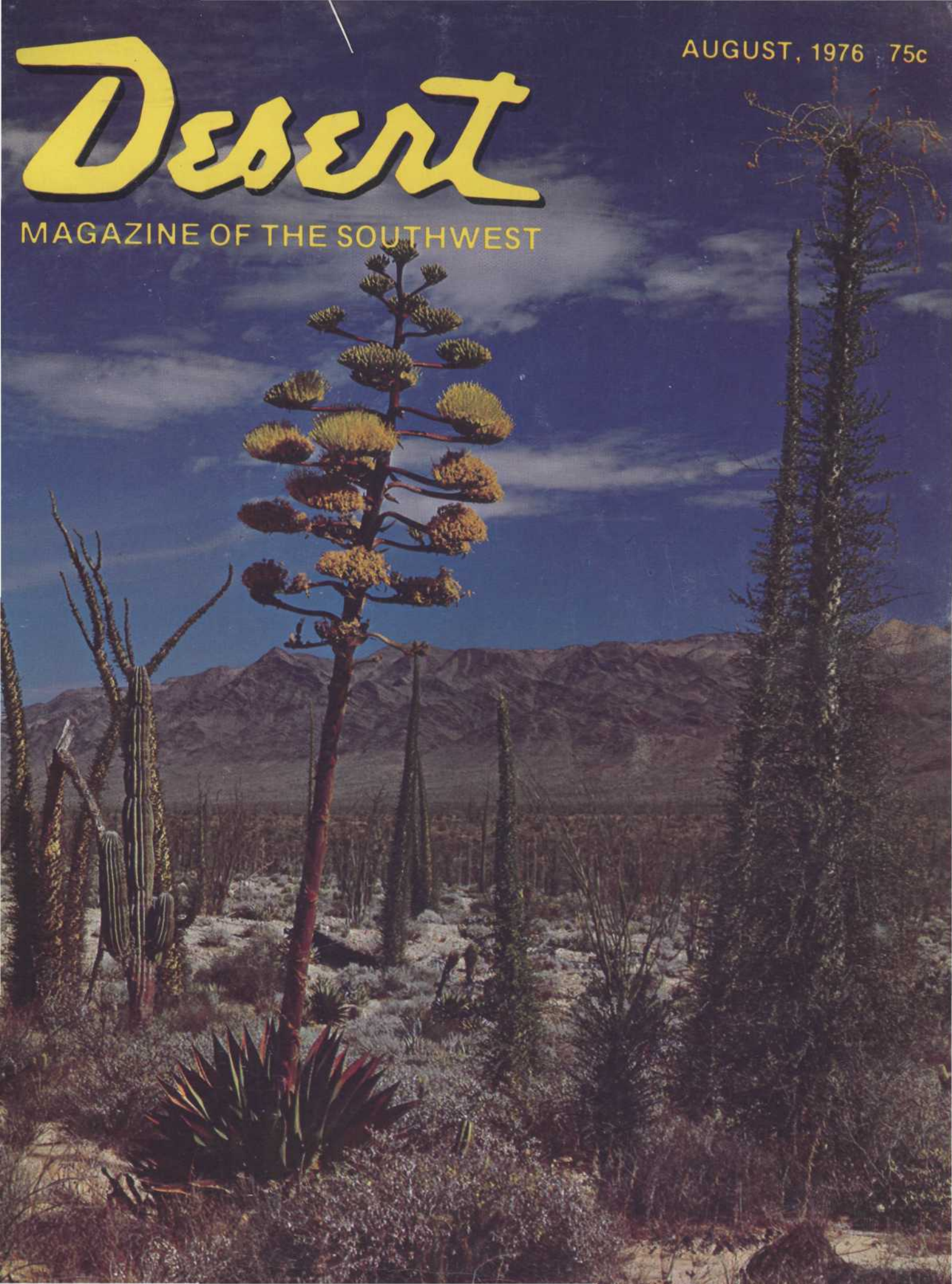


AUGUST, 1976 75c

Desert

MAGAZINE OF THE SOUTHWEST



INDIAN BOOKS OF INTEREST

TEMALPAKH by Lowell John Bean and Katherine Siva Saubel. *Temalpakh* means "from the earth," in Cahuilla, and covers the many uses of plants used for food, medicine, rituals and those used in the manufacturing of baskets, sandals, hunting tools; and plants used for dwellings. Makes for a better understanding of environmental and cultural relationships. Well illustrated, 225 pages, hardcover, \$10.00; paperback, \$6.50.



TURQUOISE, The Gem of the Centuries by Oscar T. Branson. The most complete and lavishly illustrated all color book on turquoise. Identifies 43 localities, treated and stabilized material, gives brief history of the gem and details the individual techniques of the Southwest Indian Tribes. Heavy paperback, large format, 68 pages, \$7.95.

ROCK DRAWINGS OF THE COSO RANGE by Campbell Grant, James Baird and J. Kenneth Pringle. A Maturango Museum publication, this book tells of sites of rock art in the Coso Range which, at 4000 feet, merges with the flatlands of the northern Mojave Desert. Paperback, illustrated, detailed drawings, maps, 144 pages, \$3.95.

DICTIONARY OF PREHISTORIC INDIAN ARTIFACTS OF THE AMERICAN SOUTHWEST by Franklin Barnett. A highly informative book that both illustrates and describes Indian artifacts of the Southwest, it is a valuable guide for the person interested in archaeology and anthropology. Includes 250 major types of artifacts. Each item has a photo and definition. Paperback, 130 pages, beautifully illustrated, \$7.95.



THE ROCKS BEGIN TO SPEAK by LaVan Martineau. The authors tells how his interest in rock writing led to years of study and how he has learned that many—especially the complex petroglyphs—are historical accounts of actual events. Hardcover, well illustrated, glossary, bibliography, 210 pages, \$8.95.



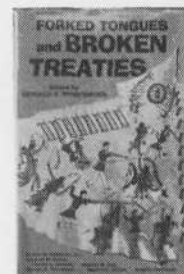
GOLDEN CHIA by Harrison Doyle. This book illustrates the great difference between the high desert chia, and the Mexican variety presently sold in the health food stores. It identifies the energy-factor, a little-known trace mineral found only in the high desert seeds. Also includes a section of vitamins, minerals, proteins, enzymes, etc., needed for good nutrition. Referred to as "the only reference book in America on this ancient Indian energy food." 100 pages, illustrated, Paperback, \$4.75; Cloth Cover, \$7.75.

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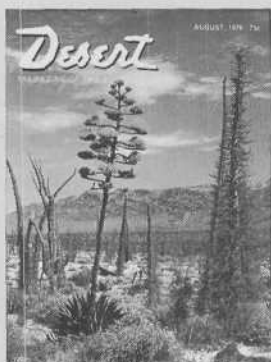
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THE COVER:

Spring in the desert of central Baja California, Mexico. Like a torch, a flowering agave reaches skyward, seen against a forest of the strange, pole-like cirio trees (*Idria columnaris*) with the ruggedly weathered Sierra de Calamajue as a background. Photo by Josef Muench, Santa Barbara, California.

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One of this month's authors, Russell Wahmann (see photo), works as a cartographer for the U.S. Geological Survey.

His article "On the Trail of the Kino Missions" was written when he was located in Flagstaff, Arizona, but he is now in Washington, D.C. Russell's hobbies are historical research and writing that often end up as published works.

Other features in this issue include Fred Cook's tale about Fort Stockton in

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Russell Wahmann

Texas and how life was in the 1880's; Utah's forts are reviewed by Joe Kraus and Ruth Heiner takes us to Idaho and the City of Rocks.

Back in California, Richard Taylor takes his metal detector to the ghostly remains of Barnwell; Van Wilkinson details the history of Modoc County and Jerry Harrell elaborates on safety and a new dune buggy used by the BLM in the Imperial Sand Dunes.

Naturalist K. L. Boynton rounds out the issue with his usual delightful treatment of the Western White-winged Dove.

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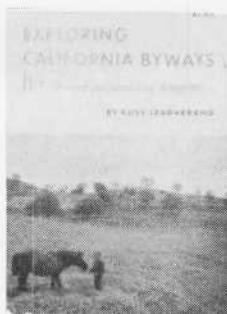
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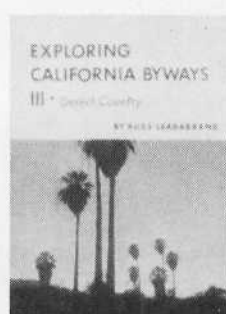
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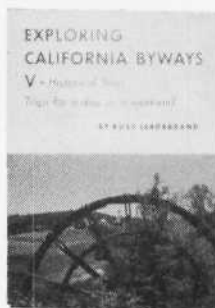
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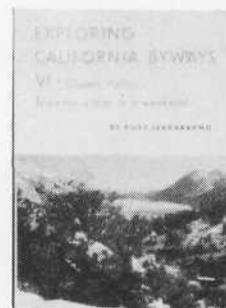
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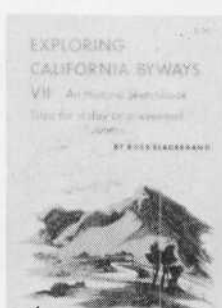
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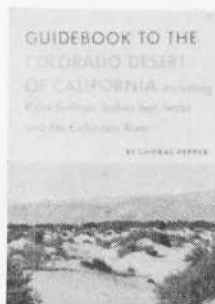
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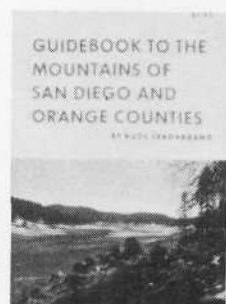
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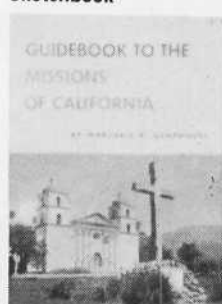
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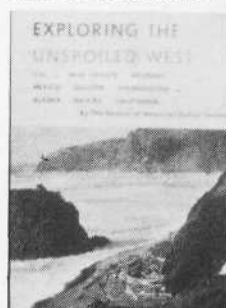
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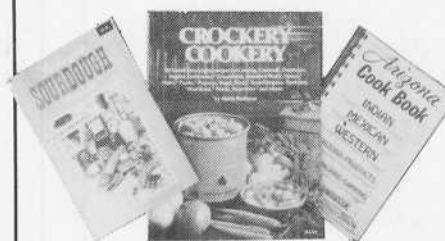


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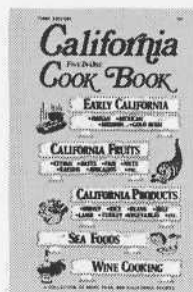
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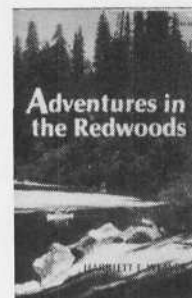
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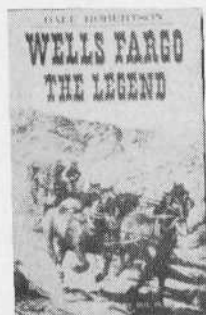
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A nostalgic look at Texas' FORT STOCKTON

DRIVING DOWN Highway 385, from Odessa to Fort Stockton, the West Texas plains seem to stretch endlessly towards an ever evasive horizon. The 100-mile stretch is broken only by the sleeping oil towns of Crane and McCamey, their presence bringing a moment of respite from the boredom of the empty land.

It helps if one has a companion or, lacking that, a vivid imagination to wile away the time. For apart from the thin ribbon of highway concrete and asphalt, this is a land little changed over the cen-

turies.

It does not take much inventiveness to see the ghosts of *Conquistadores* sky-lined on the low hills ahead, eternally looking for the El Dorado that brought

them to explore and settle this vastness. Or perhaps the file of Comanche warriors trailing along the desert wastes, en route to or returning from their raids into Mexico. A clear night, with a bright

Opposite page: Photo of the 2nd Fort Stockton. In the foreground is post trader's Friedlander's building. The building shown above the latter is the fort's post trader's building. The view is to the northeast of the present county courthouse.

Right: A view of a troop of the Tenth Cavalry adjacent to the row of officers' quarters. Both photos taken by Captain George Wedemeyer in 1885.





CKTON

by FRED S. COOK

moon, brings them into better perspective for it was the big, yellow moon, known as the "Comanche Moon," that sent the Mexicans to the South cowering and hiding behind their bolted doors.

The road dips to cross a sandy, virtually waterless gully, sometimes called rivers in this land, and you can visualize the train of prairie schooners, lurching and waving as the hoarse shouts of the drivers urge the oxen to double their efforts in pulling up the far side.

The stagecoach careens by, its "whip" flogging the air with words never meant for the lady passengers. Nor would the scene be complete without the spectacle of a vast herd of long-horned cattle headed north, perhaps to Dodge City, Abilene or some other railroad.

And lastly you see the cavalry patrol, moving in pairs, ever on the scout for marauding Indians, Comancheros, or even Mexican or American bandits that once made this land a risky one for travel—not more than a century ago. As you watch them, their pace becomes a little livelier, their talk a little spicier for they know, and now you know, they are nearing Fort Stockton and the end of a journey.

As far as may be determined, the first settlers to locate here were a group of Jesuits who planned a mission of sorts to be called "St. Gall," although there is some discrepancy amongst historians as

to whether or not this was ever accomplished, in what year, and whatever happened to the mission. Unfortunately for the good Fathers, the Comanche and Kiowa, and the Apache to the north were not as amenable to Mission life as the more docile tribes of California.

Sometime in 1854, the first of two, or actually three, posts were established here, and at that time the area was known as Comanche Springs. It was founded as a temporary post, a sub-camp of Fort Davis, about 100 miles away, and its main purpose seems to have been to deny the Comanche and Kiowa raiders the privilege of using the waters of the Pecos River and so hinder their raiding activities.

From the start, an aura of mystery surrounds the "Fort." No one seems to have knowledge as to how it was named. Some claim it was for Commodore Robert Field Stockton who distinguished himself in the Mexican War. But then, whoever heard of the Army giving a Navy man the honor of having a fort named after him? Some say it was named for Richard F. Stockton (1730-1781), a New Jersey lawyer who was one of the signers of the Declaration of Inde-



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pendence. Still others say it was for some soldier or non-commissioned officer who distinguished himself in a campaign thereabout.

The true answer will probably never be known, anymore than it will be known who carved the date "1847" on the "zero stone" which lies in the park before the court house. This stone, which is claimed to be the basis for all the surveys of the area, was reported marked by the first survey crew to come out of Fort Davis. However, in that year there was no Fort Davis. The true date of the stone, according to local historians, was 1859 when Anson E. Mills, the deputy surveyor for El Paso County, formally laid out Fort Stockton on March 29, 1859.

It was also at that time that Company "H," of the First United States Infantry, commanded by 1st Lt. Walter Jones, started construction of the first permanent fort. Prior to that it had only been regarded as an outpost and the men slept in tents.

Almost from the start the fort made history. A company of cavalry, under the command of Captain Albert G. Brackett, rested there overnight on their pursuit of a band of Comanche warriors whom they were to follow deep into Mexican territory, and thus stirred up considerable diplomatic chat-chat.

The following year, in 1860, May 23 to be precise, the status of the encampment was officially changed to "Fort Stockton" from "Camp Stockton." Actually, it never was a "fort." At least no self-respecting scribe of Hollywood westerns would have termed it that. The Officers Quarters, some of which still stand and are used as private residences today, flanked one side of the parade ground. On the opposite side were the barracks and some general buildings, all of which are now gone. One end of the ground contained general buildings, and at the opposite end were the Sutler's store and Guard House. This latter, still in good condition, is maintained by the City and is open to the general public. Nearby was a Butterfield Express Station. There were no walls of adobe or wood, and the post, often manned by a skeleton force, was never attacked.

