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Desert

Magazine of the
OUTDOOR SOUTHWEST

May 1961
40 Cents



THE PORTRAIT which adorns (I hope that's the word) this month's cover of *Desert Magazine* was begun in the year 1906, a statement which should give pause to the wisecracks who think a painter makes a killing with every half-hour's work.

It may even silence a few of the more diffident members of those legions whose first question is: "How long did it take you, mister?"

But no doubt my opening remark needs a bit of clarification, for 1906 precedes by a full decade the year of my birth. And when it became evident that the throb in Mother's breast was to receive embodiment in conjunction with a good color-eye and a love of drawing, still another 10 years went by until I was well into the habit of drawing cowboysnindians; 10 more till I was bound over irrevocably to the authority of professors of anatomy, design, drawing, color theory, art history and whatnot; and another two-and-a-half decades before the painting on the cover was taken from my easel and delivered hopefully into the hands of the color engravers.

1906? Well, had it not been for certain events transpiring on Arizona's Third Mesa in that year, this particular painting would never have been, for the regal old Hopi whose likeness I trust "plucked at your sleeve," reaffirmed in that year his right to leadership of those dwelling in the oldest continuously inhabited village in America, Oraibi. The details of this dispute are a fairly well-known story which need not concern us here, but the ructions resulted in removal of dissident elements to form new communities at Hotevilla, on the same mesa, and at New Oraibi, leaving my chieftain sole and sufficient custodian of his satrapy in the sky for over half a century to come.

Thus it fell out one sunny day that I wandered into his domain, with my psyche more than somewhat battered from seemingly interminable frustrations in a cherished project of painting the Hopi. More than a year had passed since witnessing my first Snake Dances, where I was left almost beside myself by the sight of the magnificent heads of these Indians; left also with a consuming desire to return and paint them. So here I was, straggling about over the mesas and among the villages, trying this and that, all to no avail.

With the Navajo I had got along just fine, thanks to the kindly offices of far-famed "Shine" Smith. He and I had roamed Dinneh Bikeyeh (Navajoland) together for some time, and his 40-odd years of friendship with the Dinneh stood me in good stead and produced abundant grist for my mill. Some time later I took off for Hopiland, where my charcoal and brush came to a screeching halt. Though I had several good leads and an entree or two, nothing seemed to work out. Interesting experiences came my way, eating with Hopi families, participating, after a very minor fashion, in a corn roasting ceremonial, dandling wee Hopis on my knee and feeding them pop and ice cream through a movie showing at the community hall, camping in a dry stream bed near a village and listening to the sounds of Indian life in the night and early morning. But no portraits.

So it was in no very sanguine frame of mind that I stopped near an adobe building on the outskirts of Oriabi and asked

a young Hopi to tell me the chief's name. All I could make out was something that sounded like "Tewa-quap-tewa," and I finally concluded she had misunderstood me, thanked her, and proceeded toward the village.

Despite the bleakness of my prospects, I could not suppress a thrill of delight while approaching this fabled hamlet where stories and pictures galore were springing to life as my eyes traveled over the kaleidoscopic patterns of a city compounded of earth and legend. There is about all the villages a wonderful rightness and harmony of impression, for they seem to have grown somehow from their environment, necessitating only the most minor adjustments and adaptations to produce a perfect gentleness, in livid contrast to the stark anomalies with which we whites clutter our lovely America.

The sense of stepping into history was intensified as my gaze lifted to the far end of the mesa, where one dramatic ruin tears a jagged corner from the radiant blue canopy that gathers all horizons in its airy embrace. This dark hulk is all that remains of the Roman Catholic chapel, reminding one that heroic men lived out heroic lives in this very place, until the fury of lightning laid waste this symbol of their labors.

How could a whole town be so relaxed, I wondered as I approached the utterly deserted streets and plazas where not even a chicken scratched at the pervasive somnolence, and how could I have guessed that not many minutes later my own sweet presence would have those quiet avenues awash with seething humanity? Lest you suppose I entertain fanciful notions of my nasty-tempered self, I proceed with all haste to explain that the sweetness alluded to was strictly chemical, in the form of candy kisses, jawbreakers, suckers, Tootsie Rolls and whatever the trading posts carried to ravish the heart and palate of a young Indian. (Did I say "young"? Once as Shine and I were distributing sugared largesse to the small fry in a Navajo encampment, one of the women gently rebuked me in slow, painful English, "We—aw—like can—dee.")

The change from torpor to turmoil started with what I took to be a sort of fissiparous disturbance in the street near me, but the new unit proved, upon closer acquaintance, to display occasional traces of a T-shirt under a carapace of good Hopi soil. Then it, I mean he, imparted the information that his name was Oren, I kid you not, and he was going to show me around. As evidence of my old-hand status in this sort of thing, I stood waiting for him to put the bite on me, but, *mirabile dictu*, no bite, and I at length decided it was up to me to do the decent thing.

"Do you like candy?" I asked, and was struck blind by a flash of teeth. Whether this coruscant grin resulted from sheer love of candy or from amusement over my asking such a stupid question, I cannot tell, but back to the car we went and during that brief stroll it happened. Kids.

Out from the earth they sprang, from under rocks and behind bushes, out of the woodwork, over the fences and off the rooftops, out of the everywhere into the here. The town rocked with the crashing of screen doors and I strode at the head of an army whose swollen ranks increased at every step. Here I was in a brand new role and world—Hamelin Town, of course, and Browning's piper of the gaudy threads held no more allurements in his punctured reed than I in a Campbell's soup carton stuffed with tummy-ache. Thus my solitary wandering became a parade, and we did the town in style—until the candy gave out.

Only at one point was I wholly deserted; at that juncture I decided on a good look at the ruined church, and set off for the structure, which lay a furlong or so from the nearest villa. A small knot of hardy candy-lovers stuck with me about half-way, then made a stand to await my return. When I had prowled about to my content, we regrouped and continue through the town, jaws and feet synchronized.

All this followed my encounter with Tewa, and we must

ABOUT THIS MONTH'S COVER:

How I Came To Paint

Tewa-quap-tewa's Portrait

By R. BROWNELL McGREW

now employ a flashback to pick up the story where, disconsolate and uncertain, I first ambled into town.

Just past the entrance I was met by a guardian angel disguised as a small boy. He was a voluble laddie, but it was Creek to me, and I stood there forlornly slipping small slivers of English into his torrent of Hopi on the chance one would snag on a rock of comprehension and place us in rapport. But now a second angel entered, not quite so well disguised — an older sister of my fledgling Demosthenes, possessed of neat serviceable English and a courteous mien. When she was apprised of my desire to parley with the chief, she volunteered the guide services of her eloquent sibling, and we set off.

Our way led through the open plazalike streets or aisles that separate the Hopi villas and create refreshingly irregular patterns throughout the village. I could sense we were nearing our destination as my urchin's pace slackened and he sidled toward the shadowed walls, communicating to me some of his apprehension, which served also to induce burgeoning wonder at the situation I was entering. All at once the exploration of my sensations flashed over me—I was the errant prince being led by a quaking local to the very edge of the enchanted forest where dwelt the fearsome giant in a lair strewn with remains of hapless men whose temerity had betrayed them into untimely death.

The forest's edge proved to be a spot some 50 yards from the chief's abode, and the conception thus formed was given its crowning touch when my young conductor turned and fled in approved story-book fashion, not even waiting for his pay, a fact arguing well-nigh insuperable terror.

Unslinging my shield—my wallet, that is—I stood a moment to contemplate my objective, and a jim-dandy staging it was. Facing me was a somber two-story dwelling, set appropriately apart and communicating a sense of centrality and oversight. From the road a twisting flight of stairs, made of large irregular blocks of stone or adobe, mounted to the second story where a dark aperture gave access to the interior, and in this foreboding gloom crouched a massive unmoving shape—the old chief himself, gazing out over his realm with unwearied concern for his people and their affairs. Up the stairs I went, and as I drew near, the dark mass extricated itself from the shadows and came forward onto a small landing.

Here stood Tewa-quap-tewa, subject of story and song, indomitable leader of his people and implacable foe of all that he considered inimical to their welfare. He was schooled, so am I told, at Sherman Institute in Riverside, California, where he displayed remarkable prowess in mathematics. But his resentment of governmental measures so embittered him that he put all this from his mind, refusing even to acknowledge white ways by telling time from a watch. In freezing cold, he has spurned the use of a heavy Army-issue overcoat, and while some will style this a flamboyant quixotism, there is much to applaud in the sight of someone willing to suffer cold and privation for his convictions.

In precisely what deathless phrases our initial felicitations were couched, I cannot now recall, but the whole operation skidded and lumbered about in erratic fashion for some while. What with Tewa's pidgin English and my pidgin pidgin, the afternoon was well advanced before we effected a glancing blow of the minds.

A nominal fee was charged for going through the village, and much of our difficulty seemed to hinge on an incomprehensible necessity for knowing which way I wished to go. In vain did I strive to explain my wish to saunter about ever' whichaway; this was evidently a concept foreign to the orderly Hopi mind.

Another fee was levied for taking photos, and additional ones, of course, to any individuals who might be prevailed upon to pose. For a variety of reasons, sketching was out of court for the nonce, so, like the boss's son, I figured I might



◊ The thoughts provoked by this sketch would easily build into a longer piece than the story on Tewa, for it was the first study I made under Shine Smith's benevolent sway. The subject is a Navajo medicine man named Sah-lis tall-kah, which sounded wonderfully Indian, and I pressed Shine for the spelling, whereat he grew somewhat irked at my obtuseness and growled: "S - ah - l - a - s - t - a - l - k - e - ah." Why of course, Mac, you rockhead. "Silas Talker."

Few thrills equal the delight I experienced as I settled

down to work before this splendid old Navajo, the long-loved sound of charcoal on paper mingling with those of the breeze whispering in juniper boughs, two used-looking mutts scratching alternately at the unresponsive earth and viciously responsive fleas, a wan, unhappy chicken pecking at scraps of melon rind, and Shine happily exuding billows of cigar smoke from his supine position in the shade.

As near as I could make out with my sketchy knowledge of Navajo, Shine and Silas conversed desultorily about Einstein's Unified Field Theory and Kant's refutation of the ontological argument for the existence of God. At one point there occurred a rather long and spirited exchange, after which I asked Shine what it was all about.

"I told him, 'In the beginning God created the heavens and the earth.'"

"And what did he say?"

"He thinks Coyote made it."

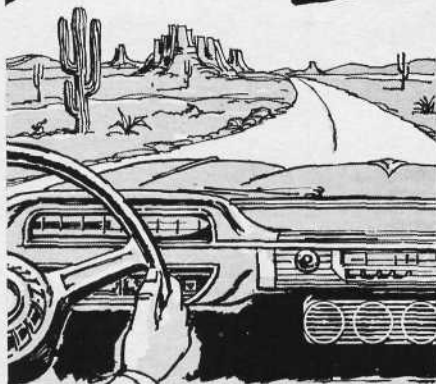
as well begin at the top and proposed to the chief that we start with him.

"Two dolla" was his response, and we closed the deal.

Afterward he thanked me with the comment that this would buy his dinner, which is fair play as he—his image, that is—may someday buy me a dinner. But his share in our enterprise occupied 1/50 second at f.11, which my abacus tells me is \$100 per second, or \$360,000 per hour, whereas I have some two or three months tied up here. More realistically, counting from 1906 when, as I said before, this picture was actually begun, I've been earning 2.08 cents per day, always provided, of course, that I can sell the painting. Anyone in the market for a set of used paints and brushes?

It is my fervent hope that no one, especially Tewa himself, will be perturbed by the slightly anomalous fact that as the painting stands, his coloring is all derived from Navajo sketches, plus a generous interlarding of subjectivism, for our brief encounter left me with only a black-and-white snapshot to work with. He was not wearing the turquoise I show, but I may hope he has such a necklace to make it authentic, and I trust the hound's tooth check sport jacket he wore is not *de rigeur* with head Hopis this season. So there stands my salute to a fascinating man and people—may it be only one in a lengthy series. ///

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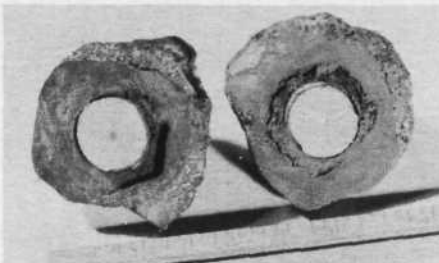
LETTERS

... FROM OUR READERS ...

The Coso Geode . . .

To the Editor: Mike Mikesell, Wally Lane and I are owners of the LM&V Rockhounds Gem and Gift Shop in Olancho, California. On a recent field trip into the Coso Mountains we picked up a geode (a nodule of stone having a cavity of crystals or minerals) which may prove to be a highly significant clue to greater knowledge of our world and universe.

In the opinion of one trained geologist, it has taken at least 500,000 years for this nodule to attain its present form—and yet, when we cut it open, we discovered a man-



THE TWO OPEN HALVES OF THE COSO GEODE

made object within the geode's cavity. (See cut.)

The Coso Geode's outer crust is of hardened clay containing pebbles and fossil shell fragments. Also in the crust are two non-magnetic metal objects resembling a nail and a washer. The inner third of the crust is of petrified wood—somewhat softer than agate or jasper. This layer was carved-out (while it was still wood) in a hexagonal shape to form a casing. Enclosed within this space is a disc of very hard ceramic or porcelain-like material, with a metal core about 2 mm. in diameter. Only this metal core responds to a magnet. It has a slightly brassy appearance. There is some evidence that the ceramic core was encased in copper, a tiny bit of which is still intact, the rest having decomposed.

VIRGINIA MAXEY
Olancho, Calif.

Padre Kino's Story . . .

To the Editor: REQUEST PERMISSION TO CONDENSE AND REPRINT WELDON HEALD'S ARTICLE ON EUSEBIO KINO APPEARING IN DECEMBER DESERT MAGAZINE.

CATHOLIC DIGEST
St. Paul, Minn.

Kino's American Relatives . . .

To the Editor: Readers of Weldon Heald's story on Father Kino (December *Desert Magazine*) may find it of interest to learn that my father and six other people whom we know, were born in Segno, Italy, the birthplace of Kino. These seven people share the surname, Chini, which is the Italian form of Kino.

GLORIA CHINI
Brooklyn, New York

A Mountain for Jaeger . . .

To the Editor: After reading Randall Henderson's usual thought-provoking column (February *Desert Magazine*), I am writing to ask that you place my name on a list of those who feel that a mountain peak somewhere in the desert be named in honor of Dr. Edmund C. Jaeger.

Years ago, while riding with Dr. Jaeger on the Desert Game Range in southern Nevada, he asked me the name of a minor protrusion on a distant skyline, which I promptly dubbed "Jaeger's Button." This is probably the first elevation "named" in his honor, but when a man overshadows his honors, greater ones must be found to fit the man.

O. V. DEMING
Lakeview, Oregon

Desert's Southern Utah Issue . . .

To the Editor: Your March issue was, in my opinion, the best ever. The closest runner-up was the July '60 special issue on "Summer Heat."

However, there was one point that I thought was in poor taste. That was the last paragraph of "America's Last Indian War" which contained a reference to an unpaid \$2 loan, owed by one of Posey's grandsons to the grandson of the man who is said to have killed Posey in the battle. This was indeed a most objectionable conclusion to an otherwise good story. The inference is that the Indians are not much good, without taking into consideration the sad treatment these people received at the hands of the whites, as brought out by this very article.

RICHARD L. DAY
Gainesville, Florida

(The only inferences the author desired to make with this mention of an unpaid \$2 loan was the way in which times have changed; and the interesting fact that here are the descendants of the story's two main characters engaged in the very natural and normal teenage activity of loaning money and then trying to collect. —Ed.)

To the Editor: After reading your special Southern Utah issue, a repeat visit to Capitol Reef National Monument is a must.

MRS. ELMER WILSON
Eureka, California

To the Editor: Nothing in print will ever compare with the very fine compliment *Desert Magazine* has paid my adopted state.

HARRY ALESON
Teasdale, Utah

To the Editor: I read with great interest

Letters continued on page 6



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Desert

Magazine of the Outdoor Southwest

Volume
24

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LETTERS . . .

—continued from page 4

the article on the Waterpocket Fold by Joyce Muench. It whetted my appetite to make an expedition into this remote corner of Southern Utah.

RODNEY J. VALENTINE
Mountain View, Calif.

To the Editor: It was good to read that Governor Clyde is taking a serious look at the wonderful section of terrain in the southern half of his state. I would like to add this plea to the governor: please keep the billboards off the roads in this area.

JOHN W. MAXON
Upland, Calif.

To the editor: A fellow member of the DUP Granny Band—the one whose picture you put in the March issue of your magazine — has asked me to send for some copies of that issue for her. She was delighted to know she was mentioned, and that her picture was in the magazine also. I had a letter from my son in Allen Park, Michigan, telling me he had read the Granny Band story and that I should get a copy. He has been so thrilled with this part of the country that he will be reading your magazine every month.

LILLIAN JOHNSON
Washington, Utah

From One Artist to Another . . .

To the Editor: I enjoyed very much Brownell McGrew's "An Artist on the Colorado" in the March *Desert Magazine*. As one who has made five trips on the San Juan and Colorado rivers, I can appreciate McGrew's astute thinking regarding the idiosyncrasies of these waters.

I must take issue with him, however, on his statement concerning the great Rainbow Bridge. His refusal to sketch or attempt to paint it, and to view it with a "yawning so what" leaves me very sympathetic and sorrowful for him.

It has been the privilege—even the duty —of artists down through the ages to bring to mankind the beauty, the might and the inspiration of nature. The talent an artist possesses is not his own, but is given him by God, Creator of all the universe—and Sculptor of the mighty "Rainbow Frozen Into Stone."

If the paintings I have done of Rainbow Bridge bring just a small bit of pleasure into the lives of those viewing them—particularly in these days of tenseness and hatred in the world—I shall be humbly and deeply grateful.

AL NESTLER
Sedona, Ariz.

From One Ditto to Ditto . . .

To the Editor: Brownell McGrew's Colorado River odyssey in the March issue, with his five-dollar vocabulary, gives us a refreshing variant to the usual *National Geographic* superlatives. Too bad he had to go blase on us anent Rainbow Bridge.

His profound commentary "so what?" has no doubt been used by other far-out cats in summing up such disappointments as Grand Canyon, the geyser basins, the Matterhorn, Stonehenge, the hewn-out city of Petra, the Palace of Persepolis, the Delphic Oracle, Victoria Falls, Lascaux and Ajanta caves.

The guy is obviously not devoid of feeling. I think he saw the bridge under the wrong circumstances, and too late in history. And why mention painting in connection with it? When I walked it from the Navajo Mountain side—alone—a good many years ago, there was no traffic jam. For two days and nights the place was all mine; not only the Bridge, but the whole appalling million-acre rock jumble so far as I could tell. Not one *tourista*, not even an Eastman wrapper. I too found some bad doggerel in the register book, but I didn't blame it on the Bridge, nor the desert forces that made it.

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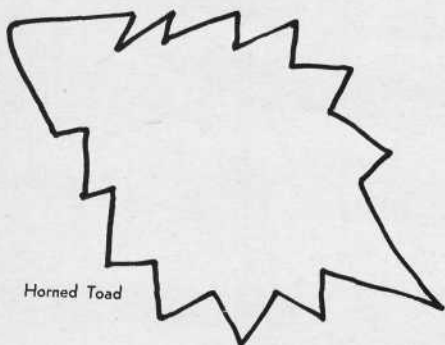
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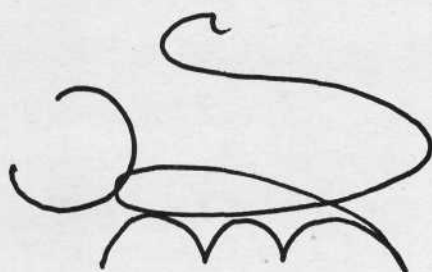


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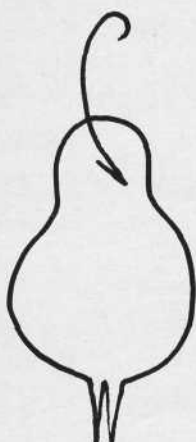
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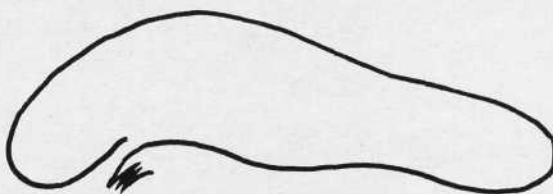
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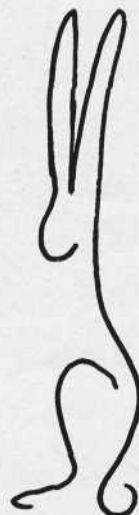
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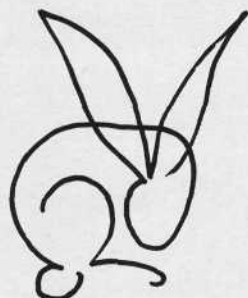
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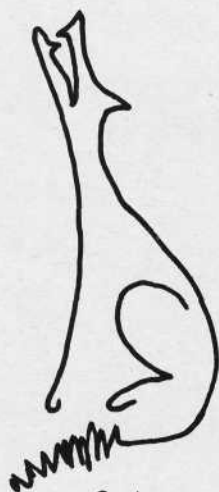
Gila Monster



Jackrabbit



Cottontail



Coyote



Lizard

With one line — sometimes two — FRANK H. DUNN can sketch a person, a thing, or, as shown on this page, desert animals. In the 1930s, Dunn was a caricaturist for *Vanity Fair* and *Judge* magazines. His one-line drawings of famous persons were the first art work ever carried by *Readers' Digest* (issue of Nov. '35). Dunn is a resident of Palm Desert, Calif., where he spends his leisure hours collecting and displaying sandstone concretions. He has hundreds of fantastically-shaped pieces in his "stone zoo," and has promised to do a story for this publication on the fine points of concretion collecting.

