

Desert

JUNE, 1957

35 Cents





Father Kino Diorama . . .

At the Tumacacori National Monument Museum in Southern Arizona is this striking diorama depicting Father Eusebio Francisco Kino and an Indian guide. The padre was a pioneer missionary explorer and cartographer whose wanderings took him over many miles of new lands around the turn of the 18th Century. Photographer of this first prize winner is Ann Seeling of Santa Barbara, California. She used a Rolleiflex camera with 3.5 Xenar lens; Plus X film; 1/100 seconds at f. 12.5 with flash.

PICTURES OF THE MONTH

The Jolly Turk . . .

W. G. Carroll of Hollywood, California, is second prize winner this month. His photo is of a balanced rock which bears a striking resemblance to a smiling man wearing a turban on his head. The figure is in the valley below Came Springs, about 20 miles southwest of Moab, Utah. When local inquiry produced no name for this stone, the photographer's wife dubbed it, "the Smiling Turk."

DESERT CALENDAR

- May 27-June 21—Exhibition of Historic Maps, Museum of Northern Arizona, Flagstaff.
- May 28-June 1—Annual Grand Canyon Tour, sponsored by the Horseless Carriage and Antique Automobile Club of Tucson.
- May 31-June 1, 2—2nd Annual Kids Rodeo, Alamogordo, New Mexico.
- June 1-2 — Annual Spanish Fiesta, Morongo Valley, California.
- June 1-2—Rodeo, Yerington, Nev.
- June 6-8 — Kearny Entrada, Rodeo and Historic Celebration, Raton, New Mexico.
- June 7-9—Pecos Valley Horse Show, Roswell, New Mexico.
- June 7-9—Rodeo, Farmington, N.M.
- June 8—Buffalo Dance, Santa Clara Pueblo, New Mexico.
- June 8-9—Carson Valley Days, Gardnerville-Minden, Nevada.
- June 9—Annual Tour to the Grave of Eugene Manlove Rhodes, from Alamogordo, New Mexico.
- June 10-17—Cattle Tagging at Boulder, Utah. Several thousand cattle, fresh from winter range, are branded, vaccinated and made ready for the summer range.
- June 12 — La Loma Fiesta of St. Anthony, Taos, New Mexico.
- June 13 — San Antonio de Padua Corn Dance, Taos, New Mexico. Also celebrated in other northern rural villages.
- June 13-16 — Cherry Festival, Banning-Beaumont, California.
- June 14-16—10th Annual New Mexico State Championship High School Rodeo, Santa Rosa.
- June 20-22—Amateur Rodeo, Vernal, Utah.
- June 21-23 — Junior Rodeo, Globe, Arizona.
- June 22-23 — Lions Indian Capital Championship Rodeo, Gallup, N.M.
- June 23 — Corpus Christi Sunday. Outdoor religious processions from St. Francis Cathedral and Cristo Rey Church, Santa Fe; Guadalupe Church, Taos; and Old Mission, Ranchos de Taos, New Mexico.
- June 23-24—Rodeo, Ely, Nevada.
- June 24—Annual Fiesta and Ceremonial Dances, San Juan Pueblo. Corn Dances at Taos and Acoma pueblos, New Mexico.
- June 24-July 5 — Southwest Writers' Workshop, Arizona State College, Flagstaff.
- June 27-29 — Rodeo, Lehi, Utah. Miniature Parade on 27th and 28th; Stock Parade on 29th.
- June 29—San Pedro's Day Dances at Laguna, Acoma, Santa Ana, San Felipe, Santo Domingo, Cochiti and Isleta pueblos, New Mexico.
- June 29-30 — Silver State Stampede, Elko, Nevada.
- June 30—Procession of La Conquistadora, Santa Fe.



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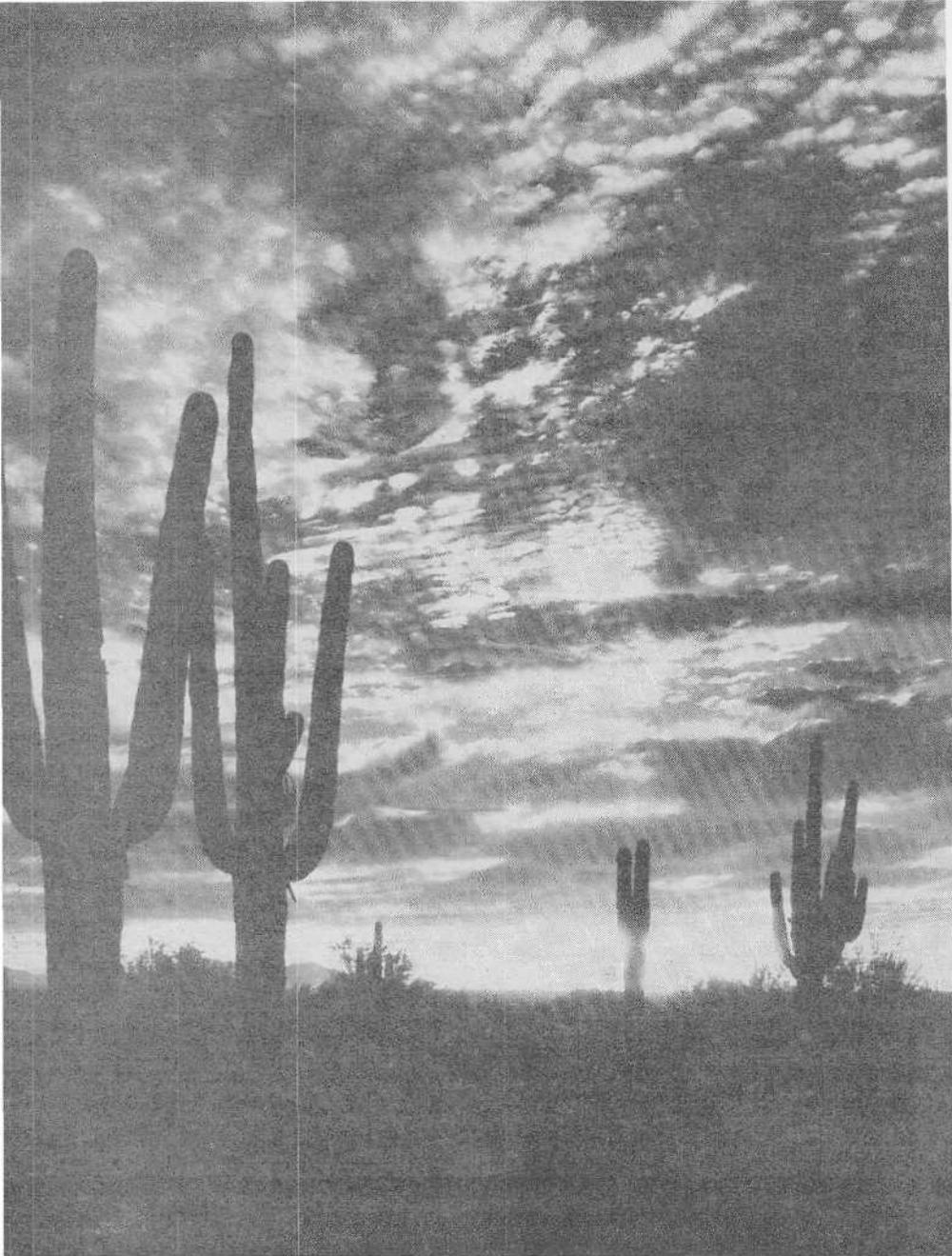
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Arizona Sunset. Photograph by Josef Muench