In 1861, the Civil War broke out and Brigadier General David E. Twiggs ordered the men out of Fort Stockton. In fact, he ordered the men in the entire Southwest to abandon their posts and re-

treat to San Diego in California. They were hardly out of sight when the post was occupied by the Second Regiment of the Texas Mounted Rifles, under the command of Col. John R. Baylor. He turned command over to Captain Bill "Good" Adams who looked after things until early in 1862 when word came that Sibley had been defeated by California troops in western New Mexico. Adams then ordered the fort abandoned and left for other parts. As far as can be determined, the Confederate garrison never engaged in hostile actions against anyone, including Comanche, Kiowa, Apache, Comanchero, banditos or you name it. And for that matter, the settlers who remained there found the intervening years rather trouble-free ones.

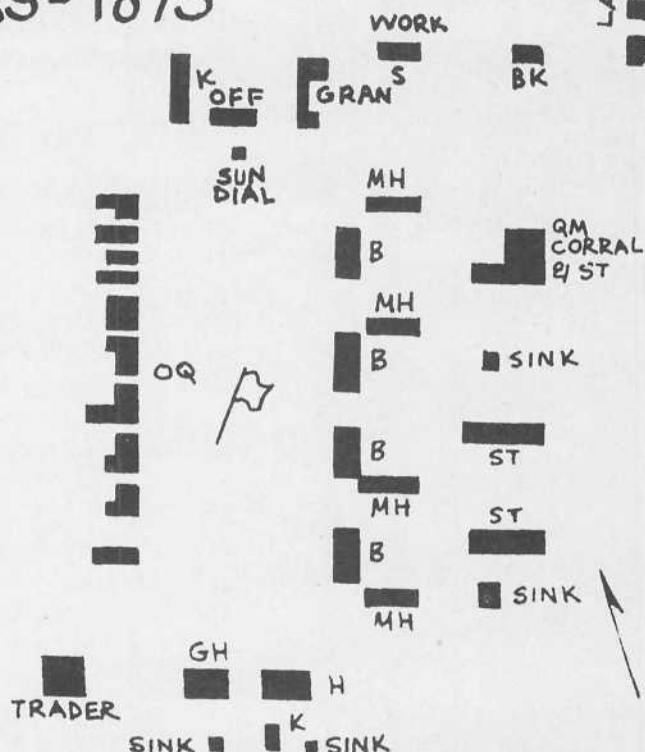
In 1867, the U.S. Army returned to the scene, this time in the shape of two companies of the 41st Infantry, and soon followed by the Ninth U.S. Cavalry, under command of Colonel Edward Hatch. The latter were black soldiers and were soon dubbed by the Indians as the "Buffalo Soldiers." They proved to be one of the best cavalry units in the Army, although there was an ugly incident at Fort Stockton when some rebelled against their white officers. The "rebellion" was put down by loyal troops and some of the participants sentenced to death while others received long prison terms.

The troops based here engaged in a number of campaigns against the Comanche and later against the Apache, but apart from that there was very little activity in the area until the period between 1876 and 1880 when, strangely enough, a number of bandits seemed attracted to the area. According to reports, or legends, Billy the Kid was a resident hereabout for a while, as was Sam Bass. There were stories that Frank and Jessie James were seen in the area, but such stories are more often the fabrication of imaginations rather than factual.

June 26 & 27, 1886, Company "G" of the Third United States Cavalry and Company "P" of the 16th Infantry packed their bags and marched off. On June 30, 1886, the fort was officially listed as being permanently abandoned by the military.

When Fort Stockton was founded, the usual resultant town sprang up. One of the best patronized places of business was the Grey Mule Saloon where soldiers from the fort, travelers and local

FORT STOCKTON TEXAS - 1875



badmen congregated. It was said to be owned by a local sheriff named Royal who was finally defeated in a close election. When he refused to give up his office, he was shot down in the courthouse by an opponent who didn't want to drag through the red tape of a recount.

About the turn of the century, a Mrs. Annie Riggs opened a hotel near the court house plaza and just to make sure that none of her guests became unruly, or bothered any strangers, she enforced her "house rules" by wearing a six-gun on each hip.

Today, the old hotel is a very well stocked and well kept museum which is open to the public. Rooms are decorated as they were about the turn of the century, allowing one to literally step into the past.

There are also a number of other old homes and buildings about town, some still inhabited and others in various stages of disrepair. One includes a museum-schoolroom where many of the local residents did actually learn their "Three R's" in the days when there were no busing problems and children minded their parents and teacher.

The County Court House is of modern vintage, but on the same site as the original court house. Some say that an investigation of old records will disclose the

signature of "Judge Roy Bean." Then there are others who say that Judge Bean couldn't write his name and never kept records anyway.

For those who like to poke around old cemeteries, Fort Stockton may prove a disappointment. When the Army pulled out they took all their bodies and re-interred them in Fort Sam Houston in San Antonio.

The early graves that are left show that living to 40 years of age in those days was an achievement in itself. But whether this was due to a lack of medical proficiency on the part of the doctors, or a lack of marksmanship on the part of the deceased, is unknown.

Today, Stockton is a friendly, small town, on the west Texas Plains, basking in the historic sunshine of its past. It is well supplied with modern hotels, restaurants and other visitor facilities. It is the home of a well known Texas historian and author, Clayton Williams, Sr., who is always ready to stop and spin a yarn with a visitor.

Within easy driving range are such historic sites as Fort Davis, now a State Park; McDonald Observatory; the one-time wild, oil towns of McCamey and Crane and to the north, it is a pleasant day's trip to Carlsbad and The Caverns, and to Guadalupe National Park. ☐

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Coin Hunting in Barnwell

by
**RICHARD
TAYLOR**

"I'VE JUST found another coin!" my wife, Leah, called for the third time. Our coin-hunting trip to the ghost town site of Manvel (better known as Barnwell), California was paying off very well.

Situated high in the sage-covered foothills of the New York Mountains, near the Nevada-California border, this old town came into being in 1893 when the completion of the Nevada Southern Railway made it a bustling railhead for mining camps and towns in the area. It was first named for Allen Manvel, then president of A&P. During the next year, it became an even more important railhead when the California Eastern Railroad was built from Manvel to Vanderbilt, then extended to Ivanpah in 1902.


Rail freight was brought to Barnwell through Needles and Goffs and then loaded on wagons for delivery to the Nevada towns of Searchlight, Nelson, Eldorado, Goodsprings and Johnnie. For a short time, freight was delivered to Las Vegas and the boomtowns of Rhyolite and Bullfrog.

Probably the most excitement the little town ever experienced occurred when Jim McKinney, a western badman, rode in after killing two men in Arizona. Shortly thereafter, the town literally bristled with lawmen: Sheriff Rolphs of San Bernardino County arrived in a locomotive commandeered at Goffs, Sheriff Frulenthal brought in a posse from Lincoln County, Nevada, Sheriff Lovin and a 16-man posse, including two Walapai Indian trackers, came up on a special train from Mohave County, Arizona and U.S. Marshal John Potts also arrived from Arizona.

However, even with a U.S. Marshal and three posses hot on his trail, the elusive outlaw escaped. He had told a teamster in Barnwell that he was headed south for the Providence Mountains. Upon learning of this, the lawmen immediately set out tracking him across the desert.

Meanwhile, McKinney doubled back and headed north, concealing his tracks by riding among a herd of cattle. He escaped over Walker Pass, but subsequently was killed in a gun battle with law officers in his home territory, Kern County, California.

For more than a decade, Barnwell boasted a sizeable population with



A weathered wooden headstone marks the site of an old grave near Barnwell.



stores, saloons, hotels and other business houses. But the town was finished in 1904 with the completion of the San Pedro, Los Angeles and Salt Lake Railroad. This new line passed through Las Vegas, taking away Barnwell's Nevada trade. For a time, the town survived by supplying a few California camps, but it wasn't profitable and rail service was

soon discontinued.

Today, only a couple of small cabins, a corral and a few foundations mark the site of Barnwell, but we were correct in assuming that it could be a coin hunter's bonanza.

We've found 32 old coins, several tokens, some excellent old bottles and other memorabilia during our several

trips to the site. Some of the coins, including a shield nickel and a 1900S Indianhead penny, are in surprisingly good condition.

With more than a decade of continuous activity in its past, Barnwell is bound to yield more coins to those who have the patience and perseverance to seek them out. □

Above: Ruins of a saloon once owned by the brother of Wyatt Earp in the gold mining town of Vanderbilt, a few miles from Barnwell.

Right: A portion of the many coins and interesting relics found in Barnwell.



Modoc County...

a history buff's minefield

HIRESIDE SMOKE snakes up into a cool October night, deep blue with the clarity of Northern California in 1855. Men and women, jubilant with the exhaustion of a gut-ripping mountain crossing, sing and dance beside verdant pines. Children sleep in wagons clustered at a flat meadow spring.

Something cracks in the boulders bundled in the dark forest slopes.

A fiddle, squeaking accompaniment to nervous off-key singers, stops. Dancers continue to stomp the Fandango. And a few singers keep it up.

From the muddy banks of a livestock-choked creek—rufflings and a shrill cry.

Silence. Too long. The last silence. Indians, Paiutes, tumble from their rocky crags. Arrows, long shafts arc across campfires. Screams of one-on-one combat choke the children awake.

Musket shots send blue clouds and unburned powder into the pine thickets. And more Indians come.

In a few minutes, in an obscure valley along the Lassen-Applegate Trail, 200 settlers are cut apart, massacred, their belongings strewn, their livestock taken and their westward progress forever stopped.

by

VAN WILKINSON



This gentle hillside was final stopping place on the ascent of Lassen [Fandango] Pass. The small lake served as a final watering spot before the great uphill struggle.

And their horror gave us the name: Fandango Pass.

To historians, of course, this is a lie. To them, the Fandango Pass massacre is a handed-down exaggeration, more accurately an incremental compilation of valid parts into a questionably grisly whole.

Modoc County, even today, is an historian's minefield: sometimes the "digging" is quiet—occasionally the parade of facts is explosively shaken by a rumor overturned or an anachronism unearthed.

Let's poke around Modoc County, starting with those bold, pained years when Northern California's uppermost territory was wholly the domain of the Paiute, Pit and Modoc Indians and was in the way of westward swarming settlers and miners.

Oregon's fertile midlands were being tilled by 1844. Eastern farmers, willing to take the term "west" at its fullest value, were hauling their futures along the Oregon or California Trail. Then, as now, time was money and first come was first served a piece of the new territory. Hence the need for shorter routes to the new lands.

Jesse Applegate (in 1846) and Peter Lassen (in 1848) helped to lure wagon trains into Oregon and Northern California by detouring from the established California Trail along the Humboldt River and striking northwest across the top of Nevada and California.

These two road finders whose names now identify the trail had either ESP or some inside data from Sutter, because the new trail system was in use just as the gold seekers began to overload the traditional trails in their desperate westward crush.

Fandango Pass (called Lassen Pass prior to 1856) is the steepest, bloodiest, mountain crossing along the trail. You can drive it today, only a half hour's detour from Highway 395.

Families of the Forty Niners who had endured the dry summer dust of Nevada's deserts and the brackish mud waters of Surprise Valley looked up the sharp eastern face of the Warner Mountains toward Fandango Pass. Some thought they were about to cross the dreaded Sierra Nevadas and then drop contented into the fertile Sacramento Valley. The wiser stayed silent—they

Right: Weather-abused sign marks site of the reputed Fandango Massacre. That the date is missing seems fitting—Indian attacks along this route were common in the 20 years between 1846-1866.

Below: A sagging barn shed and the rusted shells of steam-powered machinery litter the mining camp which used to be called the High Grade but has been renamed Klondike.



knew that hundreds of wild miles lay ahead.

The pull up Fandango Pass was mediocre for a couple of miles and hell for one more. Wagons were stripped. Oxen were double, triple teamed. Women

choked the wagon wheels just before oxen slid backwards in utter fatigue. Possessions were thrown aside as children and elders pulled on the ropes which edged the wagons up the steepest quarter mile.





A bunkhouse and workshop for High Grade miners is a classic example of log cabin architecture so popular in the Modoc wilderness where timber is a major commodity.

Alturas's history is as kinky as the county's. Sixty years after the gold rush era, Alturas residents still feared raids from random, renegade Indians. The railroad's arrival in 1908 brought a new level of urbanity, but not without some good ol' Modoc turmoil. Right-of-way squabbles halted the railway's progress at the town's edge. So, as the citizens and courts enjoyed a Sunday off, railmen constructed the line into town that day. Such is and was the mood of many in Modoc County, whose motto is "Where the West Still Lives." Yes sir.

The railroads, which came late to Northern California, deserve a mention. In particular, the NCO. That's right, the NCO. Not a biggie by anyone's standards, but possessing a sadly tumultuous and singularly obscure history rivaling any in the nation.

To NCO's early critics, the letters stood for Narrow, Crooked and Ornerly or Northern California Outrage. To the men who hung in there to put the line through, its official name was the Nevada-California-Oregon.

Starting at Reno in 1880, as a line which would lead north to Goose Lake at

Oxen and men died together on this grade.

If spirits were low on the way up, they soared as the summit was passed and the flat green expanse of Fandango Valley lay ahead.

And that's where legend and ledger differ.

Bibliophiles tell us the oft-cited wagon train descended the valley, left much of their traveling gear and disabled wagons behind, converted to horseback and moved speedily on. Later wagon trains found the abandoned debris and erroneously concluded that a massacre had occurred.

Most people prefer the account which tells of those later wagon trains finding burned, broken wagons, bloodied muskets and knives, fouled personal belongings and, of course, bodies.

No one disputes this: the Warner Mountains, Fandango Pass and the wet lowland trails leading away were under continuous attack from Paiutes and

Modocs. No trail was more draining in terms of human life and more constant in terms of Indian harassment than the Lassen-Applegate system, at least on a per man basis.

You can explore the Fandango area in Modoc National Forest (see map). Alturas, the county seat, is a good place to begin. National Forest Headquarters and the Modoc County Museum are both here.

Alturas is the biggest city in and around Modoc County, and it's a small town. It wasn't always that way—it used to be tiny. From 1870 until 1874 the name was Dorris Bridge, after the area's first ranchers. After 1874, it was renamed Alturas, Spanish for "valley atop a mountain."

All that remains of the infamous Lassen [Fandango] Pass grade are eroding ruts which run straight up the east face of the Warner Mountains.



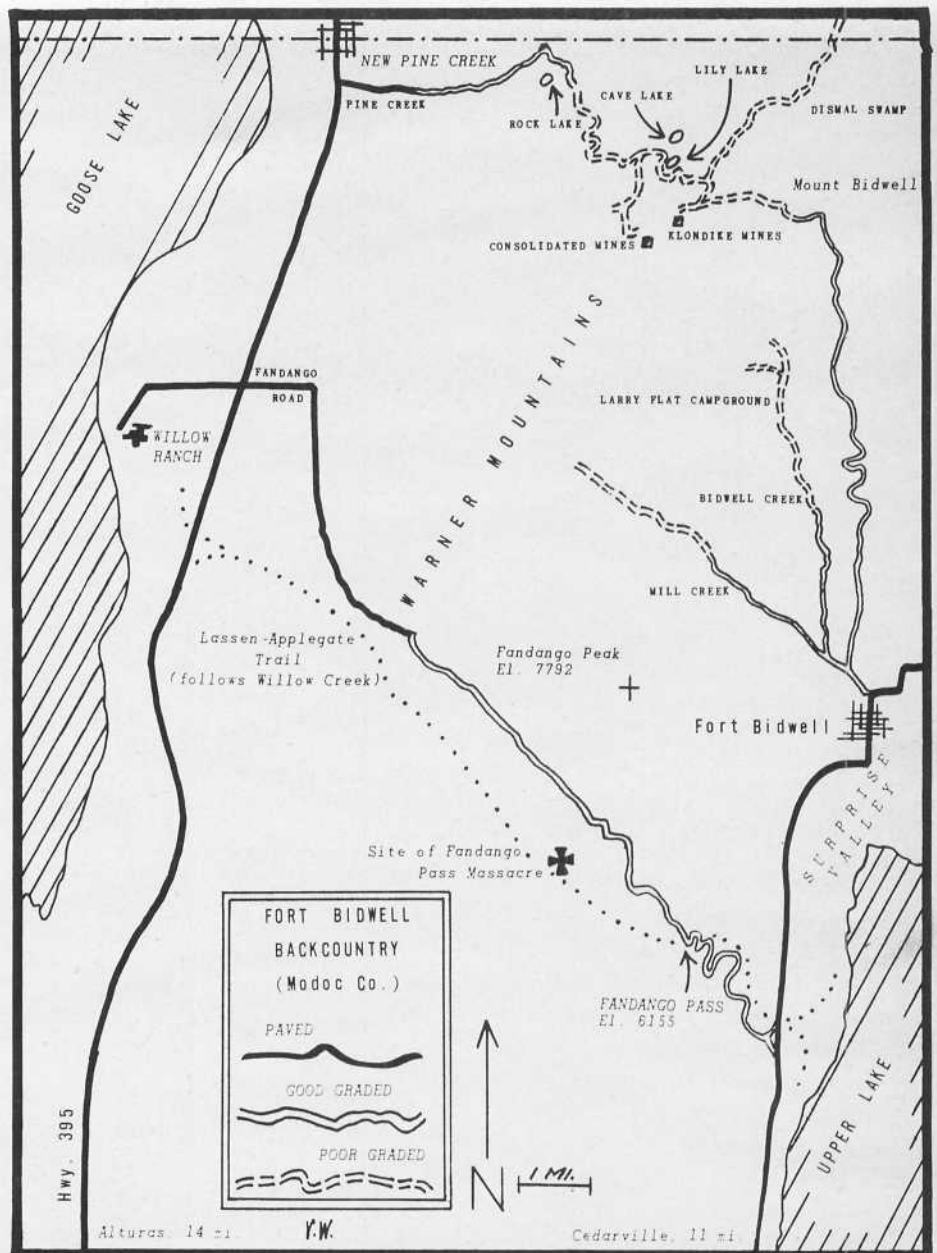
the Oregon border, the venture finally culminated at Lakeview, Oregon, in 1912, 32 years, 238 miles and some ridiculous events later.