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A GEOLOGIST'S NOTES on the IVANPAH MOUNTAINS

13 sites of interest for the back-country explorer, the mineral collector, the person who wants to be able to say, "Sure, I've been in the Ivanpahs," or those who simply want to "get away from it all."

By PAUL F. PATCHICK

RISING ABOVE the desert floor of eastern San Bernardino County, close-by the California-Nevada line, is the rugged Clark Mountain system. The Barstow - to - Las Vegas highway (U.S. 466-91) cuts through the middle of this range at Mountain Pass — Wheaton Springs; the Union Pacific Railroad avoids the mountain mass, making an easier grade by circling around to the south. The range known as the Ivanpahs lies between the highway and the U.P. tracks.

This is great country for the back-country explorer, the mineral collector, the person who wants to be able to say, "Sure, I've been in the Ivanpahs," or

those who simply want to "get away from it all." The Ivanpahs offer a variety of interests—from "haunted" caves to fossil ripple marks. There's only one dependable source of water in the proximity of its trails, and the visitor should carry his own supply. The usual precautions for all off-the-highway desert travel are in order.

Here are my notes on the outstanding geological attractions of the Ivanpahs. Chapter numbers below correspond to location numbers on the map accompanying this article.

The northern portion of the Ivanpahs is reached by a dirt road that takes off from Highway 466-91 a little less than a mile west of the roadside La Cenda Restaurant.

1. THE KOKOWEEF CAVES

In the 1920s a miner named E. P. Dorr explored a cave high-up the side of Kokoweef Peak. Later, in a sworn affidavit, Dorr reported an amazing discovery — and a lost mine legend was born. Deep under Kokoweef Peak, he said he found a swiftly flowing subterranean river; lining its banks were sands rich in gold.

The legend grew. "Facts" became scarce. The cave entrance was dynamited shut . . . there were stories of Dorr going insane, of murdered men, of men buried alive, of rich assay sheets.

Some sources say the main cave chamber has several entrances on the flanks of the Peak. In his book, *Adventure Is Underground* (1959), William R. Halliday reports that the Crystal Cave Mining Corporation now owns the property. Would-be lost mine hunters are not welcome. Besides, the danger to all but the best trained and equipped cave-explorer is extreme. Two persons lost their lives here in 1959.

2. CLARK MOUNTAIN FAULT

About a mile south of the cave, where the road bends westward, a copper prospect marks the Clark Mountain Fault trace. The hills to the east are metamorphic; those to the west, sedimentary. The fault is about 20 miles long, slicing across the landscape like a giant scar. Crossing the fault is akin to leaping across a time span of 200,000,000 years! The Pre-Cambrian schists and gneisses to the east are about 470,000,000 years old, and the Devonian limestones to the west are *only* 270,000,000 years old. The cataclysmic upheaval of this area produced a fracture having a vertical displacement of between 10,000 and 12,000 feet.

LOOKING ACROSS NEW TRAIL CANYON TO THE BULLION MINE PERCHED ON THE FAR SLOPE (NOTE DUMP, CENTER OF PHOTO). THE BULLION WAS WORKED FOR RICH SILVER.

3. CARBONATE KING MINE

During its 10 years of operation, the Carbonate King Mine produced 5½ million pounds of zinc, plus appreciable quantities of lead and silver.

The King's dumps yield a bonanza for modern-day collectors. Here you will find a profusion of white cellular highly-fluorescent hydrozincite. Red limonite occurs as masses in coarsely crystalline cream-colored limestone. Large rhombohedrons of calcite are easily cleaved from these chunks. Occasionally, some bluish or pale greenish-blue smithsonite is found by digging.

If you don't like to climb down ladders in old wet mines, the easily-accessible workings of this mine will be welcome. The portal is easily reached by passenger car, and no difficulty should be found in turning around at the adit entrance. The mine shaft is horizontal, clean, dry, safe, and offers easy walking.

Underground, the air is fresh and well circulated, thanks to a 236-foot vertical shaft that reaches the surface. Collecting in the big stope is fun, and the whole family will enjoy this outing. In addition to your lanterns, don't forget an ultraviolet lamp to spot the bluish-white fluorescent hydrozincite. If you look closely, you may even see tiny hemimorphite crystals in small cavities.

4. FOSSIL CORAL

A few hundred yards southeast of the mine, high on the steep slopes of

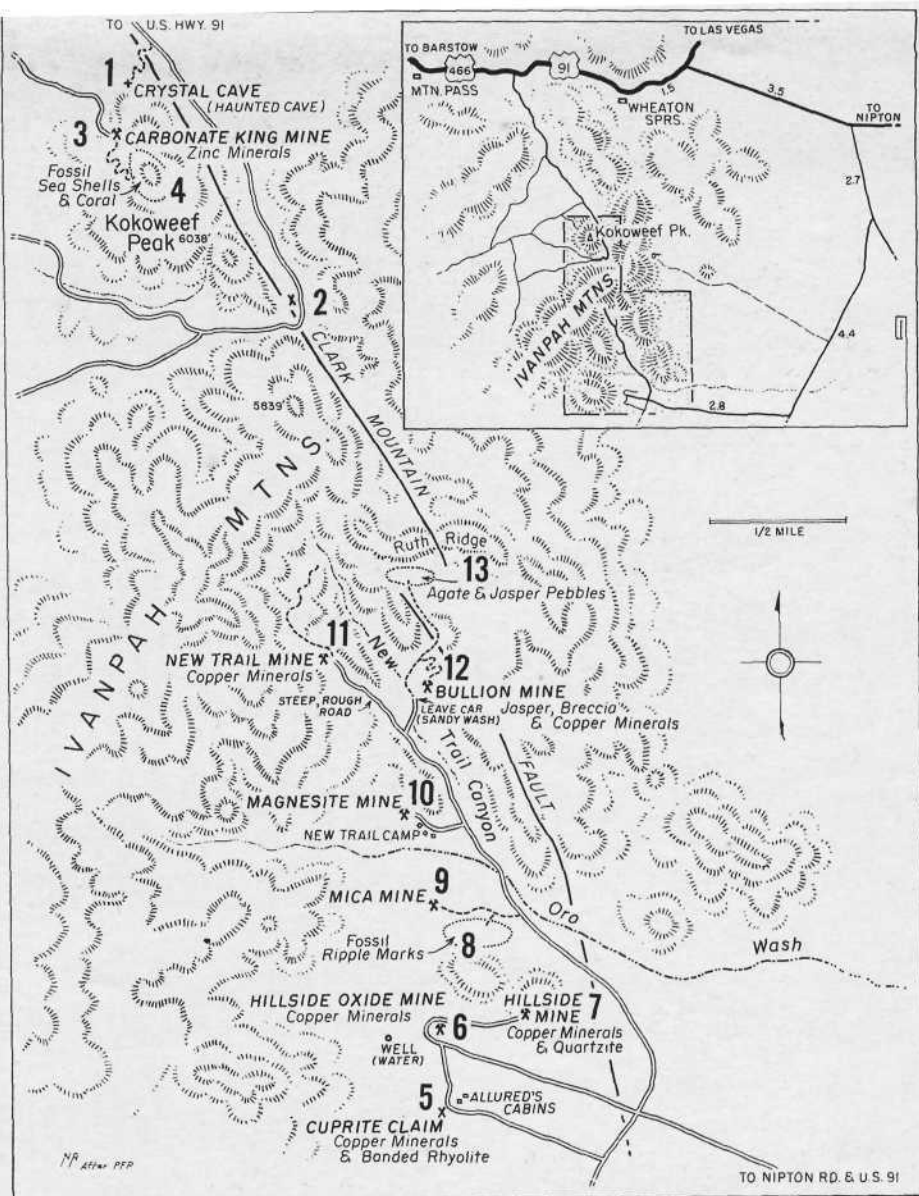


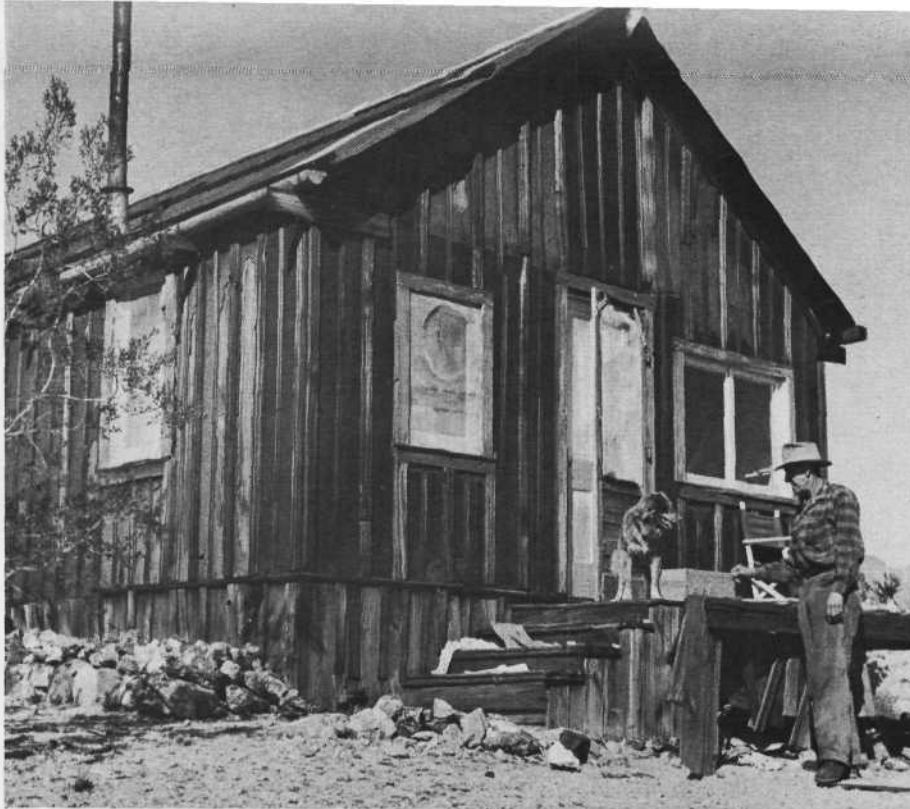
Kokoweef Peak, are found beds of fossil coral and brachiopods. These creatures of the past were entombed since the Mississippian Period (265 million years ago) in the soft limy oozes and muds of a now vanished ocean. The uplifting of the former sea floor and eons of erosion have exposed these marine dwellers. The fossils are easily separated from their limestone matrix by immersion in diluted hydrochloric acid, which dissolves the limestone.

Since there is no connecting road between the sites described above and those on the eastern flank of the Ivanpahs, it is necessary to drive back to the main highway and make a large arc to the east, south and then westward.

The first turnoff—the Nipton Road—is $1\frac{1}{2}$ miles east of Wheaton Springs. Nipton, 10 miles across the plain, is the nearest supply point. Approximately $3\frac{1}{2}$ miles from the U.S. 466-91 intersection, turn right on the Ivanpah county road. Near this turn-off is the Molybdenum Corporation of America's well. Should you need emergency water, you can get it out of a faucet on the large storage tank.

At a point about $2\frac{3}{4}$ miles south of the well, leave the black-top by angling southwest on the Cima road cutoff; 4.4 miles farther you come to a due-west trending branch—a narrow ungraded dirt road that goes up the boulder-strewn slope toward the Ivanpahs. This is the Morning Star Mine road, and is a tough





grade, but a standard car can make it easily.

5. CUPRITE CLAIM

The Allured Cabin is occupied by a resident mine foreman whose duty it is to protect the private property in this area. His permission is needed before you can collect specimens here—and in this regard, courtesy pays off. Six-hundred yards northwest of the cabins (400 yards up the canyon west of the head-frame at the Hillside Oxide Mine) is a hand-pump well. This is the only dependable water hereabouts.

It's but a short hike southwest from the cabins to the unworked copper prospect known as the Cuprite Claim. Here you will find peculiar banded rhyolite, with tiny magnetite inclusions. These easily-collected specimens undoubtedly make fine cutting material. The locality abounds in the copper oxide, cuprite, and much iron and manganese oxide gossan. Several small pits and shafts explore the prospect to a depth of perhaps 30 feet.

6. HILLSIDE OXIDE COPPER MINE

Up the road a bit is the Hillside Ox-

ED MARQUARD IS FOREMAN OF THE HILLSIDE COPPER MINE, UNDER DEVELOPMENT.

ide Copper Mine. Its dumps contain small blue azurite nodules. Although the inclined 135-foot shaft is not dangerous, underground collecting is not recommended—actually, there's no need for it because the surface specimens are abundant.

7. HILLSIDE MINE

Nearby, to the east, is the Hillside Mine, which is currently under development for copper, gold, zinc and silver. The ore minerals are yellow chalcopyrite, magnetic bronze-colored pyrrhotite, and lustrous brownish-black marmatite—all imbedded in massive milky quartz or white marble. Traces of bornite, fluorescent scheelite, and galena are also present. The complex, banded ore is rather spectacular, and probably would cut and polish well. There's much reddish quartzite for rock gardens, too. Since mining activity is in progress, and blasting is done daily, it's best to stay above ground.

8. FOSSIL RIPPLE-MARK AREA

The road up New Trail Canyon goes within 350 yards of the fossil ripple-mark locality. Here you find remarkably well-preserved and symmetrical metamorphosed ripple-marks. At one time this rock was a shale or mudstone, of marine origin. Tremendous heat and pressure altered it to form a rock called phyllite. Its age is lower Cambrian—470,000,000 years.

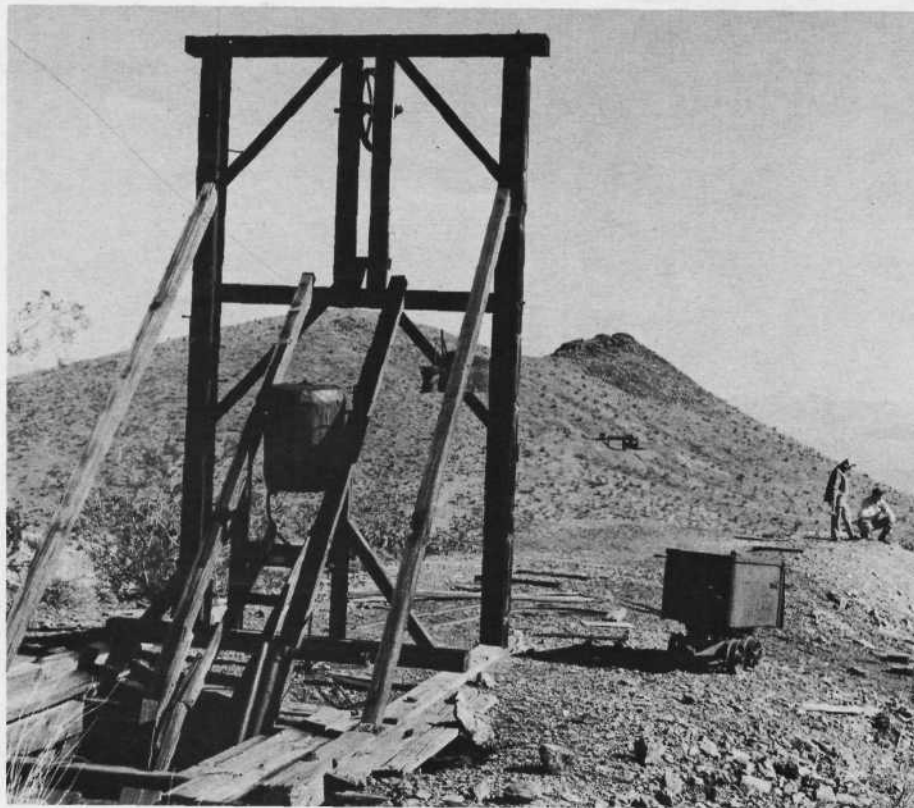
9. MICA MINE

From the fossil ripple-mark locality, it is an easy 450-yard walk northwest to a mica mine. "Books" of brown and deep-green mica crystals up to three inches in diameter are scattered over the ground surface for several hundred square feet. A shallow shaft explores this occurrence of zoned translucent-to-transparent biotite-phlogopite mica, which is associated with massive black magnetite in tactite rock. This mica is peculiar because it exhibits the property known as asterism—that is, when thin sheets are peeled-off with a knife blade and held close to the eye, a distant light source (for example, the sun) will appear as a six-rayed star.

Nearby, to the east, are a series of pits in which occur barite, magnetite, hematite, chrysocolla and calcite. These minerals are found along a limestone-diorite contact.

10. MAGNESITE MINE

Masses of cauliflower-shaped magne-



DUMPS AT THE ALLURED OXIDE COPPER MINE HAVE SMALL NODULES OF AZURITE, WHICH BECOME PARTICULARLY EASY TO DETECT FOLLOWING A RAIN. THE HILLSIDE MINE WORKINGS ARE ON SLOPE IN BACKGROUND.

site occur at prospects on a low ridge near the New Trail Camp. A path to the deposit leads northwest for about 100 yards from the abandoned cabins. This white fairly-hard magnesium-carbonate mineral with its porcellaneous luster, should take a high polish. Some of this material has a fibrous structure. The vein has been opened up by shallow underground workings, and other outcrops occur in this vicinity.

11. NEW TRAIL MINE

A profusion of lapidary material awaits the collector on the dumps of the New Trail Copper Mine. Best specimens are masses of bladed deipside. This relatively rare mineral is heavily impregnated with chrysocolla, and occurs in pale bluish-green crystalline chunks which will take a good polish. Blue azurite, green malachite, blue-green chrysocolla, and cinnamon-brown garnet tactite rock can also be collected from this dump.

The vertical mine shaft at the New Trail is over 300 feet deep. I do not recommend it for exploration, particularly since all the minerals which may be found with difficulty underground can easily be picked-up on the surface dumps.

I recall spending the greater part of an afternoon climbing up and down the shaft ladder in an effort to coax an elderly acrophobic desert prospector to come up. We had met at Wheaton Springs that morning, and after becoming acquainted, he told me he had never been underground in all of his rock-hunting days, even though he had roamed all

with the help of another man who was with me (fortunately), we pulled and pushed the prospector the remaining 250 feet to the surface.

The $\frac{3}{4}$ -mile New Trail road is very rough and steep, but late model cars can drive the grade. There is a place to turn around on top.

12. BULLION MINE

It's quite a hike up the side canyon to the Bullion Mine, but it's worth it. The abandoned mine is one of the oldest in the Ivanpahs, having shipped high-grade copper and silver ores to the smelters at Swansea, England, in the 1860-70s.

Not much is left of this historic mine perched high up the canyon side. The inclined shaft is unsafe beyond 100 feet of the entrance. It has been picked clean of all ore.

Good fault slickensides are seen here, as well as fault breccia, which would probably take a good polish. I noticed much drusy quartz coating fragments of jasper on the dumps. Also, I found some tiny hemimorphite crystals, and traces of malachite. Around the side of the cliff there are many cavernous spots in the dolomite which are generally

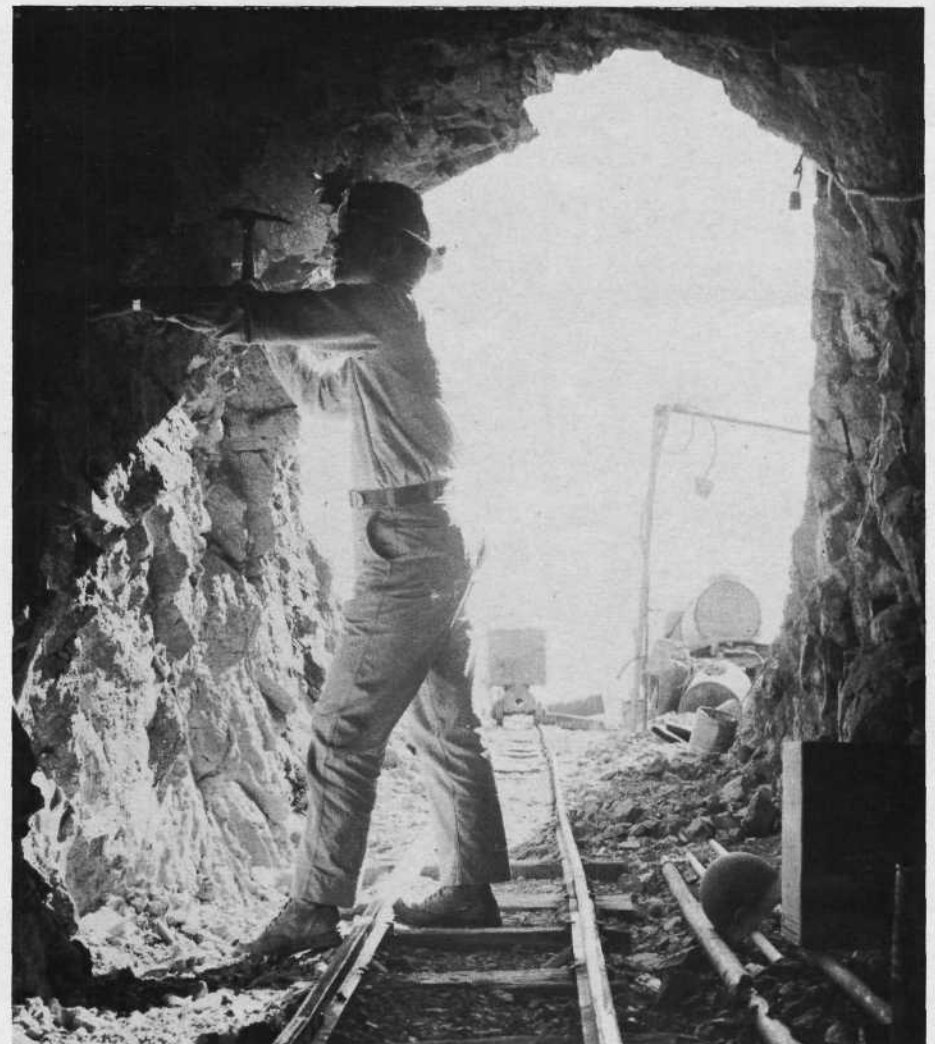
filled with small quartz crystals. For the fossil collector, the Bullion Mine vicinity offers Devonian period stromatopod corals occurring as large cauliflowerlike masses imbedded in gray crystalline dolomite.

