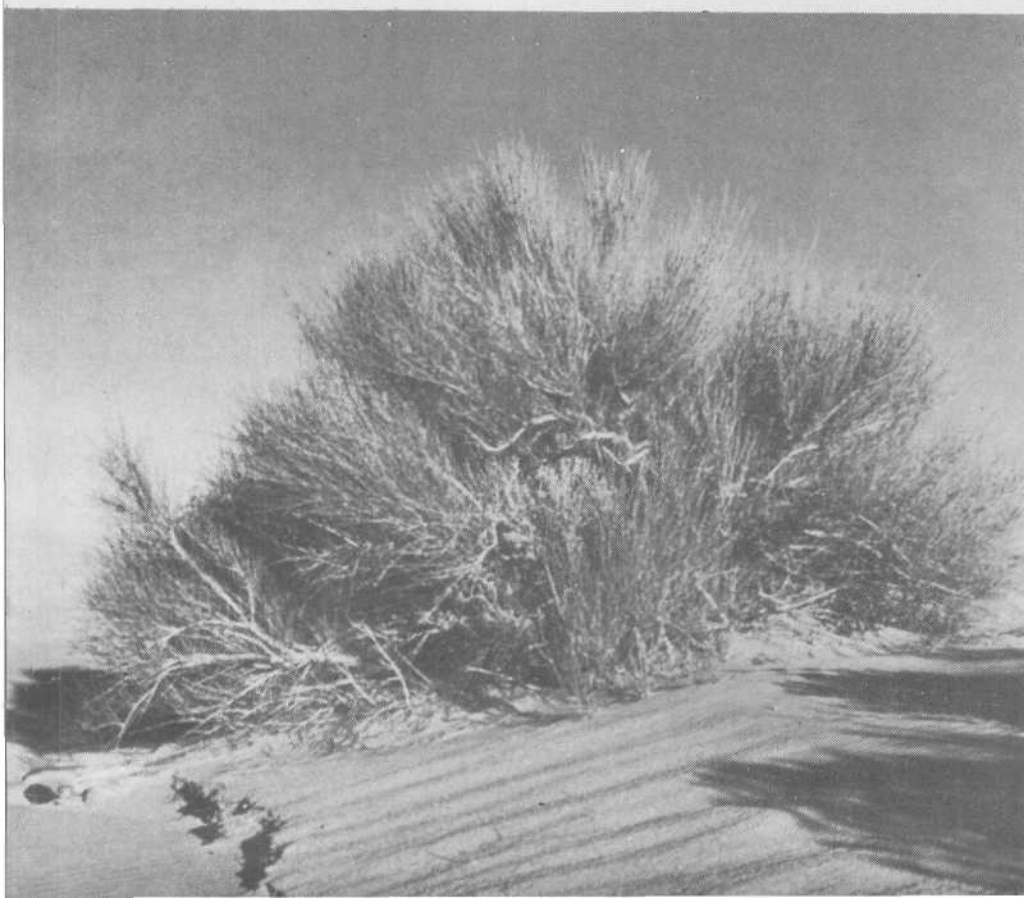
The Cahuilla, of California, stored bundles of Ephedra or "tu-tut" inside their homes, as did the Chemehuevis, formerly, at Twentynine Palms. The Navajo of Arizona and New Mexico had a name for one species that meant "grass waving back and forth."

Ephedra, in the southernmost part of the Colorado Desert, sometimes is the only stabilizing element in loose sandy areas. Indians who lived in now-vanished desert camps, or traveled along waterless trails, found Ephedra both stimulating and thirst-quenching.

We had heard of Mormon Tea, but it was in the Thomas Mountains of Utah, on a 1947 field trip, that Dr. Junius J. Hayes of the University of Utah, told us the "real" name was Brigham Tea, for the Mormon leader, Brigham Young. In the monograph, "Ethnobotany of the Navajo," by Francis H. Elmore, *E. trifurca* is called Mormon Tea, Brigham Tea and Brigham Young Tea, among other names. And *E. viridis* is called Green Mormon Tea. This latter species, according to the Navajo name, is "cough medicine." Many Indians, too, are said to chew the stems to relieve thirst on a waterless trail.

A sad footnote on this use by desert travelers was supplied by Bill Keys, pioneer of Death Valley and Twentynine Palms country. It was Keys who found the body of Johnny Lang, up near Keys View, now in Joshua Tree National Monument, in March 1926. The oldtimer, forever associated with the Lost Horse Mine, had been carrying a little bag of Desert Tea—but no water.

In recent years, as many have become aware of health measures, they have sought more "natural" foods and beverages. And recently the coffee prices have driven many others to seek substitutes. Ephedra, although used for centuries, is new to most people. The ephedrin of the pharmacists is well known, but this comes from the Chinese species, *E. sinica*, used for nearly 3,000 years. Its important ingredient is the alkaloid ephedrin. Our several desert species lack its potency for treatment of various ailments. Nevertheless, they have been used by Indians medicinally and as a tonic, as well as a pleasant beverage.



The tannin of our species serves as a thirst quencher. The author, Mary Austin, who lived in both Owens Valley beside the Sierra Nevada and in New Mexico, wrote that desert tribes in California used the dry stems to chew in lieu of water, and when possible they used the tea to prevent thirst.

Ephedra is best known by laymen as a tea. The Ephedra connoisseur does not steep it, according to some. Boiling is necessary. Some used dried stems, others the green, but there is no choice if it cannot be gathered in its spring prime.

The Navajo, before making the tea, are said to roast the stems, in or near a campfire. This might produce a more effective tea without so much boiling. To prepare the decoction for medicinal use, the Navajo crushed the stems to powder, then stirred it into water. It seems that this powdered form would be especially appropriate for those traveling a long trail with little water or time. Navajo used *E. trifurca* especially for medicine, and *E. viridis* for the beverage, according to Elmore's information.