Railroads crept into Modoc's rich farming and timber land near Fandango Valley and over the Warner Mountains into Surprise Valley at Cedarville. But these short lines had ever shorter lives; they were scrapped and dismantled shortly after completion.

Campers, fishermen and hikers of Modoc often stay at the secluded lake spots right below the Oregon line in the Warner Mountains. The road in goes through the High Grade mining area (renamed Klondike), the only significant mining area in the Warner Mountains—the weathered and tilted outbuildings date to about 1910, when the county's only gold rush was at its height. Further along this bumping, steep road one comes to the ghost townsite of Fort Bidwell. As late as 1911, residents around Fort Bidwell were terrorizing or being terrorized by local Indians.

Modoc names, untraceable to definite points, pull from historic sources all over the Early West. "Modoc" appears to be either a misbreeding of two Klamath Indian words, "moa" (southerner) and "dock" (near), or a Shasta Indian word of unclear meaning, or the name of a character (Maidac) in a novel read by the explorer John Fremont, who assigned the area that name.

The local Indians, having been there a



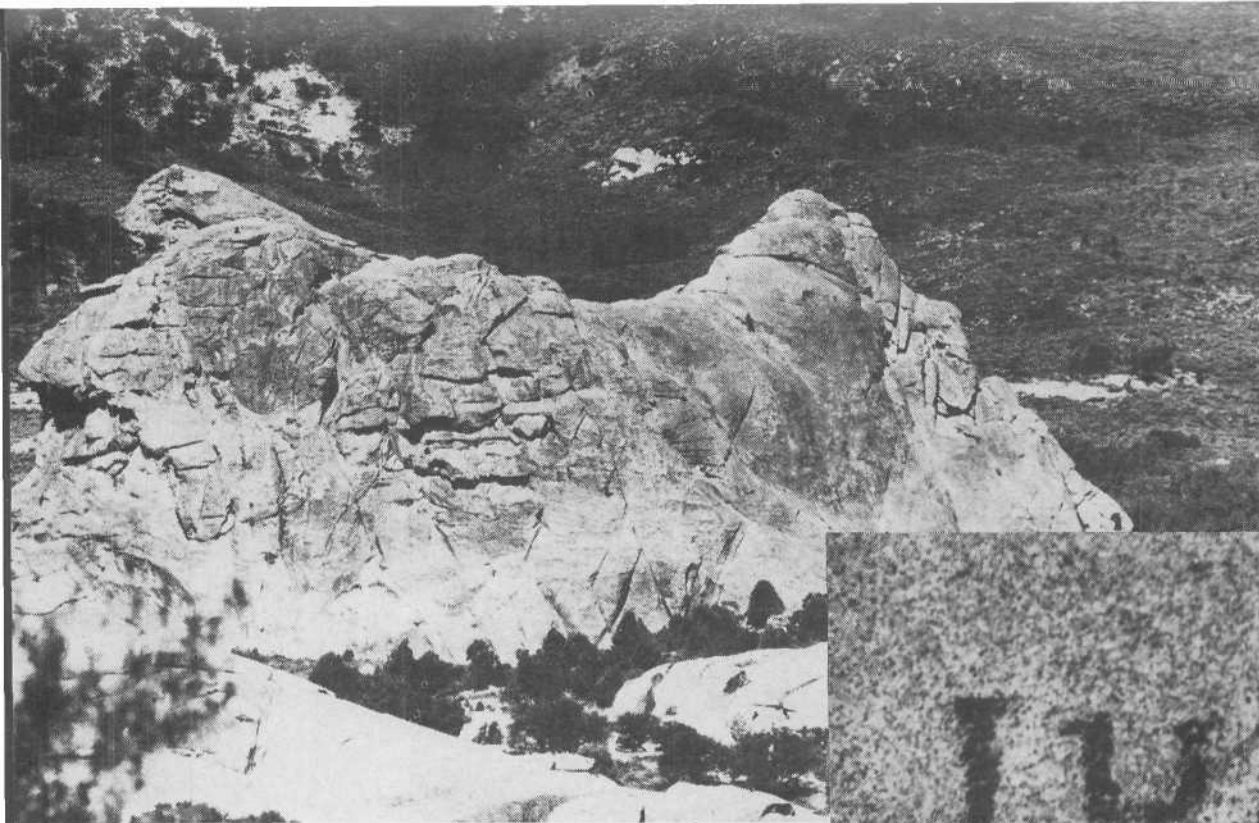
bit longer than Fremont, called the area "Smiles from God." White settlers and travelers dubbed it the "Battle Ground of the Pacific." The Indian tribes came in all names: the marauding Paiutes controlling Surprise Valley to the east, the war-ready Modocs in the north and the peaceful Pits living in the central, wet lowlands.

To protect worried stockmen and farmers from uncooperative Modocs, Fort Bidwell was established in 1866, about 16 years too late to help those along the Lassen-Applegate Trail in the Westward Movement. Except for California's only Indian war in 1873, which saw Modoc warriors outfight cavalrymen in harsh lava fields, most conflicts were minor enough to allow the 1893 closure of the fort. Today it stands as a Department of Interior school for Indians.

There's not a lot going on in the northeasternmost niche of California, even in the "busy" summer season. No four-laners full of smogged-in tourists, but plenty of clear two-laners which lay in beautiful vacant straightaways through farm fields and prairie highlands.

Winters come hard to Modoc County; they hit soon and stay late. Roads close under the vast arctic blades of snow-wind which wail across the Great Basin. Otherwise, Pacific storms keep Modoc pine mountains green and moist.

History is spread thicker here than its population. Mysterious remnants, hilarious episodes and pristine environs gang up on the novice Modocophile. A casual tour, and there simply is no other way to do it, awakens the old Fandango question: why is it so peaceful and quiet here? □



*Left:
Rock fantasy
high above
a meadow
with tiger
head on
the left.*



*Right: Close-up
photo of
pioneer names
written on
rocks with
wagon grease.*

ONE OF THE FEW remaining unmanaged and undeveloped historical landmarks in southern Idaho is the unique City of Rocks whose comely and grotesque formations stand like mute sentinels guarding the secrets of her past. In this Bicentennial year, our heritage looms clearer in our conscience, and the preservation of these mileposts becomes ever more significant and meaningful.

This picturesque phenomenon in nature is only 35 miles from the city of Burley, Idaho. Situated in the rolling Albion-Malta mountains known as the South Hills, the silent city is in the Sawtooth National Forest. This mountain pass, curiously resembling a modern city skyline, was once the hub of three famous east-west pioneer trails which crossed the barren deserts and desolate wastelands.

But even more than the nostalgic romantic legends of the past, the silent city has great scientific value for its granite mantled gniess dome formations which reveal its geological history.

These huge rocks are scattered over an area of more than 35,000 acres, part of which is used for grazing. Threaded through the towering spirals passed the trails of the Indian, the fur trader, adventurous exploration parties and brave men and women seeking peace, freedom and fortunes. The Indian followed the buffalo from water hole to water hole,

and the fur trader followed the Indian. The vanguard scouts followed the fur trader, and the settlers followed the scouts as the last frontiers melted away.

Just over 100 years ago, this land of scenic grandeur was the scene of warring Indians, stage coach robberies, and the hijacking of wagon trains. The Fort Hall-Raft River route, the Soda Springs-Hudspeth cutoffs to the California trail, and the famous Oregon Trail all crossed through the tottering cathedral peaks.

One can hear the rustle of the wind through aspen, pine and juniper as it whispers of the past, and the lonely cry of the coyote at night echoes other strange sounds in history. The slow plodding of the oxen, and the creaking

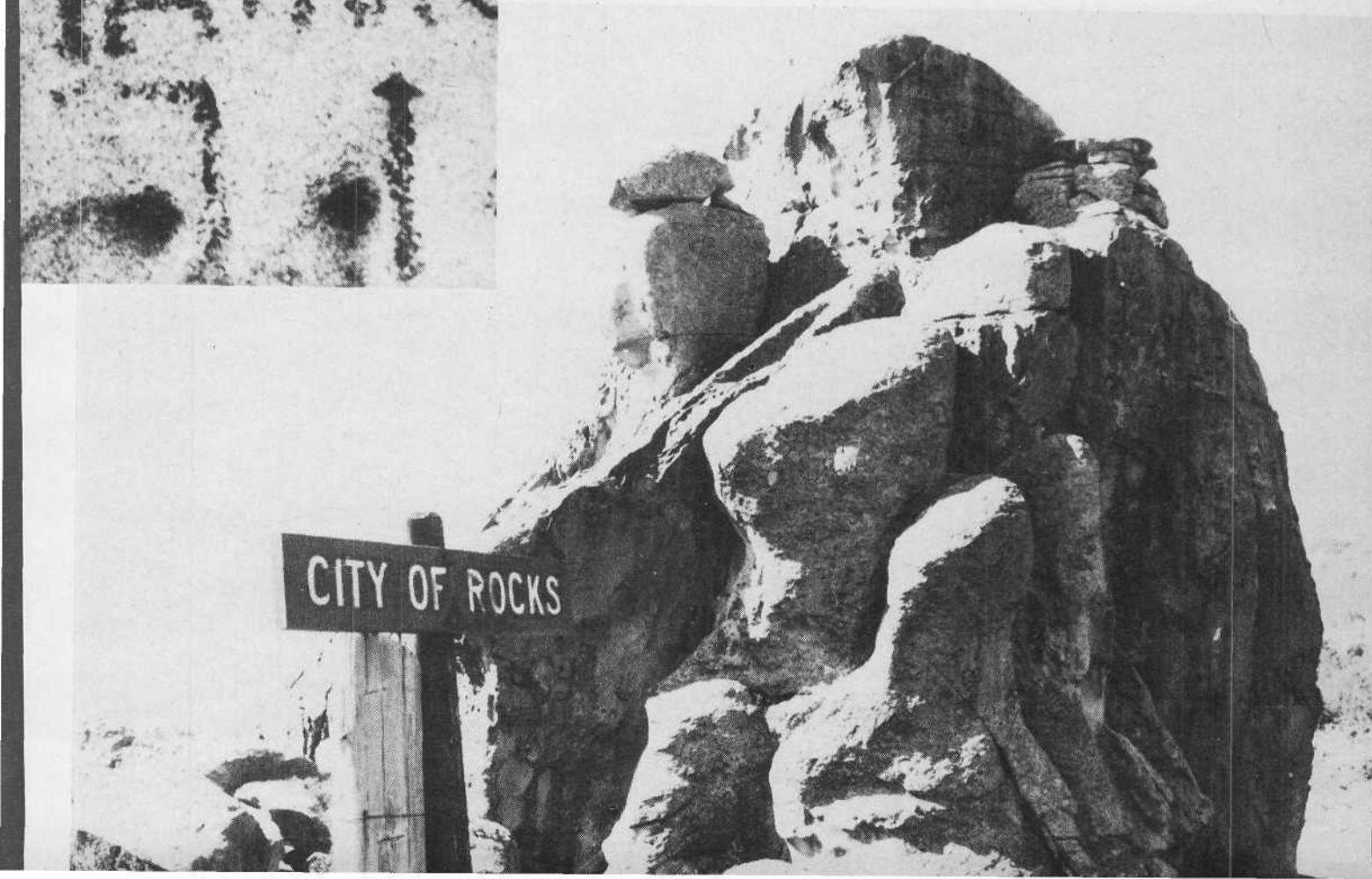
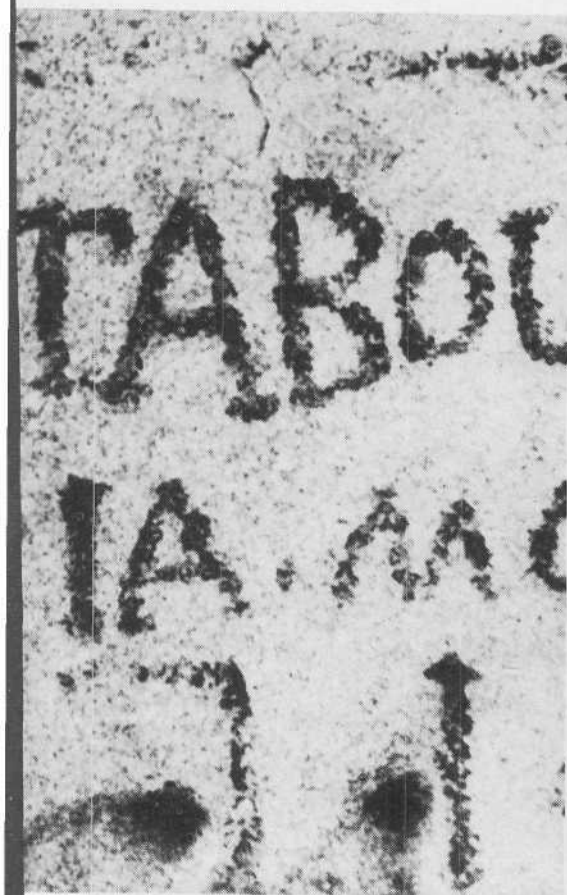
groans of the Conestoga wagons mingled with the happy laughter of pioneer children; the screaming angry cry of Indians answering the sharp crack of immigrant rifles, the yell of a driver, or the loud clatter of startled horses pulling unbending coaches.

Time has not erased the most fantastic register of dates and names painted with wagon grease on a huge rock (Register Rock) by a few who paused to rest. These stand out in bold relief even though the elements have eroded and chipped away at the rocks on which they were written. These awesome etchings and messages of that period in history cannot be duplicated anywhere else in this Magic Valley area.

Idaho's Silent City of Rocks

by
RUTH
HEINER

*Below:
The entrance
to City of Rocks.*



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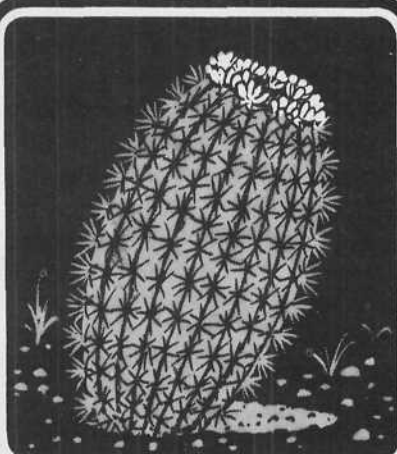
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*Turtle Rock
sits in
stoney silence.*

The rusting metals on the wheels of the wagons are still seen on the rocks as a reminder of the anguished struggle to push the wagons over areas that the teams alone could not manage. Twisted and gnarled trees also bear evidence that they were used to anchor block and tackle equipment to hold wagons from slipping. Old diaries are replete with the reactions of the immigrants to this steeped marvel, and also filled with stark tragedy, romance, and colorful folklore of this area.