13. RUTH RIDGE

If you manage to scramble up the steep mule path to the Bullion Mine, you might as well struggle on the 800 yards to Ruth Ridge. It may be of some consolation to you to know that I named this spot after my wife, a mother-of-one and two-months expectant when she trudged behind me all the way to that mile-high summit. And on that particular November morning, it snowed. But, what a view!

About 350 feet below the summit occur outcrops of the Prospect Mountain formation. This is the best field in the Ivanpahs for the amateur gem collector. Here you will find delicately banded and colored agate. From these outcrops some of the material has been washed down as far as Oro Wash, opposite the Hillside Mine area (location 7). The agate on the slope of Ruth Ridge occurs with jasper and flint chunks, and non-gem milky quartz. ///

PORTAL OF THE HILLSIDE MINE IS DRIVEN INTO PRE-CAMBRIAN GARNET BIOTITE-GNEISS, A ROCK OVER 470 MILLION YEARS OLD. RICH COPPER ORE IS BEING MINED HERE.



over the expanses of our great Mojave Desert. At the time I was making a geological survey of the Ivanpahs.

"Say," he said, "how about taking me underground with you when you go mapping this morning?"

"Sure," I replied, "I'll be glad to." What a hectic afternoon that turned out to be!

He got down to the bottom in good order, but on the way out, he could climb only 50 feet. There, on a small landing, he refused to budge.

I talked, coaxed; gave him water, cheese; tried "psychology"—all to no avail. He was frightened, and talked of falling and of dying in that "miserable shaft-coffin."

I tried to show him how easy it was to climb the ladder. After my ninth round-trip, I decided more drastic measures were in order. I placed a wire cable around his 190-pound bulk, and

1882

Zuní Pilgrimage to the Atlantic Ocean

By HOPE GILBERT

(adapted from Sylvester Baxter's "An Aboriginal Pilgrimage," which appeared in the August, 1882, "Century Magazine")

ZUNI PUEBLO had never known such happy excitement as occurred on February 22, 1882. The entire population of 1600 souls was assembled at the edge of town before the governor's house. In hushed expectancy they watched *Nai-iu-tchi*, chief priest of the Order of the Bow, ascend the ladder to the upper terrace of the house. From this vantage point he scattered prayer meal to the six directions of the universe—north, east, west, south, up and down—and then, in a loud voice, blessed the silent throng.

The parting formalities of embraces—heart to heart, hand in hand, and breath to breath—now over, the crowd broke into noisy confusion as the six Zuni and the white man with long blonde hair climbed into waiting wagons to start their epoch-making journey to the home of the Great White Father at Washington, D.C., and on to the Ocean of Sunrise—the Atlantic. Their wagons were piled high with pueblo food in case they should be unable to eat American food, and with paraphernalia for the ceremony they would conduct on the shore of the ocean.

The slender blonde man, dressed in complete Indian regalia, was 24-year-old Frank Hamilton Cushing who had been living in Zuni for more than two years, studying the customs of these people and participating in the activities of the pueblo. Cushing was a member of the Smithsonian Institute's ethnological field party under the direction of Colonel James Stevenson. While Stevenson and the others in his group had gone to the Hopi villages in September, 1879, Cushing had come alone to the Zuni pueblo.

At first his presence had caused

some irritation, but soon he so completely won the trust and affection of the Zunis that they not only adopted him as a son, but made him a priest



FRANK HAMILTON CUSHING WAS IN HIS EARLY 20S WHEN HE ESCORTED THE ZUNI DELEGATION EAST. HERE HE APPEARS IN TRIBAL REGALIA.

of the sacred and exclusive Order of the Bow.

Although Cushing planned the Eastern tour ostensibly to impress the Zunis with the finer features of American culture and to arouse their desire for education, he had a personal objective as well: entrance into the innermost sanctum of Zuni life. Only thus could he hope to complete his studies of the Zuni culture.

To achieve this purpose it would be necessary somehow to gain membership in the *Ka-Ka* or dance societies which constituted the core of all Zuni thought and action. Cushing's initiation into the Order of the Bow was only a beginning—a mere scratching of the surface of the complex Zuni institutions and religion.

To become a member of the *Ka-Ka* two courses were open to him. Either he must marry into the tribe or, as an alternative, perform some unusual service for the pueblo.

To the Indians, a blood-tie was the most logical. Some months after his arrival in Zuni, two of the village's most attractive maidens were selected to make advances on Cushing in accordance with Zuni custom.

When Cushing side-stepped the marriage issue, the tribesmen were humiliated. To regain favor, he proposed the expedition to Washington and the great ocean of the East.

The Zunis were delighted with this bold plan. They had long dreamed of making a pilgrimage to the "Waters of the World of Day" and of bringing back some of the sacred water for their ceremonials to the rain gods. Ancient Zuni tradition told of the people who had gone Eastward in the days when all mankind was one, and the tribesmen believed that these "Lost

Others" might now be living in the form of Americans.

Many deliberations were held in council before the weighty problems regarding the trip were settled. Only after earnest assurance from Cushing that the party would return in time for the sacred summer rites did the people willingly consent to the journey.

The six Indians chosen to accompany Cushing ranged in age from 35 to 80-plus. Ancient Pedro Pino was a former governor of Zuni, having served in that capacity for 30 years, and he was one of the liveliest members of the party. *Pa-lo-wah-ti-wa*, governor of Zuni and brother by adoption of Cushing, in whose home the white man had lived, and *Lai-iu-ah-tsai-lun-k'ia*, Cushing's father by adoption, were two members who had befriended the ethnologist from the first. *Na-na-he*, the youngest member, a Hopi who had been adopted by marriage into the Zuni tribe, was handsome and popular with the ladies, contemporary reports stated. *Ki-a-si*, the junior priest of the Order of the Bow, was of a stern ascetic nature, whereas *Nai-iu-tchi*, the senior priest, was of a genial nature, full of poetry and a charming narrator of folk tales.

Like his fellow-travelers, Cushing was attired in a woven serape shirt, deer - skin knee - breeches, leggings trimmed with rows of silver buttons, and moccasins. Holding back his hair was a headband, and for adornment he wore a massive silver belt, and necklaces of shell and turquoise.

Cushing was a modest man and did not wish to attract attention to himself once his delegation boarded the train at Fort Wingate. But, considering that he had been accepted as a priest of these people, the matter of dress was a serious one and not to be treated lightly. When Cushing broached the subject of changing into American garb, his Zuni companions were shocked. Only after persuading them that Americans were just as conventional about their dress as were the Zunis and that the refusal to permit him to change his outfit would displease their American brothers, did Cushing secure their assent. But not until they reached Washington was he able to get the permission of his peers to do something about his hair, which had grown below his shoulders. Hair, in the opinion of the puebloans, was man's crowning glory and a requisite of certain priestly rituals.

As the railroad had only recently reached western New Mexico, most of the Zunis had never before seen the Iron Horse. As soon as they took their seats, they opened the windows

and started to pray aloud, each one scattering prayer meal of ground corn and powdered sea shells which they carried with them in little bags.

Several hours later, when the train passed the pueblo of Laguna, the Zunis were amazed. "Can it be," one of them asked, "that the sun is standing still in the heavens? For in a few short hours we have passed a place

ders of the trip continued to unfold, they asked pardon of Cushing for having doubted him at Zuni when he had described the sights they would see. They said that he had demonstrated that the Americans were truthful and not "liars like the Navajos."

Chicago, their first stop, was cause for continuous wonder. They called it a city of many pueblos and asked



THE 1882 ZUNI DELEGATION IS SHOWN IN THIS RARE BUREAU OF AMERICAN ETHNOLOGY PHOTO. BACK ROW, FROM THE LEFT: NAI-IU-TCHI, SENIOR BOW PRIEST; NA-NA-HE, THE HOPI; KI-A-SI, JUNIOR BOW PRIEST. FRONT ROW: LAI-IU-AH-TSAI-LUN-K'IA; PEDRO PINO; AND PA-LO-WAH-TI-WA, ZUNI GOVERNOR.

which used to take us three days upon our fleetest ponies to reach!"

At mealtime they withdrew to the baggage car to eat Zuni style—seated on the floor. Later when they sampled American dishes, they found many that pleased their fancy. However, it was their opinion that Americans ate too great a variety, thus "daring their insides!" One of the men remarked one day that his "inside is not only filled with food, but also with much fighting."

The second day on the train one of the Indians was invited to ride in the locomotive. *Nai-iu-tchi* eagerly accepted the opportunity. He wished to touch all the different parts of the locomotive in order to absorb its unseen power. After silently watching the man-made monster in action, he commented: "The Americans are gods, only they have to eat material food!"

The Zunis spent a great deal of the time praying. Each stream that they crossed evoked a prayer and a scattering of sacred meal. As the streams grew progressively larger and the won-

if each block contained the members of separate clans. They thought Lake Michigan must be the ocean and were on the point of preparing for the ocean rites on the lake shore when Cushing explained that their journey was only half over.

In Chicago came their first attempt at using knives and forks—"fingers of iron," they dubbed them. The comical scene "brought down the house," but the Indians persisted, for they were determined to honor the customs of the Americans when in their land.

From Chicago they went on to Washington where they were vastly impressed by the fine reception accorded them by President Arthur. At Washington's Tomb the five younger Zunis kept their emotions well in check, but old Pedro Pino openly wept. While steamboating down the Potomac on a wintry March day the old fellow, who gallantly insisted upon staying out on deck with some ladies, took a chill and was unable to go on to Boston with the rest of the party. He remained behind, enjoying the hospitality of Colonel Stevenson, and greatly enliven-



AN EARLY-DAY PHOTO OF ZUNI PUEBLO FROM
THE BEN WITTICK COLLECTION, SANTA FE

ing that household. Pedro Pino had the unabashed enthusiasm of a child at his first visit to the circus. Having heard that from the top of the Washington Monument men below looked like crawling ants, horses were no larger than mice, and the Potomac appeared a mere trickle like the Zuni river, Pedro determined to see these marvels for himself. He set out alone, unbeknown to his hosts, to make the ascent. He climbed up and up the steps until his "thighs said no," and by sheer determination reached the top. For several days thereafter he was more dead than alive, but he vowed it was worth it.

In Boston and its environs, Cushing and his five proteges were extensively entertained at public and private receptions. They in turn entertained with Zuni dances and songs, and through Cushing, as interpreter, told of Zuni legends and customs.

They considered Wellesley College to be "enchantingly beautiful." "What love must the Americans bear their children," they said, "to send them so far away from home to become finished people!" Their attendance at an athletic event in the Harvard gymnasium evoked great admiration on their part. They asserted that the competitors must be members of some order similar to their order of the Elks, since to achieve such skill they must be inspired by the gods.

They were vociferously enthusiastic

over a Negro minstrel show in Boston. In the midst of the clog dancing they suddenly became silent and began to stretch out their arms toward the dancers. The Zunis believed they were witnessing the mysterious rites of some secret American order, and by extending their arms they hoped to draw in the spirit of the "holy men" on the stage. Thus the audience was treated to two performances.

In Salem, when the Zuni visitors were told of the execution of the witches, they heartily approved, for witchcraft was a capital crime in Zuni. They asserted their belief that due to the vigorous measures taken against the witches by the early colonists, America was now prosperous and free of the curse of witchery. At a public reception *Ki-a-si*, the junior Order of the Bow priest, preached a brief sermon on witchcraft which, it is said, would have gratified Salem's chief witch-hunter himself.

The adoption of two of Cushing's friends by the Zunis was the occasion of an impressive ceremony. The prayer offered by *Nai-iu-tchi* was an example of the sincere quality of their faith: "My child! This day I take you in my arms and clasp you strongly, and if it be well, then our father the Sun will, in his road over the world, rise, reach his zenith, hold himself firmly, and smile upon you and me that our roads

of life may be finished. Hence I grasp you by the hand with the hands and hearts of the gods. I add to thy wind of life, that our roads of life may be finished together. My child, may the light of the gods meet you! My child, *Thli-a-kwa* (Turquoise)."

At the conclusion of a week of sight-seeing and entertainment in Boston came the highlight of the Zunis' journey into the outside world—the long-dreamed-of rites before the Ocean of Sunrise and the acquisition of the "water that brings rain." Zuni lore relates that their forefathers had once lived on the shore of an ocean. After many wanderings, however, the gods had led their people to dwell in the land of Cibola, and had taught them the prayers and songs whereby the land might be blessed by rain. The efficacy of these prayers would now be greatly enhanced by the presence of a drop of the "Waters of the World of Day."

The Indians wished to perform their sacred rites at the most easterly point possible. So when the appointed day arrived, a special boat was chartered to carry the Zunis and the company of guests invited by the mayor, out Boston harbor to Deer Island. Once on the island, the Indians and Cushing retired to a tent which had been set up for them, and there attired themselves in their ceremonial regalia.

The place selected for the ceremony

was the easternmost rocky point of the island. As the participants solemnly advanced toward the sea, each member carried in his left hand the plume sticks of his order. Two priests carried war-clubs, bows, quivers and shields. *Nai-iu-tchi* bore an ancient fringed gourd, traditional container for the holy water. *Ki-a-si* and Cushing carried "whizzers." *Lai-iu-ah-tsai-lun-k'ia* carried two ollas and the basket in which were placed plumes of special sacrifice to the sea gods, and the sacred-cane cigarettes prepared and consecrated in Zuni by the priest of the Sun.

Facing the east and the open sea, the celebrants scattered sacred meal on the rocks. Then singing a low plaintive chant, they waved their prayer sticks in special entreaty to the deities of the sea. As the tide rose higher about them, they interpreted this as a favorable omen. More pollen was scattered by the two high priests, and after puffs to the six points of the universe, the ceremonial cigarettes were handed round. Each member then uttered a prayer, and after exhaling the smoke, they cast the cigarettes upon the deep.

The vessels were then filled with sea water to the accompaniment of more prayers, water was sprinkled in the six directions and toward the spectators, the whizzers were whirled, and the celebrants retired shoreward. A prayer was offered petitioning care for the children of the Zunis, of the Americans, and of all men, and also of all beasts and birds and creeping things of the earth. Turning about, with their arms now stretched toward the west and the distant home of their people, they intoned a concluding chant, each stanza of which closed with this refrain: "Over the road to the middle of the world (Zuni) will thou go!"

A final, brief ritual which had been planned without Cushing's knowledge now served as a fitting climax to a day of deep significance for the redmen and their white brother.

In token of their appreciation for Cushing's signal service to them, the Zuni celebrants took a significant step toward final acceptance of their benefactor into all the secret orders of their tribe. Standing with him on the shore they dipped water from the sea. Then sprinkling him with the water, accompanied by embraces and prayers, they ceremonially adopted their American brother in the presence of their gods, thereby acknowledging their eternal brotherhood and fulfilling the two-fold purpose of their pilgrimage to the Ocean of Sunrise. ///

CAMERA

ANGLES

Here's the low-down on good picture production in the Desert Southwest. In this colorful region where the local landscape is apt to jut straight up and down, there are two sure ways of bringing home an unusual photo: either get on a high perch and shoot down; or lay flat on your back and aim the camera up. The man who took the photo below followed the former method; his models are pursuing the latter.



TO SEE WHAT KIND OF PICTURE
CAN BE TAKEN FROM THIS ANGLE, TURN THE PAGE



A NAVAJO WAVES TO THE PRONE PHOTOGRAPHERS

CAMERA ANGLES

continued from preceding page

HARD ROCK SHORTY



... OF DEATH VALLEY

"Skunk Crick waz named Skunk Crick 'cause there waz skunks in Skunk Crick," said Hard Rock Shorty in an exasperated tone as he answered the 25th question put to him by the young naturalist from a small New Hampshire college who was on his first field trip to Death Valley.

"But . . ." the professor started to say, pointing a long finger at a passage in an open book.

"There ain't no buts 'bout it," broke in Shorty. The naturalist started to interrupt again, but Shorty gestured him into silence.

"Hold on," said Shorty. "I know what yore gonna say so don't say it. Thet book sez there ain't no polecats in them hills yonder, but the fella who writ thet book wazn't here in '29 when Pisgah Bill got his brainstorm durin' the drouth of '28. Workin' eight months in the mine with nary a drop 'o water fer a bath, Bill concluded that people prefers to smell good.

"Leastwise, thet's wot got him going on this skunk farm scheme up at th' crick wot's now Skunk Crick.

"Bill figured thet if he could feed sweet-smellin' rose petals to them skunks, thet in time his critters would give off good smells.

"Why, Bill had her all worked out. Everybody in Amerikee would want one 'o Bill's pet perfumed skunks around to make th' house smell sweet.

"Bill quit the mine and sent to a mail order house fer a bunch of brood skunks. Then he packed in five-six burroloads of rose petals from Wildrose Canyon fer 'em to eat.

"Going pretty good fer a spell, but thet danged drouth hung on into most of '29, and Bill's bizness waz sunk."

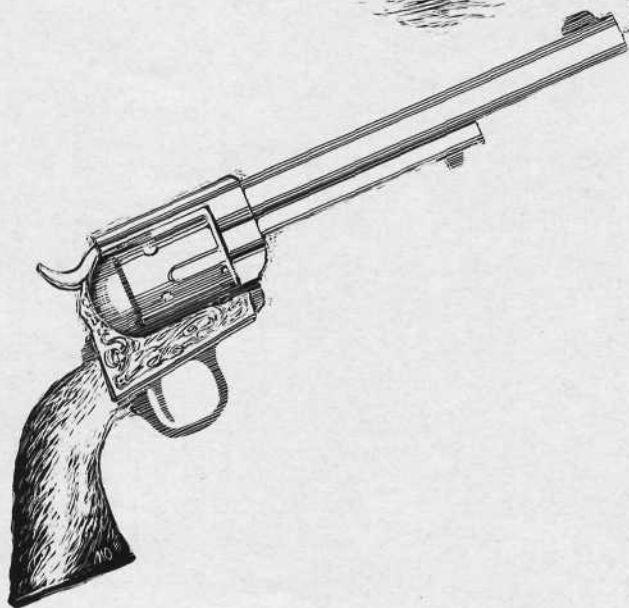
The naturalist stirred. "Drouth snuff out the rose-petal supply?" he asked.

"Some say thet's the way it wuz," answered Shorty. "Some say the sweeter them skunks got, the harder they found it to acclimate themselves to their surroundings, 'specially to the president of the company."

JUVENILE GUNMEN

IN THE GOOD OLD DAYS

By
Matia
McClelland
Burk



WHEN WE READ of big city gang fights and deplore the youthful possession of firearms, we are apt to look back to the good old days when children were more likely to mind their manners. Are we right in our estimate of these earlier times?

The following item is taken from the files of the *Tombstone Epitaph*, September, 1899:

Fernando Dominguez, aged 11, was shot and badly wounded by Willie Engle, 10 years, at Bisbee Monday, as a result of a boyish quarrel. A single barreled, 12 gauge shot gun was the weapon.

The boys quarreled over the fact that Engle had told on his stealing sacks and caused him to get a whipping. Engle claims Dominguez threw stones at him and merely used the gun to frighten him away and that the discharge was accidental.

Engle is a former Tombstone youth and well known here. Dominguez may lose an eye and probably his life. His face and body are badly peppered on his left side.

So it is calmly passed off as an accident.

In a letter published in the *Tombstone Epitaph* of October 12, 1933, and written by M. M. Sherman, first principal of the Tombstone Schools (1881-1884), Mr. Sherman said of the old days:

The pupils had been gathered in haste from everywhere, good schools and poor schools, some of the best and some of the worst communities. First I had to order leaving six shooters at home,

then take their firearms from them, and finally confiscate till the end of the year.

One boy bigger and stouter than I, who had done up a school master somewhere, I had to grab by the coat collar, and before he was fully aware he was on the flat of his back outdoors on the ground. Not believing in corporal punishment, it was in some cases made use of in preference to suspension or expulsion.

These instances are only mentioned to show that the phases of the life of a community find reflection in the school and a true picture cannot be drawn without slight references. The hasty assembling of any diversities meets with difficulties. The establishment of order is no easy task.

Would this be an understatement?

In the weekly *Commercial Advertiser* for May 20, 1882, we find the following item quoted from the *Tombstone Epitaph*:

Last evening a young boy named Willie Simms, aged about fifteen years, who resides at Fulton, between seventh and eighth streets, had a narrow escape with his life, in consequence of his practice of carrying a pistol. It seems that the lad was in the yard in the rear of his residence and was amusing himself by shooting off the pistol. The pop hung fire and the lad anxious to learn the cause peeped down the barrel. At this moment the gun went off, and the youngster, when he could realize what had happened, found himself lying on the ground.