The Cahuilla boiled *E. nevadensis*, picked in late summer, until the water became wine-colored, according to David Prescott Barrows, who was among these Indians of Coachella Valley and San Jacinto Mountains in the 1890s, and for many years afterward.

Steeping in hot water produced the beverage for the Zuni, using *E. nevadensis*.

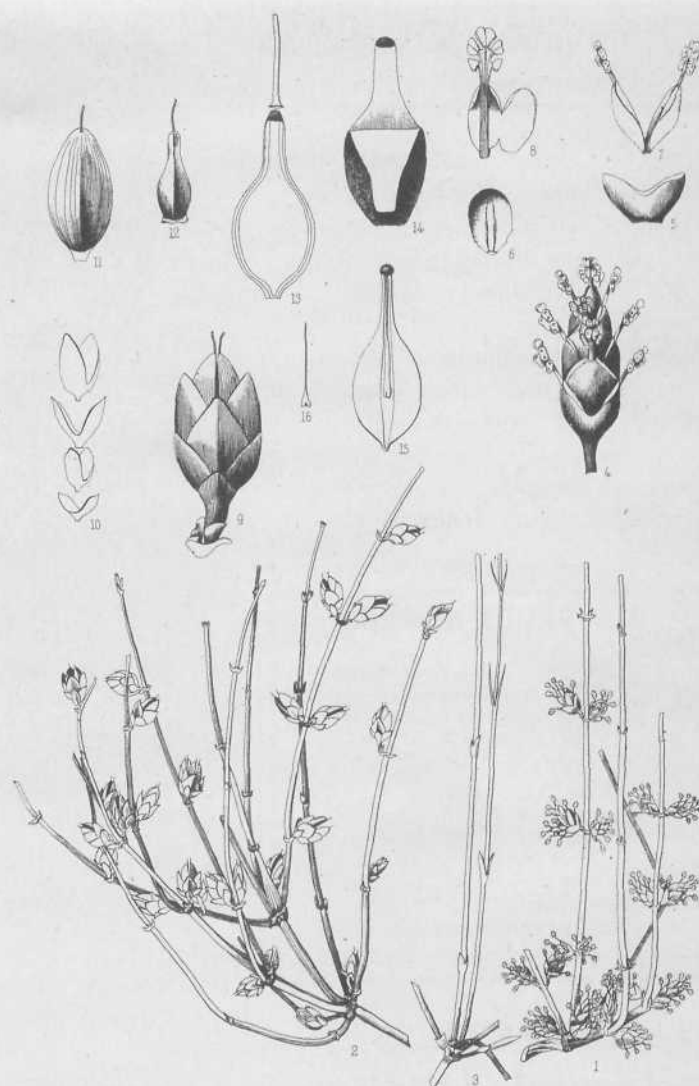
No one can help liking Ephedra tea, declares John Bruno Romero, a Chumash Indian, in his "Botanical Lore of California Indians." Calling it the American Tea of the Indian, he extolls its "delicious taste." And many desert people, Anglos, who have experimented with it, confirm Romero's opinion.

Directions usually call for a "handful" of stems to a cup of water, but this allows wide latitude in the amount, depending on the length of the stem pieces. Some say this combination should be brought to a boil, then allowed to steep 20 minutes.

Naturalist Edmund C. Jaeger described a method of brewing and serving that should appeal to nearly anyone. He prefers the green to the dried form. After ten minutes' boiling, the water should be deep amber. Then add a teaspoonful of sugar per cup, and a bit of lemon or strawberry jam. A variation on this

This engraving, made 106 years ago, shows parts of a species of *Ephedra* collected during the Geological Exploration of the Fortieth Parallel, the report on botany, by Sereno Watson, being published as Vol. V, in 1871.

Most of the plants in the catalog were found in Nevada Utah. Lower left shows branch from fertile or female plant, with scale-like leaves and fertile aments or "cones." At right, the staminate or male plant. Above each is the corresponding cone, enlarged four diameters.



might lend a more complete desert beverage: use some cactus syrup for a bit of sweet.

But Ephedra grows in many places in the Southwest, and if small amounts of the stems are cut carefully, the plant will not be injured. The problem occurs when slow-growing desert plants are harvested for commercial purposes. This not only decimates native vegetation but in many cases it can damage the soil, leading to erosion and creating dust bowls. Ephedra often serves as a sand and soil binder. In places it mounds over dunes, forming stabilizing hummocks such as mesquite does in other desert areas.

Half dozen or more species of Ephedra grow at different elevations from California to Texas and south to Baja California and Sonora. *E. trifurca* is found in low sandy and rocky places below 2,000 feet, in the creosote area. A shorter stemmed species, *E. californica*, grows up to 3,000 feet, in creosote range of Colorado and Mojave deserts, and into the chaparral of

San Diego county. Others found in both deserts are *E. aspera*, *E. viridis* and *E. nevadensis*. Death Valley country has *E. funerea*, growing from 2,000 to 5,000 feet elevation.

The ovulate and staminate flowers or catkins usually occur on different plants, and the little fruiting cones have one seed; or two in case of at least one species. These seeds are nut-like but bitter. Some Indians roasted and ground them, making bread. Panamint Indians were among those using the seed meal in bread.

Cahuilla, after grinding them into meal, made a mush. If any amount of bread or mush was made from these little seeds, the Indians must have collected great bales of the plant. And they did, for besides the tea, Ephedra provided medicine for many ailments.

Regardless of its importance in medicine, tea was the premier product of Ephedra. Many new users are agreeing with Romero, "it is of a very delicious taste." □

TONOPAH BOOMS

Continued from Page 31

Previous years have seen pancake breakfasts, beef and beans luncheons, drag races, air shows, performances by the Tombstone Players, beard contests, black powder shoots and western dancing.

For those who want to wander around town between events there is plenty to see and do. An antique shop, gift shops, a department store and other shops are well worth visiting.