OF AN ANCIENT REGIMEN

By GRACE R. BALLARD
Santa Barbara, California

This piece of broken pottery lies
Beside the dusty way,
Where thoughtless ones discarded it
Long since as useless waste;
That which an ancient craftsman's hands
Fashioned from desert clay.
Upon its surface, carefully,
With patient skill he traced
Those sacred, ritualistic forms
And symbols to convey
Traditions, long-forgotten by
This restless, alien race.
The sun for light; the falling rain;
The serpent—to be wise;
The sacred eye to watch men's ways;
To make him realize
That there is nothing hid from Him
Whose Word makes thunders wake—
The flash of lightning's sword, whose wrath
In fear makes mountains quake.
How quiet, now, this fragment lies;
Of an ancient regimen;
Still dignity attends its form—
Casket of vanished men.

SAND-BORN COLORS

By BLANCHE M. ASHBY
Los Angeles, California

I love the sand-born colors
Of desert flowers, bright and gay.
Brilliant reds and dainty pinks,
Gay yellows and deep purples,
Blue and gold
And mauve and gray.

They linger in the sunset
Then steal silently away,
Till morning sun awakens them
In desert flowers—another day.

True Worth

By TANYA SOUTH
I'd rather do my daily task
With courage, strength and will,
Nor other privileges ask,
Save God's design to fill,
Than have much splendid world
renown,
Or worldly power and pelf.
The one true spiritual crown
Is goodness in oneself.

Sunsets

By A. MARION DURRANCE
Tucson, Arizona

There are suns that set in coral seas
Mid shimmering waves of gold,
There are suns that set from mountain leas
In splendor and beauty untold.

There are suns that trail through a sky
blue-green,
Lonely as a desert flower,
Their pathway ends in a silver sheen,
Beauteous in an opal bower.

But here's to the sun that shines when low
Through clouds of desert dust.
Whose crimson robes burn red and glow
Then fade in the purple dusk.

UPSIDE DOWN RIVERS

By GRACE R. BALLARD
Santa Barbara, California

I came from a land where the rivers flow
Bank full and deep beneath willow-trees;
And even in summer their crystal clear
Waters are ruffled; the passing breeze
Sings joyously to the laughing stream
That turns the ponderous mill-wheel's
weight;
Chattering to the abundant grain
Like a happy wife to her sterner mate.

But desert rivers run "upside down";
Hoarding their wealth like a miser's gold;
Flash-floods end drouth; but the sand-
locked tide
Still clutches the earth in a deathless hold.
But the miracle of the desert flowers
Emerging from lands seeming parched and
brown
Emancipates those sun-drenched hours
When desert rivers run "upside down."

REPOSE

By E. A. GLANTZ
Palm Desert, California

On the pathless sands of the desert
The feet of time shall cease.
Mutation's urge will not divert
The spirit's quest for peace.

It is not progress here we stress,
Nor the lure of pleasure's bait;
Only a sense of timelessness
To calm us while we wait.

Serene, we fold our hands, and muse,
Until the storms are past,
While others, made for sterner use
Stand up against the blast.

This passive mood may not appeal
To them in troubled times;
But one whose wounds are yet to heal
Must rest "behind the lines."

THE TRAMP DOG

By LUCY JANE BULLOCK
Long Beach, California

How did you make your way
Across the burning sand?
We tried to understand—
As quivering with joy
With laughter in your eyes
You sensed our deep surprise.
What made us take you in?
Your trust and faith in man,
Your need to join his clan?
Or did you fill a place
Left empty 'til you came?
Was comradeship your aim?

Where Scientists Work Above Timberline ...

By NELL MURBARGER

Photographs by the author
Map by Norton Allen

BETWEEN OWENS and Fish Lake valleys on the California-Nevada boundary, the White Mountains rise to a height of two-and-a-half miles—their gaunt flanks rent by steep canyons, their summits sown with brown malpais. In years past, when business took me into the valleys below this range, I looked curiously at that aloof barrier and wondered what secrets it held, remembering that folks had said this was “good country to stay out of.”

Last summer while crossing the southern tip of the Whites on the sunny juniper-fringed road between Big Pine and Lida, I was thinking of that high desolate desert range spreading away for 50-odd miles to the north. Then, almost before I knew it, Temptation took the wheel — and my car was bumping over the trail that leads north from the summit of Westgard Pass!

The little sideroad climbed doggedly through juniper and pinyon forests and past wild gardens splashed with penstemons, paintbrushes and lupines. After the needle on my altimeter moved from 7276 feet at the pass to 9000 feet, the steep narrow road be-

Sheltered from ocean-bred storms by the nearby High Sierras, the 14,240 foot White Mountains on the California-Nevada border afford an excellent vantage point for scientists interested in high altitude research. This is Nell Murbarger's story of her spur-of-the-moment drive over the highest auto road on the North American continent north of Mexico, to the scientific stations on the lofty mountain.

gan skirting high windswept promontories from which I could see all the sprawling length of Owens Valley, and a whole necklace of majestic peaks in the white-topped Sierra 30 miles to the west. My car had been pulling hard in low gear for several miles and the altimeter was hovering around 10,000 feet, when I seemed to burst into another world! It was an impossible, impractical, outer-space world, fabricated of stone and snow, sky and

Dr. G. Ledyard Stebbins, right, and Joshua Lee, both of the University of California at Davis, plant high elevation grasses above timberline on White Mountain.



space, and endlessness and timelessness—all wonderfully big and frightening, and terribly beautiful.