No two rock formations are shaped alike, and many have been given names by common consent or legend. The highest peak rises 7,699 feet above sea level, and Twin Sisters (62 stories high) 6,838. Bath Rock, 26 feet high and almost perpendicular to the road, holds accumulated rain water, and if one bathes in it before sun-up his youth will be restored, according to legend.

Eons ago, when the earth was very young, the great river plain to the north, east and west of the Silent City (also known as Goblin City) was a great river plain of semi-tropical gardens through which flowed the mighty Snake River and many small streams. Through those verdure-clad plains roamed the mastodon, mammoth, camel and species of the horse. Great catastrophes overwhelmed the valley on seven different occasions and volcanic ash from these eruptions spewed forth a sea of lava covering the beautiful valley with a blanket ranging up to 800 feet deep. In the cataclysm, all of the teeming life was annihilated, the small rivers were burned up and the channels obliterated. The Snake River cut its way through the lava carving one of the most scenic canyons in the west. The lofty Tetons were uplifted to frame the eastern boundary.

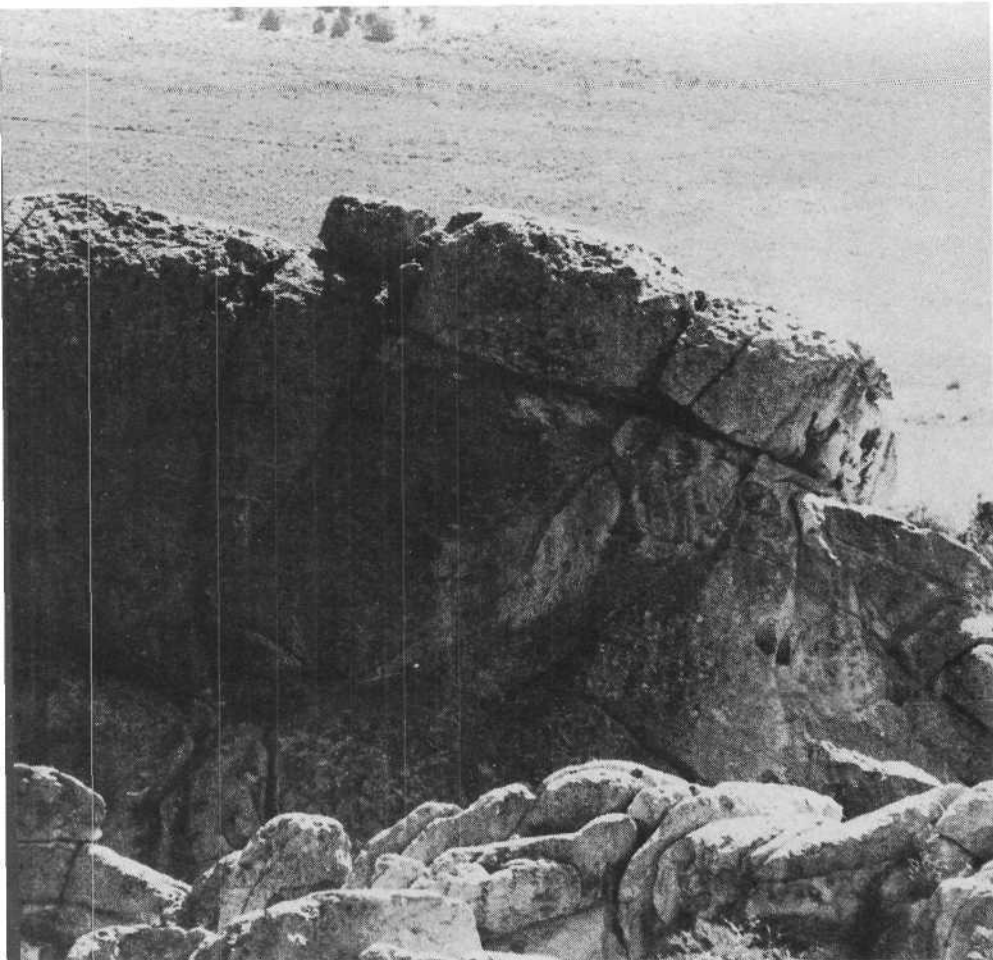
Thus the land was dry and desolate where only bands of savage Indians roamed to hunt or fish on a choice river bank before the fur trappers arrived. Nature from primeval times has slowly sculptured what appears to be an endless sea of domes and turrets from mountains which have been pushed, heaved and faulted until they have eroded and crumbled away leaving these

weird giant spires and minarets. The rocks clearly reveal the continual transition of time, and are easily accessible for study.

These boulders are of oldest Precambrian crystalline basement complex, having been buried by 50,000 feet of Paleozoic and Mesozoic rocks which resulted in high temperatures and extreme pressure deep below the earth's surface. As time passed, these rocks eventually became exposed and uplifted in thrust and shifting in a 10-mile vertical uplift in this area. Some geologists say that part of these rocks originated far to the west of where they now stand, and the unique protruding monoliths are a geologist's paradise!

The granite rocks are light in color and appear as mushroomed or cone-shaped domes whose caps or tips are slightly darker in color, and more hardened than the sides and bases. Where moisture has penetrated the tiny fractures in the rocks, it has dissolved some of the minerals which have jelled, filling up the fractures and pores which hold the sand and rock together somewhat like a cement, and forming a hard cap crust. Below the cap the absorption of moisture and evaporation has caused chipping and falling away of the decomposed





granite at the base where it is more vulnerable, and has been carried away by winds, rains, and melting snows.

Some precious stones such as water rubies, garnets and opals were found by the mica miners among the irregular cone formations where the dream cathedrals sparkled in brilliant splendor.

According to legend, the area was the campsite of some of the Blackfeet Indians, the Bannock, and as recent as the early 1900's some Shoshone tribes wintered among the tottering peaks.

Just four miles away are the remains of the famous debatable Almo massacre. The story is told of an immigrant wagon train of 300 men, women and children (60 wagons) who were supposed to be buried in a hole they had frantically dug in an effort to find water. They were surrounded and cut off by Indians who had been watching for an opportunity to entrap them. There are several versions of the story. One is that on the fourth night of the siege, a man and a woman slipped between the wheels of a wagon into high sagebrush and escaped across the Utah-Idaho border, staggering into the little Mormon settlement at Brigham City, more than 100 miles from the besieged wagon train.

Another man and two women, crawl-

ing on their hands and knees, also escaped into the Raft River area where they were later found by the rescue party. One of the women had wrapped her nursing baby in a blanket which she held in her teeth as she crawled to safety. The rest of the wagon train were dead in the smoldering blackened ashes when help arrived.

Two years later, Chief Pocatello and his Bannock Indians burned and looted seven wagons in a train headed for California.

Since this historical area is not under any county, state or federal control, there are no facilities at the silent city itself, but the nearby town of Burley has numerous accommodations.

There is a good highway leading to the area, but through the strange formations themselves, there are only dirt roads.

Seasonal wildflowers abound, especially during years when rain is plentiful. Ground squirrels, jack rabbits, coyotes, and occasionally deer, can be seen in the area, in addition to birds, hawks, partridges, blue grouse, sage hens, and once in a while an eagle.

The Silent City of Rocks holds many secrets of the past, geological formations unequalled in the West, and a quiet escape for pondering and meditation. □

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ON THE TRAIL OF THE KINO MISSIONS

by RUSSELL WAHMANN

FEW MEN have left their mark on the desert as has Father Eusebio Kino, Jesuit missionary, explorer, astronomer, cartographer and ranchman, who for a quarter of a century was the outstanding figure on the Sonora-Arizona-California frontier.

Kino's mark, standing today as monuments, are the remnants of a chain of missions he established between 1687 and 1711. A score of present-day towns and cities began their history as one or more than 110 mission pueblos he founded.

From Tucson, over good highways, one can visit at least nine of the desert missions associated with Padre Kino. In a two-day swing via Nogales, Santa Ana, Caborca and Sonora, and returning to Tucson, one can see these missions and even view Kino's recently discovered, and now authenticated, remains in a specially built structure at Magdalena.

Six miles south of Tucson, just west of Interstate Highway 19, is San Xavier del Bac. The site was first visited by Kino in 1692. He later introduced cattle, grain and seeds. In 1700 he began a church about a mile north of the present site. The structure there today, begun in 1783, is a stunning example of Spanish colonial architecture, a baroque monu-

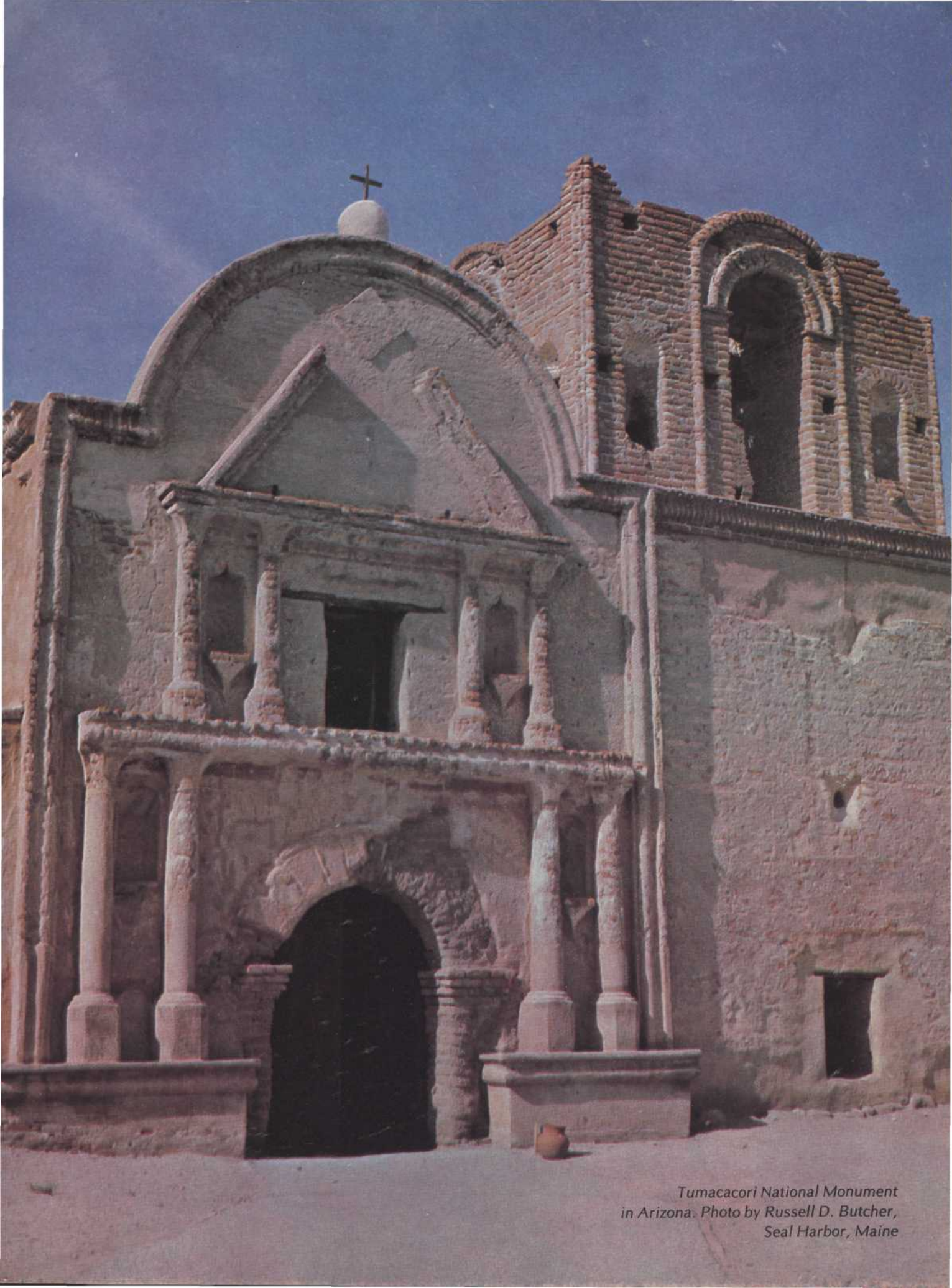
ment to the splendor of civilization on the desert frontier, and one of Arizona's art treasures.

Continuing southward on Interstate 19-U.S. 89 about 43 miles from Tucson is San Cayetano del Tumacacori. Father Kino founded this church in 1691. The present structure, built between 1796 and 1821, is the third. The latter two were built on the same site. Destroyed by an Apache raid in 1821, it remained in ruins until restored by the National Park Service in 1929.

Cross into Mexico at Nogales. No passport is needed, only proof of U.S. citizenship and an auto registration is required. Obtain a Mexican Tourist Permit here just inside the border. You will need to show it at a check-point just south of Nogales, Sonora. Without it you must return to the border. It is a good idea to also obtain Mexican auto insurance, either in Tucson or Nogales, Arizona. It's inexpensive and might save a few headaches later because Mexicans drive with a "Latino machismo" attitude. Travel south on Mexican Highway 15 to the village of Imuris. There you will turn left on Mexican Highway 2 toward Cananea.



San Xavier del Bac, near Tucson, aptly called "The White Dove of the Desert," is the finest example of Spanish colonial architecture in Arizona. Familiar to many tourists, it is thought to be the fifth church structure on the site. The baroque decoration around the doorway is characteristic of European influence.



*Tumacacori National Monument
in Arizona. Photo by Russell D. Butcher,
Seal Harbor, Maine*



The mission ruin of Cocospera is easily reached on the highway. The site is located on the northwest side of the road approximately 20 miles from Imuris. Perhaps it is too accessible because it has been continually ravaged by misguided treasure seekers. Don't fall into this class of vandals. Leave everything as it is and respect the fragile walls. No church in northern Sonora has ever held the same degree of fascination created by the lonely ruin of Nuestra Senora del Pilar y Santiago de Cocospera. Situated on a high bluff above the picturesque Cocospera Valley, this mission has witnessed the rise and fall of empires.

The rich river lands provided the Spanish with produce and the Apaches used the valley as an invasion corridor on the central Pimeria Alta (northern frontier). Father Kino laid the foundation for a church with transepts and adobe arches. Later, Franciscans built a church around the walls of Kino's Jesuit mission. Kino's square defense towers formed the bases for twin bell towers of the latter structure.

Return to Imuris and Highway 15. A few miles south of Imuris look for a sign

In this specially built monument, the remains of Father Kino may be seen at Magdalena. They lie where they were found 255 years after his death. The attractive plaza surrounding the monument, museum and present church contains many fine shops.

on an unpaved road to San Ignacio. Turn right and drive into the village of San Ignacio de Caborca. Time has passed it by as it rests peacefully along the Rio Magdalena. This once important mission, a training ground for new Jesuits on the desert frontier, reflects the characteristics of the earlier churches of the Pimeria. Go in and admire the circular mesquite-log staircase.