Sadly, some of Tonopah's historic



The 1976 double jack drilling contest. Timekeeper stands to right, watch in hand.

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buildings have fallen victim to fire and the gaping holes along Main Street are mute evidence of the damage fire does in a mining camp.

Some of the buildings to see are the old railroad depot, the fire house above Main Street, the Belvada Apartments which once housed a bank, The Family Drug and the Mizpah Hotel. The old brown shingle house at the top of the Brougner Street hill used to belong to the Knights of Columbus, and around the corner on the farthest point stands Tonopah's castle — supposedly haunted. These last two are private property.

Tonopah is a mecca for dump diggers and people spend days in campers hoping to unearth opium bottles or gold coins. The digging is good and there are many acres of the old dump at the end of Knapp Avenue. "We don't even have a shovel and we're doing pretty well," said a man from California. "I'm a can collector and we found a lot of 'em over there." He gestured to a spot close to the rise of a hill near the dirt road, then shook his head. "My wife sure wishes she'd brought her boots."

A good point to remember. Boots, a pair of gloves, a hat to shade your eyes from the bright desert sun and a jacket. It can be cool in May and these are

recommended for non-diggers as well.

The small flowers of the desert are some of the most beautiful and if you are lucky you will see the roadside carpeted with multi-colored wild blooms, some so tiny you need to get out for a closer look to really appreciate them.

It is wiser not to wander off the main roads if you don't have proper equipment. Try to carry water, warm clothes, a blanket and some food if you plan to do off-the-road sightseeing. It never hurts to let someone know where you plan to go and when you should return.

There are good accommodations in Tonopah including two overnight trailer parks, five motels, a hotel and several restaurants. It is a good idea to make advance reservations for Butler Days.

In 1977 Jim Butler Days promises to be as innovative and exciting as any previous year. Ken Eason, new president of the Chamber of Commerce, hopes to make boxing matches part of the celebration. "After all," he said, "boxing was a tradition in the early days."

Whatever new events are in store it is certain that a good time will be had by all. So plan now to be in Tonopah May 27-30 of this year. You may discover a bit of the Old West for yourself. □



Happenings at Hite

The newest marina on Lake Powell is getting its first major "facelifting," compliments of a new concessioner and the National Park Service.

Hite Marina, at the "top" of Lake Powell, has increased its 1977 houseboat and powerboat rental fleet by 33 percent.

Auto visitors arrive at Hite via Utah 95, dubbed the "Bicentennial Highway" after it was fully paved and dedicated last August. Beginning in March vacationers and sportsmen will see more than new boats at the marina located at the confluence of the Colorado and Dirty Devil rivers, one mile south of the Colorado River bridge.

Scheduled for completion by March 31 are:

New service station, grocery store, boat repair shop and a dry storage area with security fence for 300 boats.

Also, a Marina radio station for boaters and a Unicom radio for airplanes using the Hite air strip.

Additional mooring buoys will be installed.

Considerable utility installations including flush toilets in their campground will be completed by the National Park Service.

The service station, grocery store, boat repair shop and dry boat storage will be operated at one location by Hite Resort & Marina, Inc., a wholly owned

subsidiary of the Del E. Webb Corporation which purchased Hite Marina late in 1976.

Additions by Webb to its rental operations include six new 14- by 36-foot houseboats, sleeping six. Refurbishing is underway on Hite's 1976 fleet of 18 houseboats, each 43 feet and sleeping nine passengers.

Other new services at Hite include guided fishing charters and pick-up of Colorado river-runners at Cataract Canyon 31 miles upstream.

Ten new powerboats are divided between 16- and 18-foot runabouts and 17-foot bass boats.

"We are increasing services in all areas," says Bill Ward, Hite's general manager. "Our radio facilities are important, since Hite previously had no communications facilities of any kind."

"Also, we are now able, via Unicom radio, to meet private and charter airplanes at the 2200-foot Hite air strip, which was surfaced last year by the National Park Service."

Hite is 40 miles south of Hanksville and 55 miles from Blanding, both Utah towns.

Prices and other information can be obtained by writing Hite Resort & Marina, c/o Del E. Webb Corporation, 3800 North Central Avenue, Phoenix, Arizona 85012. □

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TRILOBITES: Geology's Teachers

THE STORY of historical geology contains many plants and animals that lived long ago, but did not survive to the present. The dinosaurs (named from the Greek meaning terrible lizards) have been greatly popularized, and are known to most people. Some ancient fishes are also well known. However, there are many very small animals that had a great effect on the sequence of life on earth. These are just as interesting, or perhaps more so.

The animal that probably had the greatest effect on the story of ancient life is the trilobite. This animal appeared on earth about one billion years after its formation, and lived for about 300 million years thereafter. During this period, many trilobite species appeared, were dominant for a span of time, and then disappeared. Their place was taken by other species of these animals. In all, there were many hundreds of species.

The name trilobite is again from the Greek, meaning three-lobed. The name was given because their body was divided into three parts (lobes); head, a mid-section called a thorax, and an abdominal portion. The earlier members showed this three-part body markedly, but later species did not show it as well.

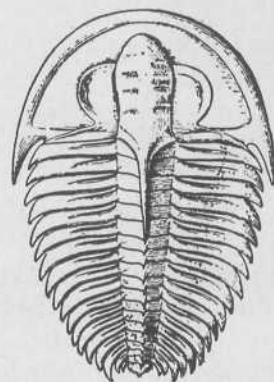
Trilobites were not the first animals to inhabit the earth, although at one time geologists thought this to be true. (Bacteria and worms were evidently the first living things.) Trilobites appeared in huge numbers during what is now known as the Cambrian period. This period (named for Cambria, in England) was the beginning of the Paleozoic era. This name is again from the Greek, meaning ancient life. The fact that life is known to exist in pre-Cambrian times somewhat spoils the meaning of the word paleozoic, but it does denote an era in geologic history.