For three days I prowled the roof of this strange lofty land. I crossed July snowbanks to photograph delicate Alpine plants—and from them looked down upon the parched borax flats of southwestern Nevada, 9000 feet below! The highest auto road on the American continent north of Mexico took me to the second highest research station in the world.

The one quality about the White Mountains that pleased and thrilled me most during my three-day stay was finding them open and quiet, and mar-

velously bare of humankind and clutter! In all the 600-square-miles of this range there is not one town—not even a gasoline station. Neither are there ski runs, dude ranches, fishing or hunting lodges, riding stables, or swimming, improved campgrounds—not a mile of hard-surfaced road save that over Westgard Pass—and all the permanent residents in the range could be evacuated in one truck load!

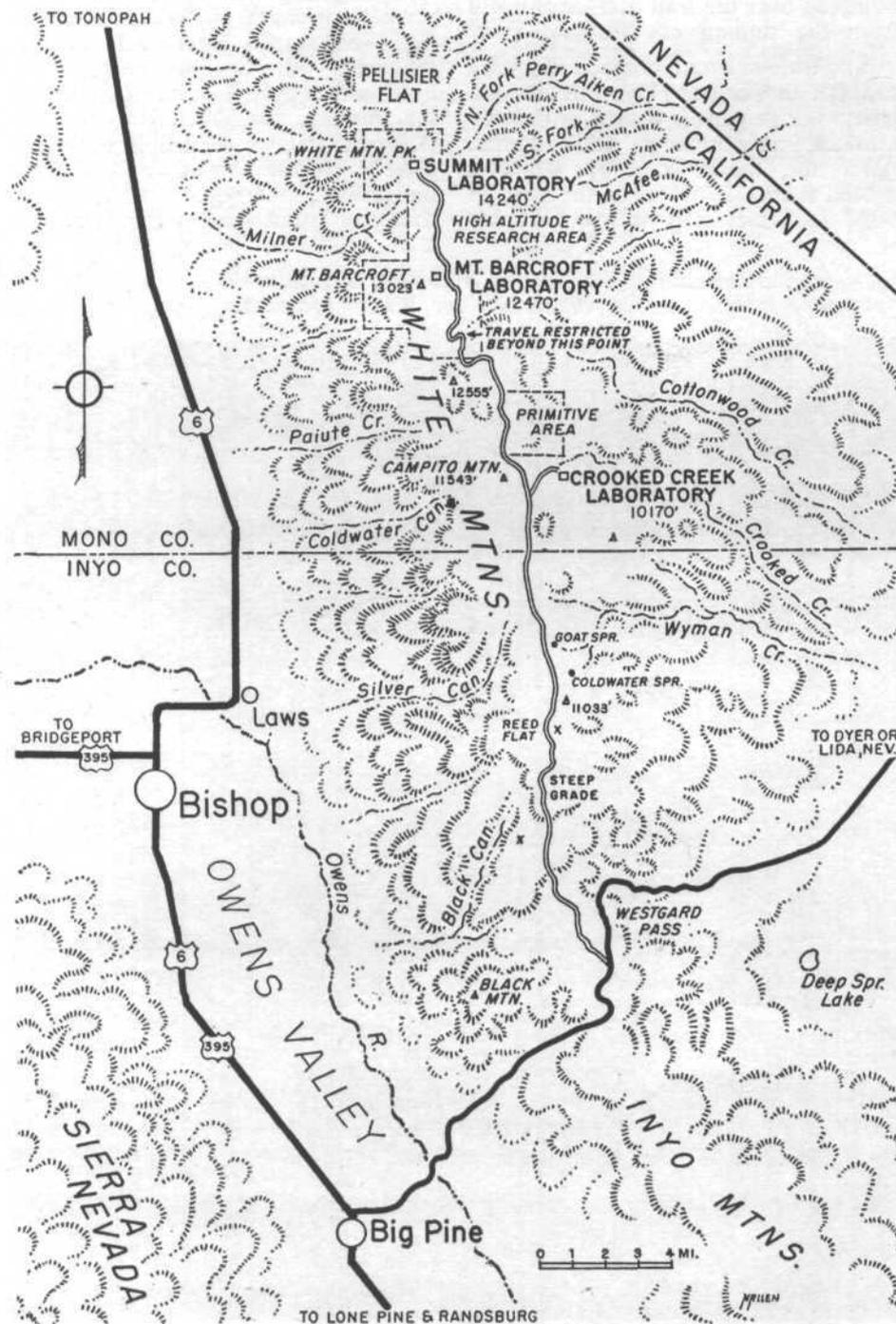
Most of these folks are in the employ of White Mountain High Altitude Research Station, operated by the University of California and financially aided by the Office of Naval Research, Rockefeller Foundation and National