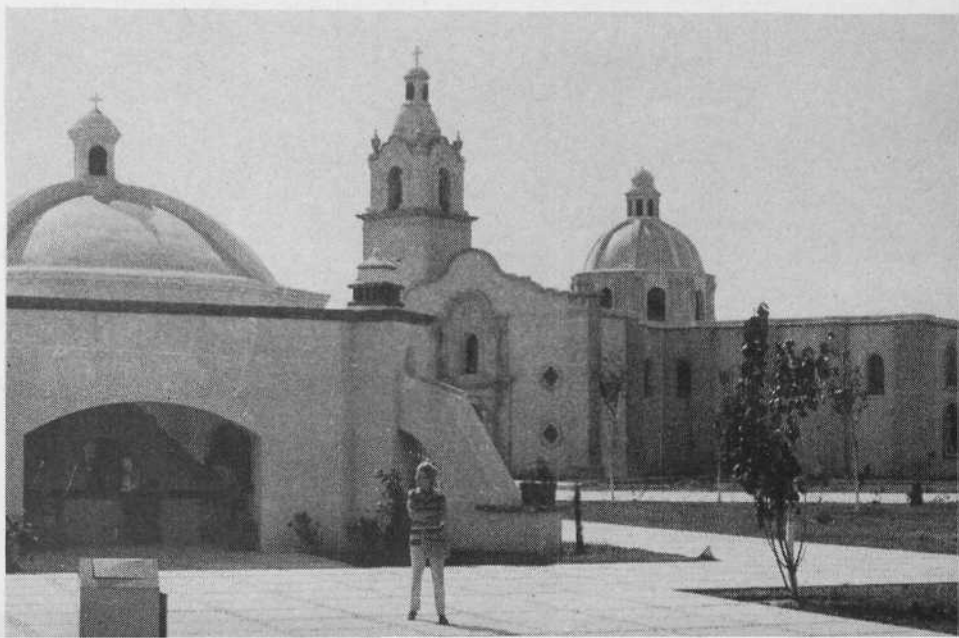
From here you may follow the unpaved river road or return to the paved highway for your next stop at Magdalena. Founded by Kino in 1690, it was destroyed in the Indian revolt of 1695. Father Agustin Campos built a chapel here, Santa Maria Magdalena, in which Kino died on March 15, 1711. After

Interior of Cocospera. Wood was employed for roof beams, lintels, doors and furniture. Here is a heavy mesquite vigor or beam which held a choir loft. Originally adzed square, time and vandals have taken their toll of the beams. A thick gypsum plaster covered the adobe and finished the walls of the altar area.

years of archival research by some of the churches' foremost scholars, on May 21, 1966, 255 years after his death, the remains of Padre Kino were found. The Mexican Government maintains a museum and monument at the grave site. The remains may be viewed through a window of a specially-built domed structure sitting in the middle of an attractive plaza which contains shops dedicated to tourists.

Ten miles south of Magdalena is the village of Santa Ana. To continue along the mission trail, turn west here on Mexican Highway 2. Leaving the green Magdalena Valley, the next 44 miles to the town of Altar reveals the harsh Sonoran desert which characterizes most of the Pimeria Alta. At Altar one may take an optional detour to the right (northward) to the small towns of Oquitoa, Atil and Tubutama. Although optional, this leg may prove to be the most rewarding personal experience.

In these tiny villages, off the beaten tourist path, a smile and a sincere attitude on your part will break through the language barrier and the usual feeling of suspicion. One time, with companions, at Atil, and with a flat tire, the entire town mobilized itself in our behalf to find a tire pump. On the west side of the



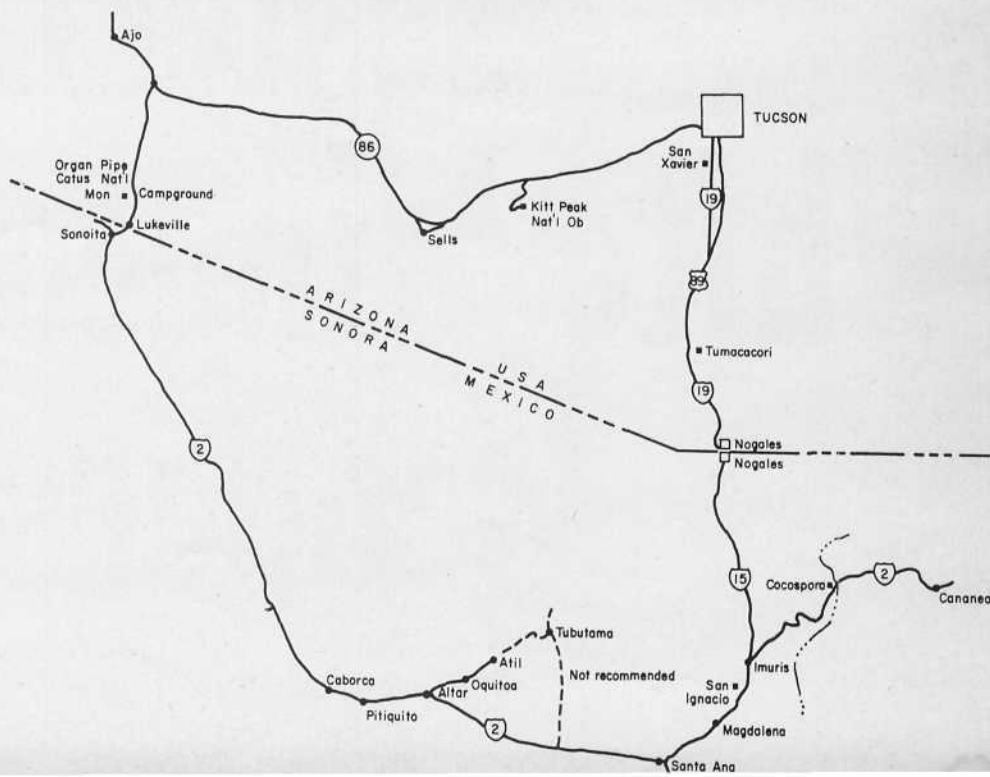


Nuestra Señora de la Concepción del Caborca in Sonora, Mexico. Main architectural features of the Franciscan missions in Sonora are in evidence at Caborca; solid massive walls and buttresses, arcaded corridors, arches supported on piers and two-storied belfries. The arcades are directly traceable to Spain. There, the arches are supported on columns in the Plateresque style. In the Sonora missions, the use of adobe and small stones, together with the lack of skilled workmen, dictated the use of simple square piers in place of columns. Buttresses were introduced to strengthen the long, high adobe walls and to react against the thrust from vaulted roofs and domes above. Caborca is the finest example of Mexican frontier architecture in Sonora.

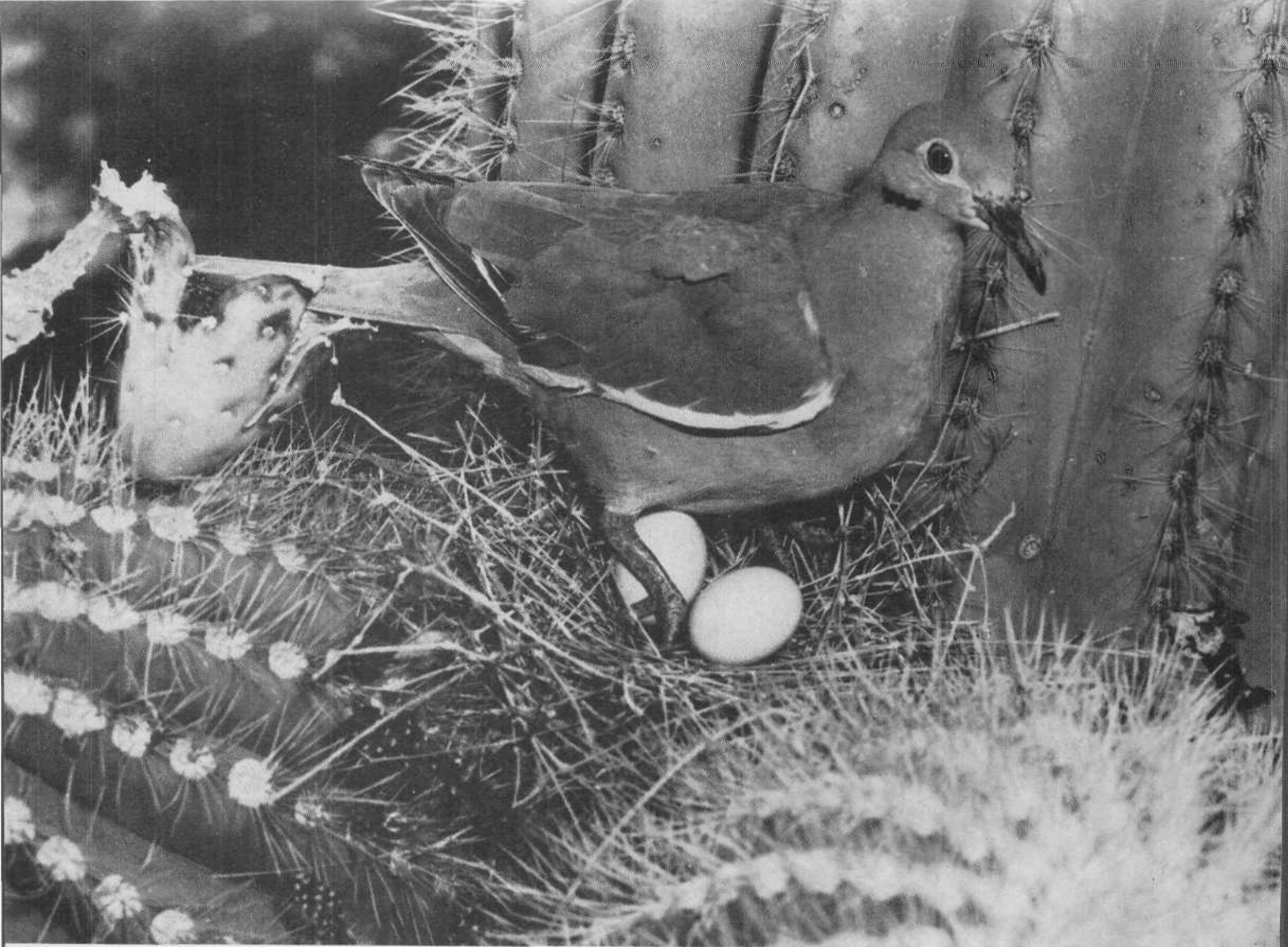
plaza is the adobe ruins of Kino's mission, next to the "modern" church, Santa Teresa del Atil. The old church at San Antonio del Oquitoa was constructed in 1705 and the present Franciscan structure at Tubutama was built in 1791.

Here again, the graciousness of the villagers of Tubutama was revealed as the last two cans of cold Cervesa were sold to us. The Delco electric plant which supplies the village and the only means by which new ice (*hielo*) could be made, runs only between 5 P.M. and 10 P.M.

A word of caution about the road from Altar to Tubutama. It is partially paved with improvements continuing in a slow fashion (by U.S. standards). A new alignment and bridges are being constructed. Driving in darkness is dangerous and road warning signs are rare. A pile of white rocks in your lane may be



Continued on Page 40



Western White-Winged Wonders

by K. L. BOYNTON

© 1976

WESTERN WHITE-WINGED doves migrate great distances from their winter quarters in Mexico and points considerably south for the dubious pleasure of raising their families in the deserts of the Southwest. Why any bird in its right mind elects to conduct its domestic proceedings in a harsh environment and during the worst months for heat and dryness at that, is hard to understand. A few birdbrains among them, might, maybe; but how can practically a whole clan be wrong? Yet, every spring sees these birds zooming into the southern parts of Arizona, New Mexico and Texas by the thousands, all set to pitch right in on family chores.

Various and sundry biologists looked into this seemingly witless behavior, wondering how this good-sized bird (measuring some 12 inches and weighing probably a third to a half pound) can handle the rigors of desert living. Here certainly is no small bird that might tuck into a bit of shade and get along on practically nothing. Whitewings need plenty

of groceries to fill their menus and a bouncing family of two squabs, yammering their heads off for food, likewise have to be stuffed while growing up.

The first bit of news that showed up in the scientific investigations was that the whitewings, with no apparent advance notice while in Mexico, still seem to know somehow when the deserts up north are going to start spreading out the provender. The Arizona-bound contingent, for instance, knows specifically and exactly when the big saguaro commissaries will open for business. Since the giant cactus is a main source of whitewing food during the peak of the mating season, they check right in on time. An Organ Pipe Monument study, for example, shows them arriving in force on April 19, and the saguaros opening their first blooms only two days later.

These flowers provide the first food offered by the saguaros. Big, white blossoms, with that waxy gloss typical of cactus blooms, they withstand the desert heat well and the blooming season is long. In each flower's bell is a generous supply of thick sweet nectar, and the doves, dunking their heads in, imbibe deeply. When the fruit ripens, the doves

dine royally, staining their faces and bills red with the juicy pulp. Seeds and fruit of various other plants are also available, wild jujube and the tasty purple drupes of the *Condalia* being particularly favored in certain areas.

However, in spite of dining on food with high water content, these doves, unlike certain other desert-breeding birds, are absolutely dependent on additional free water each day. This is available season long only at a few permanent water sources in scattered locations in the desert, which means that the doves have to fly considerable distances every day to drink.

Anatomists, regarding the whitewings, report that when it comes to flying these doves certainly have what it takes. Their wing shape is elliptical, an excellent design to give high maneuverability and precise control with a minimum of drag. The skeleton itself is especially well built in the flying department, with its deep-keeled breast bone and enlargement of the upper arm bone, both providing wide areas for the attachment of the big breast muscles that power the flight.

The first and largest of these muscles, attached to the edge of the breastbone

and to the under side of the arm by a complicated tendon arrangement, lowers the wing. A second big flight muscle, also attached to the breastbone and this time to the upper side of the arm, raises the wing with the help of a couple of smaller ones. Various joints and muscles of the arms spread the wing and adjust its shape during each beat. The position of the feathers—a very important matter in flying—is handled by tendons on the back of the hand part of the wing. The big depth of the breastbone, besides increasing the length and mechanical advantage of the flying muscle fibers, strengthens the skeleton as a whole. This is a definite plus, since in the air a large part of the dove's body weight is carried on the breastbone.

With an anatomical set-up like this, the whitewing is highly capable of the rapid, powerful and sustained flight demanded by the need to travel for water. Lew Arnold's comprehensive study of the doves in Arizona found that the birds nest within a radius of 10 miles from the nearest source of water—probably even farther away. A water tank in the Sand Tank Mountain region, for example, drew them from all directions, making

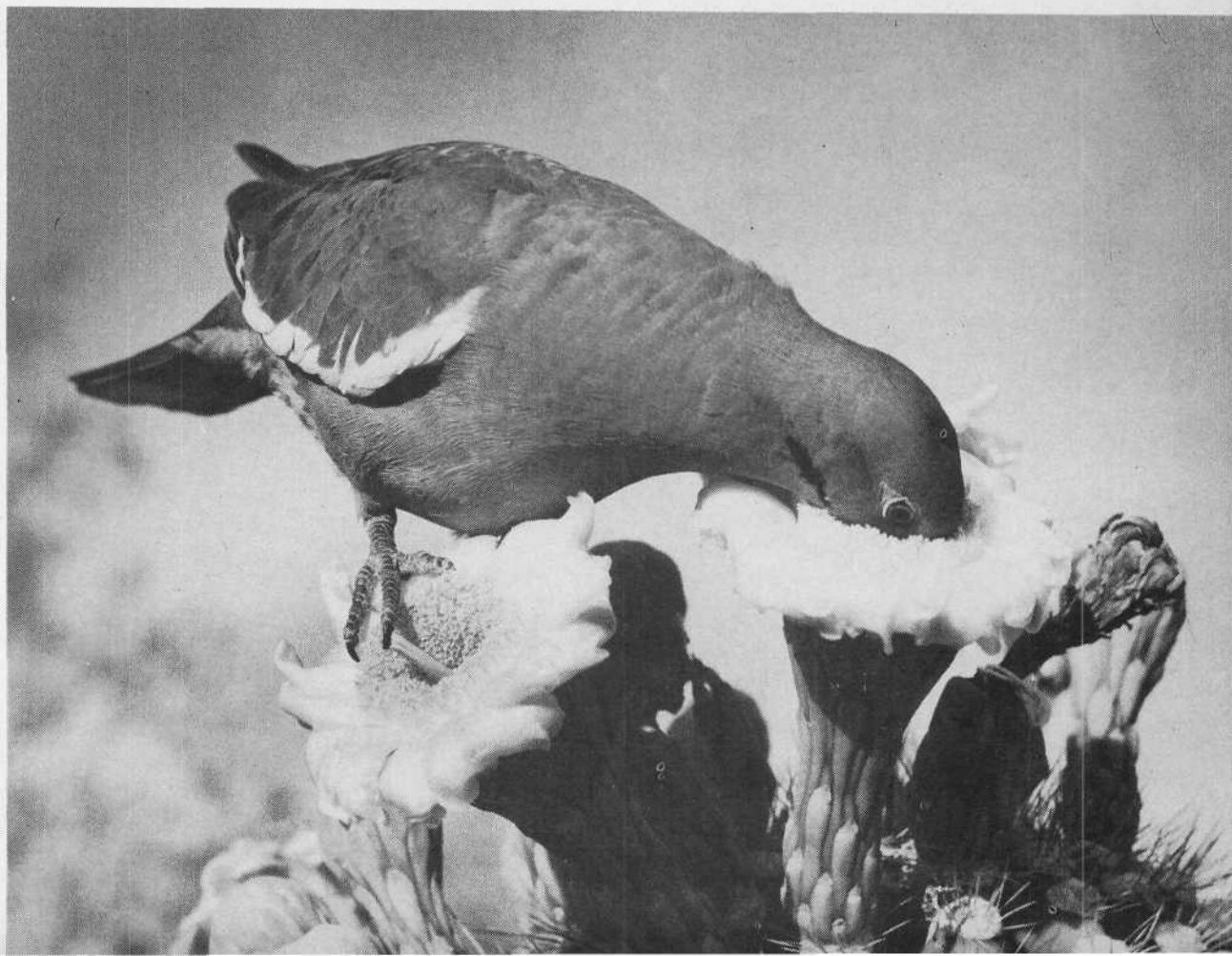
Opp. page:
White-winged
dove builds
a nest
in a giant
saguaro cactus.