The bullet entered the bridge of his nose, and penetrated upwards, came out at the roots of his hair. He was attended by Doctors Seawell and Henderson and had his wound dressed. The wound is not serious though ragged and ugly. This should be a warning to parents to keep a close watch on their children and prevent them from carrying pistols.

Probably half the boys in town, between the ages of eight and sixteen, are the proprietors of pistols, and accidents such as occurred last evening are likely to occur at any time. The cheap auction houses where pistols are sold to boys should be placed under police surveillance and the unhealthy traffic discouraged.

You wanta go back to the
good old days? ///

EXPLORING THE VIRGIN BEACH

ERLE
STANLEY
GARDNER

Based on the author's personal adventures in Baja California. This chapter—the third and concluding installment in *Desert Magazine*—is taken from Erle Stanley Gardner's recently published book:

HUNTING THE DESERT WHALE

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MURL EMERY SHOWS SOME OF THE "PLUNDER" RECOVERED FROM THE BEACH: GLASS FLOATS AND PURPLE BOTTLES

SOUTH OF Scammon's Lagoon, a range of mountains projects out some forty or fifty miles into the ocean, forming a huge crescent-shaped sickle and somehow manages to turn one branch of the southbound ocean current in the Pacific into a huge eddy.

Driftage from all over the Pacific Ocean is siphoned into this current, swept around in a huge circle and brought down into this collecting basin. During periods of storm or high wind it is washed ashore. The peculiar thing is that since this shoreline is building up at the rate of half a mile every few hundred years, the wreckage, once caught, is trapped in low, drifting sand hills which can completely cover it within a relatively short time, but, conversely, they can, in turn, be blown away by vagaries of the wind, until almost every week sees some new wreckage covered up, some old wreckage uncovered.

According to Emery, no human being had set foot on this stretch of beach within modern times. On the ocean side it is pounded by a terrific surf. On the land side it stretches back in mile after mile of soft sand: hills of sand blown into odd-shaped dunes and at times swept by winds which drive the blowing particles of sand against the skin in

a stinging spray. It is in fact a huge triangular-shaped island of sand.

On the north is Guerrero Negro, the "Black Warrior" Lagoon. On the south is Scammon's Lagoon. Landings can be made on the north and south ends of this island but only with a small boat, and the physical problem of transporting supplies across these intervening miles of barren sand is insurmountable.

While we had been busily engaged in trying to photograph whales, Murl Emery had given his attention to his beloved project of beachcombing.

He made one preliminary expedition with his Tote Gote power scooter, but didn't have enough extra gasoline along to fight his way through the deep sand after the tide came in. He was unable to get as far as he wanted to go and still stay on the safe side; but returned nevertheless with a prize assortment of loot, things which would delight the heart of a beachcomber.

What we didn't know at the time was that we were engaged in one of those peculiar "truth is stranger than fiction" coincidences.

On his first trip down to this country, Emery had conceived the idea of getting a stripped-down car over on the virgin beach. Years before Emery had been

faced with the necessity of getting a car across the Colorado River. He had stripped the car down to bare essentials and then by using two boats and a lot of ingenuity he had managed to get the car across the river.

So, when Emery had seen a Mexican with a pick-up that had been stripped down to wheels and engine and not much else, Emery had suggested loading the car on a boat and crossing Black Warrior Lagoon.

The Mexican had told Emery he was crazy, but Emery had expostulated at length on his idea, telling the Mexican just how he had ferried his car across the Colorado.

The Mexican remained firm in his opinion that Emery had polluted a naturally weak mind with too much loco weed, tequila and marijuana. In short, there was no sale.

As we were to learn subsequently, this Mexican, a man named Sande, is a very remarkable individual. Thinking back on our dealings with him, I only wish that we could make him a Secretary of State or a Minister of Finance. Our troubles would be over. We would have a balanced budget, there would be an end of the Cold War and we would be sitting pretty.

Sande is a thinker. Sande has an innate ingenuity, and if he had ever taken up chess, would have been a world champion.

Sande's mind started toying with the idea that the crazy gringo had put up to him. The more he thought about it, the more feasible the idea sounded.

So Sande looked around until he found a boat of the right size, battered and ancient enough so that it could be obtained at a moderate price. He stripped a truck down to bare essentials. A rather flat gasoline tank tilted on its side became the dashboard. A couple of light boards became the seats. There was no such thing as a hood, mudguards or body. The truck consisted of a motor, a gasoline tank, a radiator, four wheels and a frame. It was a light pick-up type which had a gear ratio permitting it to go anywhere.

So when there was a low, low tide, Sande parked his skiff on the hard sands of the beach at Guerrero Negro and drove the pick-up over the boat. Then he jacked up the pick-up and removed the wheels. He lashed the pick-up firmly to the old battered boat and waited for the tide to come in to see if it would float.

The tide came in. The battered old boat did its stuff and Sande had a few inches of freeboard. He found himself in possession of a boat and a truck

nicely afloat on the waters of Guerrero Negro.

So then Sande got a skiff and he and his two sons slowly, patiently and laboriously inched their strange load across the water of Guerrero Negro until they came to a place where they could make a landing on the island. They tied up their craft and waited for the waters to subside as the tide went out.

Then Sande put on the wheels. Lo and behold, he had the first gasoline-powered motor ever to land on a virgin beach.

Now as it happened, within less than two hours of the time that Sande landed his strange assortment on the north end of the beach, Emery was landing his Tote Gote on the south end of the beach, with a determination to explore the beach thoroughly and see what it contained.

It is almost inconceivable that this could happen, but happen it did.

It took Sande a little while to get organized, to ferry gasoline over and set up a camp. It took Emery a little while to work out a system of carrying spare gasoline for his Tote Gote, loading a canteen of water and lunch.

At last, however, Emery's plans were complete. He started from the south end of the beach, determined to go clean to the north end.

On that same day, and within a few minutes of the same time, Sande and his two sons started their old jalopy, ran down to the firm sand on the low tide and started south with a determination to see what was on this beach the gringo had told him about two years ago.

Appropriately enough, Sande had christened his skeleton pick-up "Tirame III." (Throw me away, the third.)

Emery, going north on his Tote Gote, convinced that he had reached a section of beach where human foot had never trod, looked up and was astounded to see what appeared to be a gasoline vehicle bearing down on him from the north.

At the same moment, Sande and his two sons, convinced by this time that they were in a veritable treasure-trove of lumber and shipwrecks, with all the world to themselves, looked up and saw a strange apparition creeping toward them.

As the distance shortened and the two vehicles came together, Sande saw, to his amazement, the same bearded gringo who had first propositioned him about getting a gasoline vehicle on the beach two years ago. And Murl Emery saw, to his amazement, the fruition of the idea he had suggested to a Mexican who had at the time dismissed the whole thing as being impractical.

The two men dismounted and pro-



THE "TIRAME III" TAKES ON GASOLINE

ceeded to exchange greetings, each had the idea that he wanted to be the first to explore the beach, each somewhat suspicious of the other, each determined to adapt himself to the new situation so the other didn't win *all* the advantages.

Emery advanced the proposition that, after all, he wasn't interested in lumber. He had only a light Tote Gote and couldn't carry anything. He was interested in exploring and finding what was on the beach, in taking photographs and in getting a few glass balls and other interesting souvenirs. He suggested that his time was very limited. He would only be on the beach for a few days. Sande, on the other hand, had the entire summer ahead of him and could, of course, have all the lumber—and lumber in Baja California is precious.

Emery pointed out that he had companions who were tremendously interested in exploring a virgin beach, but the Tote Gote would only carry one person. His friends had insisted that he should be selfish with the Tote Gote and explore the beach himself. But Emery knew that his companions desperately wanted to see what was on the beach.

So why not capitalize on the situation? Why shouldn't Sande turn his skeleton pick-up, the Tirame III, into a taxicab, come down to our camp, pick us all up and show us what was on the beach so that we could all see it together? This would only delay Sande's operations by one day and there would be money—much money.

Sande was cautious. How much money?

Emery tried to be equally cautious, but by that time it was too late. He had exposed his hole card.

Sande had a considerable knowledge of English which he tried to conceal

behind a mask of ignorance. Emery has a fragmentary knowledge of Spanish which he tried to enhance, behind a false front of linguistic erudition.

The men sat on the beach and bargained.

At length, Sande made his final proposition. He would come to our camp at one o'clock the next afternoon. He would take us up the beach and back so that we could see it. He would charge us twenty dollars in American money. He wanted a gallon of lubricating oil and five gallons of gasoline delivered F.O.B. our camp.

Emery squirmed and twisted, but Sande was obdurate, so Emery made the bargain and returned, still somewhat dazed, to tell us that on this virgin beach which had never been trod by human foot he had hired a taxicab.

The next day we all bundled up against the rigors of a rapid transportation where there would be no windshield, no doors, no mudguards, where we would have to cling to the steel frame of a pick-up by ropes and make improvised seats out of pieces of driftwood. And we waited.

We waited and we waited and we waited. One o'clock came and went. Two o'clock came and went. And then, when there remained only two hours of daylight, Sande showed up.

Emery protested he was late.

Sande shrugged his shoulders and went into voluble Spanish. Gandara wanted to act as interpreter.

Sande didn't want any interpreter. He and Gandara clashed fire right from the start.

Sande had made a bargain. He was entitled to twenty dollars in American money, five gallons of gasoline and a gallon of oil. He wanted it.

Emery protested it was too late to do any good.

Sande was indignant. He had made a bargain. Did the gringos want to see the beach or not? There was not much daylight left.

We wanted to see the beach. We bundled up, tied pieces of driftwood on to the frame and started off.

It was a wild ride and a wonderful experience. We had to go about five miles before we came to the place where the beach really got good, and came to our first wreck.

I only wish there had been time really to study these wrecks. Looking at them, one is surprised to find the inherent strength which has been incorporated by the builders in constructing ships. And then, as one sees the wreckage, one is equally surprised at the force of the water which tears down the work that man has done.

Here were old wrecks with oak timbers, reinforced with huge bolts, double hull construction fastened together with steel, and all twisted and battered simply by the force of water. Here were acres of glass balls, miles of intriguing flotsam. It would take many days even to explore the stuff that was there.

As we advanced farther north, however, it became apparent that the reason for Sande being late was that he had been outwitting the gringo with the Tote Gote. He had apparently put in the entire morning and most of the afternoon staking out claims to various interesting bits of wreckage. The entire north half of the beach was staked out with Sande's claims and crisscrossed with tracks from the Tirame III.

Emery noted this circumstantial evidence with an increasingly dour appraisal.



THE EXPLORERS DISCOVER THEIR FIRST WRECK

The sun dipped low in the west. A cold wind began to blow in from the ocean. Sande took Emery to one side and expostulated. Emery took me to one side.

"We're late," he said.

"I know we're late."

"It's getting late. It's going to get dark."

"I know that it's late and it's going to get dark."

"Sande tells me that if he is going to show you the rest of the beach up to his camp it will be necessary for him when he returns to bring his two sons with him and spend the night at our camp."

"There isn't any room."

"They will take care of that. They will cling to the truck in some way. But that's the only way you can see the rest of the island. Otherwise, you'll have to turn back from here, because when Sande gets to his camp he won't have time to drive back to our camp, which is a good fifteen or eighteen miles, and then return to his camp."

Sande stood aloof during all of this argument. He had the trump cards and he knew it.

So it was agreed that we would explore the north end of the island and pick up Sande's sons and they would spend the night at our camp.

We dashed on into the cold dusk, noticing everywhere that Sande had staked out claims to the most interesting potentially profitable bits of wreckage.

We came to Sande's camp, and then it became abundantly apparent that this strategy had all been carefully worked out in advance. His sons had their bedrolls all ready and were awaiting our arrival.

There was a scene of hurried activity while the sons threw their bedrolls on to the frame, put on stray pieces of driftwood, lashed the whole thing in place and we started back into the teeth of the wind.

That wind became more and more biting. The sun dipped down behind the horizon. The tide was coming in. We had to hurry. Occasionally we went through patches of soft sand where everyone had to get off and push. Then we would get down to the waterline where the wheels would be churning up water.

There was no protection by way of body or by mudguards. Sand and salt water covered my glasses. Sand and salt water covered the exposed side of my face. Sand and salt water got in my ears. Sand and salt water got down



SANDE—KING OF THE BEACH

my neck. The wind cut like a knife. It got too dark to see anything. All I wanted was a campfire and warmth.

I realized that we were paying something like a dollar a mile for the experience.

The entire north half of the beach had been staked out by Sande. It was a nice gesture. However, he had apparently left the south half for Emery and his Tote Gote. As it happened, the north half was by far the most desirable, but Sande had camped on the north half and we had camped on the south half. That was the way the cookie crumbled.

So we reached our camp after dark. The wind began to blow hard and sand began to drift from the big dunes back of camp, hitting my face so that it stung the skin.

It was a rather bleak and bitter camp.

Next morning we paid Sande off and

he and his two sons started back to camp in their strange vehicle.

We had breakfast and then Emery started out to the north in his Tote Gote.

Pretty soon he was back with a wry expression on his face.

Sande had manipulated things in such a way that he had had a good hour and a half head start up the beach. He and his two sons were engaged in putting out claim stakes on everything on the south half of the beach. Emery had finally caught up with them—at least to a point where he could see them in the distance. Sande and his two sons were stopping the car here and there and running — yes, running — to drive claim stakes into the beach.

Sande had staked the whole beach from north to south. He had completely outsmarted us. He had received twenty dollars and enough gasoline and

oil to enable him to stay on the job and exploit his claims.

Emery gripped the stem of his pipe in his teeth, filled up a can with an extra supply of gasoline, took a canteen of water and a can of beef and said nothing. There was nothing he could say—and he knew it.

He did have one trump card.

On the excursion last night he had noted a place where the beach went back for probably a mile and a half into sand dunes in what had perhaps once been a lagoon. Emery felt certain that the Tote Gote would traverse that, and that the claim-staking Mexicans couldn't get to that section of the beach in their truck.

It turned out Emery was right.

He returned late that night with the Tote Gote literally laden with loot. He had picked up a wooden basket which had drifted over from China and which had, in all probability, been carried for many miles on the end of a bamboo pole by some coolie transporting night soil to a rice patch. But it was now worn by waves and drifting sand, scoured clean by tropical sunlight.

Emery had, indeed, found a section of virgin beach. Deep tracks in the sand showed that the Tirame III had struggled in vain to get through the sand and had finally been forced to give up. Sande simply couldn't afford to get stuck with the only vehicle on the island, nor could he afford to waste precious gasoline in churning his way in low gear through deep sand.

Emery had found a place where there were hundreds of acres strewn with glass balls from the Orient, with bits of interesting flotsam, with glass bottles that the intense sunlight and the passing of many years had turned to a very deep purple. He had also found one glass ball which had become opalescent because of sunlight and salt incrustations. He had found a hand-carved crossbow which had drifted all the way from some tropical island. He had found a torpedo, a wrecked airplane of World War I vintage, the helmet of an aviator.

Emery was a happy man, but he had been forced to leave literally thousands of glass balls which intrigued the collector in him, and would have been worth a fortune in the curio stores in the United States. He had been forced to leave dozens of bottles that had been turned, not simply to an amethyst hue one frequently finds in the desert glass, but to an absolutely deep purple by the action of the sunlight. He had encountered shipwrecks of old sailing ships which were more than a hundred years old. He had encountered all sorts of

driftage, stuff that he hadn't even had time to examine. But there were no claim stakes, and, just to show that he wasn't to be trifled with, Emery had staked out a claim to the whole beach. Not that he ever expected to see it again, but it would at least let Sande know that the gringos were not entirely dumb.

I don't think Emery knows how to play chess, but he fancies himself as an expert poker player. Somehow or other, however, I have the idea that he wouldn't like to play stud poker with Sande.

Once the land of Baja California has stamped its charm upon you, you can't remain away very long at a time. Those who have known this peninsula continue to love it and to return to it—and those who have hunted whales in Scammon's Lagoon are marked men. Whale hunting is too exciting not to leave an indelible mark.

Too few people know anything about Baja California. The roads in places are bad. The climate is wonderful. The marine scenery is unsurpassed, and there are literally thousands of potential resort sites within a short distance of the heavily populated centers of Southern California.

As my friend, Donald Douglas, pointed out in a recent conversation with me, the technical and scientific developments in the field of converting sea water into good drinking water are des-

igned to have a terrific impact on the future of Baja California.

In the vicinity of Los Angeles there are hundreds of thousands of sportsmen who are fed up with the fished-out streams they so frequently encounter, who would give their eye teeth to drop a line in virtually virgin waters, well populated with hungry fish. Yet within one or two hours flying time of Los Angeles there are these blue waters, literally filled with fish. There are white sand beaches, a relatively gentle, curling surf, a climate which combines the dryness of the desert with the cool, moist breezes blowing off the ocean.

It seems inevitable that Baja California is on the threshold of a great expansion.

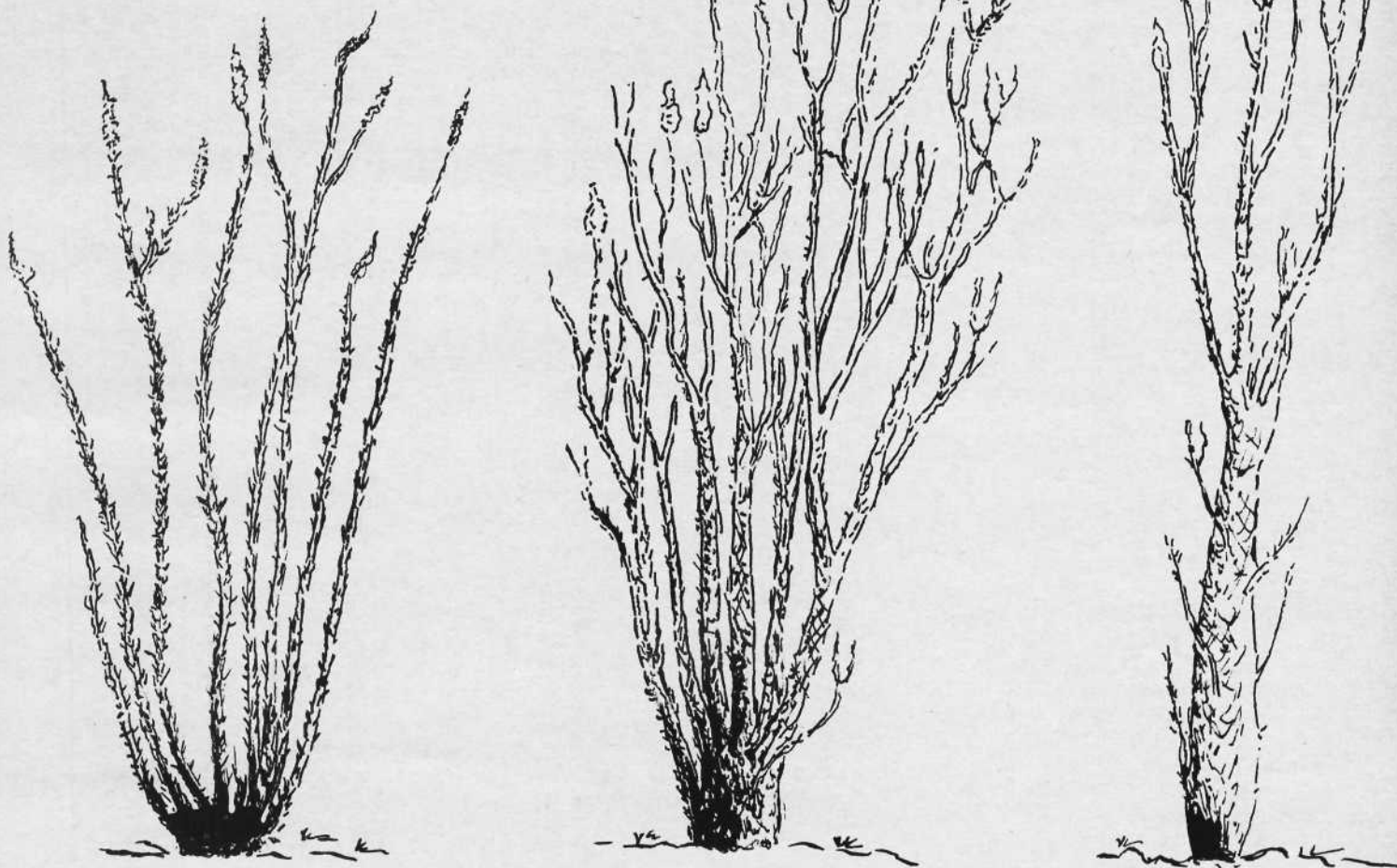
I know some of the prominent people who are in business in Baja California. They are interested in promoting better international relations and in making the country more accessible to the tourist. As air transportation becomes faster, safer and more economical, more sportsmen are going to become familiar with this country, and as tourist traffic justifies it roads are going to be built and improved and resorts are going to spring up.

Baja California is a land of adventure, and more and more people are going to become familiar with the charm of a country where dry air, warm sunshine, cooling breezes and blue waters present an irresistible combination for sports and recreation. ///



MURL'S TOTE-GOTE IS LADEN WITH BEACH TREASURE

Three main types of branching in Ocotillo are shown in the drawings below. At the left is the form of *Fouquieria splendens*, *F. fasciculata* and *F. burrageri*. *Splendens* is the most widespread of the Ocotillos, and the most familiar to U.S. desert visitors. The center drawing shows the conformation of *F. maddougallii*, *F. peninsularis* and *F. formosa*—Ocotillos having a well-formed and definite trunk and stout main stems. At the right is *F. purpurei*, whose swollen basal stem resembles that of the exotic Cirio tree, a near-relation of the Ocotillo.