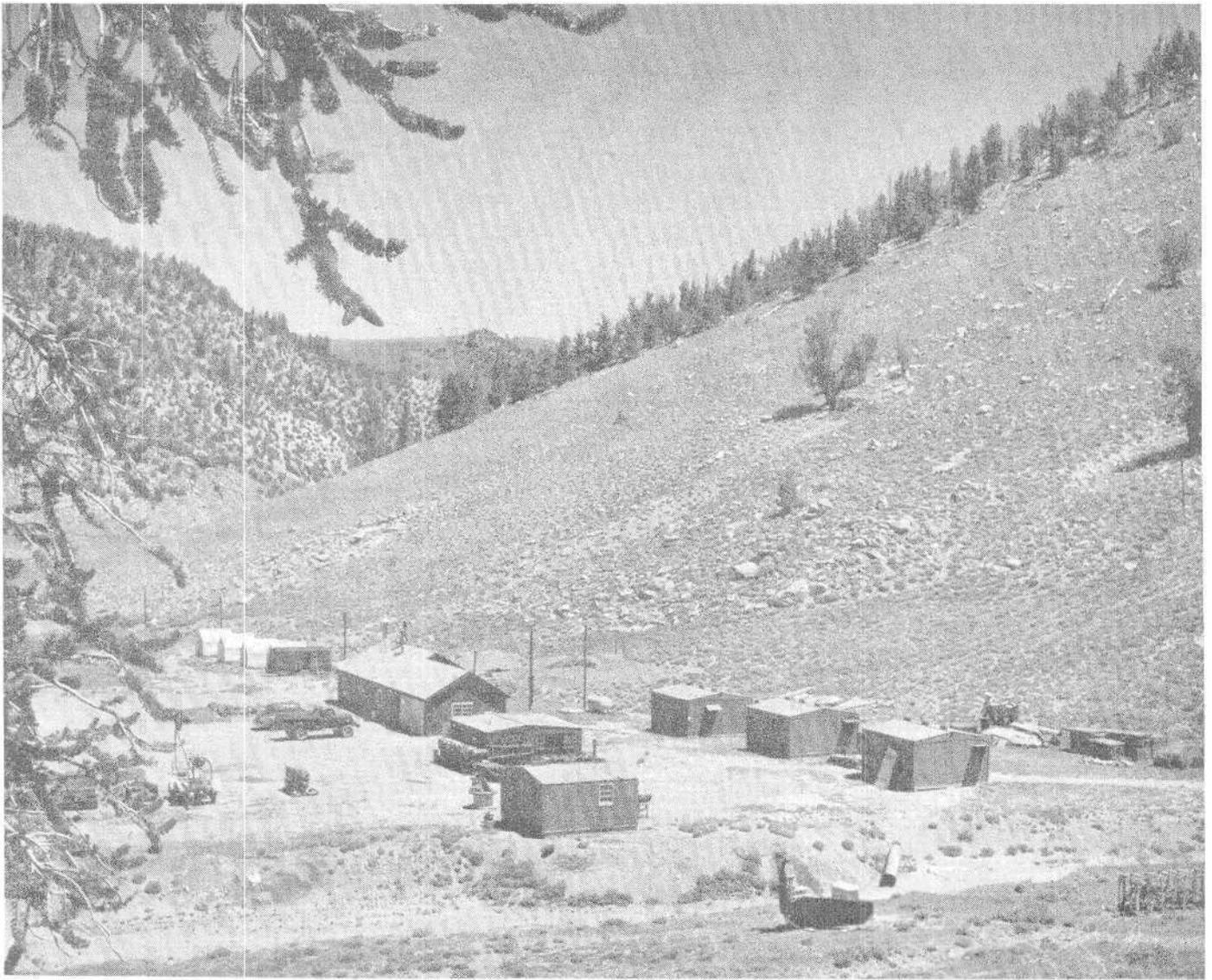
Science Foundation. At the Crooked Creek laboratory of this station, I was made welcome by Paul Manis and Joe Wentworth, operations director and maintenance foreman, respectively. I headquartered in a tenthouse on the laboratory "campus"—using a station jeep for my explorations, sharing Joe's good cooking with half-a-dozen working scientists, and taking my daily turn at the dishpan.

Established in 1948 when the Office of Naval Ordnance required a high altitude station from which to conduct guided missile and other classified research, the Crooked Creek laboratory was transferred in 1950 to the Office of Naval Research and its operation delegated to U.C. This development came at a time when Drs. S. F. Cook and Nello Pace, then professor and associate professor of physiology at the University, were seeking a site where research could be conducted into problems incident to life at high altitudes. Although situated at 10,170 feet elevation—more than half a mile higher than any point in the United States east of the Rockies—the Crooked Creek installation was not deemed sufficiently lofty to enable the high altitude tests contemplated by Drs. Cook and Pace, and in 1951, on the east slope of Mt. Barcroft nine miles north of Crooked Creek and 12,470 feet above sea-level, construction of a new laboratory was begun.

The new lab and the road leading to it were built by 14 graduate students in physiology, two Ph.D.s, and three physiologists at the professional level, led by Engineer Robert B. Choate. Three years later, a still-higher installation was built atop White Mountain Peak, at 14,225 feet elevation—only 270 feet lower than the summit of Mt. Whitney, highest point in the continental United States. With addition of this facility, White Mountain High Altitude Research Station became the second-highest establishment of its type in the world, with Barcroft and Summit labs the only U.S. research stations at elevations in excess of 12,000 feet able to operate throughout the year.

This fact of year-around accessibility does not mean that winters in the White Mountains are mild, except in a comparative sense. During the four years weather data has been kept at Mt. Barcroft lab, the lowest temperature recorded was in March, 1956, when the mercury fell to 32 degrees below zero. Wind velocity averaging 82 miles per hour for a full hour has been measured at the same station. Weather at Crooked Creek, naturally, is milder—lowest temperature recorded there since commissioning of the sta-





Crooked Creek laboratory in its setting of bristlecone and limber pines. Altitude here is 10,170 feet.

tion in 1948 was 20 degrees below zero. Summer days are pleasant and sunny, but never more than 75 degrees in the shade; and during my July visit, ice half-an-inch thick froze nightly.

Main advantage White Mountain has over other ranges insofar as high altitude research is concerned, is its position behind the so-called "rain shadow" of the Sierra Nevada. As a majority of storms in this section of the country originate over the Pacific and sweep in from the west, most of their moisture is deposited upon the high summits of the Sierra. Only a fraction is carried past that range to fall on the White Mountains and the Great Basin area beyond. Thus, a point in the High Sierra may receive 400 or 500 inches of snow in the course of a winter, while a comparable elevation and latitude in the Whites is fortunate to receive even as much as 100 inches. Approximately two-thirds