*This thorny
haven makes
it difficult
for predators.*

*Photo by
Lewis
W. Walker.*

Right:
Western
white-winged
dove
feeding on
saguaro nectar.

*Photo by
George Olin.*



possible at least 314 square miles of potential breeding range. This tank alone served some 3,000 pairs of whitewings. Here at 7 P.M. on June and July evenings there might be 4,000 birds coming to drink. Every tree and bush large enough to hold them was covered with birds. More were on the ground in the shade of bushes and washes, hot, thirsty and panting, waiting a chance at the water.

Once the whitewing gets the old bill in, however, he can take on a load in a hurry, thanks to the drinking style evolved by his family long ago. This is achieved by a pumping action gullet which permits him to suck up water instead of having to take a bill full and then tilt back his head to let it run down his throat, as most birds do. Biologists R.E. MacMillen and C.H. Trost, interested in the whitewing's water needs, found the bird drinks about 12.4 percent of its body weight a day when it has an opportunity, but can get by with as little as 4.2 percent. An interesting parallel study of the mourning dove by G.A. Bartholomew and W.R. Dawson showed that these birds can drink in 10 minutes an amount of water equivalent to over 17 percent of their body weight. So the chances are that the whitewing, guzzling as fast as he can, gets his quota safely aboard.

Water available in the desert is apt to have considerable saline content, and

here again the dove tribe has evolved ways of handling this problem. Whitewings offered fresh water and 12.5 percent sea water by MacMillen and Trost failed to discriminate between them, flourishing equally well on both. If two higher saline solutions were offered, however, the birds always selected the water with the lower salt content. Water containing salt beyond a critical limit, however, was refused, the birds not drinking at all, even if they lost weight.

Although they arrive by the thousands, whitewings are really not gregarious birds, yet many nests are apt to be found in the same area. This is largely due to the fact that housekeeping sites offering food and nesting facilities within flying distance to water are so few and far between. What goes for a nest with these birds is the usual sloppy job typical of doves: a flimsy platform slapped together with a few sticks laid carelessly lengthwise, crosswise, any-old-wise. Where? In a mesquite crotch, on a limb of an ironwood, palo verde, on an arm of a saguaro, in a cholla cactus. In the trees there might be some chance of shade, but one nest was built on the stump of a saguaro in the blazing sun, the bird sitting on the eggs apparently unconcerned.

Two eggs are par for a clutch, with both parents sharing the sitting chores during the 17-19 days of incubation. The females sit through the night and morn-

ing, the males taking over around midday until late afternoon. Teamwork is essential, for one parent can't handle the big job of raising squabs successfully under desert conditions. The eggs and young cannot be left alone to broil in the sun, take cold in the night or be eaten by predators. Somebody has to be sitting no matter how uncomfortable conditions may be.

The adult birds are consequently subjected to heavy water loss. Both sexes need water just to keep up their own body weight. True, whitewings like their cousins the mourners, can stand high temperatures and dangerous dehydration remarkably well. They can also unload body heat from the surfaces of their bare legs and feet and by lifting their wings thus exposing the body parts that are scantily feathered. And, in high heat, they flutter their gullets, panting. But in addition to the loss of water due to environmental conditions, there is another heavy drain: first by the female in the production of the eggs and then by both parents in providing "crop milk" to feed the squabs until they can handle regular food.

During the incubation period, the crops of both the male and female enlarge, stimulated by the hormone prolactin. By the time the squabs make their bow to the world, a substance chemically quite close to the milk of mammals is ready, secreted by cells in the crop lining. At feeding time the parent opens its beak, the youngster puts its bill in, and the fluid is literally pumped into it. Highly nutritious, crop milk contains some 18 percent protein and 12 percent fat, and it of course provides the youngsters with the moisture they need. Fed on provender like this, the young squabs grow fast. This desert adaptation is fine for them, but rough on the parents, the production of crop milk being a major reason to travel daily to the water sources.

The birds are up early in the morning, cooing and feeding among the saguaros shortly after sunrise, and the daily flight schedule soon gets underway. From about 7 to 10 A.M. the mass movement to water is made up almost entirely of males tanking up for their hot midday stint on the nest. Back they go, the flight dwindling away. Around noon, the second big wave arrives, this time made up of females now off duty. They drink

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and depart. The evening incoming flight landing around 7 P.M. is made up of both sexes, the hundreds of pairs nesting within travel distance seeming to come in turns for the last drink of the day.

During all flight periods, the traffic around a water hole for a good quarter of a mile is tremendous—birds swooping and flying, crowding the trees, waiting a chance, shoving at the water hole and finally taking off, flying away. Arnold, watching the milling birds, had a vivid answer to his question: Why don't the doves nest close to the water source and save flying energy and time? Why? Because nobody, not even the doughty whitewing, could raise a family in such a bedlam.

All things considered, the whitewings are pretty successful in their family affairs with the choice of nest location making some difference. Arnold's study in the Tucson Mountain Park Area found that the birds did best when nesting in jumping cholla with 85 percent success. Palo verde nests came off with 73 percent success, Ironwood with 50 percent and saguaro nests not doing so well with only 25 percent. Biologist Max Hensley, reporting on his Sonoran desert contingents in various nest sites, ran thus: 24 nests, 44 eggs of which 45 percent hatched. Of these, 90 percent reached the fledgling stage.

Coyotes, snakes, birds of prey account for some of the lack of success. The Gila woodpecker might be guilty, too, as this bird dearly loves to poke its bill into hen eggs and lap up the contents with its barbed tongue. Since its range is almost identical to that of the whitewing, and since eggs have been found with holes whacked in them and the contents gone . . . well? A suspicious eye was also cast at the white-throated woodrat as a nest predator, but Arnold's study showed this fellow tolerant of whitewing neighbors, a fact corroborated by Zoologist D.M. Gorsuch's observations of a Gambel's quail nest built in the entrance of a wood rat home. Everytime the rat came or went it had to climb over Mrs. Quail. Beyond a few scolding clucks from Mrs. Q., and the scrabbling noise of the rat squeezing by, there was no trouble.

With this fairly good score for nest success, and the fact that the whitewings have two batches in most of their range, the clan keeps up its numbers. That is, if

the parents are not slain during the breeding season. It used to be thought that with the advent of the summer rains in Arizona, for instance, the birds took off for Mexico since they were no longer seen in droves around the permanent water holes. Consequently, it was thought the hunting season should begin before their "departure." Arnold's conclusions showed this was not true, that indeed the birds were still nesting. They were not at the permanent water sources because the rains, filling the natural depressions and holes near their nesting sites, made it no longer necessary to undergo the long flights. Therefore, mid-season hunting of the birds at permanent holes prior to the rains is obviously mighty poor game management. Families are bound to be broken up in the middle of the breeding season, the eggs don't hatch and squabs die without the double parental care. Population drops are inevitable.

Left to its own devices, the whitewing gets along fine due to its remarkable capacity to stand dehydration, to make rapid and sustained flights, and to make up its water deficiency fast. The trick of the trade developed over the ages in crop milk production that nourishes and waters the young gives the offspring a remarkably good chance at survival.

After all, the big Southwest desert, seemingly so inhospitable, is a very good provider for a bird with know-how like these whitewing wonders. □

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Forts of Utah

by JOE KRAUS



THE TERRITORY now within the State of Utah never really experienced the rowdiness and lawlessness as did its neighbors in Arizona, Nevada and California. But it did have its Indian problems. And the Army as well thought it had a problem with the Mormons (members of the Church of Jesus Christ of Latter-day Saints).

Although the Mormons themselves built most of the forts for protection against Indians, they were more interested in making peace with the Indians than fighting them. As a result, the Mormons got along much better with the red men than did the Army who most often didn't believe in peaceful methods. With the Army killing Indians needlessly on one side and wagon train emigrants bound for the gold and silver fields in Nevada and California killing Indians needlessly on the other, the Indians themselves often didn't know who was friend or foe.

As a result of all this several forts took shape. These included Fort Douglas, Fort Thornburgh, Fort Rawlins, Fort Crittenden, Fort Cameron, Cove Fort, Fort Deseret, Fort Harmony, Fort Buenaventura, Fort Utah and Camp Floyd. Most of these are only memories today with nothing more than one building, an historical marker or a cemetery to remind one of what it once was. Three of these forts, however, with much more to offer, are well worth visiting. These include Fort Deseret, Cove Fort and Fort Douglas.

FORT DOUGLAS

It was usual procedure that western

Ten-year-old Lee Wortman looks over the adobe walls of old Fort Deseret. The walls are all that are left of the old fort, built in 1865 as a protection against Indians.



Army forts were built to protect settlers from Indians. Not so with Fort Douglas, located now within the city limits of Salt Lake City. Fort Douglas was established "unofficially" to protect the Army or in fact the United States from the Mormons. Because they were different the

Army didn't trust the Mormons. General P. Edward Connor, commanding officer at the fort, was sure a musket-shooting Mormon hid behind every bush. Long an outspoken critic of the Mormons, he even founded a newspaper in which he could unleash his opinions.

Not all that excited that an Army post was established so close, the Mormons went to the courts to have the post removed as a public nuisance. That failing, they set up a close watch on the fort and even installed a telescope on the top floor of Brigham Young's home, where

Above: Probably one of the most well-built forts in the West, Cove Fort is in a perfect state of preservation.

Right: Old barracks buildings at Fort Douglas have been improved over the years, but still retain their original design and size.

Young James Chesley enjoys an outing at the old fort, almost within walking distance of his home in Salt Lake City.



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they could watch the soldiers and have time to prepare in case of attack. One day when cannons blasted from the fort nearly all of Salt Lake City was in arms in preparation for the invading soldiers. The cannon blasts, however, turned out to only be in celebration of Connor's promotion to brigadier general.

Occasionally Indians posed a problem in the territory and the Army was forced to leave their vigil among the Mormons to chase the troublemakers. On one such encounter, in pursuit of Indian horse thieves, the Army used a cannon. The first blast killed several government mules in a nearby corral. The second split the adobe building that was hiding the howitzer. No more shots were fired.

Although its Indian fighting and Mormon watching has now ceased, old Fort Douglas is still in operation. And as many Mormons over the years have joined the Army, so have many military men at Fort Douglas joined the Mormons, being converted to the faith by the good examples of living demonstrated by the people of Utah.

The only reminders of the fort's not-too-pleasant past are the numerous buildings built in the 1800s and still standing. Most of the buildings of that era line the old parade grounds and include officers row and the original barracks buildings. Old cannons and a gazebo are located where once they overlooked parading cavalymen in full dress uniforms.

Besides the old buildings and parade ground, another interesting site at the fort is the post cemetery. Here markers include those of soldiers killed in several skirmishes with the Indians. There are also markers for some 21 German prisoners who died while confinement at the post during World War I. There are also monuments to Connor and his California-Nevada Volunteers.

COVE FORT

Probably one of the most well-built forts in the West, Cove Fort looks today like it might have just been built only a short time ago. It is the only fort in Utah in a perfect state of preservation. The unique structure was built in 1867 by the Mormons during the Ute Black Hawk War. Now a monument to the pioneers who built it over a century ago, it is a popular tourist stop between Las Vegas and Salt Lake.

Built of black volcanic rock laid up in

lime mortar, its walls enclose a 100-foot-square of land with an open courtyard. Because of the high cost of metal nails, wooden pegs were used in construction of the fort. After the big wooden timbers were locked in place, a wooden peg was hammered down through them. Walls are 18 feet high and four feet thick at the bottom tapering to two feet at the top. This was done to prevent the walls from cracking.

Gates that provide entry into the fort were filled with sand so that if a burning arrow lodged and burned through, the sand would put out the flames. It would also withstand bullets used during that time. Other features include 25 port-holes, placed between each chimney on the north and south sides. Catwalks on the east and west sides gave the settlers protection from all sides. Lookouts stood watch from the roof.

The fort contains 12 rooms, six on the north and six on the south. These rooms are complete today as they were 100 years ago with typical pioneer furnishings and Indian handicraft. These rooms were built backed against the stockade, the fourth wall being the enclosing wall itself. A well was dug in the center of the square, and hanging in the front arch of the entrance was a huge bell to be rung as warning of an Indian attack.

Although the establishment was primarily a fort to hold off the attack of Indians, it also served for many years as a communications center for the Church, a supply station and cattle ranch. It also served as a station on the old Salt Lake—Pioche Stage Line, and as an overnight stopping place for travelers.

The fort is located off Highway 15, some 23 miles north of Beaver, Utah. Designated an historical monument, the fort is owned by Alice Kesler. Adults are admitted for a small fee which helps maintain the property. Children are admitted free.

FORT DESERET

It at times it seems like it takes forever to get something built these days you might take notice that things weren't always quite so slow. Take for instance the time they decided to build a fort in the central part of Utah, complete with walls, barracks, mess hall and out-houses.

In 1865, filled with the spirit of competition, it took 98 men, divided into two teams, just 18 days to complete the job.

Of course, their motivation might have been a little different. It was either work fast or get an Indian arrow through your chest.

If you're wondering about quality of work, well, its been over 100 years and part of the fort is still standing. That's more than you can say for many modern-day dwellings which often far outlive their usefulness in half that time.

They called their 2½ week creation Fort Deseret (a name out of the Book of Mormon which means "honey bee"). It was 550-foot-square with bastions at the northeast and southwest corners and gates in the middle of each side. The walls were made of adobe mud and straw mixed by the feet of the oxen. When completed they were 10 feet high, three feet wide at the base and one and one-half feet at the top. They rested on a stone foundation.

Today all that is left are these walls. And although they have suffered some by the elements over the past century, they are solidly built. Upon close observation you can still see the straw mixed in with the adobe mud and the remains of the two bastions. Other interesting features include the sentry lookouts with the original wood still implanted within the walls. It was here that men placed their rifles and fought off attacking Indians.

The old fort was erected by order of Brigham Young. Its purpose was as a defense against Pahuant Indians in the Black Hawk War. William S. Hawley and Isaac W. Pierce were foremen in the fort's construction with John W. Radford serving as superintendent. It was these men who were probably surprised most of all that the project was completed in record time.