OCOTILLO

By EDMUND C. JAEGER, D.Sc.

author of "DESERT WILDFLOWERS," "THE CALIFORNIA DESERTS,"
"OUR DESERT NEIGHBORS," "THE NORTH AMERICAN DESERTS"

THE OCOTILLO or Candlewood is one desert plant that once seen is never mistaken for any other. The thickset slender spine-armed stems, from three to 20 feet long and springing from a very short trunk, form a flaring bouquetlike arrangement of rare beauty. Perhaps this beauty is best appreciated when the plant is seen in silhouette against pink skies at sunrise or sunset, or against a background of white-to-dark cumulus clouds at time of an incoming or retreating storm.

This shrub is a member of a rather

widely-spread group of plants found from far southern Mexico northward to the Grand Canyon of Arizona. There are seven species of Ocotillo—*Fouquieria splendens*, so familiar to southern California and southern Arizona residents, being most widespread. Because of the graceful stems, small bright green leaves and spikes of brilliant red flowers, this plant has endeared itself to every traveler.

Although Ocotillo grows to a height of 10, 15 or even 20 feet, it is classed as a shrub since its graceful wandlike branches spring from such a short cen-

tral woody crown. It is indeed a hardy plant denizen, especially fond of growing—often in unbelievable numbers—on the stony mesas or the broad detrital fans issuing from the mouths of canyons. Sometimes it is not adverse to occupying rocky canyon walls alongside paloverde and ironwood trees, and branching cane cacti. The greatest heat does not discourage it nor do long periods without rain. In fact, as long as there is alkali-free soil, good drainage and three to four inches of rainfall per year, Ocotillo flourishes and seems not

to be particular as to the company it keeps.

The roots for the most part are shallow and radially-spreading in every direction. They and the larger stems possess flaky spongy bark which allows the plant a chance to utilize the moisture of shallow-penetrating rains. These roots are very angular, fitting themselves snugly around stones and exploring their way into numerous rock crevices. They certainly do valiant service as anchors during times of strong winds.

The Ocotillo stems are armed with numerous stout spines which are formed in a very peculiar way. The primary or first leaves of the young branches are soon deciduous, but the petioles or leaf-stalks persist and become the permanent sharp spines which give the plant such major protection against browsing animals.

In days not too far past, when one of the principal means of carrying bedding and provisions cross-country was by mule or burro pack, the tall thorny Ocotillos were almost a constant source of annoyance to travelers. Often the pack-animals were not discreet in avoiding proximity to the strong, lithe and thorn-armed stems, and in consequence the canvas coverings on these packs were frequently torn, much to the annoyance of the packers.

During much of the year the Ocotillo's gray stems are without leaves, and the Ocotillo "forests" then give a region a most lonely, barren and inhospitable appearance. But let a rain come and within a very few days the leaves—bright green and numerous—sprout forth to completely cover the stems with friendly verdure, and completely hide the spines. With the advent of drouth and subsequent decrease of water content of the stems, the leaves soon turn red, then yellow and finally fall off. But each new soaking rain produces a new set.

Sometimes before the leaves emerge, sometimes after, the plants flower. The tubular many-stamened flowers are flaming red and arranged in elongate pointed panicles at or near the ends of the stems. An Ocotillo with many (perhaps up to 40 or 50) stems, each with its elongate clusters of flowers, is a really fine spectacle. Sometimes one finds a lone Ocotillo with white flowers. Such a one I found recently.

The aboriginal desert people ate both the Ocotillo's flowers and the small seed-pods which followed. They also made a sweet drink by soaking the flowers in water. Because of the blossoms' bright color and sweet nectar, they are always soon visited by many hummingbirds and nectar-probing insects.

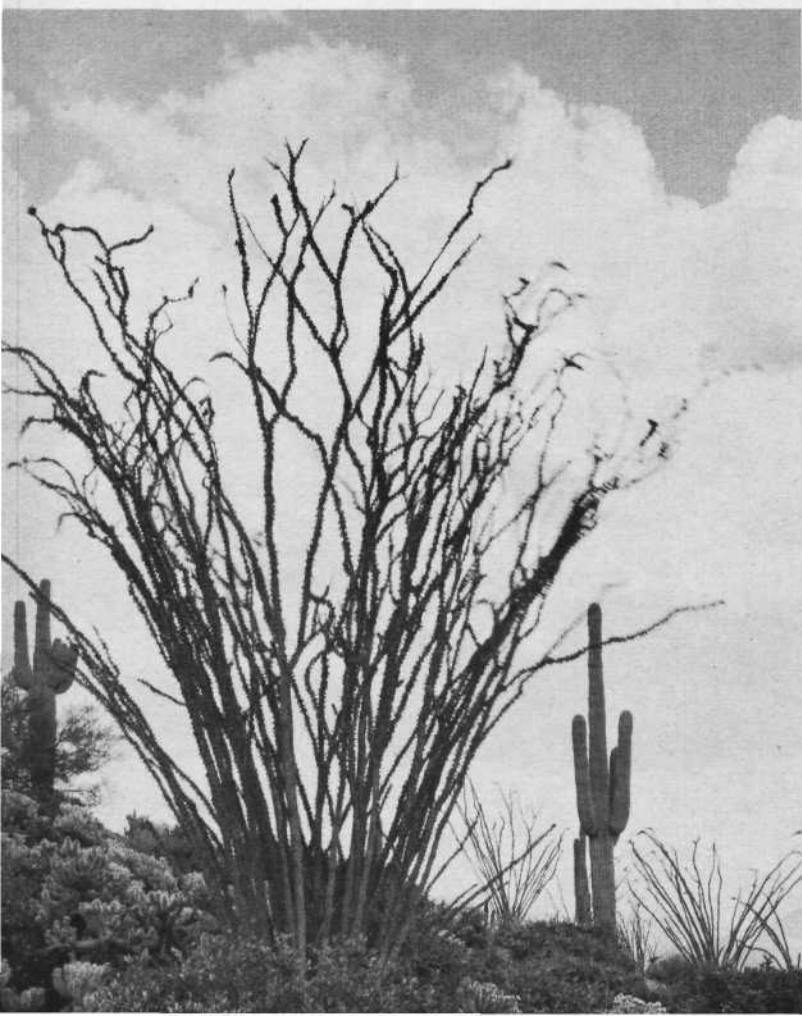
On a recent windy day I surprised a three-quarter-grown antelope ground squirrel up in a small sprawling Ocotillo eating the sweet blossoms. When he saw me, he hastily descended to the ground (in spite of all the thorns); then ran pell-mell into a hole beneath the base of this same Ocotillo. I waited nearly half-an-hour, my patience nearly worn out, when the little round head with big black bulging and curious eyes appeared very cautiously at the opening to his underground retreat. He took one look at me then dashed back into his "Ocotillo-cellar." The next appearance came 10 minutes later; again followed by a quick retreat. But after another three minutes he emerged, sat upright, and nervously vibrated his tail. This use of Ocotillo by rodents as safe places beneath which to make burrows is fairly common. They find good protection here against the fast digging coyotes and foxes.

The Ocotillo stem is very strong and pliable, bending without breaking in the strongest wind. The wood of the green plant is light yellowish-green. I had for many years taken it for granted that the stems were pithy in the center like those of their near relation, the spiny cirio (*Pachycormus discolor*) and that there was only an outer basket-weave framework of woody fibers to give strength to the stems. But, in truth instead of spongy pith, the stems have a hard brown woody core with growth rings, just like a tree. Only the fibrous bark has holes in it and through these openings the thorns and nubbins of the leaf bases appear. If there is water stored in the stems, it is mostly found in the thin pithy layer of the inner bark.

Ocotillo wood burns exceedingly well, its deep yellow flame providing much heat. However, it gives off a very black smoke which soon covers my camp kettles and skillets with a velvety-black coat of soot. This is due to the high content of waxes, resins and gums of the bark.

In parts of mainland Mexico and Baja California, especially where straight-stemmed trees are scarce or absent, the straight stouter stems of tall Ocotillos are much used in building the crude domiciles of the poor. The stems, set upright and plastered with mud, make the walls and sometimes are used as supports for the thatched roof. Fences and even casings for the shallow hand-dug wells are made from these stems. On the sandy plains of Sonora and Baja California one frequently sees where the natives have used their axes and machetes to cut the long Ocotillo stems.

The very common *Fouquieria splendens*, the kind of Ocotillo we see on the southeastern California and southern Arizona deserts, extends southward into



A SUMMER
STORM
APPROACHES
A SOUTHERN
ARIZONA
HILLSIDE
CROWNED WITH
SAGUARO AND
OCOTILLO

the hills and plains of Sonora and Coahuila and at least almost half-way down the Baja California peninsula. At Bahia de Los Angeles it consorts with the Peninsular Ocotillo (*Fouquieria peninsularis*). This handsome shrub was first described in botanical literature from specimens secured from New Mexico's dreaded Valle Jornada del Muerto ("Valley of the Journey of Death"), a name bestowed because of the number of early Spanish refugees who perished here in 1690 as they fled from enemies over the waterless plains toward Old Mexico.

The two most widely occurring and well-known Ocotillos after *Fouquieria splendens* are the Peninsular Ocotillo and the Tree Ocotillo (*Fouquieria macdougalii*). The Peninsular Ocotillo is largely confined to the sandy and gravelly areas of the southern half of Baja California. It grows on many of the Gulf islands; also on the coast near Guaymas in Sonora. It differs from our common ocotillo in having a well-formed and definite (although short) trunk, more spreading, and stouter main stems and many branching and crooked minor ones. The bark is brown and not gray as in *Fouquieria splendens*, nor green as is the case with the Tree Ocotillo. The dark-red flowers are arranged in elongate panicles.

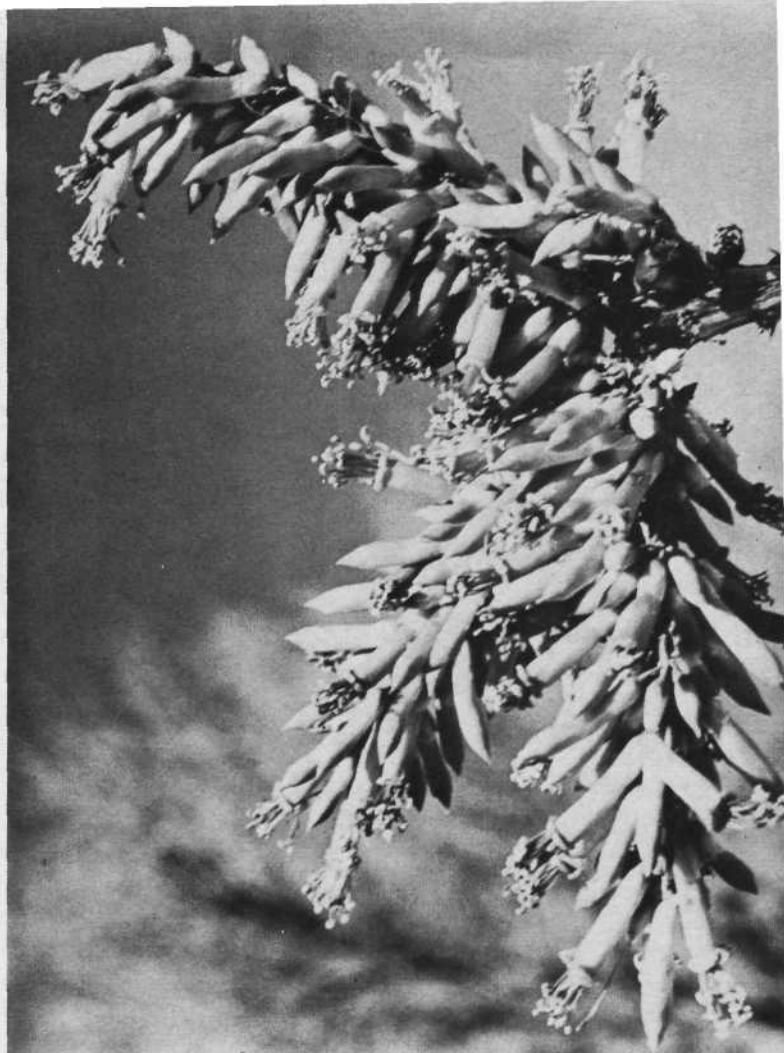
In southern coastal Baja California the stems of Peninsular Ocotillo often are draped with the air plant called orchilla or rocella, which superficially resembles Spanish moss. In years long ago the orchilla was gathered and shipped in quantities to Europe for the making of dyes.

The early Spanish settlers called this Ocotillo, Palo de Adan ("The tree of Adam"). Said the botanist, the late T. S. Brandegee: "I have never been able to discover the origin of this name. It seems entirely vague unless it refers to its habit of clothing itself with leaves after every rainfall."

The strange Tree Ocotillo occurs on both sides of the Gulf. I have seen it near Bahia de Los Angeles; also along the road south from Nogales, I meet it when yet some 30 miles north of Hermosillo. It may be either a shapely shrub or a quite inornate tree, so far as form of crown and arrangement of branches is concerned. There are several main stems and the outer branches repeatedly divide; the bark is a vivid green. The flower pannicle is a more or less flat-topped short cluster of red tubular blossoms. Because most of the branches are very short, little use can be made of the wood except as fuel for the campfire.

Dr. Daniel T. MacDougal, after whom this plant was named, was long connected with the Desert Botanical

THE
TUBULAR
RED
BLOSSOMS
OF
OCOTILLO



Laboratory at Tucson. The type specimen was taken at a small station called Torres on the railroad between Nogales and Hermosillo.

The native Mexicans call this Ocotillo, *Jabonillo*, literally, "little soap," since they found its bark useful in washing clothes. Especially was it prized for laundering woolen fabrics.

One of the most southerly growing Ocotillos, *Fouquieria purpusii*, approaches its near relative, the cirio tree, in having the basal stem swollen and gradually tapering upward "like a slender carrot turned upside down." Its leaves are very narrow rather than broadly ovate, and its tubular flowers are white instead of scarlet.

This Ocotillo, found only on the rocky slopes of Cerro de Coscomate in Oaxaca, was described by Dr. T. S. Brandegee who did so much to explore the peninsula and bring to our attention the many peculiar and interesting plants of that unique area.

Burrage's Ocotillo (*Fouquieria burragei*) grows up to 22 feet high, and is known only from Pichilique Island off the Baja California coast near La Paz. It has a very short main trunk and is the only Ocotillo having bell-shaped flowers; in color they vary from pale purple to nearly white.

In Durango State and perhaps in ad-

jacent arid Coahuila grows a long-tubed red-flowered Ocotillo with leaves definitely rounded at the apex. It is known to the botanists as *Fouquieria fasciculata*, but I found the native Mexicans calling it "Barda" (Sp. "brush"). Its long wand-like branches are utilized in constructing the sides of the natives' primitive houses, and its pulverized seeds as a remedy for toothache.

In Jalisco and southeastward to Oaxaca is a thick-trunked very spiny-branched Ocotillo called "Palo Santa" (Sp. "sacred tree"). It too has bright red flowers, these closely set on a long central stem. It has been given the scientific name of *Fouquieria formosa* (*formosa* means "full of beauty, splendid") because of its colorful flowers. It was earlier given the specific name *horrida* (horrid) because of its numerous stout-spined branches; all of which goes to show how differently a plant may impress different observers, and on which characters they place most emphasis.

The generic name *Fouquieria* given to all of the Ocotillos described above commemorates Pierre Eloi Fouquier (1776-1850), Professor of Medicine at Paris. Ocotillo is a native name meaning "the little torch-pine," its wax-and-resin-filled stems being useful in the kindling of fires and, when made into bundles, as torches. ///

WIND - The Desert's Worst Weather

By ERWIN K. KAUPER*

A BLAST OF SAND, torn off the top of a sheltering dune, sprayed over the sleeping camp. This was the beginning of a series of sand pricks that finally managed to wake the entire family. What had been a beautiful clear springtime desert night now turned into a hurrying swishing darkness. We who enjoy sleeping on the floor of the desert were putting up with an expected but not welcome taste, literally, of the desert. A windstorm was roaring full-tilt across the expanse of Death Valley.

The rest of the night was spent inside the confines of the family station wagon, listening to the sand rattling off the vehicle's sides.

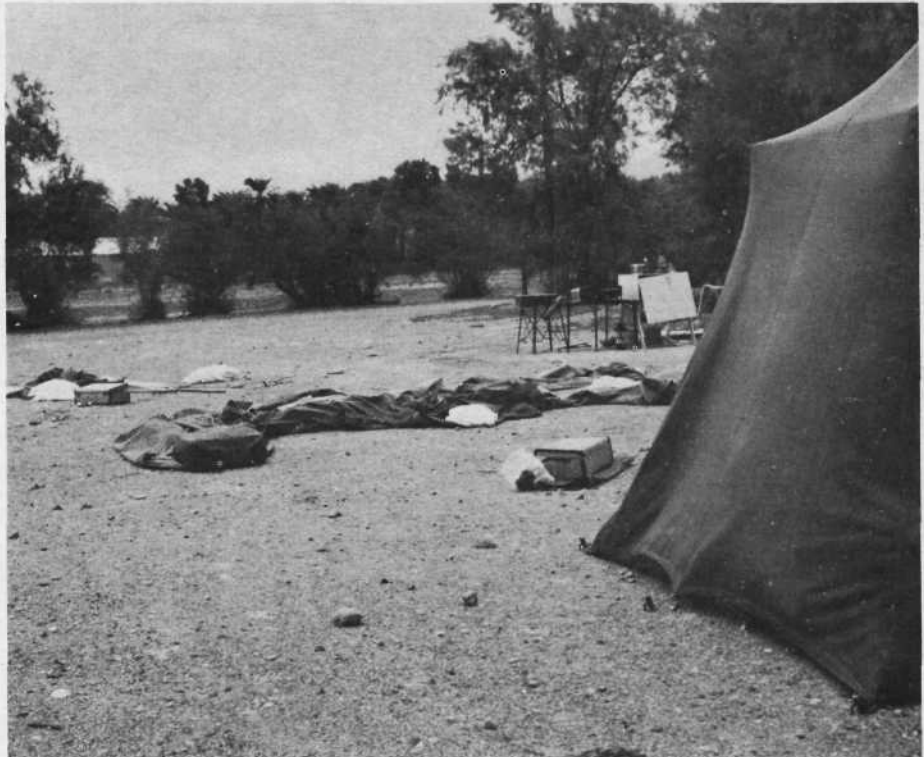
With the dawn, when sleep-clogged heads cleared, there were the usual comments and sallies directed at a weather-forecaster father who allowed himself to be caught in an inclement weather situation. The best I could do was to turn the conversation away from the "busted" forecast to a discussion of how the wind came to be.

It was admitted by all that wind is only air in motion; and that air movement is nature's way of keeping the atmosphere in balance. When low pressure areas are created, either by the occurrence of a storm or the heating of the air by contact with a hot surface such as the desert floor, nature attempts to fill these low pressure spots by bringing in air from surrounding higher pressure regions.

In effect, this is similar to the well-known action of water flowing downhill. In the case of air, however, the downhill direction will vary with the location of the moving high and low pressure centers.

*Erwin K. Kauper, a senior meteorologist with the Los Angeles County Air Pollution Control District, is charged with operating the smog forecasting service. His duties also include doing research into the meteorological aspects of the phenomenon known locally as smog, but, as Kauper puts it, "really better described as photochemical-type air pollution."

To this he adds: "Having to work in downtown Los Angeles in the above-mentioned stuff may have something to do with the eagerness with which I look forward to the trips into the desert with my family." The Kaupers have four children, three boys and a girl, and their main desert interest is exploring ghost towns and old mines.



CLOTHING, SUITCASES AND A FALLEN TENT LITTER A CAMPGROUND NEAR FURNACE CREEK RANCH IN DEATH VALLEY FOLLOWING A SUDDEN WINDSTORM

Unfortunately for the repose of our family, we chose a night when a low pressure area began developing in the desert eastward of the Sierra Nevadas. This condition often occurs when a Pacific storm front passes on-shore over northern California and moves across the barrier mountains into the Great Basin. Typically, the wind sequence is a southerly wind, followed by a shift to a northerly or westerly wind as the storm front passes (see Figure 1).

Actual direction of wind flow at a given location depends on the local topography. For example, the various desert valleys tend to have winds blowing along their axes, heading toward the low pressure ends of these valleys.

The entire desert area of the Southwest is particularly subject to persistent blows because of the arrangement of north-south trending mountains and valleys. This orientation, cross-wise to the prevailing westerly wind flow that is strongest in the cool months of the year, allows for the creation of lee-side low pressure areas, due to the action of the westerlies blowing over the mountain crests and entraining some of the air up

from the lee-side valleys (Figure 2). This causes a local depletion of air, hence a lowered pressure. When this pressure change takes place within a relatively short distance, a large pressure gradient is formed, and the result is strong winds.

Because most of the winter storms pass across the northern portion of the continent, the northern deserts, such as those in Nevada and Utah, suffer numerous "blows." The lower elevation deserts along the southern border of the United States experience relatively fewer windstorms.

For the desert resident, be he homeowner, farmer or an itinerant spring vacation camper, the desert wind is certainly a force to reckon with. It is, in truth, the worst of the desert's weather vagaries.

Men have fought the desert wind, but never have they conquered it. Some, such as the late O. J. Backus of Mojave, Calif., made it an ally of sorts. He settled in the Antelope Valley in the early days, and being told by neighbors that "the wind always blows," Backus built a string of nine windmills to utilize

this free power source. He soon realized that the wind did not blow all the time. Even in the windy Mojave, the wind came in cycles in response to the migrating weather systems. His interest aroused by this variation in the wind, he began a study of the wind and desert weather in general that led to his becoming one of the country's outstanding Weather Bureau Cooperative Observers.