Trilobites were small animals, ranging in size from about an inch to about four inches in length. Even though diminutive, these animals filled two very important needs of early living things. First, they were nearly all scavengers, living off the dead tissues of other plants and animals. This probably was an im-

portant role; that of keeping the bottoms of large seas clean. Most of them simply crawled over the bottom, using their many legs. Some burrowed through mud, and lost their eyes in the process. A few others were swimmers, again using their many legs.

The second function of trilobites was that they were an important food, perhaps even the staple diet, of many larger animals. Being a food source may seem to be somewhat unimportant, but they were present in huge numbers for nearly 300 million years. This means that they were a good food source from the earliest time up to the age of the dinosaurs and the first of the vertebrates. The dinosaurs and vertebrates did not eat them, for the trilobites were gone by that time, but most animals that preceded the large animals found the trilobites to be at least part of their diet.

As far as is known, no trilobites ever came out of the ancient seas to live on land, and thus could not have been food

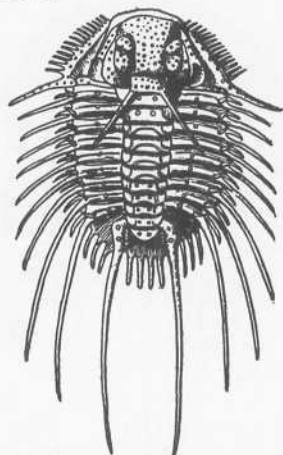


for land animals. There were, however, a number of land animals that are thought to have been descendants of trilobites that did live on land. Insects, crabs, and other like animals evidently had trilobites as forebears. One of these that closely resembles trilobites is still with us today. He goes popularly by the name of sow bug, or pill bug, and any gardener knows him. He is the creature with a fairly hard gray shell which he can roll into a ball when he is attacked. He has the same shell that trilobites had, as well as the many legs. Many of the trilobites rolled into a ball, exactly like the sow bug.

The first of the fishes, which appeared and rose during the Paleozoic era, were bottom feeders and undoubtedly found trilobites to be tasty morsels. Some of the first snails (ammonites) were also bottom feeders. The list is long.

What has the story of the trilobites to do with geology? Their presence in fossil stratas has told geologists many things. The trilobite can be used to tell us what kind of rocks were being eroded at what time, by studying the silt in which they are buried. This can give us a clue to the weather conditions that prevailed at the time. The presence of trilobites with other fossil remains can help place a second animal in time. In turn the second animal can date another geological formation.

Trilobite species changed greatly during those 300 million years. The changes were, at least in part, due to the pressures of their environment. They developed new ways to defend themselves, and new ways to better gather and use the food that was available to them. These animals changed over this time, from simple crawling bottom dwellers, to relatively complex animals with special adaptations.



Toward the end of the span of trilobites, some species became very ornate and covered with spines or other appendages. At first, geologists assumed this to be simple defensive mechanisms to protect against predators. Later, a biologist came up with a theory that when an animal cannot cope with a changing environment, it will become ornate and complex in order to possibly conform to a hostile surrounding.

As is the case with most new ideas, other biologists viewed this with some skepticism. A previously perplexed geologist came to his aid by pointing out that exactly that same thing had happened to the trilobites during their last days. Thus, the trilobite was a contributor to biological thinking.

Trilobite fossils are found in many regions. Many fine examples are found in the central and midwestern portion of

our country. Other Cambrian, or later Paleozoic deposits in other parts of our country, as well as many parts of the world, yield excellent examples of trilobites.

Our own desert has one deposit of Cambrian trilobites that is reasonably easy to reach, and yields good fossils. About 15 miles east of the nearly deserted town of Amboy, California, the Marble Mountains lie astride of Highway 66. This highway has been replaced by the Interstate 40 freeway, and accounts for the decline of Amboy. Between Amboy and the Marble Mountains is a small community known as Chambless, which also is nearly deserted. At Chambless, a gravel road turns south toward Rice which is a railroad community. A few miles south of Chambless, a telephone line crosses the road. By taking the two-track road that parallels the telephone road, and going east, the southern end of the Marble Mountains will be seen. When the mountains are as close as is possible to this telephone line road, a dim trail should be seen leading to an old quarry at the end of the mountains.

The trilobite deposit lies just above

and slightly to the west of the quarry. The shale which contains the fossils is brownish and quite soft.

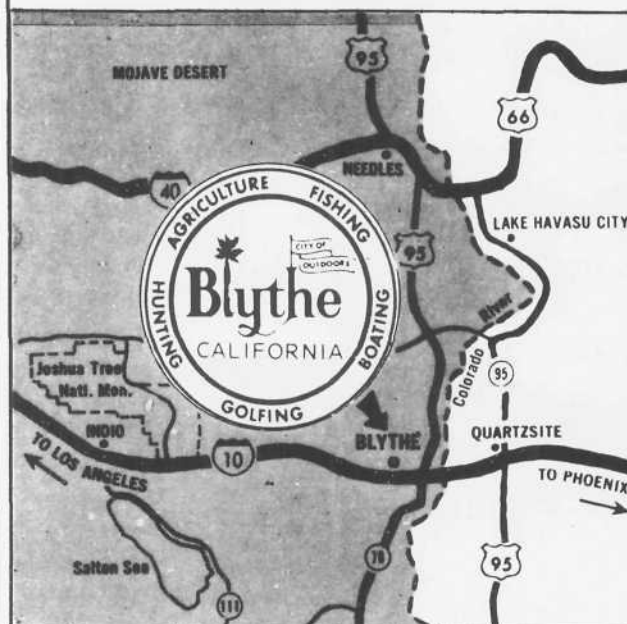
A word of caution; most of these roads are maintained only at infrequent intervals, or not at all. Even though the distance from Chambless is not far by automobile, it is a long way on foot. If you wish to gather trilobite specimens, be certain you have a vehicle that is capable of making the trip. Be certain that someone knows (not necessarily the people at Chambless) exactly where you are going. Better yet, do the trip with two vehicles. If there is any doubt about the last section of road, leave one vehicle at the telephone line road.