Located near Delta, Utah, Fort Deseret is just one mile south of the small community of Deseret. It is located on land designated a state historical park. Near the fort a dirt road leads southwest for about five miles to the Gunnison Monument, a marker commemorating the spot where Captain John W. Gunnison and seven of his men were killed by Pahuant Indians in 1853. The murder of Gunnison and his men, then engaged in a Federal railroad survey, was to revenge the killing of a Pahuant Indian by non-Mormon emigrants bound for California who passed that way only a few days before. □

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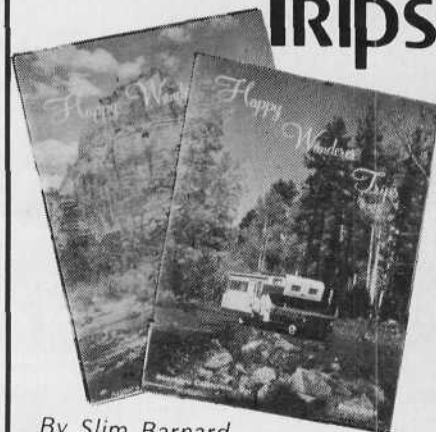
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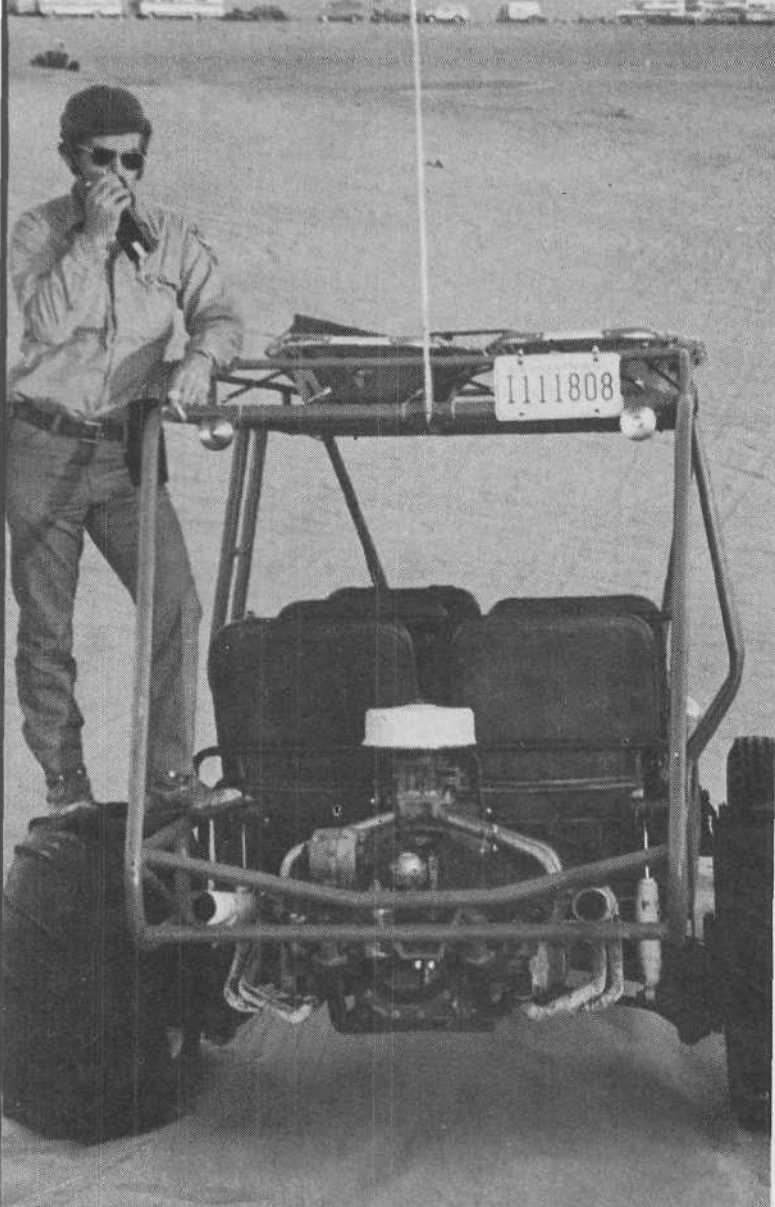
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The Dune Patrol

by JERRY HARRELL



Desert Ranger Dave Krouskop calls in during patrol of the Imperial Sand Dunes. Two-way radios link rangers with temporary ranger station, BLM area and district offices, and the Imperial County Sheriff's office.

THE IMPERIAL Sand Dunes rise 300 feet above the floor of the California Desert, their stark white ridges in bold contrast to the mottled greens and browns to the east and west. The dunes run southeast-northwest from just below the Mexican border 36 miles into California. Their width varies from three to six miles.

A striking feature of the dune environment is silence most of the time, in spite of two east-west highways cutting across them. But the stillness gives way on weekends to the roar of the engines of dune buggies, the whine of motorcycle engines and the boom-town atmosphere of instant cities of trailers, campers, motorhomes, buses, vans and tents.

On a winter holiday weekend — Thanksgiving, New Year's, Washington's Birthday—the Imperial Sand Dunes teem with up to 10,000 camping vehicles and 5,000 dune buggies.

Glamis, a wide spot in the road on California Highway 78, lives up to its self-proclaimed title of "Dune Buggy Capital of the World." Dune buggy clubs play follow-the-leader, their warning flags waving above the sand ridges to announce their presence. Others challenge steep hills like "Competition Hill" or run drag races. Children and adults

Close-up of dune buggy shows how accident victims can be rushed from the Imperial Sand Dunes to nearby medical facilities.



zip all about on two-wheeled motorcycles and three-wheeled all-terrain cycles.

Accidents can happen, and frequently do.

The Imperial Sand Dunes are almost solidly National Resource Lands administered by the Bureau of Land Management. Existing heavy use marked the Dunes for priority status when BLM launched its interim critical management program for recreation vehicles on the California Desert.

Under the program, revised and renamed the "California Desert Vehicle Management Program," the dunes south of Highway 78 are open to off-road vehicles. North of the Highway, the dunes are closed to protect unique plant and wildlife communities, but there is a mile-wide vehicle corridor on the west side.

BLM's initial management efforts were hampered by an inability to get around in the dunes. A conventional two-wheel-drive government pickup was like a fish out of water in the sandy world of the dunes.

The obvious answer was a dune buggy, so in 1974 BLM contracted for a dune buggy designed for patrol, visitor assistance and management in the dunes. Modifications specified by BLM—including rear seats that fold down to accommodate litters for accident victims—



boosted the cost from \$5,000 to approximately \$5,500 for the buggy, its trailer and a spare set of wheels.

After shakedown runs and further changes to strengthen the drive train, the buggy went into service in early 1975. In its first year, the buggy hauled more than 50 injured recreationists out of the dunes, provided assistance to uncounted people who were stranded and gained a strong foothold for manage-

ment in the chaotic world of the weekend dunes.

"The buggy has made all the difference in the world for BLM's management program in the dunes," said Barry Ashworth, Lead Desert Ranger for the Southeast Desert Resource Area.

A hearty "amen" is added by Dave Krouskop and Dave Bush, two rangers who operate the buggy.

"This buggy is the greatest thing the

Above: Desert Ranger Dave Bush talks with a dune buggy operator about Bureau of Land Management's California Desert Recreation Vehicle Management Program.

Right: Specially designed and built dune buggy gives Bureau of Land Management mobility in the Imperial Sand Dunes.

The machine can carry six persons, or rear seats can be folded to accommodate litters to carry two accident victims.



BLM Ranger Dave Krouskop
surveys activity at
"Competition Hill"
in the Imperial Sand Dunes

Bureau has ever had as far as this area is concerned," shouts Krouskop over the roar of the buggy's engine.

"We were intruders when I first came down here a year and a half ago. People saw a government rig and said, 'what did I do wrong now?' Now they come up and talk about the buggy, and this opens



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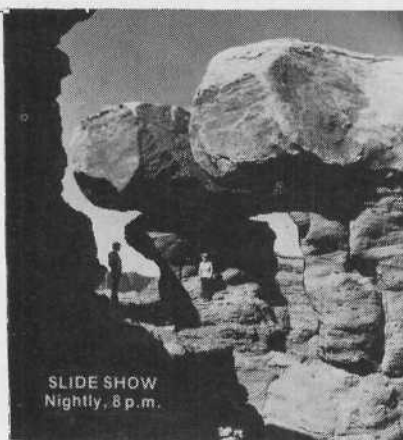
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up other subjects and gives us an intro to talk about our management program.

"They even wave to us now," he says, returning the wave of a passing buggy operator.

Bush's experience was the same: "People didn't think we had a right to be out here—they thought they owned the dunes. We were not accepted. They would not stay out of the closed area. We were the bad guys and in their eyes all we were doing was closing the desert.

"Then we came out in the buggy and started working accidents—providing a service that was badly needed and no one else had the capability of providing. They began to accept us, and to recognize that the dunes do belong to all the people and that we manage the dunes.

"They see we are doing something productive and not just closing the desert," Bush adds.

Krouskop points out that the BLM buggy was designed as a management aid, but is also an invaluable public tool because of its status as an "ice-breaker" with the recreational community.

"And because it is a PR tool, it's a more effective management tool," says Lead Ranger Ashworth.

BLM's buggy has paid for itself in the

Hazards of the desert. Desert Ranger Dave Krouskop displays a 22 millimeter cannon shell found by a dune buggy enthusiast in the Imperial Sand Dunes and turned in at Bureau of Land Management Ranger station.

eyes of the rangers. But the vehicle is not used solely for recreation management. It has been used in the East Mesa and other Southeast Desert areas for archaeological surveys and such resource inventories as range, watershed and wildlife.

The buggy has two sets of rear tires: big paddle-track tires for the dunes and more conventional high-flotation truck tires for use elsewhere.

The buggy is powered by an air-cooled, 140-horsepower Chevrolet Corvair engine. It will operate for an hour on a gallon of gas, so its 25-gallon tank gives it excellent range.

The two litters, backboard and first aid kits can be stowed atop the buggy's steel frame or on the folded-down rear seats.

Five of the seven Desert Rangers in the Southeast Desert Resource Area have undergone extensive emergency medical technician (EMT) training. It came in handy in 13 rescues during the 1975 Thanksgiving weekend. All the rangers have been familiarized with explosive ordnance by a U.S. Army Explosive Ordnance Detachment so they will recognize the various types of ordnance left behind by years of aerial gunnery practice in and near the dunes.

Rangers on patrol are equipped with portable two-way radios connecting them with the BLM's Cahuilla Ranger Station. The station is a 55-foot trailer set up at the intersection of BLM's Imperial Sand Dunes Road and Highway 78. The station is in radio contact with Southeast Desert Resource Area headquarters in El Centro, the Riverside District Office and the Imperial County Sheriff's Office.

Capability is still limited. BLM covers about 60 percent of the dunes, but has virtually no capability in the southern 40 percent near Interstate 8 and Buttercup Valley.

The first BLM dune buggy is still having some mechanical "bugs" ironed out. But while it is partly an experimental prototype, it is also a valuable management tool that has won its spurs in heavy use. □



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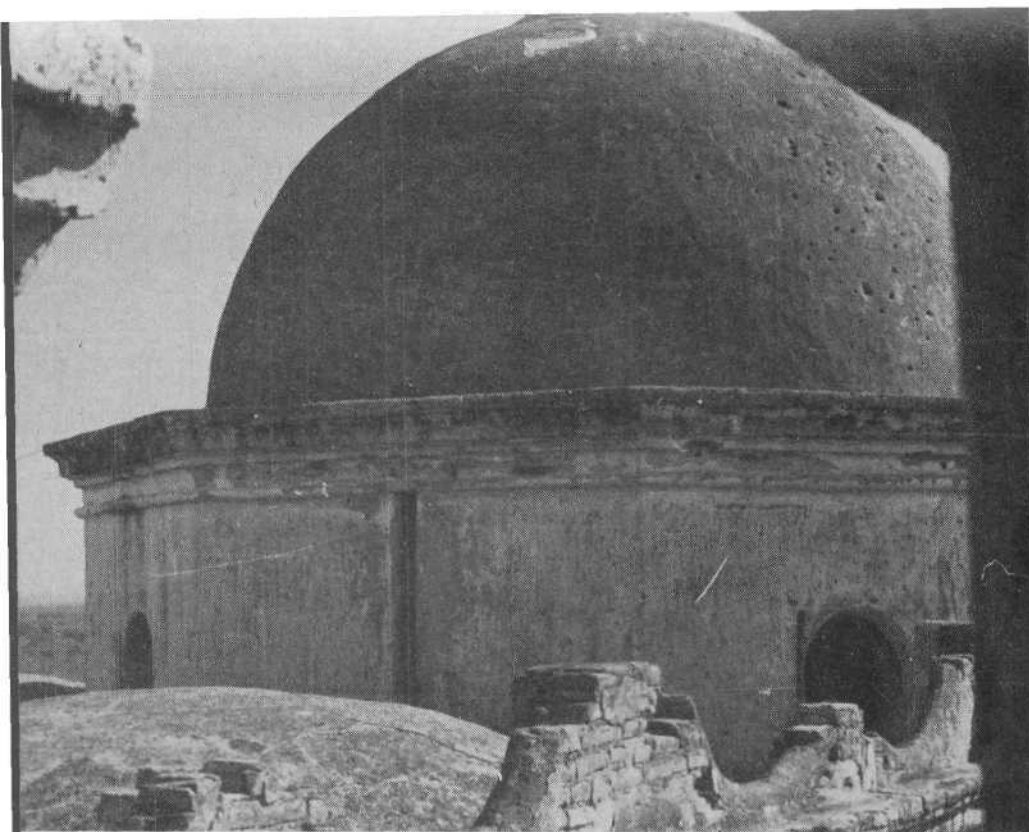
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On the Trail of the Kino Missions

Continued from Page 27

the only warning you can expect. Return to Altar on the same road.

From Altar, continue 13 miles westward to Pitiquito or Pitiquin. The church, San Diego del Pitiquito, is south of the

highway. Painted white, it sits on a small knoll in the village which is easily seen from the highway. Founded by Kino in 1695, it escaped the Indian uprising. The present church is Franciscan.

Continuing another five miles, approximately 166 miles from Tucson, is Caborca. A large city and commercial trade center for this region, there are

Dome of Caborca. Domes are characteristic of the more pretentious churches. They are of several types and always constructed of a single shell of brick. Caborca offers a splendid opportunity to study a variety of dome construction ranging from the flat vault at lower left to the central hemispherical type built upon an octagonal drum. The architects of the missions were usually the padres themselves, who as a rule conceived the work and directed the Indians in the erection of the buildings. In the case of Caborca and San Xavier, it seems evident that trained architects were employed, and probably the same architects in both cases since the features throughout these two churches are so similar.

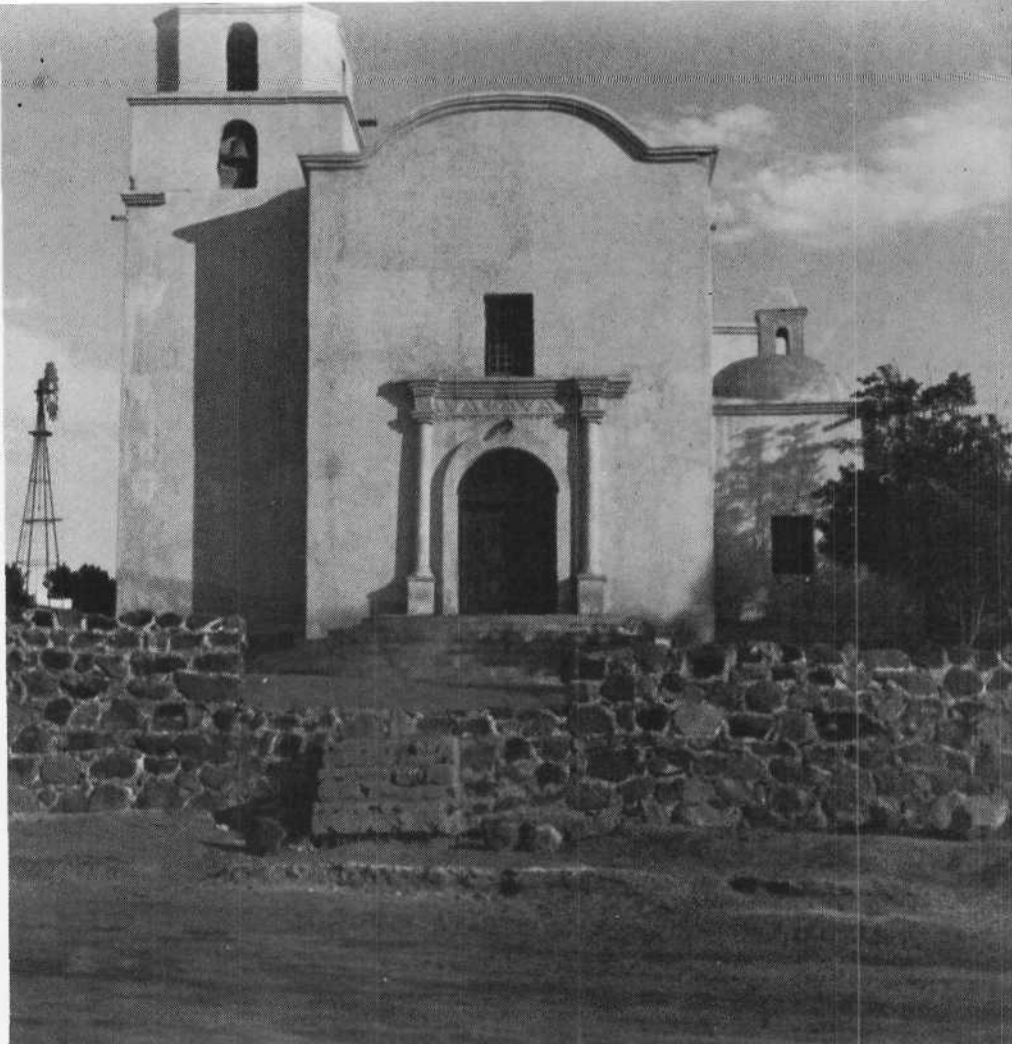
good restaurants and two excellent motels. The cathedral-like church on the city's main plaza is not the Kino-associated mission. You may ask directions or follow signs to the church of Nuestra Senora de la Concepcion del Caborca south of town.