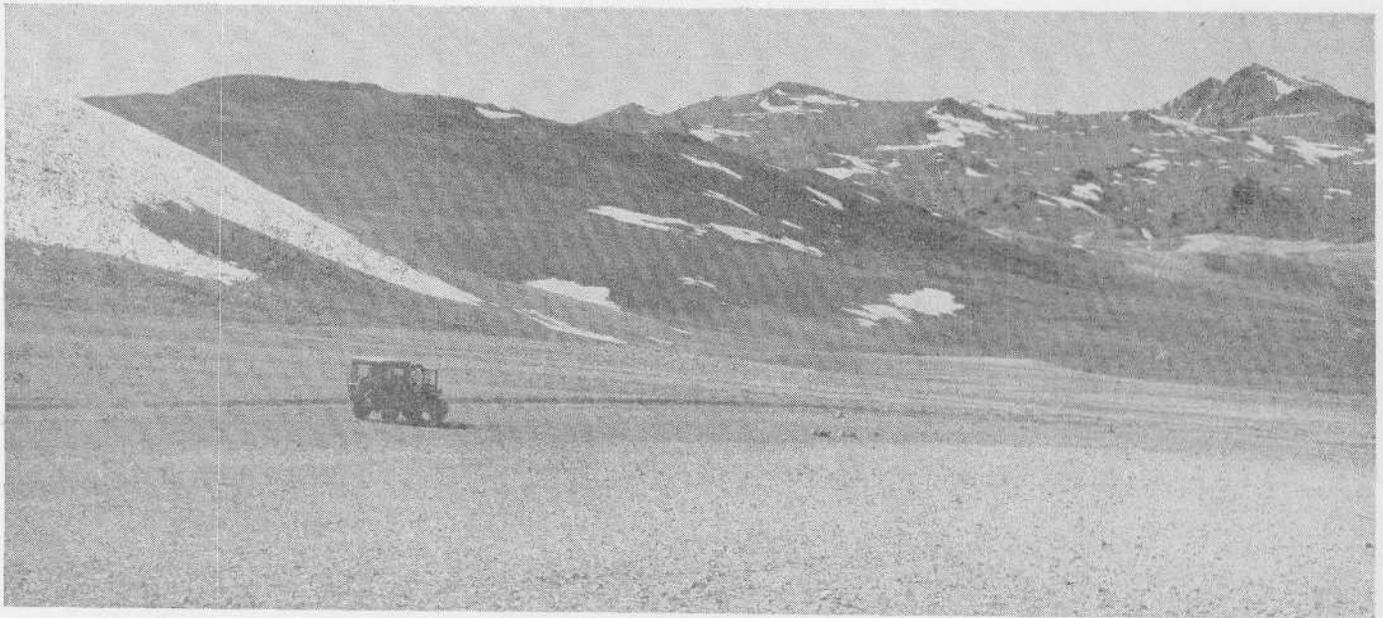
of the annual precipitation of 7 to 12 inches comes in the form of snow—the remainder falling as rain during midsummer months when the region occasionally is visited by hard electrical storms.

Use of facilities at these stations is not restricted to the University of California. Any qualified university in the world—any individual, as far as that goes—is welcome to use the stations while conducting research into high altitude. Fee for such use is \$6 per day, which includes dormitory or tent-house lodging and three hearty meals. Additional charges are made for use of station vehicles, storage of materials, care of experimental animals and extraordinary use of power, fuel, equipment or time of station personnel.

Use of station facilities is available only through prior arrangement with the Berkeley office. The station is not set up to handle gasoline sales or the feeding and lodging of casual visitors.

No public facilities of any kind—gasoline, oil, tire repairs, motels or meals—are available in the entire area between Big Pine and U.S. Highway 95, a distance of nearly 100 miles.

Research follows no prescribed course. Several scientific groups have made this their headquarters while studying cosmic radiation and electrical conductivity. Others have concerned themselves with the effects of low oxygen and low temperatures on living organisms. At the time of my visit, investigation was being conducted into the keeping qualities of various foods stored in a cold low-oxygen environment; Dr. Arthur H. Smith, associate professor of animal husbandry at the University of California at Davis, was testing the hatching potential of eggs produced by the experimental poultry flock maintained at Mt. Barcroft laboratory; Fulton Fisher, botanist from Melbourne, Australia, and Carnegie Institute, was collecting spe-



Jeep parked on 11,800 foot plateau. Highest point in range, 14,240 foot White Mountain Peak, is at right.

cimens of the 500-odd species of plants native to the area; and Dr. G. Ledyard Stebbins, assisted by Joshua Lee and Roman Gankin, all of the Davis campus, were making experimental plantings of timberline grasses from the Atlas Mountains of Spain. At the same time, but less academically, Carl and Martin Grauer, a father-son team from Castro Valley, were running a power line survey to the top of White Mountain Peak; I was collecting notes and making black-and-white photos for this article, and color slides of the range for a natural history program; and Paul Manis and Joe Wentworth were engrossed in their 24-hours-a-day

jobs of management, coordination and maintenance.

But despite the fact that each of us was dedicated to his individual task, we also felt a sympathetic interest toward work and problems of the others. We all ate at the same long table and cheerfully shared the duties of K.P.

Despite the important position this facility holds among high altitude research stations of the world—and despite the significant research programs being pursued all around me—I found it difficult to tear my attention from the land itself, and the plants and wild life inhabiting it.

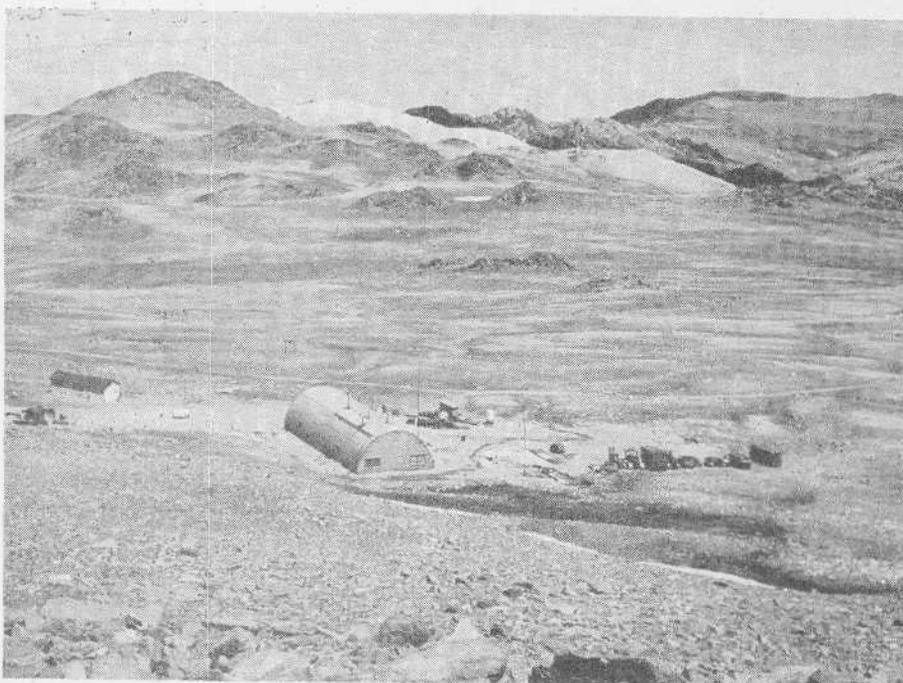
Due to excessive winds and general

aridity, the range supports but few species of trees. Scattered sparsely over the rounded limey hills at the head of Crooked Creek are limber and bristlecone pines (*Pinus flexilis* and *P. aristata*) in about equal numbers; but from approximately 11,000 feet to timberline at 12,000 feet I noted only the latter species. Twisted and tortured by the high winds, their stubby dead limbs sandblasted to gleaming white, the bristlecone pines of the White Mountains are as distinctive as any tree in the world. From the first one I saw, until I left the range I was fascinated by them—but never so completely as during those moments when I stood beneath the patriarchal bristlecone believed to be the largest representative of its species in the world!