Over the years of our desert experiences, we have given directions to many people. As a result, more than one member of a Sheriff's office has given us dire threats if we direct someone out into the desert that they have to go out and rescue. To date we have not felt the wrath of the Sheriff's Department, and we would like to keep the record as is.

So, dig your trilobites, be safe while on your trip, and return under your own power! □

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CALIFORNIA GOLD CAMPS, a Geographical and Historical Dictionary of Camps, Towns and Localities Where Gold Was Found and Mined, and of Wayside Stations and Trading Centers, by Erwin G. Gudde. Includes 7 excellent maps, in addition to a List of Places by County, a Glossary and Bibliography. Highly recommended. Hardcover, 467 pages, \$19.50.

THE WESTERNERS by Dee Brown. The author follows the frontiersman into his heroic world—tells the story of early explorers, trappers, fur traders, Forty-niners, builders and operators of stagecoach and mail services, telegraphs and railroads—through the experience of a few influential, representative Westerners—white men, white women and Indians. Hardcover, beautifully illustrated with color and black and white photos, 288 pages, originally published at \$17.95, now priced at \$7.98.

MEXICO'S WEST COAST BEACHES by Al and Mildred Fischer is an up-to-date guide covering the El Golfo de Santa Clara to the end of the highway at Manzanillo. Excellent reference for the out-of-the-way beaches, in addition to the popular resorts such as Mazatlan and Puerto Vallarta. Although traveling by motorhome, the Fischers also give suggestions for air, auto, ferry and train travel as well. Paperback, well illustrated, 138 pages, \$3.00.



ADVENTURES IN THE REDWOODS by Harriett E. Weaver. The fascinating story of the giant redwood is told by Harriett E. Weaver, whose career as California's first woman park ranger was spent among these living skyscrapers. A detailed guide to all major redwood groves in both the coastal and Sierra regions is included. Beautifully illustrated, paperback, \$2.95.

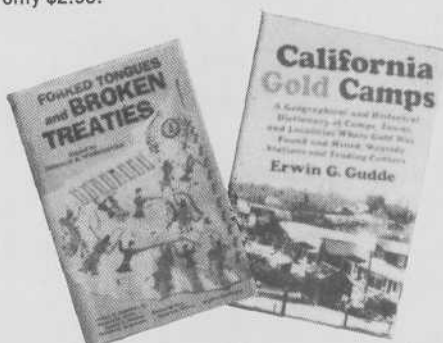
HANDBOOK OF CALIFORNIA BIRDS by Vinson Brown, Henry Weston Jr., and Jerry Buzzel. This second enlarged edition includes facing color plates showing numerous similar-looking birds for comparison at a glance; the names of each birds on each color plate so you can use a hand or card to cover them to test your ability to identify them; new sections on bird courtship in addition to sections on migration, eggs and nest, bird territorial behavior, etc. Paperback, beautifully illustrated, 224 pages, \$7.95.

CALIFORNIA DESERT WILDFLOWERS by Philip A. Munz. Illustrated with both line drawings and beautiful color photos, and descriptive text by one of the desert's finest botanists. Paperback, \$3.95.

THE AMERICAN WEST, A Natural History by Ann and Myron Sutton. A first-hand information-packed description of the plant and animal life and geological evolution of the 15 major natural areas of America's West, illustrated with magnificent photos (71 in color) and maps, makes it clear just why the forests, animals, flowers, rivers, deserts and caves of the Land of the Big Sky are exactly as they are. Large 10"x12 1/2" format, hardcover, 272 pages, originally published at \$25.00, now only \$12.98.

RELICS OF THE REDMAN by Marvin & Helen Davis. Relics can be valuable! Those dating back to Indian history in our land are becoming almost priceless, say the authors. How to search for these "hard to find" Indian relics, where to search and at what time of year, and types of tools needed, are among the many helpful suggestions given. Large format, many color and b/w illustrations, a striking cover. Paperback, 63 pages, \$3.95.

THE GOLD MINES OF CALIFORNIA: Two Guidebooks. Includes *California and Its Gold Regions* by Fayette Robinson. A typical guidebook which was rushed from the presses to sell to the Forty-niners; and *California in 1850 Compared With What It Was in 1849, With A Glimpse At Its Future Destiny* by Franklin Street. More realistic and lacking the flamboyant optimism which marred most of the 1849 guides. Hardcover, another in the "America's Pioneer Heritage" Series, originally published at \$10.00, now only \$2.95.



17th CENTURY MISSIONS OF THE SOUTHWEST by Francis B. Parsons. The author reveals the fascinating history of the old churches, monuments and ruins of the Southwest that we see today. Well illustrated with photos of each mission. Paperback, \$2.95.

RAILROADS OF NEVADA AND EASTERN CALIFORNIA VOL. I by David F. Myrick. The poignant record of over 43 railroads of Northern Nevada, many of them never before chronicled. Fantastic reproduction of rare photographs and maps (over 500). A deluxe presentation. Large format, hardcover, \$15.00.

RAILROADS OF NEVADA AND EASTERN CALIFORNIA VOL. II by David F. Myrick. Just as Vol. I detailed the history of the Northern Roads, Vol. II expands the railroad history of the Southern Roads of Nevada. This volume also contains a useful Index to both volumes, and is a reliable and accurate travel guide today as the reader wanders among the ghost towns of the past. Lavishly illustrated with maps and old photos, large format, hardcover, \$15.00.

DESERT VACATIONS ARE FUN by Robert Needham. A complete, factual and interesting handbook for the desert camper. Valuable information on weather conditions, desert vehicles, campsites, food and water requirements. Information on desert wildlife, mines, ghost towns, and desert hobbies. Paperback, illustrated, 10 maps, 134 pages, \$3.95.