Backus recorded the doings of desert weather at his homestead near Mojave from 1935 to his death in 1957. At his own expense he built and equipped a complete evaporation weather station—at a time when the Weather Bureau said it was not interested in Mojave Desert weather records. Backus filed his reports anyway, and soon his unique contributions to weather knowledge came to be recognized. The present observer is George L. Turcott, who is carrying on in the tradition of the station's founder.

Backus discovered that the Mojave's hard steady winds came in March, April and May in a definite yearly pattern, which sees November receiving the least amount of wind movement. However, big blows are likely to occur at any time.

Many people planning to build homes on the Mojave Desert sought out the amateur weatherman's advice on how to "beat the weather." The most important factor to determine, Backus believed, is the direction of the prevailing winds at the proposed homesite. Best way to find this out is to interview the nearest neighbors, for the winds vary considerably in small given areas. This is due to topographic factors that can bend or block the prevailing continental air flows; and the lee-side behavior of wind mentioned above.

"Once you know which way the wind is most likely to come from," Backus would say, "be sure the doors of the house are placed on the protected side so the wind will not be blowing you in and out of your house."

Harry C. James, the eminent author and conservationist, adds this to our knowledge of desert air movement: "I have noticed this about winds in the deserts: often a very slight shift in position will make a terrific difference in the force of a wind. Time after time we have camped at places where by moving our fireplace just a dozen feet or so we would be able to have a cooking fire that would be free from gusts. Recently we stopped for lunch at a spot beside the Palms-to-Pines Highway in Southern California. Where we first planned to eat it was hot and there was absolutely no breeze. When we moved just about a dozen feet up a small ridge, we found a fine breeze.

"I am sure that if people would take

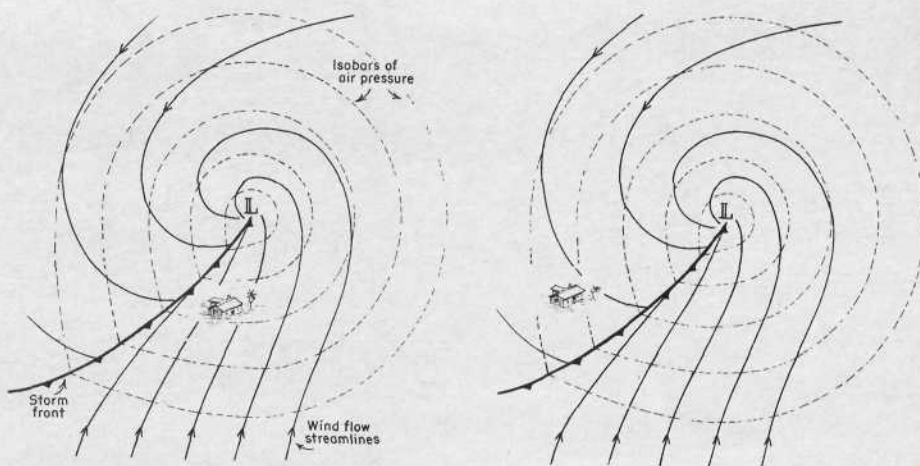


FIGURE 1: When a Pacific storm front moves across California's barrier mountains into the Great Basin, the typical desert wind sequence is a southerly wind (in the drawing at the left, the house lies in the path of streamlines moving south to north); after the front passes (drawing at right), there is a shift to northerly and westerly winds.

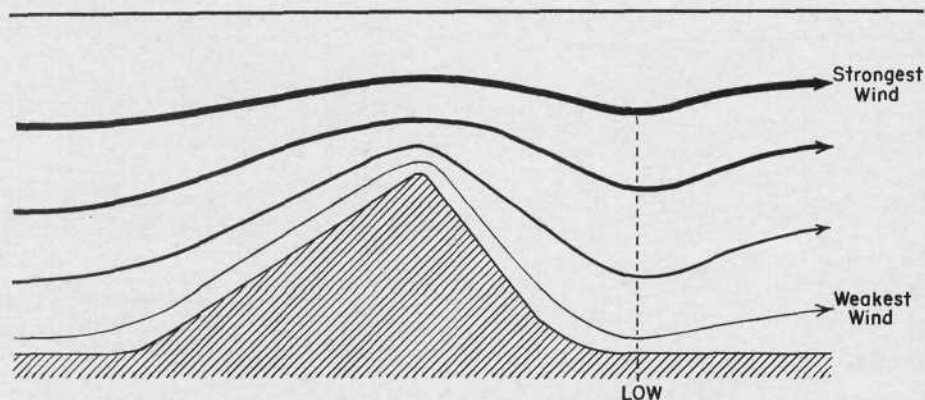


FIGURE 2: When the prevailing westerly wind blows over a north-south trending desert mountain crest, a local depletion of air and subsequent lowering of air pressure occurs on the lee-side of the ridge. When this pressure change takes place within a relatively short distance, a large pressure gradient is formed, and the result is strong local winds.

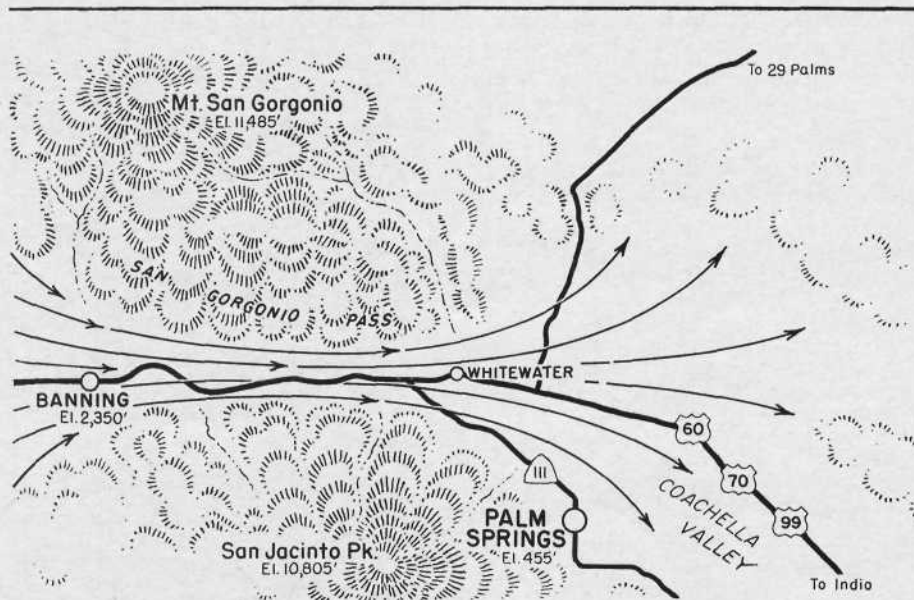


FIGURE 3: The San Gorgonio Pass siphons air from the Los Angeles coastal plain to the warmer and lower Salton Trough, creating a classic Mountain Jet and a wind-damage problem to automobiles traveling Highway 60-70-99.



DESERT THERMALS PROVIDE THE LIFT FOR GLIDER FLIGHT

a little time to study locations before making up their minds as to where their buildings are to be placed, they could gain very considerable protection from wind damage."

The continuing settlement of the Desert Southwest has caused air movement to become more and more of a problem as increasing numbers of man-built objects are exposed to the wind's wrath.

As agriculture spreads with the development of water supplies, farms encroach on dune areas. Sometimes the wind returns the desert to its supremacy in such places, driving the dunes of shifting sand back over these works of man, as was the case years ago at some of the date groves near Indio on California's Low Desert.

There are certain desert areas with wind conditions that try the treasuries of the automobile insurance companies, for here cars are sand-blasted during windy nip-ups. Perhaps the most infamous of these places is the Whitewater

area, along U.S. Highway 99 west of Indio (Figure 3). Here two factors combine to provide a heavy windshield replacement and repainting expense: much automotive traffic and even more wind.

The traffic increases yearly, the wind, thankfully, remains relatively constant. Unfortunately, it is constantly too strong. This wind is the result of air being forced through the constriction of San Geronio Pass and rushing down to the trough occupied by the Salton Sea. Wind in this area is a classic example of a mountain jet. The obstructing mountains on both sides of the Pass force the main mass of the normally eastward-flowing air to funnel between them. In the Pass area the air must speed up in order to allow the same volume of air to move through the constriction as is pushing into the western approaches to the Pass. The wind, however, is actually stronger below the Pass at the eastern portal near Whitewater than directly in the throat of the Pass. Here an added effect is at work. Air from aloft is

brought close to the surface because of the downward component of the flow down the lee-side of the mountains. The net result is the famous Whitewater blows.

Wind uses up part of its energy in remaking the face of the earth. Loose soil is carried off from one section, leaving only the rocks and larger pebbles behind, and even these are sand-blasted. The widespread occurrence of "desert pavement" illustrates the action of the wind, helped out occasionally by pelting rainstorms. In another location, where a topographic obstacle causes the wind to lose some of its force, the air-borne soil and sand grains are re-deposited, forming dunes.

An oddity of nature, the skating boulders of the Racetrack in Death Valley, are thought to be propelled by the strong winds that blow through that area. When a winter storm produces enough precipitation to slicken the clay surface of the Racetrack, the strong persistent winds are able to move the rocks. So far this is only a supposition, since no one has actually observed such activity. Only the skid marks in the clay testify to the fact that the boulders do move. Probably the reason no human observer has viewed this action is that it occurs only during really miserable weather, cold wind and pelting rain, or even snow. This condition, together with unsurfaced roads that may be impassable in such weather, will keep even the most dedicated outdoorsman at his fireside.

When a strong wind-flow in the course of its headlong run across the Southwest comes across an area denuded of cover, it exuberantly tosses aloft great quantities of soil particles. This is the "duster," scourge of the 1930s in the Dustbowl of eastern New Mexico and Colorado, and western Oklahoma and Kansas. Such a duststorm in full flight lifts the thick dark clouds of soil particles to 20,000 feet, as reported by more than one surprised airline pilot.

THE DUST DEVIL

On hot summer days, dancing cones of madly swirling wind, outlined by flying sand and dust, provide a spectacle that has been repeated for the amazement of desert man from earliest times. A watching Navajo would recognize it as the *nadziyoldisito*. To the Spanish Conquistador it was the *remolino movil de arena*. We know it as the dust devil or whirlwind. All these terms are fully descriptive.

However, the nature of the dust devil as deduced by an observer is dependent on the point-of-view of the beholder. This is true for all of nature, of course, but is particularly so for such an ethereal

object that has its feet on the ground and its head in the heavens.

Air behaving in such an unusual manner certainly caught the superstitious imagination of the Indians who lived in the Southwest. To them the whirlwind was a form of evil, the same connotation that remains in our term, dust devil. The various tribes have differing legends regarding the whirlwind. In the Pueblos the spinning vortex of wind is a spirit; at Jemez it is said to cause miscarriage; a Laguna tale deals with the carrying off of a girl by the Whirlwind Man; Zuni witches are believed to travel within the vortex; the Hopi believe the whirlwind spirit prowls abroad at noon. To the California Indians the spirits within a dust devil were made of dead shamans' dust and were poisonous. The unfortunate who was unable to dodge out of the erratic path of one of these evil spirits had to suffer an exposure to smoke in order to cleanse his body. It is obvious from the above that the aborigines did not think highly of whirlwinds. But, a desert wanderer, be he Indian or modern man, recognizes a kinship with the dust devil, now slowly meandering across the plain, now suddenly darting up a ridge, following a will-of-the-whisp of its own.

The concepts held by the Indian have been replaced by the understanding of meteorological science, but still much of the dust devil's nature is imperfectly understood. To an earthbound mortal the dust devil appears as a small cone or tube of spinning air, made visible by the dust it has been able to pick up. When the paths of devil and man cross, man recognizes that strong buffeting wind is characteristic of the devil. This is what causes the dust to be raised and suspended in the air.

From the viewpoint of a glider pilot, the dust devil represents a visual indication of rising vertical air currents — thermals—that will sustain the glider. A world-renowned locale for such thermal soaring is El Mirage Dry Lake in the Mojave Desert. Here, under the direction of Gus Briegleb who operates the airport there, an ever increasing number of enthusiasts are experiencing the thrill of birdlike flight, remote from the sound and vibration of aircraft engines.

A strong family resemblance is evident between our desert dust devil and the tornado of the American Middle West and the Eastern states. Both have the characteristic spinning motion of the air contained within their circumferences. However, the tornado is, in size and destructiveness, a granddaddy dust devil. Wind speeds up to 170 miles per hour have been measured, compared with the 20-40 mile per hour speed of the wind

in a dust devil. The difference in intensity is due to the greater instability of the air mass that is able to spawn tornados. The tornado air is moist so that any lifting of the air causes condensation to appear, usually resulting in thunderclouds. A moist air mass is potentially more unstable than a dry one, such as those over the desert. Therefore the ordinary dust devil is doomed to remain a pigmy tornado, since there is no supply of moist air to aid in its further development.

There have been instances of tornados reported over the Southwest, but they have been short-lived and usually were not able to penetrate to the ground surface. They more commonly are noticed hanging out of a cloud base—a cone of cloud with the apex remaining off the surface. A combination of rough terrain and marginally unstable air masses tend to inhibit tornado developments of a serious nature.

The dust devil is born in the upward moving air of thermals. When a mass

of air is locally heated beyond endurance it shakes itself free of the surface heat source and seeks a cooler environment aloft. When this takes place slowly, smoothly and over a relatively large area, a thermal occurs. At times, however, the low pressure created by the rising air is sufficient to cause a sudden inflow of air at the surface. This creates a situation where air is coming together from all points of the compass. A traffic jam is avoided by the competing air streams finding an accommodation. The result is a turning of the wind, forming a circulation, either clockwise or counter-clockwise in direction. The core of this circulation is relatively calm, an area of transition of wind direction. As the column of heated air continues to rise, this circulation rises also. Finally the fully developed dust devil is in operation; hot air is feeding into the bottom of the system, rising, and being removed from the top by diverging winds aloft.

The dust devil will continue as long

An Ill Wind Blows Him Some Good . . .

After a decade of traveling the windy stretch of desert highway near Whitewater, and on the majority of these trips seeing the "man with the cart" walking briskly and erect alongside the roadway, curiosity got the better of us. We pulled over to the side of the road and introduced ourselves.

After the usual opening statements about the weather (it was mid-summer), we became acquainted with a most unusual man.

William McDavid makes his living from the highway, and his chief helper is the wind that blows almost constantly through the San Geronio pass.

"I travel between Garnet and Banning," McDavid told us. "I pick up these things that blow from the cars, and put them in my cart—desert water bags, hub-caps, hats—all sorts of things. The wind always comes from that direction, and nearly everything that blows off of a car lands on this side of the highway."

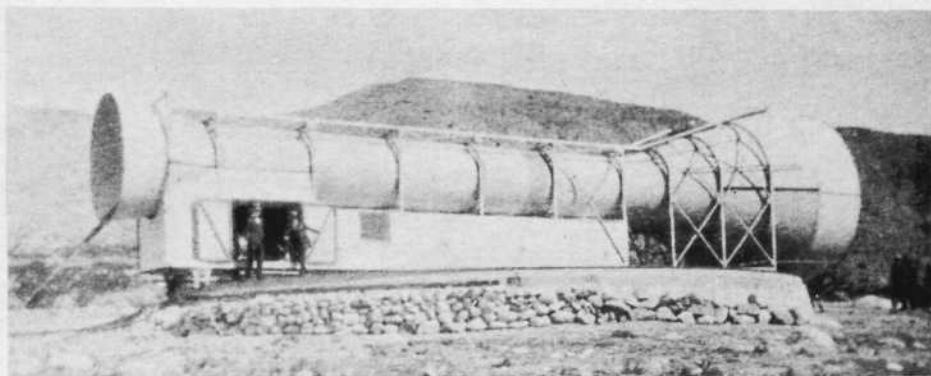
"Used to get 10 or 12 cases of beer bottles—quarts, that is. But, with all the tin cans today, I don't find many bottles. And besides, there's only one place where I can trade-in the bottles for my groceries."

"Don't find many hub-caps now, either. Just one this trip. And hub-caps are getting harder to sell, too. The water bags are easier to sell. On some trips I find as many as a dozen."

"Used to make the trip from Garnet to Banning in one day, but now I have an overnight stop going and coming. That way I make the round-trip (about 40 miles) in three days. Makes it easier that way."

Mr. McDavid has been "working" the highways for 38 years, the last dozen of which he has spent on the Banning-to-Garnet stretch. "It's a healthy life," he says.—By MILDRED ROTTMANN

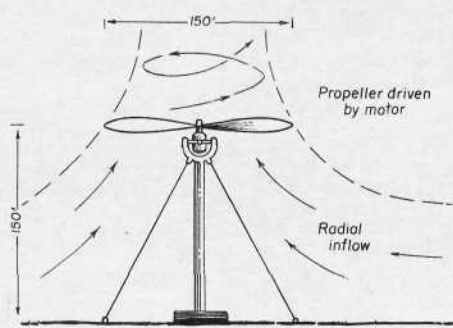




IN 1926, AN INVENTOR NAMED DEW OLIVER ERECTED THIS GIANT RUBE GOLDBERG CONTRIVANCE IN WHITEWATER (SEE FIGURE 3), A PLACE OF "PERPETUAL WIND." THE WIND ENTERED THE BELLED-END OF THE "OLIVER ELECTRIC POWER GENERATOR" AND WAS MAGNIFIED 12 TIMES UNDER PRESSURE. OLIVER'S MACHINE ACTUALLY PERFORMED AS PROMISED, BUT THE INVENTOR BECAME TANGLED IN LEGAL MATTERS, THE VENTURE WAS ABANDONED, AND THE MACHINE WAS SCRAPPED.

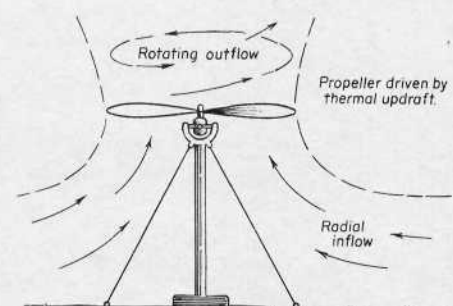
the calumnies leveled against it by various tribes of the genus man. However, the picture held in the eye of the beholder has changed—from an incarnate evil spirit to a column of heated air escaping from the earth's hot surface. And with this change has come a threat to the whirlwind's freedom. The future generation of dust devils may well find themselves domesticated by man in his quest for new sources of energy.

When the wind storm has passed and the dust clouds settle slowly over the land, the desert turns its best face outward. Then it is, between outbursts of its windy temper, that the desert allows its inhabitants to enjoy their most peaceful days. But these are not days when weather forecasters prowl the land. We know such days exist for the records left by men such as Backus tell us so. Should you ask a certain forecaster's family, however, they will tell you that there are no such days in the desert. This they know from long personal experience. ///

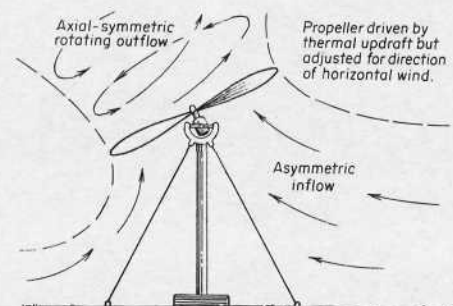


as there is a supply of hot air available on the desert floor, and a dispersion of air aloft. Should either of these conditions no longer hold, the dust devil will subside and die.

While a storm of very local nature, the dust devil obviously represents a considerable amount of energy. Man, who has been ingenious enough to develop windmills to utilize some of the energy of the normal steady-state wind, has turned to the intriguing possibility of domesticating the whirlwind.



Dr. Werner Spilger, a former German meteorologist and physicist now serving in a research capacity with a Southern California electronics firm, has developed this idea and is convinced that the energy of the dust devil could be successfully tapped (Figure 4).



He proposes to cause the dust devils and thermals that occur in a random manner over the desert floor to be concentrated at a specific point. To do this he would put a large fan in operation directing a stream of air vertically. The fan would be turned on at a time when the air, due to intense surface heating, was approaching instability. The inauguration of an artificial thermal, or body of rising air, just prior to the occurrence of natural thermals would, Dr. Spilger believes, cause the energy normally available to the widespread natural thermals to be concentrated at the location of the artificial one. As air is lifted by the fan the surrounding air would move in at ground level and up into the vertical current. At this point the fan that supplied the initial energy to the air would be removed from its power source and the energy of the sustained upward-moving air would continue to drive the fan. This would then be energy available for beneficial use, much like that supplied by a windmill.

The dust devil, a minor player on nature's stage, has continued from the beginnings of the earth's atmosphere to exhibit its essential spirit, unchanged by

Poem of the Month The Stillness Of A Desert Night

There is a stillness far and near,
A quiet we can almost hear.

It has a texture, scent and form,
It speaks in accents soft and warm,

I think the desert's soul must be
Its full prevailing symphony,

And when we listen, heart alight,
We hear it on some desert night.

—MIRIAM R. ANDERSON
San Bernardino, Calif.

FIGURE 4: Dr. Werner Spilger's proposed machine to harness the energy of dust devils. Artificial movement upward of hot air is created by motor-driven propeller (top drawing). Once updraft is sustained, the rising column of hot air would spin the propeller (middle and lower drawings).

Desert Magazine pays \$5 each month for the poem chosen by the judges to appear in the magazine. To enter this contest simply mail your type-written poem (must be on a desert subject) to Poetry Contest, *Desert Magazine*, Palm Desert, Calif. Please include a stamped return envelope.