It is a short thick tree, its bumpy trunk 35 feet in circumference at the smallest point, and its entire height not over 40 feet. It is a fine stout old fellow, and my pride in having made its acquaintance is depreciated only by the fact I failed to meet three other notable bristlecones simply because they were not discovered to science until the month following my visit.

These last mentioned trees are much smaller than the giant bristlecone—being only 20 to 50 inches in diameter at the base and 15 to 20 feet high—but according to Dr. Edmund Schulman of the University of Arizona, they are quite possibly the oldest living things on earth! While investigating tree rings in furtherance of research into weather cycles of past years, he found these ancient pines breasting the elements on a high exposed ridge between Westgard Pass and Wyman Canyon. Their ages, established by the reliable

Mt. Barcroft laboratory at 12,470 feet. University of California photo.



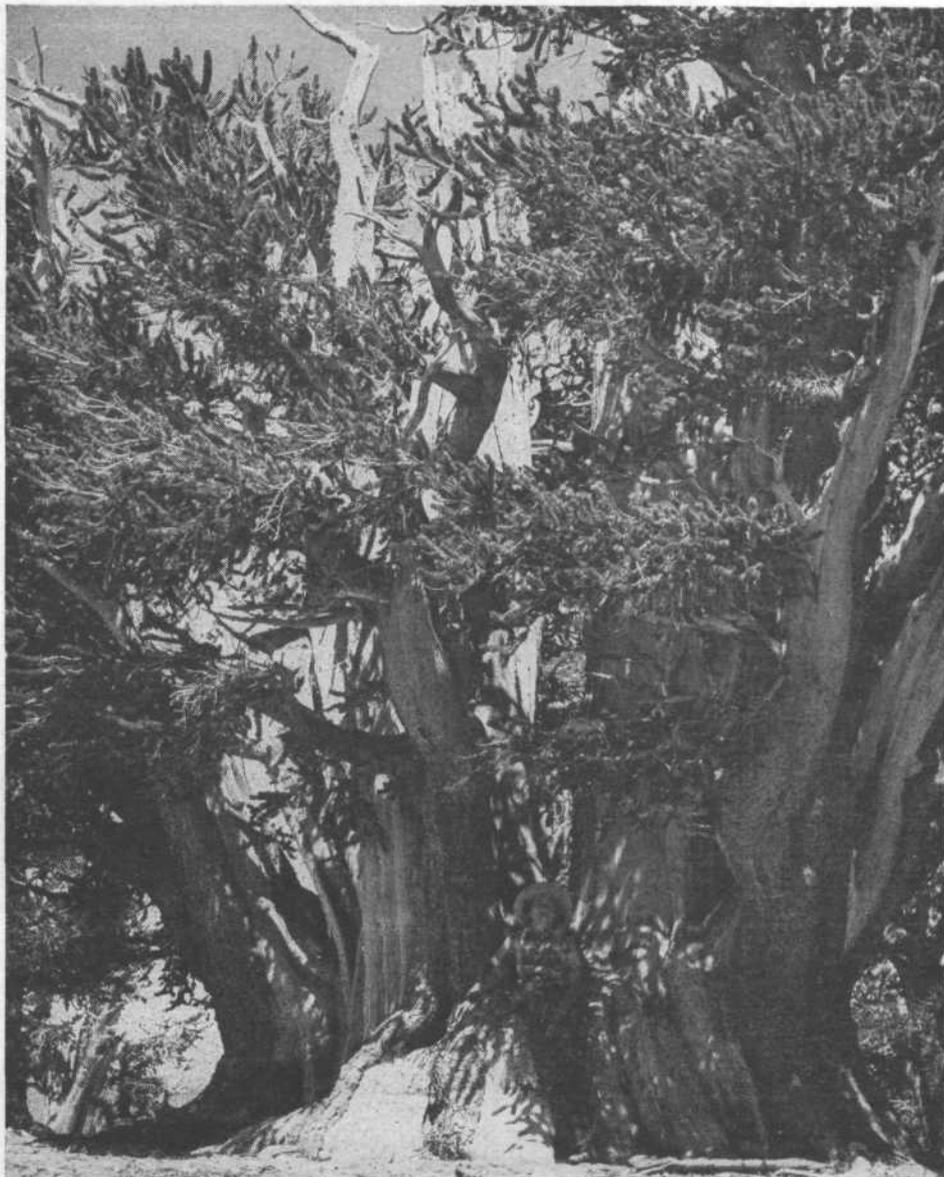
tree-ring system of dating, are 4100, 4050 and 4000 years—indicating that this patriarchal trio may have been battling for existence on this wind-riven ridge for as long as 10 centuries before the oldest sequoia now living sprouted in its seed!

What is believed to be the finest stand of bristlecones in the White Mountains—including the largest, but not the three oldest trees—is assured perpetual preservation by the U. S. Forest Service which has set aside a Natural Area of 2330 acres surrounding and embracing White Mountain Peak. Near the south boundary of this tract, at an elevation of about 12,000 feet, private vehicular travel is halted by a padlocked chain across the road. Only horseback riders, hikers, station-owned vehicles and motorists having special permission of the operations director—and a key—may proceed beyond this point. On the second day of my stay I accompanied the four botanists—Stebbins, Fisher, Gankin and Lee—on an all-day trip into this area.

With our cameras, binoculars, canteens, lunches and collecting gear stowed in two jeeps, we set forth at mid-morning. Stopping occasionally to collect plants and shoot pictures—and once to observe a pair of fat marmots ambling over a rock slide, and another time to watch the antics of a big buck deer—we drove to Mt. Barcroft station where we tarried about an hour. While Dr. Stebbins and his volunteer assistants planted high elevation grasses, I climbed to the rounded summit of Mt. Barcroft, 553 feet above the 12,470 foot high station. Then we got back into the jeeps and headed for the still higher country beyond.