LOAFING ALONG DEATH VALLEY TRAILS by William Caruthers. Author Caruthers was a newspaper man and a ghost writer for early movie stars, politicians and industrialists. He "slowed down" long enough to move to Death Valley and there wrote his on-the-spot story that will take you through the quest for gold on the deserts of California and Nevada. Hardcover, old photos, 187 pages, \$4.25.

LOST MINES OF THE GREAT SOUTHWEST by John D. Mitchell. The first of Mitchell's lost mine books is now available after having been out-of-print for years. Reproduced from the original copy and containing 54 articles based on accounts from people Mitchell interviewed. He spent his entire adult life investigating reports and legends of lost mines and treasures of the Southwest. Hardcover, illustrated, 175 pages, \$7.50.

ANZA CONQUERS THE DESERT, Commissioned by James S. Copley, Written by Richard F. Pourade. The story of the conquest of the Great Desert by Juan Bautista de Anza. The colonization of California in the 1770s received its greatest impetus with the opening of the overland route from northern Mexico. Hardcover, beautifully illustrated, 216 pages, large format, \$12.50.

OUR HISTORIC DESERT, The Story of the Anza-Borrego State Park. Text by Diana Lindsay, Edited by Richard Pourade. The largest state park in the United States, this book presents a concise and cogent history of the things which have made this desert unique. The author details the geologic beginning and traces the history from Juan Bautista de Anza and early-day settlers, through to the existence today of the huge park. Hardcover, 144 pages, beautifully illustrated, \$10.50.



THE CHEMEHUEVIS by Carobeth Laird. A superb ethnography destined to become a classic in anthropology, by the author of *Encounter With An Angry God*. Based on information provided by the author's husband, George, a Chemehuevi tribesman, the work is a delight to both scholars and general readers. With glossary, maps, index, place-name index and appendices on language and cartography. Beautifully decorated. Paperback, 349 pages, \$8.95 paperback, \$15.00 hardcover.

CALIFORNIA by David Muench and Ray Atkeson. Two of the West's greatest color photographers have presented their finest works to create the vibrations of the oceans, lakes, mountains and deserts of California. Their photographic presentations, combined with the moving text of David Toll, makes this a classic in Western Americana. Large 11x14 format, hardcover, 186 pages, \$27.50.

JEEP TRAILS TO COLORADO GHOST TOWNS by Robert L. Brown. An illustrated, detailed, informal history of life in the mining camps deep in the almost inaccessible mountain fastness of the Colorado Rockies. 58 towns are included as examples of the vigorous struggle for existence in the mining camps of the West. 239 pages, illustrated, end sheet map, hardcover, \$7.95.

GHOST TOWNS OF THE COLORADO ROCKIES by Robert L. Brown. Written by the author of *Jeep Trails to Colorado Ghost Towns*, this book deals with ghost towns accessible by passenger car. Gives directions and maps for finding towns along with historical backgrounds. Hardcover, 401 pages, \$7.95.

THE WEST

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NATIVE TREES OF SOUTHERN CALIFORNIA by P. Victor Peterson. Interesting and descriptive text with line drawings and four-color photos, as well as individual maps of areas covered. Handy size makes it ideal for glove compartment. Paperback, 136 pages, \$2.95.

THE COLORFUL BUTTERFIELD OVERLAND STAGE by Richard Pourade and Marjorie Reed. With 21 stage coach paintings by Miss Reed, the text concentrates on the Fort Yuma to San Francisco run of the tough Butterfield route. Album format, heavy art paper, \$6.50.

DOWN THE COLORADO: The Diary of the First Trip Through the Grand Canyon, photographs and epilogue by Elliot Porter. Contains John Wesley Powell's dramatic journal of 1869 when ten men in four boats swept down the raging Colorado River, over rapids considered impassable, to chart the unexplored river and its surrounding canyons. Includes a 48-page gallery of four-color photographs by America's foremost photographer of nature. Hardcover, large 10 1/4"x14 3/4" format, 168 pages. Originally published at \$30.00, now priced at \$9.98.



GOLDEN CHIA by Harrison Doyle. The only reference book on the chia plant and seed. This book illustrates the great difference between the high desert chia, and the Mexican variety sold in the health food stores. If you study, practice and take to heart, especially the last ten pages of this nutritionally up-to-date, newly revised book, you will find many answers you've been searching for to the achievement of health and well being, lengthen your life expectancy measurably, and be 99% less susceptible to disease of any sort. Fourth printing, 105 pages, illustrated. Paperback \$4.75, cloth, \$7.75.

STAGECOACH WEST by Ralph Moody. The lively story of stagecoaching in the West, which provided the lines of rapid communication, hauled the wealth of a new nation, and helped Americans settle the region between the Missouri and the Pacific. Well illustrated, including many detailed maps. Hardcover, 341 pages, originally published at \$8.95, now only \$3.98.

A HISTORY OF THE COMSTOCK SILVER LODE AND MINES, Nevada and the Great Basin Region, Lake Tahoe and the High Sierras, by Don De Quille [William Wright]. Gives an excellent description of Nevada mining, particularly in the period of its greatest productivity. Also includes history of the region, its geography and development. Hardcover, one of the "America's Pioneer Heritage" Series, 158 pages, originally published at \$6.95, now priced at \$2.95.

100 DESERT WILDFLOWERS by Natt Dodge. Each flower is illustrated with a 4-color photograph and described in detail, where found, blooming period, etc. Habitats from sea level to 4,000 feet. Slick paperback, 64 pages, \$2.00.

100 ROADSIDE WILDFLOWERS by Natt Dodge. A companion book and with the same format as 100 Desert Wildflowers, this book lists 100 flowers found from 4,000 to 7,000-foot levels. Also has 4-color photographs. Slick paperback, 64 pages, \$2.00.

A FIELD GUIDE TO WESTERN REPTILES AND AMPHIBIANS by Robert C. Stebbins. A Peterson Field Guide. 207 species, 569 illustrations, 185 in full color, 192 maps. The best book of this type. Hardcover, \$6.95.