Grand Canyon In May

By THOMAS LESURE

Desert Magazine's Arizona Travel Correspondent

MAY IS LIKE a melody at Grand Canyon. The fragrance of spring scents the highland forests. The little squirrels seem to bounce with even greater vigor, reflecting a magic mood. Sunny skies bring a warmth that breeds contentment. Nights have just enough of a nip to add a bit of zest. And the summer crowds still are weeks away.

Biggest focal point for activity is the South Rim. The higher North Rim usually gets a later start since it takes longer for the frost to leave the land. Each rim, of course, has its partisans, but there's no question that, for travelers at least, the most lures lie along the South Rim.

For motorists coming to Grand Canyon from the west, State 64 north from Williams remains the key route. Those arriving from the south or east, though, have a choice of approaches in addition to the route from Williams. State 164, now completely paved, provides a new short cut from Flagstaff to the Valle Airport on State 64. Most scenic of all is the routing over U.S. 89 and the eastern segment of State 64 from the Cameron area, since this tosses in gulping glimpses of the Little Colorado River gorge and more than 20 miles of excellent viewing along the East Rim Drive from Desert View to Grand Canyon Village.

On any extended Canyon stay, this latter road will be traversed many times, and rightly so. There are few roads anywhere in the west with so much packed into such a short distance.

Viewpoints like Mather, Yaki, Moran, Grandview and Lipan afford varying vistas of the mighty gorge, but—over and above these—a quartet of East Rim Drive magnets stand out. For a climax, though, they cannot be taken in direct order; it's a small disadvantage.

First of all, there's the relatively new Visitor Center, just east of Grand Canyon Village. Spacious and attractively arranged, its exhibits, dioramas and other displays spell out a short but concrete picture-story of the gorge's geology, and ethnological and natural history. Ranger-naturalists provide ready answers to questions, as well as maps and leaflets.

Next point of call is 25 miles away—at Desert View Watchtower overlooking vast stretches of both the canyon and the Painted Desert. It's rather commercialized, but the view is worth the visit. In the tower (admission charge) are paintings by the noted Hopi artist, Fred Kabotie, plus Indian pictographs. From here, a short drive back over the Rim Road takes you to the turn-off for the Tusayan Ruin and Museum, located amid tall ponderosa pines. The small but good museum illustrates the saga of early Indians in the canyon area while the ruins—mostly crumbling walls—give evidence of some of their old habitations.

Climax of the quartet is Yavapai Point and Museum with one of the most expansive and impressive views of the canyon. High-powered binoculars are trained on points of interest in the gorge, and the exhibits *cum* ranger-naturalist lectures give a superb understanding of the region's wonders. For a better orientation, there's a large model of the canyon showing in

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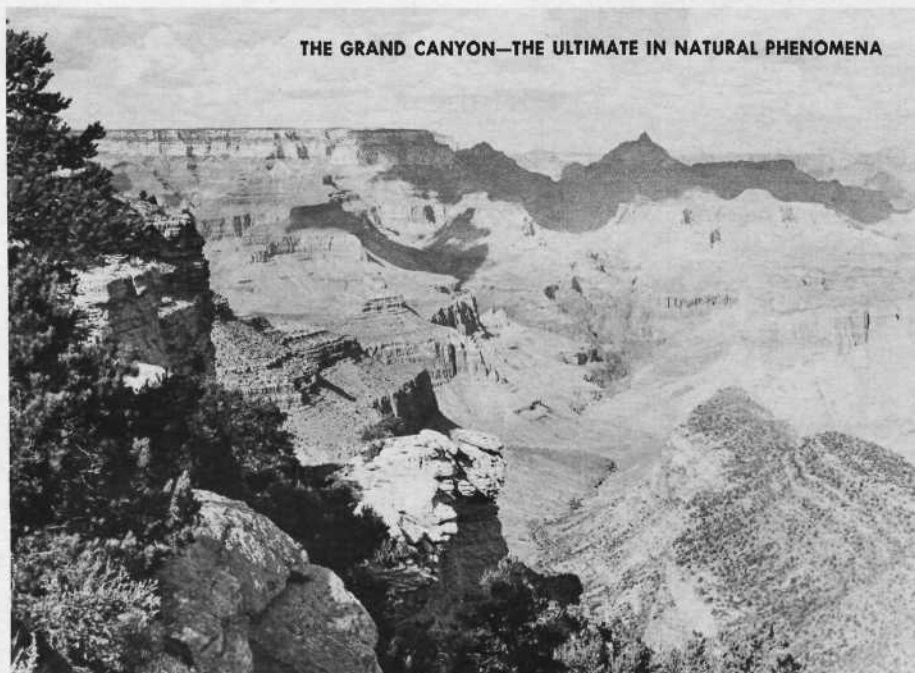


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THE GRAND CANYON—THE ULTIMATE IN NATURAL PHENOMENA



miniature its 217-mile length and 4-to-14 mile width.

West Rim Drive, which runs to Hermits Rest, adds other enticing scenes at numer-

ous points—as well as picnic spots amid the pines where wildlife is commonly seen. And, too, there's plenty right around Grand Canyon Village—from Hopi House to the

illustrated lectures at the Kolb Brothers Studio, or campfire talks at night.

Never to be missed on any stay of several days is one of the mule rides down Bright Angel Trail. One trip goes to Tonto Plateau, halfway down the gorge. Another descends all the way to the Colorado River, and like the Tonto Plateau ride, is an all-day affair. Two-day trips (or for longer stays inside the gorge) go across the river via the Kaibab Suspension Bridge for an overnight stop at Phantom Ranch practically on the canyon floor. After many repeated visits to Grand Canyon, I've found that making the mule trip is the only way to really understand and completely appreciate this natural marvel.

Some tourists—I've seen them—dash to the Canyon for a quick look, and having seen it, leave the same day. If there were not fine accommodations at Yavapai Lodge, Bright Angel Lodge and El Tovar Hotel—or the less pretentious auto village with its pine-scented campgrounds and cabins—there might be a reason for speedy departures. As it is, and especially in May, anyone who doesn't linger must have more rocks in his head than the canyon has in its formation. And that's considerable!

Arizona in May will see these special events:

May 7: Camera Club Tour—last one of the season; Yuma.

May 7: Gymkana at Black Canyon Saddle Club Arena, Phoenix.

May 27-28: Yavapai County Fair, Prescott.

May 29-June 18—"The Outlaw River"—Color Photographs of the Colorado River, Museum of Northern Arizona, Flagstaff.

Across the state line in Nevada, these events are planned:

May 13-14: Pershing Horseman's Rodeo, Lovelock.

May 14: Lake Mead Yacht Club Flotilla.

May 19-21: Helldorado and Rodeo, Las Vegas.

May 20-21: Grand Western Archery Tournament, Elko. ///

The featured desert artists:

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CLYDE FORSYTHE

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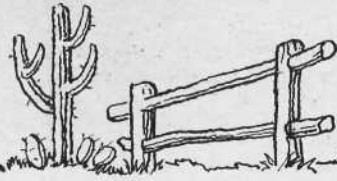
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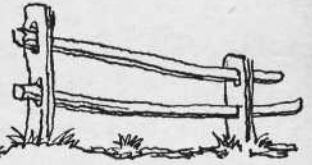
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Desert Quiz How well do you know the place names of Arizona and Nevada? In the quiz below are listed 60 of the less-familiar names of towns and places in the two Desert Southwest states. Each line contains three such place names—and in every case, two of these three will be either Arizona or Nevada locales. Your job is to determine which of the two states claims two out of the three place names in each question. 12 correct answers is a passing grade; 13 to 16 is good; 17 or better is excellent. Answers are on page 35.

1. Arivaca/Aurora/Austin
..... Ariz..... Nev.....
2. Beowawe/Buckeye/Bumblebee
..... Ariz..... Nev.....
3. Candelaria/Clemenceau/Cochise
..... Ariz..... Nev.....
4. Dayton/Delamar/Dragon
..... Ariz..... Nev.....
5. Elgin/Eloy/Ely
..... Ariz..... Nev.....
6. Fairview/Fernley/Florence
..... Ariz..... Nev.....
7. Galeville/Gardnerville/Goodyear
..... Ariz..... Nev.....

8. Hamilton/Hano/Hotevilla
..... Ariz..... Nev.....
9. Inspiration/Ione/Iron Springs
..... Ariz..... Nev.....
10. Jarbidge/Jerome/Joseph City
..... Ariz..... Nev.....
11. Kayenta/Kimberly/Komatke
..... Ariz..... Nev.....
12. Lahontan/La Paz/Lund
..... Ariz..... Nev.....
13. McDermitt/Minden/Moenkopi
..... Ariz..... Nev.....
14. Naco/Nixon/Nogales
..... Ariz..... Nev.....
15. Oatman/Ophir/Oraibi
..... Ariz..... Nev.....
16. Panaca/Pancake Summit/Peach Springs
..... Ariz..... Nev.....
17. Quartzsite/Quinn River Crossing/Quitobaquito
..... Ariz..... Nev.....
18. Red Lake/Rhyolite/Rillito
..... Ariz..... Nev.....
19. Salome/Schellbourne/Seven Troughs
..... Ariz..... Nev.....
20. Tacna/Tubac/Tuscarora
..... Ariz..... Nev.....

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Continued from preceding page

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NATURAL PLACER gold, cleaned mine run, \$40 troy ounce. Satisfaction guaranteed. Cashier's check or money order. Marcum Bielenberg, Avon, Montana.

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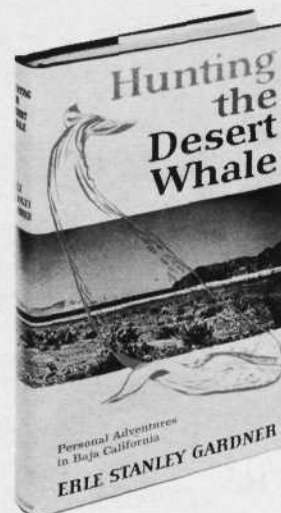
JOB WANTED: caretaker light work by pensioner; mountains or desert, isolated place all right, will batch. Good health, references. Write: Box TM, Desert Magazine, Palm Desert, California.

DESERT QUIZ ANSWERS

Questions are on page 33

1. Nevada (Aurora, Austin)
2. Arizona (Buckeye, Bumblebee)
3. Arizona (Clemenceau, Cochise)
4. Nevada (Dayton, Delamar)
5. Arizona (Elgin, Eloy)
6. Nevada (Fairview, Fernley)
7. Arizona (Galeyville, Goodyear)
8. Arizona (Hano, Hotevilla)
9. Arizona (Inspiration, Iron Springs)
10. Arizona (Jerome, Joseph City)
11. Arizona (Kayenta, Komatke)
12. Nevada (Lahontan, Lund)
13. Nevada (McDermitt, Minden)
14. Arizona (Naco, Nogales)
15. Arizona (Oatman, Oraibi)
16. Nevada (Panaca, Pancake Summit)
17. Arizona (Quartzsite, Quitobaquito)
18. Arizona (Red Lake, Rillito)
19. Nevada (Schellbourne, Seven Troughs)
20. Arizona (Tacna, Tubac)

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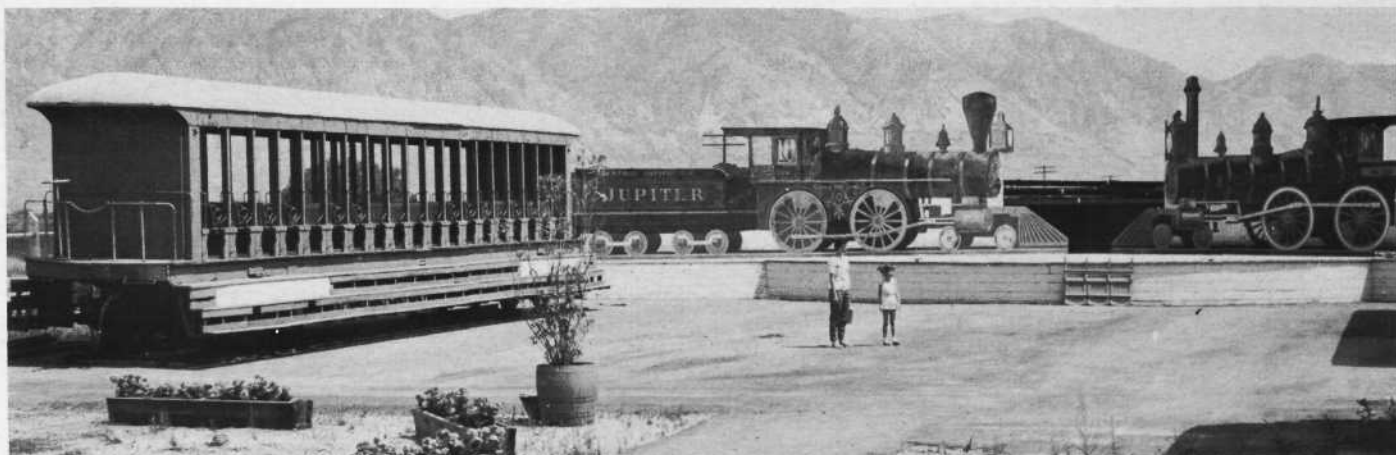
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RAILROAD VILLAGE MUSEUM AT CORINNE, UTAH. AT RIGHT REAR, ON 80-FOOT STAGE, ARE BILLBOARD REPLICAS OF THE TWO ENGINES THAT MET AT PROMONTORY SUMMIT IN 1869 TO COMPLETE THE TRANSCONTINENTAL RAILROAD. OPEN PASSENGER CAR AT LEFT SERVED SALT LAKE CITY AT THE TURN OF CENTURY.

Memorial to the Iron Horse

By FRANK JENSEN

Desert Magazine's Utah Travel Correspondent

ON MAY 10, 1869, at 12:47 p.m., a tall man impeccably dressed in a frock coat and Homburg hat gripped a silver-headed maul laced with telegraph wires. A motley crowd of Chinese coolies, laborers, soldiers, railroaders, and bandsmen in brightly colored uniforms watched in silence as Leland Stanford, President of the Central Pacific Railroad, stepped forward to drive a golden spike that would link the continent with iron rails. He swung and missed, hitting instead the rail. An electrical impulse passed from the wired maul to telegraph lines, setting off a fire alarm in San Francisco and a bell in the nation's capitol in Washington.

Thomas C. Durant, vice president of the Union Pacific Railroad, next in line, politely missed in deference to the California governor. While others drove the last spike, telegraph operators were hastily tapping the message to President Grant: "The last rail is laid. The last spike is driven. The Pacific

Railroad is completed. The point of junction is 1086 miles west of the Missouri River and 690 east of Sacramento City."

Today, the Golden Spike lies in a glass-faced vault in the Stanford University Museum. The laurel tie into which the spike was driven was lost in the San Francisco earthquake, and the rails at the place of meeting were torn up in 1942 for scrap. Only an unkempt marker remains at the site to remind visitors that it was here a continent was linked by steel.

Any modern-day visit to Promontory Summit, Utah, must be made in the spirit of a pilgrimage. The best place to begin is at the Railroad Village Museum at Corinne, 62 miles north of Salt Lake City on Highways 30 and 191, and 20 miles from Promontory Point.

The Museum was completed in 1959 and dedicated to the "age of steam railroading." A railroad depot, more than 50 years old,

was moved from nearby Honeyville to serve as museum headquarters. Two engines of later vintage than the old "No. 119" and the diamond-stacked "Jupiter," which faced each other that historic day 92 years ago at Promontory, were donated to the museum by the Union and Southern Pacific Railroad companies.

An eighty-foot stage was also built, and painted replicas of the original engines erected against a backdrop of the Wasatch Mountains.

The Railroad Village Museum is managed by Charles Clifford and his wife, Myrtle, who take more than a casual interest in their work. Clifford, who was employed as a hostler for the Union Pacific Railroad and is now semi-retired, grew up in the railroad tradition. His father witnessed the Golden Spike ceremony as a boy of 13, and later worked for the railroad.

Corinne was a stepchild of the railroad, surveyed and laid out as a freighting terminal for the then flourishing gold mines in Montana and Idaho. For a while Corinne prospered, and a tent city of 1500 doubled in population almost overnight. Warehouses were built and land was set aside for schools and churches with the prospects of a bright future. But after the mines disgorged their wealth, Corinne became just another railroad stop, and the town today is on a branch line between Malad, Idaho, and Brigham City, Utah.

The glory that was once Corinne, however, can still be found in the old photographs that decorate the museum and modest railroad library. For special guests (anyone who displays an interest in railroading) Clifford will wheeze out a rendition of the "Battle Hymn of the Republic" on an old pump organ brought by team and wagon with the first settlers.

The amiable curator of the Railroad Museum may also invite a youngster to pull



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on a wire connected to the old Corinne fire engine. "Pull hard!" he admonishes, and the sudden clamor of the fire bell never fails to delight young and old.

The Corinne Museum is also a good place to satisfy that boyhood urge to climb into the cab of a steam engine and get behind the throttle where you and your imagination make like Casey Jones.

The two big engines which face each other at the Railroad Museum are old "No. 1774," an oil burner built 56 years ago for use on the Southern Pacific run between Sparks, Nevada, and Ogden, Utah; and a big coal burner which plied the Northwest for the Union Pacific. The larger of the two engines weighs 183 tons, the smaller 120 tons. Neither has been in operating condition for some time. The museum also has on display a red caboose and several passenger cars from a bygone age of steam railroading.

The pageantry of the Golden Spike ceremony is also re-enacted each May 10th at the museum when members of the Sons

and Daughters of Utah Pioneers dress in old time costume to once again drive the last spike.

From Corinne it is only a short fifteen-minute drive to Brigham City, which boasts the world's largest bird refuge. Brigham City is also the site of the Maddox Ranch House, one of Northern Utah's finest roadside inns.

In 1950, Maddox was only a one-room log cabin short-order house specializing in hamburgers. In 11 years under the direction of its owner, Irvin B. Maddox, the inn has grown like topsy to a rustic-styled restaurant that can serve 200 people, all of whom arrive at the front door by gasoline-driven automobiles, successors to the iron horse of yesterday.

Three Utah events in May:

19-20: Dairy Cattle and Horse shows, Richmond.

20-21: Friendship Cruise, Greenriver to Moab (write Box 7, Greenriver, Utah, for boating details.)

30th: 21st Annual Regatta and Races on Utah Lake. ///

DESERT MAGAZINE'S



OLD TIME WESTERN FLAPJACKS (Or, How To Make Friends With Your Burro!)

Sift together:

- 1 cup flour
- 1/4th teaspoon salt
- 1/4th teaspoon baking soda
- 1 level teaspoon baking powder
- 1 heaping tablespoon brown sugar

Add 1 egg. Stir with butter-milk only, to light creamy consistency. Cook on hot griddle to deep nut brown.

—Harrison Doyle, Vista, Calif.

NAVAJO BREAD

- 2 cups unsifted flour
- 4 teaspoons baking powder
- 1/2 teaspoon salt
- Water enough to make a moist but workable dough
- Shortening enough to half-fill a 10-inch frying pan.

Mix flour, baking powder and salt, add water gradually, working the mixture with the hands to a soft dough consistency. When thoroughly mixed,

flour your hands and form dough into two balls about the size of baseballs. Flour your hands again and squeeze a ball through the hands much as you would squeeze a balloon to push out all the air. Then slap the dough from palm to palm in a quick clapping motion, spreading the dough in a flat pancake about 8-inches across. Drop carefully into the very hot fat. Cook rapidly to a crisp brown. (It may be necessary to hold the bread down with a fork while frying, for it will puff unevenly on top as it fries.) Drain on paper towel. Serve piping hot. Will serve 2 to 4 people.—Mrs. Fred R. Hearcock, Bagdad, Arizona

CAMP CASSEROLE

Take a used vacuum-type coffee can and place in it the ingredients as directed below. Place can on campfire coals and let simmer until it "blows its top." (Actually, you'll see the casserole dish spewing and sputtering around the edges of the can top.)

- Layer of thin-sliced potatoes
- Layer of thin-sliced onions
- Slab of ham

Repeat these layers in order. Then add:

- Canned milk (enough to cover)
- Two tablespoons of butter
- Salt and pepper to taste

The milk-soaked ham impregnates the potatoes with unbelievable and unforgettable flavor. —Bob Hunt, Tucson



AN ATTRACTION REBUILT CALICO HAS THAT THE ORIGINAL LACKED—A BOTTLE HOUSE

Calico's Lively Ghost

By LUCILE WEIGHT

Desert Magazine's California Travel Correspondent

IF YOU EVER thought of a ghost town as being a melancholy place, that notion will be dispelled as you walk up the streets of Calico. You won't have to stretch your imagination to get into the spirit of this once great silver camp of the Mojave Desert.

Though its rich silver attracted thousands in the 1880s and '90s, even more thousands are coming back to Calico today. It's the liveliest ghost in the desert, where the entire family may find unusual recreation.

Within sight of Highway 91-466, it is 12 miles east of Barstow and about 150 miles from Los Angeles. Between Barstow and Yermo, turn north near Calico Motel. Skirting Calico Dry Lake and starting up the grade, today's visitors can imagine themselves dodging ghostly freight wagons with silver ore, or passing rocking Concord stages bringing new hopefuls to the "greatest camp on the desert."

From the parking area you may walk—or a little car will zoom you up—to Main Street, but before you enter the town, you can listen to a push-button operated recording of the voice of Walter Knott, who is restoring the town, giving you a personally conducted verbal tour of all you can see and do in and around the town.