Having seen the last bristlecones long before reaching Mt. Barcroft, the remainder of our out-bound journey was made well above timberline in the strangest alpine world one can imagine. Nothing about these summits suggested the dizzy heights and depths associated with mountain climbing. As we neared 13,500 feet, our road still followed the gentle undulations of the land which could have passed for the rolling hill country of Nebraska or Iowa—except these naked heights wore no concealing cover of prairie grass, shrubs or trees. Yet, plant life was not lacking. Botanists believe there are not less than 500 species of plants native to this portion of the range above timberline. Many of these varieties never have been described botanically.

Examination of the ground surface between the closely-set rocks revealed that almost every cupful of topsoil held its abundance of vegetation—wirey tufts of grass, dry mosses, cotyledons and myriad species of alpine



Author at base of world's largest known bristlecone pine (Pinus aristata) in White Mountains, at about 11,500 ft. Tree measures 35 feet in circumference at smallest point between base and crown.

flowers. Few of these representatives were more than an inch or two in height, and some were almost microscopic—yet, that warm July day found each driving forward toward its budding, flowering and seeding phases in mighty thrusts of vigor aimed at completion of its life cycle and perpetuation of its kind in the few brief weeks allotted between snow and snow.

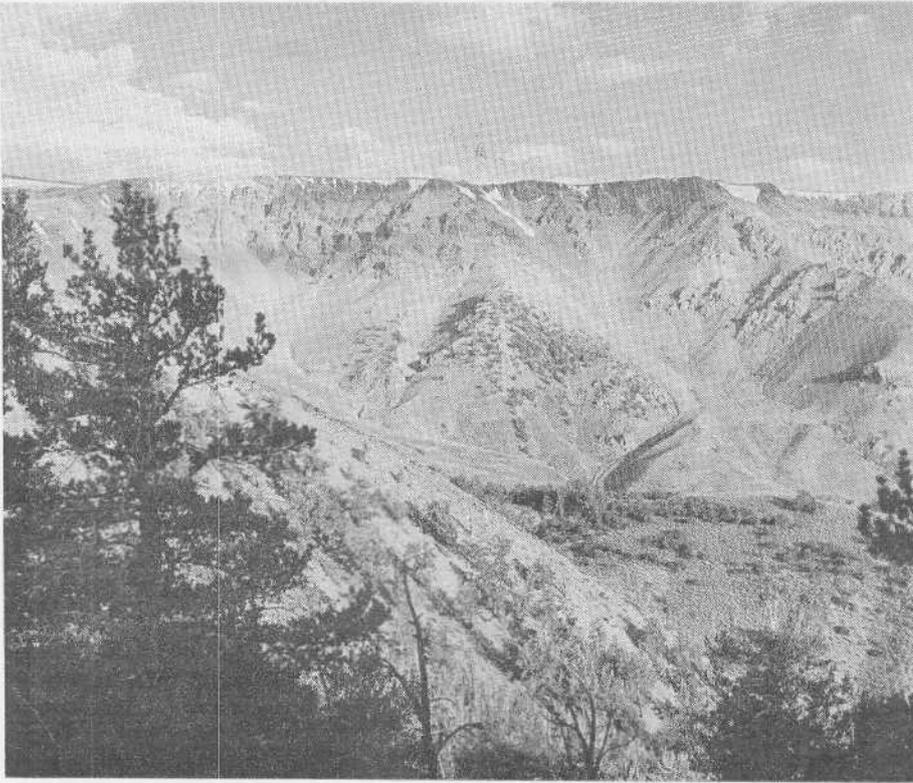
With the long snowy Sierra Nevadas hemming our world on the west, and the bald head of White Mountain Peak at our back, we halted for noon lunch at the edge of a deep snowbank between 13,000 and 14,000 feet. Northward stretched the remainder of the White Mountain range, terminating in 13,145-foot Boundary Peak, highest point in Nevada. Spreading to the east were 10,000 square miles of Ne-

vada's desert mountains—the Silver Peaks, the Monte Cristos, the Cactus, the Kawich, the Reveilles, range beyond range until the rim of the world was lost in the blue-shadowed haze of infinity.

From the snowbank at our feet we looked down more than 9000 feet to the heat-shimmering flats of Fish Lake Valley, almost directly below us, and on the slopes surrounding those flats we saw pin-point clusters of trees that marked the home buildings of ranches, and the spidery line of the main valley road.

In three days I had learned a little, at least, about this strange world beyond timberline. I was glad Temptation had taken the wheel and turned my car into the dim dirt road that leads upstairs from Westgard Pass.

Mountains Are For Everyone



Pellisier Flat, a unique strip of desert high country that rises gently from 12,000 to 13,500 feet in seven miles in the White Mountains of east central California. Seen from the Nevada side. These cirques show signs of glaciation. Photo by Arnold Shulman.

(probably the highest ancient Indian workshop yet uncovered in the United States), and several low, crescent-shaped stone walls of ancient vintage, such as Indians used for blinds while hunting bighorn sheep.

The Desert Peakers, through the Board of Directors of the Sierra Club, have asked the Forest Service to set this plateau aside as a Wilderness Area. For such high country, Pellisier Flat is easy of access. An old Indian trail coming up the east side, from Post Meadow, Nevada, was widened in the 1860s by a lumbering concern, one of whose wagons may still be seen smashed against a pine just below the rim of the Flat. In this vicinity grow some of the Bristlecone Pines recent research has proclaimed as a species that may date back even farther than the Sequoia, making it our oldest living thing.

A road to a tungsten mine makes the lower end of the Flat almost accessible by jeep; planes have already landed on the carpets of Alpine flowers that are trying to reclaim the soil. Unless it receives protection soon, another exceptional bit of desert wilderness will be lost to those who love to explore the virgin mountain areas.

The Desert Peakers presented to the Forest Service a photographic exhibit, a botanical report and a map marking the proposed boundaries. When we joggled them about it months later, they said they had lost the data. Another file was made up and sent to them. They have now postponed further consideration until the issuance of a new topographic map of the area.

June and July are the best months to hike on Pellisier Flat. The flowers are then at their best; run-off from snowbanks usually makes it unnecessary to carry water. We know of no other place where mountain terrain so gently rises from 12,000 to 13,500 feet.