TREASURE HUNTER'S MANUAL #7 by Karl von Mueller. Treasure, or treasure trove, may consist of anything having a cash or convertible value; money in all forms, bullion, jewelry, guns, gems, heirlooms, genuine antiques, rare letters and documents, rare books and much, much more. This complete manual covers every facet of treasure hunting. Paperback, 293 pages, illustrated, \$6.50.

UTAH GEM TRAILS by Bessie W. Simpson. Newly revised edition for the casual rockhound or collector interested in collecting petrified wood, fossils, agate and crystals. The book does not give permission to collect in areas written about, but simply describes and maps the areas. Paperback, illustrated, maps, \$3.50.

WILDLIFE OF THE SOUTHWEST DESERTS by Jim Cornett. Written for the layman and serious students alike, this is an excellent book on all of the common animals of the Southwest deserts. A must for desert explorers, it presents a brief life history of everything from ants to burros. Paperback, 80 pages, illustrated, \$2.99.

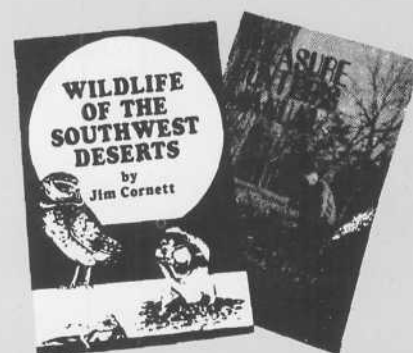
BROKEN STONES, The Case For Early Man in California by Herbert L. Minshall. "The Broken Stones" peels back some of the story of man in America, back beyond the longest racial memory. Author Minshall pulls together all that has been learned or suggested by amateurs as well as experts, including his own discoveries. To them the broken stones are beginning to speak—and they speak of the presence of man on the American Continent many thousands of years before he shaped the first bow and arrow. Large format, beautifully illustrated, hardcover, \$16.50.

YOUR DESERT AND MINE by Nina Paul Shumway. A significant history of California's Riverside County's date culture from its origins to the present. A fascinating, true story of the fascinating Coachella Valley. Limited quantity available. Hardcover, an historian's delight, 322 pages, \$8.95.

200 TRAILS TO GOLD, A Guide to Promising Old Mines and Hidden Lodes Throughout the West by Samuel B. Jackson. Rated by the pros as "one of the best," this comprehensive guidebook is jam-packed with detailed descriptions of hundreds of gold-prospecting opportunities, histories of past bonanzas, and stories of still-to-be-located lost mines. It covers every gold-bearing section of the United States. Hardcover, 348 pages, illustrated, \$8.95.

DESERT EDITOR by J. Wilson McKenney. This is the story of Randall Henderson, founder of DESERT Magazine, who fulfilled a dream and who greatly enriched the lives of the people who love the West. Hardcover, illustrated with 188 pages, \$7.95.

FROM THIS MOUNTAIN, CERRO GORDO by Robert C. Likes and Glenn R. Day. The height of the boom, the decline—the entire history of this mining outpost of Cerro Gordo is told in detail. Paperback, illustrated, \$3.95.



ON DESERT TRAILS by Randall Henderson, founder and publisher of Desert Magazine for 23 years. One of the first good writers to reveal the beauty of the mysterious desert areas. Henderson's experiences, combined with his comments on the desert of yesterday and today, make this a MUST for those who really want to understand the desert. ORDER NOW, LIMITED QUANTITY AVAILABLE! Hardcover, 375 pages, \$7.50.

THE OLD TRAILS WEST by Ralph Moody. The story of great legendary routes that bound a wild land into a nation. The Oregon Trail, El Camino Real, the Butterfield Overland Mail, The Santa Fe Trail and many more names that conjure up the romance of the past. It recounts the true stories behind the trails and how they contributed to the settling of the West. Illustrated with maps and reproductions of authentic old prints. Hardcover, 318 pages, originally published at \$8.95, now only \$3.98.

THE OREGON DESERT by E. R. Jackman and R. A. Long. Filled with both facts and anecdotes, this is the only book on the little but fascinating deserts of Oregon. Anyone who reads this book will want to visit the areas—or wish they could. Hardcover, illustrated, 407 pages, \$8.95.

BUTCH CASSIDY, My Brother by Lula Parker Betenson. Official version of the authentic life story of Butch Cassidy, actually Robert Leroy Parker, famed outlaw of his native Utah and adjoining states, told by his surviving sister. The book also offers a new look at Utah Mormon history by a participant. Hardcover, many rare pictures, 265 pages, \$7.95.

THE SALTON SEA, Yesterday and Today, by Mildred deStanley. Includes geological history, photographs and maps, early exploration and development of the area up to the present. Paperback, 125 pages, \$1.75.

Letters to the Editor

Letters requesting answers must include stamped self-addressed envelope

Television Substitute . . .

We have just returned home from a mountain cabin where we spent the Christmas Season. While there we noticed a rack full of *Desert Magazines* dating back to the 1940s. Since there was no television to watch, the evenings seemed so long we started reading and thoroughly enjoyed it—especially the issues of *Desert*.

We would like very much to subscribe to your publication, and would appreciate information on how to obtain some of the older issues.

MR. & MRS. ROBERT HENDRICKS,
Huntington Beach, California.

10-Code Info . . .

In reference to the October 1976 issue of *Desert* and the article by Mary Frances Strong about CB radios and their use, I would like to ask for a confirmation on the 10-Code you published. I came up with some conflicting information from a CB handbook.

KURT RASEMANN,
Westminster, California.

Editor's Note: The 10-Code published in Desert is the one generally used by emergency teams [React, Alert, etc.]. It is taken, in part, from the 10-Code of the Los Angeles County Sheriff Department.

There is no "final authority" for the 10-Code and you will find many conflicting codes being published.