Kino first visited Caborca, on the Rio de la Concepcion, in December 1693, building a simple adobe hall-like meeting place. The present church, one of the finest of its architectural type, and one of four on this site, was started in 1803. Kino was impressed with the agricultur-



Tubutama exterior. A common feature of all the Sonora missions is the large areas of undecorated wall surface. This characteristic, of Moorish ancestry, proved extremely practical in the mission construction of Sonora, because of the employment of unskilled natives. Any exterior elaboration was confined about the entrance and further tends to illustrate the influence derived from the mother country. This exterior, at Tubutama, is lime plaster over brick with plaster relief decoration on the entrance facade. Unique, and unlike any other Sonora mission, is the entrance which is on the side of the nave rather than the end. The dome at the left is high over the crossing between north and south transept set on an octagonal drum with windows to admit light. The interior walls are of burned brick, adobe and stone, showing different periods of construction and additions. These domes are crowned with crosses in Byzantine style rather than lanterns as at Caborca.

Right: Pitiquito. Kino founded a church on this site in 1695. The present church is Franciscan. The massive whitewashed walls throughout the interior once contained large liturgical murals. Women of the church accidentally uncovered them in 1967 while washing the walls with a detergent. Below: Oquitoa is characteristic of the smaller of the Sonora churches. With a narrow nave limited to the length of the beams which form a flat roof, this is a fairly well preserved building. The twin belfry is a wall type, a simpler form, which is merely an extension of the front wall above the roof line having openings in which bells are hung. This church, too, has the scalloped motif decorated about the entrance way. Remains of the adobe walled cemetery, which could be entered from the Sacristy, are seen here. The mausoleums are recent additions.



al potential of the fertile plains along the river valley. Caborca's calm was shattered by the Pima rebellions of 1695 and 1751. In spite of this, the place grew in importance as an agricultural heartland.

Peace ended again, temporarily, in 1857 when an American, Henry A. Crabb, brought an ill-fated army across

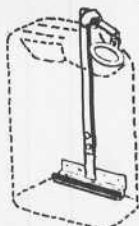


the border in an attempt to seize northern Sonora. Although at one point Crabb had the townspeople besieged in the mission church, his expedition ended in the execution of his entire force on the mission steps. Bullet marks on the facade are said to date from this historic episode. The Mexican Government has since restored the church and made it a national monument.

From Caborca, continue west along Highway 2 to Sonoita, Sonora and Lukeville, Arizona. There is a good motel at Lukeville (Gringo Pass). From the Mexican border you travel north through Organ Pipe Cactus National Monument, with its excellent campground. Take time to stop at the Visitor Center and tour the 12-mile loop road into the Ajo Range. Although unpaved, the road is well maintained and will provide you with rewarding views of desert mountains and wildlife.

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Rambling on Rocks

by

GLENN and

MARTHA VARGAS

UBEHEBE CRATER: Known as a Maar

DEATH VALLEY National Mounment contains many geologic features, but to us probably the most interesting is Ubehebe Crater. This crater is located somewhat off the beaten path, to the west of the well-known Death Valley Scotty's Castle. The small percentage of visitors to the monument that do get to the crater probably leave wondering what is so interesting about a huge hole.

This type of hole is known to geologists as a maar. It is defined as a volcanic crater, the result of a single huge explosion, not followed by a lava flow. The definition also states that a maar usually contains a crater lake. Due to the lack of

rainfall in Death Valley, there is no lake, but there is a small dry lake at the bottom that holds a small amount of water after one of the infrequent rains.

To completely describe what went on at Ubehebe, it is best to describe what normally happens during the formative life of a volcano. All volcanoes do not begin exactly in the same way, but the usual thing is for a small vent to open, releasing smoke and gasses. This is followed by small explosions, then greater ones, each throwing out certain amounts of ash, small stones, blobs of lava and steam.

This was the sequence of the volcano that appeared in a corn field near Paracutin, Mexico. A farmer was surprised a few years ago to find smoke coming from a small hole in his corn field. He actually admitted filling it with a shovel full of dirt to cover it up. Subsequent events showed his folly.

Some volcanoes appear near older ones, and go through a series of more or less violent explosions that eventually release enough ejected material to form the usual cone that is associated with a volcano.

After the cone is well under way, but not necessarily at its full height, the explosion activity may cease, and lava usually begins to flow. The lava breaks through the cone near the base (it seldom flows over the top) and may cover a large section of the surrounding country.

Many normally formed craters have very small lava flows, or in some cases, none. These are known as cinder cones. Our Southwest desert is studded with cinder cones, and some are found very close to Ubehebe Crater. Some cinder cones are partially complete, the balance of the cone having been blown away during an explosion. Evidently, such explosions are the final phase of the eruption. At least this appears so in many cases.

Many of these cinder cones have a history that is further intriguing. Some erupted through a narrow crack, or fissure, that was not enlarged during the series of eruptions. When the final action ceased, this fissure became clogged with solidifying lava, finally sealing off the opening. This type never again erupts through the same crater. Amboy and Pisgah Craters, west of the desert town of Amboy, California, are examples of this type. Both are cinder

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cones, Amboy is especially symmetrical, and both spewed out small lava flows, but they are now sealed.

The series of events at Ubehebe Crater is in some ways similar to the above examples, but is vastly different in others. Just to the south and east of the huge crater is a series of cinder cones. These erupted first in the usual manner, with very little evidence of lava flows. These cones, about a half dozen, lie crowded together, some partially covering another. The whole area is black, covered with a deep layer of cinders.

The parking area for Ubehebe Crater is on the west side. As one walks toward the crater, the cinder cones may be seen ahead and to the right. After the cones had reached their present sizes, there was a cessation of activity among them. Evidently great pressure began to build beneath. Each of the cones must have sealed itself off at the close of its last eruption. These were undoubtedly fissure flow types.

This pressure beneath the surface finally built up to the point where the rock layers above could not withstand further pressure, and there was one huge explosion. The result is a nearly circular hole a half-mile in diameter, and 800 feet deep.

The walls are very steep, but it is possible to descend to the small dry lake at the bottom. An interesting cross section is exhibited by the walls of the crater. The top few hundred feet are black, the lower portion is brown rock, more or less banded. Indications are that the explosion happened in one of two ways. It could have blown through the previously deposited layers of rock and the cinders from the nearby cones, and had no further eruption. The other possibility is that it deposited some cinders in an eruption following the explosion. We like to feel that the former is correct. It appears that the explosion was extremely violent, and scattered the brown rock formation over a great distance. Any of the brown material that fell on the black cinder cones would be greatly scattered, and not easily visible unless viewed from a close distance.

If the crater had erupted after the explosion, some of the nice clean lines of the cinder cones would have been erased by being partially covered with ash and cinders.

It does not really matter much whether the explosion sent up only rock that was

lying in place before the explosion, or whether black cinders followed the explosion. Either way, it took an enormous amount of energy to create a hole of these proportions.

Regardless of the magnitude of the explosion, it was evidently the last of the eruptions for the immediate area. The nearby cones could and did not erupt again, and the crater stands much the same today as it was immediately after the explosion. The only change seems to be that a small amount of rock and cinders have been washed down into the crater.

Further evidence of the complete sealing and the lack of additional eruptions is shown by the lack of cinders around the edge and on the bottom.

Knowing these principles and the eruptive acts that follows them causes wonderment when one stands at the edge of such a gaping hole. Many questions ran through our minds. Why did the crater itself not erupt following the explosion? The probable answer is that once the pressure was relieved, there was no further activity in the area.

How deep was the pressure that caused the explosion? It probably was not very far beneath the surface. The cone is of a nice acute form, and if it had not been partially filled with falling material, it would have come to a point about 500 or 600 feet down. If this is true, we like to think that the apex of the pressure area was only about 1500 feet below the surface.

Was there an earthquake? Almost undoubtedly, but not of the usual type which results from movement along a fault line. There certainly were shock waves that radiated away from the explosion site, but they could have lasted only a few seconds.

What was the effect on wildlife? Certainly, any living things that were present at the actual explosion site did not survive. Animals within a half-mile or so away from the edge of the crater probably suffered from the sound shock. If they survived the sound shock, they were in great danger from falling debris.

Plant life that was not destroyed by falling material was probably not effected in any way. Much of it within a radius of a mile or two was probably covered with falling material of some kind.

There was the explosion, followed by the rain of falling rock, then silence. ☐



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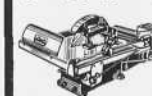
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Letters to the Editor

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Pardon to the Cardon . . .

The April *Desert* was a gorgeous issue. Unfortunately, there is an error in K. L. Boynton's "World of the Saguaro" wherein he refers to the saguaro as the largest cactus in "North America."

North America connotes the continental area above Central America and includes Mexico, where by far the largest North American cacti grow. I refer to cardons, and am including a photo and data for your files.

FRANK P. McWHORTER,
Carmel, California.

This is the Cardon characteristic of Mexico's northwestern Sonoran desert. Cardon is

the Mexican name for the cactus. The technical name is *Pachycereus pringlei*. Location, near Kino on the Sea of Cortez. There are five species of cardons in Mexico, but all authorities agree this species is the largest of all cacti. The tallest ones attain a height of 60 feet, but even those only 40 feet tall weigh tons. Note that the flowers occur on the ridges of the upper branches. Conversely, the flowers of the saguaro occur only on the tips of the terminals. Photographed April, 1973 with a 180mm lens on an old model Mamiya-flex twin-lens camera.

Old Switch Padlock Identified . . .

In answer to Bertha E. Pierce's question regarding the old railroad switch padlock which she found near Yuma (June, 1976 issue), I also found an identical lock in Daggett many years ago in the rubble left from an old saloon which I was told burnt down in 1901.

The lock was also marked C.P.R.R. and was from the old Central Pacific Railroad. An old atlas I have, which was printed in 1879, shows this railroad and its connecting branches throughout California from Yreka south to Visalia. From Sacramento it went eastward and connected with the Union Pacific, probably in Utah.

JOHN A. KOPEC,
La Puente, California.

Calendar of Events

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

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

AUGUST 21-SEPTEMBER 6, 19th Annual Weed Show and Art Mart, Julian Town Hall, Julian, California. Displays, guest artists. Art for sale.

AUGUST 28 & 29, "Nature's Crown Jewels," sponsored by the Simi Valley Gem and Mineral Society, Larwin Community Center, 1692 Sycamore Dr., Simi Valley, Calif. Demonstrations and dealers. Chairman: George Martin, P. O. Box 3571, Simi Valley, Calif.

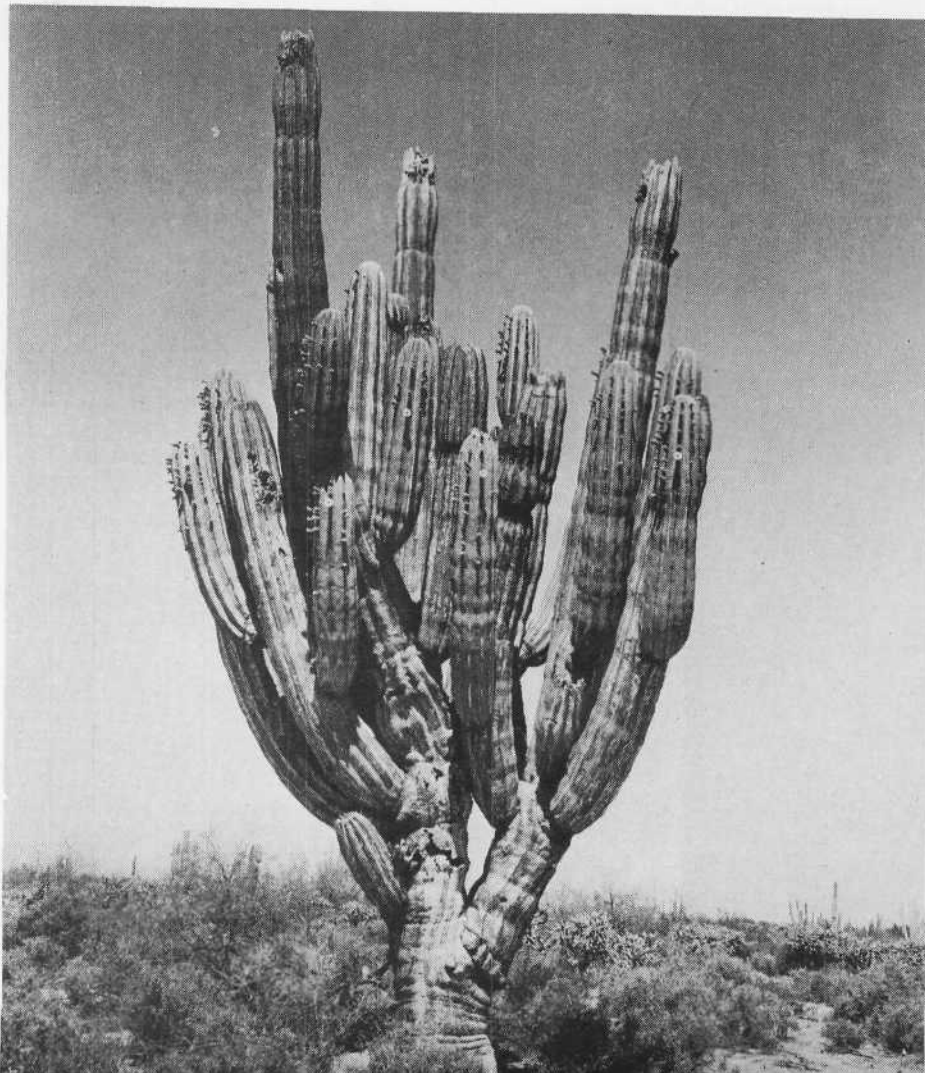
SEPTEMBER 4 & 5, Calaveras Gem and Mineral Society, Inc., Jewels of Calaveras, Frogtown, Calaveras County Fairgrounds in the Mother Lode County. (Not held during the Jumping Frog Jubilee.) Chairman: Earl Klein, 1899 Martin Blvd., San Leandro, Calif. 94577. Camping, Field trips, etc.

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

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

SEPTEMBER 11 & 12, 6th Annual "Gem-boree" of the Santa Maria Gem & Mineral Society, Convention Center Fairgrounds, Santa Maria, Calif. Displays, demonstrations, dealers. Free admission and parking:

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





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