Then you walk along the streets of a real mining town, past Diamond Lil's Dance Hall, into Lane's General Store with authentic oldtime stock, browse in little shops with souvenirs of long ago. At the newspaper office you can get your *Calico Print* (first published here in July, 1882); then up the street step into the Assay Office and learn how the richness of ore is determined, or see beautiful gems and minerals of the desert.

If you're hungry by now, there are snacks, refreshments, or a meal at the restaurant.

In fact, if you've had enough walking for a while, you and the family can climb into the horse-drawn tally-ho or the little railroad. The children may enjoy a burro ride.

Angling east past the remains of Chinatown and a boarding house, you come to the Bottle House which has a relief model of the area, traversed by a model electric train. Now you are close to the shaft house of the Maggie Mine. Here you can enjoy a conducted tour through part of the underground workings of a real silver mine.

Back to the main street and continuing up, you reach the little school house, which may seem quaint to modern youngsters but dispensed plenty of learning to the children of Calico miners. Pupils came not only from Calico, but trudged several miles over a footpath leading from Bismarck and other camps in canyons to the east. They had no cafeteria, but carried their lunches, often in lard pails; and sometimes their companion on the trail was the famous dog Dorsey, who carried mail between the camps.

Not far from the school is the Hyena House, which was called the best hotel in Calico by its proprietor, who lured unsuspecting guests there after meeting the Calico Stage. If a corner of the barrel stove, rock and dirt structure caved in on them at night, their host would pull them out with apologies for the "leaking roof." His breakfast menu was said to be chili beans and whiskey.

Dominating the town on the east side of Wall Street Canyon is the remains of the Silver King Mine, one of the most important factors in development of the town. Before there was such a name as Calico, a strike miles northwest of here brought prospectors from all directions. In April, 1881, one party, grubstaked by John King of San Bernardino, staked several claims. Assays were low, but when some of the men came back in June to do assessment work, horn-silver was discovered at what they called the Silver King. News of this find spread overnight, bringing many who neither knew how to prospect nor took the time—they just built monuments and located claims. Many such claims, whether or not they turned into mines, sold for enough to grubstake their discoverers, who continued searching for the "big thing."

Meanwhile, the Silver King Company was formed, and the first carload of ore, shipped to San Francisco, was worth a reported \$400-\$500 a ton. Soon this ore was worked at the Markham and Johnson five-stamp mill at Oro Grande, freight teams hauling it over the route now closely followed by the new freeway between Barstow and Victorville. The ore at first was loaded from the mine onto rawhides which were dragged down to where the freighters could load it.

The following year, Markham and Johnson bought the King Company, and in

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September, 1882, engaged young Herman Mellen and his carpenter father, of Los Angeles, to construct works for handling the ore at the mine. They had to build a trackway from mine to dump, an ore chute and bin, including a complicated trestle. At Christmas time the entire town turned out to cheer when the first carload rumbled across the long trestle-way. But, the wind came up, and the carmen refused to push ore cars out on that trestle teetering 80 or 90 feet above ground—a "Calico Zephyr" can match nearly any on the desert. Supt. Barber thought adding a railing was foolishness. The company already had spent too much money, though it still was cheaper than constructing a practical road. He went striding out on the trestle to show them up, but a blast of wind caught him and he crawled back on all fours, yelling: "Good gad, board it up solid and batten the cracks, Mellen!"

The adjoining Red Jacket, the Occidental, Oriental, Garfield, Total Wreck, Burning Moscow, Bismarck—these are but a few of the Calico mines which produced an unknown quantity of silver. When the railroad was built through Daggett, further savings on transportation was realized. But the drop in the price of silver in 1892 was disastrous to most of the mines. By this time the King was owned by a London concern, and the mill enlarged to 30 stamps. It still operated day and night for a while after others shut down. Even the Waterloo, which had employed at least 150 men in the mine and two mills, stopped in the spring of 1892.

From time to time, with changing economic or mining conditions, miners would try their luck again at Calico.

One such effort, a cyaniding operation, was being made in 1913. At this time a young couple, Walter and Cordelia Knott, were homesteading the Mojave River bottom near Newberry, within sight of Calico. They were raising a fine family but little else, so Walter filled in with jobs on the roads and in the mines. In the summer of 1915 he helped build the redwood cyanide tanks below Calico.

But that was not his first link with Calico, for his uncle was the same John

King who grubstaked the discoverers of the Silver King. Although Knott left the desert and later became nationally known for the Berry Farm at Buena Park, and the later tremendous entertainment and business expansion there, he never forgot Calico. Year after year, especially in his work with the Roads to Romance Association, he noted the camp's gradual disappearance. Some of this was disintegration, but some resulted from the moving away of buildings, to Daggett, Yermo and elsewhere.

Knott resolved to do something about it, and early in 1951 he and his family bought most of Calico townsite. That was the beginning of the first such over-all reconstruction of a Western mining camp, estimated at one time to cost \$1½ million. He has already gone a long way toward that figure, yet is perhaps half-way through.

Earliest work was research, to learn so far as possible where every building once stood, its construction and use. Little by little the town's outlines took shape, as old pictures, town plats and aerial photos were patched together. He was able to locate a number of the original Calico buildings and haul them back up to the town. Others were constructed as authentically as possible. Next came the furnishing, then a selection of people who are carrying on many of the daily activities familiar in early Calico.

The Knotts do not regard this as a commercial enterprise. They are sure they are putting more money and love into it than will ever be returned. They are doing it for the sake of that spirit which made Calico Days glorious—and for you and me, that we might better appreciate this heritage of our Desert West.

Here are Desert California's May events:
4-7: Blythe Community Fair.
6: Oasis Garden Club Show, Indian Wells Valley (Ridgecrest).
6-7: Ramona Outdoor Play, Hemet.
7: Eastern Sierra Coin Club Festival, Bishop.
13-28: Wildflower Show, Julian.
21: 4th Annual Placerita Festival, Newhall-Saugus.
27-28: Hesperia Days. ///

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NEW DESERT BOOKS

THE ROWDY CHARACTER WHO FOUNDED PHOENIX

By reconstructing a prehistoric irrigation-canal system in the Valley of the Sun, Jack Swilling became the "father" of Phoenix—an undying kinship that the capital city of Arizona probably wants to forget now that the Wild West is pretty much replaced by the Mild West, at least in parts of the Copper State.

Jack Swilling was *muy hombre*. He arrived on the Arizona scene about the time gringos, greasers and 'paches were mixing it up in a free-for-all fight for survival. Between brawls, Swilling occupied himself as farmer, horse thief, soldier, gun fighter, cattleman, border ranger, prospector, miller, justice of the peace, canal builder and, finally, convict in Yuma Prison.

The book, *I, Jack Swilling*, is rather unique in that author John Myers tells the story of Jack's life in the words he thinks Jack would have used to relate this drama. Not recommended for children or those who think founders of great cities are great men.

308 pages; index; \$5.95. This book can be ordered by mail from Desert Magazine Book Store. See details below.

PREHISTORY IN NORTHERN ARIZONA

Forty-two years of archeological study and work in Northern Arizona are reviewed in the new book, *Black Sand*.

Progressing slowly backward in time, the archeologist brings history into close focus, even though hundreds of years have elapsed since the Ancient People lived and labored in the Southwest. By tree-ring study and the use of the new Carbon 14 dating method, scientists have been able to uncover some clues to an unwritten history.

Author of this new work is Harold S. Colton, emeritus director of the Museum of Northern Arizona in Flagstaff. His earlier books include *The Sinagua* and *Hopi Kachina Dolls*.

What caused the rise and downfall of this old civilization? *Black Sand* has a partial answer. About 1050-75 A.D., volcanic action in the San Francisco Peaks

area scattered "black sand" over a wide portion of the country. This created, in time, fertile soil—and the Indians cooperated in building long irregular ditches across the desert to the fields. Increased yields of corn and other crops brought prosperity—and increases in population. Regulated community life gave time for art and other activities. Distant tribes learned of this good land and moved into the area. These were fruitful years.

Tremendous apartment dwellings; ball courts for the pursuit of sports; differing burial ceremonies; changes in art as evidenced by design in pottery, jewelry and "rock pictures"; myths and religious history; epidemics caused by unaccustomed urban life, and lack of sanitary conditions—all are reviewed in this book. 132 pages; well illustrated; \$4. (See below for information on how you can buy *Black Sand* through the mails.)

STANDARD MINERAL GUIDE IN THIRD PRINTING

First published in 1953, Frederick H. Pough's *A Field Guide to Rocks and Minerals* third edition recently rolled off the presses. The new edition contains full color illustrations of 72 rocks and minerals which, in the first two printings, were shown in black and white. Of the 264 photographs designed to aid collectors, 149 now appear in full color.

One of the most authoritative guides to the identification of rocks and minerals in the field, Dr. Pough's book contains the basic information needed by the beginner in mineralogy. It is, at the same time, complete enough to satisfy the demands of the advanced collector.

All rocks that can be identified in the field are included. All the common minerals likely to be encountered by the non-specialist are described in detail, as are a few of the rare specimens that so delight the collector who comes upon them.

349 pages; index; glossary. \$4.50 by mail from Desert Magazine Book Store (see footnote).

Books reviewed on this page can be purchased by mail from Desert Magazine Book Store, Palm Desert, California. Please add 15c for postage and handling per book. California residents also add 4% sales tax. Write for free book catalog.

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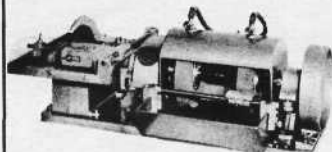


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By RANDALL HENDERSON

ON A CAMPING TRIP in Baja California recently, Arles Adams and I found a palm oasis we had been seeking for years. A surveyor had told me about the palms in the early 1930s. They are located in the Cocopah Mountains which border the great Colorado River delta on the west.

These are the only wild palms in the Cocopahs, a lonely little group of 47 Washingtonias clustered around a spring of good water at the head of a wide arroyo which extends back into the range five miles. This was once the habitat of the Cocopah tribesmen, and an old Indian trail leading to the spring is evidence the ancients came here, perhaps to hunt the bighorn sheep and other forms of wildlife which frequent this waterhole.

Much of Baja California is still a virgin desert wilderness, unmapped and unexploited. Under the pressure of increasing population and depleting natural resources, such areas in the United States are shrinking very rapidly. I go on a camping trek into the region below the border at every opportunity because it is a refreshing experience to get away occasionally from radio reports and newspaper headlines of warring tribesmen in Laos and the Congo, of violence to human freedom in Cuba and racial bigotry in New Orleans and Birmingham.

At one time The United States might have acquired the entire peninsula of Baja California at what today would be regarded as a very nominal cost. This was in 1854 when the U.S. Senate was debating a treaty with Mexico involving the acquisition of territory now known as the Gadsden Purchase. James Gadsden, who had been appointed by President Pierce to negotiate the treaty, favored buying at least enough territory to give the United States a tidewater seaport on the Gulf of California, or even the entire peninsula.

There was strong opposition in Washington. Northern Senators were afraid the new territory would align with the Southern Confederacy and result in the spread of slavery to the Pacific. It was desert land, and no one regarded it as having any value except as a right-of-way for a southern transcontinental railroad. Before the treaty was ratified the tract had been whittled down to 45,000 square miles in what is now southern Arizona and New Mexico. It cost Uncle Sam \$10,000,000—about 35 cents an acre. Part of it, which became the City of Tucson, now has an appraised value including improvements of \$700,000,000.

Today, more than a century later, it is quite obvious Uncle Sam made a good investment, and could have made a better one. But there should be no regrets. Under Mexican ownership there has been little exploitation of Baja California's natural resources. The wealth is still there. The coniferous forests in the majestic San Pedro Martir Mountains, and hundreds of miles of shell-strewn beaches remain undisturbed and uncluttered. Perhaps future generations of Mexicans and Americans will be grateful that there has been preserved a

bit of the North American continent with the virgin beauty of its original creation.

* * *

The weather gods have been quite contrary this season. While the eastern half of the United States has been shoveling snowdrifts and repairing the damage of tornadoes and floods, the Southwest has received less than one-third of its normal rainfall. It has been the driest winter in 30 years.

It has been a disappointing season for the photographers who come to the desert in March and April hoping to get pictures of colorful fields of wildflowers in blossom. Fortunately, drouth does not destroy the billions of seeds which lie dormant in the sands awaiting the proper amount of moisture. Under nature's plan for the perpetuation of the species, the seeds are endowed with a timing device which enables them to remain in a sort of hibernation for many years if necessary—until the rains come.

I have been reading William Vogt's latest book, *People*, in which he makes the forecast that unless the human species very soon imposes upon itself and accepts the discipline of birth control, the children of parents now living will find it necessary very drastically to curtail their use of water. Inevitably that will mean a lower standard of living, for it is logical to assume water rationing first will be imposed on those industries which use fabulous quantities of water in the manufacture of goods not as essential as food and water. Steel and paper are two of these items.

Unfortunately, plants and animals—including man—cannot go into hibernation during periods of drouth as do seeds, although some desert species such as the cacti have gone a long way in making such an adaptation.

Vogt makes an interesting appraisal of the evolutionary process as it affects the human race. He points out that we have adjusted to two epochal changes—the agricultural and industrial revolutions. Now we face the third, and the most critical—adjustment to a world over-crowded with people. The author attributes much of the unrest and confusion around the globe today to the factor of excess population. It is something for all of us to ponder.

* * *

I added a gem of wisdom to my scrapbook this week. According to newspaper reports, a student organization at the University of California had invited to the school a speaker who is suspected by the Committee on Un-American Activities of being subversive. From off the campus came a petition to President Clark Kerr, president of the University, to overrule the students and cancel the engagement. Defending the right of the students to listen to whomever they please, Dr. Kerr said:

"The University is not engaged in making ideas safe for students. It is engaged in making students safe for ideas."

OPEN AIR ARCHEOLOGY

The story of the Chicago Natural History Museum's Field Camp near Vernon, Arizona

By W. THETFORD LeVINESS



WORKER, LEFT, CLEARS OFF A STONE SLAB USED BY PREHISTORIC INDIANS FOR A HATCHWAY COVER; HIS PARTNER EXCAVATES A FIREPIT

VERNON, ARIZONA, is a quiet little farming community just off U.S. 60, near Springerville and the New Mexico line. Approaching it by car, it has the appearance of any of a dozen or so rural settlements in the area—frame houses with gabled roofs, a small church, expansive fields, and lots of trees. A stream meanders by. There are forests on the outskirts, mountains in the distance.

It does not look as though anything unusual ever happens here, yet Vernon is the site of the archeological field camp of the Chicago Natural History Museum. Each summer since 1946 it's been a "bone-diggers' paradise"—expeditions go out daily to one

or more of the many ruins within a 50-mile radius; material brought back is cataloged and analyzed. Some is sent to Chicago for further study at the end of the season, and a few items eventually go on display there.

It's a part of the life work of Dr. Paul S. Martin, chief curator of the Museum's Department of Anthropology. He and his assistant, Dr. John B. Rinaldo, are studying remains of the Mogollon Indians and their culture. These vanished people inhabited what is now eastern Arizona and western New Mexico for, roughly, four-and-a-half millennia—from before 3000 B.C. to about 1350 A.D. Dr. Martin has conducted summer excavations in the area for more than 30 years, and is the author of a recent book about the Mogollones, *Digging into History* (Chicago Natural History Museum; 157 pp., \$1.50).

Archeologists arbitrarily named these Indians for the Mogollon Mountains nearby. Dr. Martin believes the Ancients to have been an extension and ramification of the so-called Cochise culture, which flourished in the Southwest as far back as 6000 B.C. With no knowledge of metallurgy, Mogollones developed a surprisingly progressive stone-age civilization. They lived at first in caves, then in pit-houses, finally acquiring masonry techniques from Anasazi Indians to the north. The Mogollones' elaborate underground kivas were roofed, and some had covered access ramps; paraphernalia found in a few of them indicate a highly complex ceremonial system. Mogollones probably had strong family and clan organizations, and at least the rudiments of municipal government. They hybridized corn, raised squash and beans, and supplemented their diet with grapes and sunflower seed. They never had a potter's wheel, but their ceramics stand up with some of the best ever made in archaic America.

For no known reason the Mogollones disappeared from these hills and dales around the middle of the 14th century. By the year 1400, only the cultural remains were left. No one knows

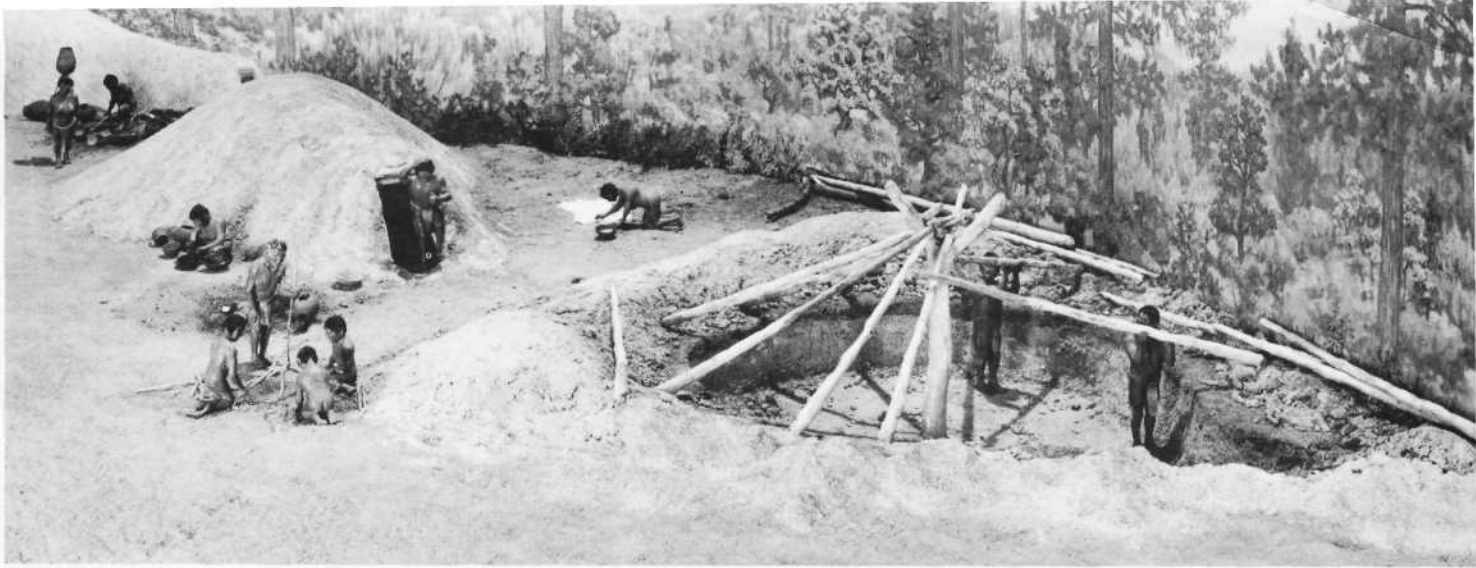
where this ancient tribe went. Dr. Martin feels reasonably sure, however, that a great deal of their culture was absorbed by Hopi and Zuni peoples, whose descendants occupy pueblos in Arizona and New Mexico today. Every summer, his excavations tend to support this theory.

"The designs on thousands of potsherds discovered in this region are unmistakably similar to those found on later ceramics among the Hopis and the Zunis," says Dr. Martin. "We feel certain that Hopi Indians, especially, owe a great deal to this old civilization."

The Chicago Natural History Museum owns the farmhouse and outbuildings that comprise the field camp. Drs. Martin and Rinaldo take a full staff to Vernon each year; much of the actual digging is by students. Ruins in the general area date from the 10th to the 14th centuries, with overlapping spans of occupancy. Much scientific effort has been concentrated on these sites in the past few summers.

Two principal methods are used to date archeological material (they are both recent developments, and both have been applied to Mogollon remains), dendrochronology (the tree-ring process) and radiocarbon testing. Dendrochronology is based on the fact that in years of considerable rainfall tree-rings are wide, while in dry years they are narrow. Beginning with modern weather reports and living pines, a pattern of tree-rings has been worked out that goes centuries back; at present the tree-ring calendar extends to about 59-B.C. Logs that once supported the roof of a pueblo or a pit-house can be accurately dated by matching the visible rings to the new slide-rule measuring device, for any given period in the past 2000 years.

In radiocarbon testing, results are not quite as accurate, but they go back around 40,000 years. When plants and animals are alive they contain a substance called "carbon 14." When they die they cease to absorb it, and it decays at a constant and known rate. The degree of decay determines the age of the wood, fiber, bone, leather,



DIORAMA IN THE CHICAGO NATURAL HISTORY MUSEUM DEPICTING PROBABLE APPEARANCE OF A VILLAGE



DR. PAUL MARTIN AND ASSISTANT, TOD EGAN, USE SURVEYORS' INSTRUMENTS TO MAP THIS KIVA

LARGE PREHISTORIC PUEBLO INDIAN VILLAGE OF A.D. 1350-1500. SEVERAL ROOMS HAVE BEEN EXCAVATED AND OTHERS ARE IN PROCESS OF EXCAVATION.



or other product of the plant or animal observed. Thus archeology, the study of the very old, is updated to include the very new — in atomic counts!

After three decades among remains of the Mogollon Indians in the Southwest, Dr. Martin has a nuclear-age philosophy too. Scholarly to the last bison-tooth or owl-claw, he nonetheless is concerned with the moral and ethical justification of his chosen career. "The value of archeology," he says, "lies in searching for truth and beauty where it leads us. We need to broaden our understanding of man's hopes and desires and our knowledge of man's nature. Perhaps if all of us put our heads together we can discover the causes for the rise and decline of civilizations and thus save our own from destruction." ///

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