My advice is "use the one the emergency teams use." Mary Frances Strong.

Knew Shorty Harris . . .

In 1930 I went to see Shorty Harris, California's most famous prospector, in Ballarat where he was living in an old school house. He was in bad shape physically including bad prostate trouble. He said he once had gone to Paris with \$15,000 and painted the town red and nobody could take that from him. He discovered Rhyolite and Harrisburg and other mines.

I went up to Panamint, walking the last part as it was steep and the road was very wet.

Chris Wicht, an old-timer, was living at the mill at the mouth of the canyon. He was having heart trouble.

According to Shorty Harris the original Panamint of 1880 was the old stone buildings. Above those is a large mill with a high smoke stack and other buildings all built about 1913 by a promoter from Atascadero to sell stock.

The original Panamint was bought by Senator Clark of Nevada with his money from Virginia City mines. He also bought Santa Monica for a deep water port and railroad terminus for Panamint. Panamint mines played out but Santa Monica did real well and still does. There is a monument to Senator Clark on the bluff overlooking the ocean at the foot of Wilshire Boulevard where the Senator used to sit and watch the sunset.

I wrote to Harry Carr (the columnist for the *Los Angeles Times*) and told him Shorty Harris was going fast. Carr interviewed Shorty and gave him a double-page write-up in the *Sunday Times*. Shorty Harris, the single blanket prospector, was buried on the floor of Death Valley next to his old friend, the mule team driver.

I have been a subscriber to *Desert* for over 30 years.

NEWELL CHARDE,
Niland, California.

The Happy Herpetologist . . .

My neighbor and I were talking on the subject of Anza-Borrego State Park, and he mentioned he had just received his monthly copy of *Desert* which contained an article on that area. He let me see that issue, as well as the whole year's issues, and all I can say is there are no words fitting to describe *Desert* magazine.

To me, a person who loves reptiles and also breeds them, not one issue failed to publish something on wildlife, and I don't mean just furry creatures, but also insects, etc. How wonderful.

Please enter my subscription, and I'll be looking forward to more articles on reptiles.

SHARKEY SIMPSON,
Los Angeles, California.

Desert Tortoise Rooter . . .

"The Desert Tortoise," by Gloria Nowak in the February issue of *Desert Magazine* was very interesting indeed. The Desert Tortoise are very few in numbers, are found only in certain localities of the desert and are on the verge of extinction. I feel the fine of \$500.00 for taking a Desert Tortoise is much too low.

I have always been a conservationist at heart and wish to keep our wildlife for those to see after we are gone. By setting aside their natural habitat is the only way to save the Desert Tortoise from being totally destroyed, as I see it.

ELMO MENETRE,
T. or C., New Mexico.

Calendar of Events

APRIL 9 & 10, Paradise of Gems, sponsored by the Paradise Gem and Mineral Club, Veteran's Memorial Hall, Elliott and Skyway, Paradise, Calif. Free camping for Dealers and Guest Exhibitors. Dealer space taken. Admission 50 cents.

APRIL 16 & 17, Santa Barbara Mineral and Gem Society's 19th Annual Show. Earl Warren Showgrounds, Santa Barbara, Calif. Demonstrations. Dealer space filled.

APRIL 16 & 17, 7th Annual Show of Northside Gem and Hobby Club, Wendell High School Gym, Wendell, Idaho. Dealers.

APRIL 23-24, Annual Spring Show sponsored by the Antelope Valley and Palmdale Gem and Mineral Clubs, Fair Center Hall, A.V. Fairgrounds, corner of Division St. and Ave. I, Lancaster, Calif. Field trips daily, dealer spaces filled. Parking and admission free.

APRIL 23 & 24, Silvery Colorado River Rock Club's Tenth Annual River Gemboree, Junior High School, Hancock Rd., Holiday Shores, Bullhead City, Arizona. Exhibits, field trips, demonstrators. Parking and admission free.

APRIL 23 & 24, 10th Annual Kern County Heritage Days Celebration sponsored by Heritage Days Committee, Bakersfield, Calif. Old-time observance at Kern County Museum Pioneer Village. Free admission, parade, exhibits, entertainment.

APRIL 23 & 24, 12th Annual "Gold Dust Days" show, sponsored by the Amador County Gem & Mineral Society, Amador Co. Fairgrounds, Plymouth, Calif. Dealers, displays, field trips, camping spaces.

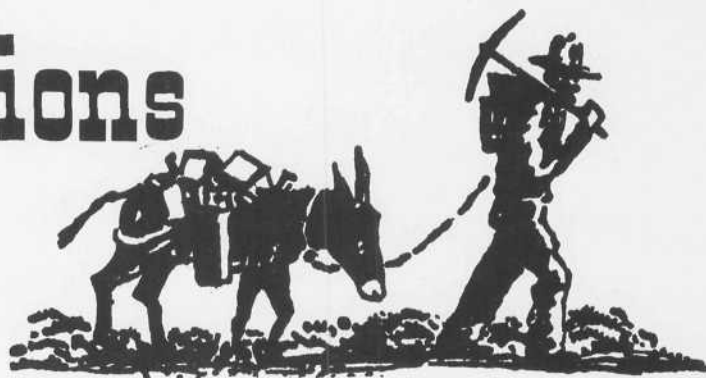
APRIL 23 & 24, South Bay Lapidary and Mineral Society's 28th annual show, Torrance Recreational Center, 3341 Torrance, Torrance, Calif. Free admission and parking.

APRIL 30-MAY 1, Million Dollar Gem Show sponsored by El Monte, Canyon City, La Puente Clubs, Los Angeles County Fairgrounds, Pomona, Calif. Displays, dealers, special exhibits.

APRIL 30-MAY 1, Norwalk Rockhounds 13th Annual Gem Show, Masonic Lodge, 12345 E. Rosecrans Ave., Norwalk, Calif. Admission free. Prizes.

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