The Desert Peaks Section of the Sierra Club, a group that makes a hobby of exploring the desert mountain ranges of the Southwest, has scheduled a trip to this bristlecone pine area in White Mountains. Here is advanced information for readers who may wish to join them.

By LOUISE TOP WERNER

**JUNE 8-9
Bristlecone Pine Area and Reed
Flat (11,033 ft. el.)**

ACCESSIBLE ONLY via the narrow, steep, unimproved road along the backbone of the White Mountains. The leader warns that only drivers experienced in forcing their cars up such roads should attempt it in a stock car. Four-wheel drive or low-g geared trucks are recommended.

Beautiful camping area at Reed Flat, at 10,000 feet. Bring water for the entire week-end. Easy five mile hike to the peak affords unsurpassed view of 85 miles of the Sierra Nevada under snow.

Driving: 600 miles roundtrip from Los Angeles, via highway 395 to Big Pine, California, (last gas at Big Pine) then east to the summit of Westgard Pass where the party will rendezvous at 8 a.m. Saturday, to caravan from there up the road.

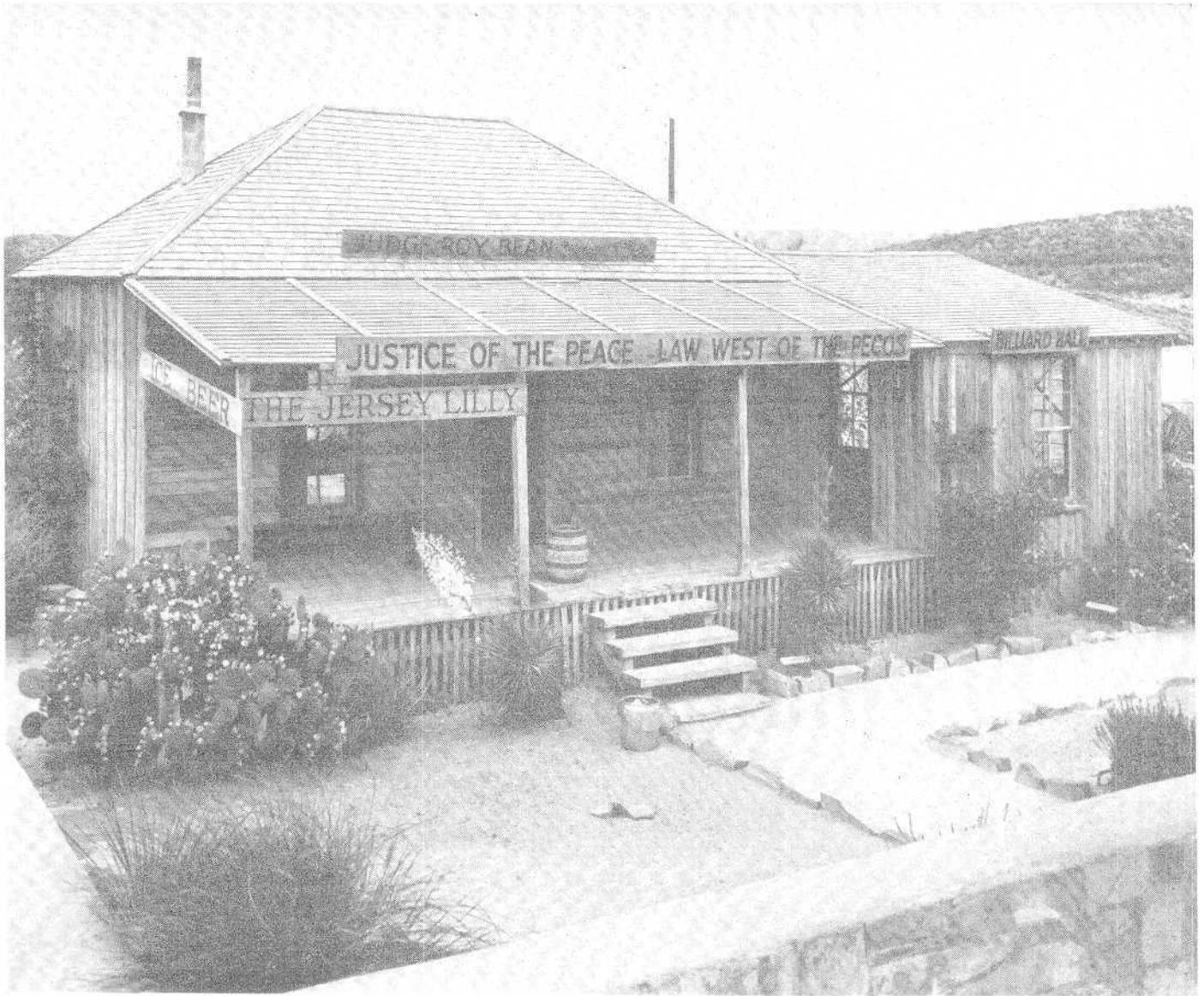
Leader: Bob Bear, 1980 Rangeview Dr., Glendale 1, California. Phone TH 8-0819.

The highest desert mountain in the U.S., (14,240 feet) White Mountain Peak in the southern end of the White Mountain Range, was a favorite objective of Desert Peakers until the armed forces took it over as a station for high altitude research, cutting a jeep road almost to the summit.

North of the peak, between it and Mount Montgomery, lies a unique bit of high desert called Pellisier Flat, a strip roughly half a mile wide and seven miles long, rising gently from 12,000 to 13,500 feet. Formerly denuded by sheep-grazing, it is now coming back with carpets of miniature alpine flowers.

During several exploratory trips into the area the Desert Peakers identified dozens of plants, found a scattering of obsidian chips at about 13,500 feet





HISTORIC PANORAMAS IV

Judge Roy Bean's Courthouse

By JOSEF and JOYCE MUENCH

At Vinegaroon, Texas—renamed Langtry, for the famous singer—a shady-porched cabin keeps alive the legal and extra-legal traditions of Judge Roy Bean, self-styled “Law West of the Pecos.”

At once saloon and courtroom, the building on U.S. Highway 90 in west Texas is a legendary spot. Bean, who lived from 1825 to 1903, handed down unorthodox legal decisions with a free hand, often fining culprits a round of drinks for the assembled crowd. Whether prejudiced or wise, this flamboyant pioneer character

had a share in stabilizing life on the frontier and the legends which grew up around his memory are full of a salty and authentically western flavor.

This simple wooden structure symbolizes in the extreme the raw west's early attempts at meting justice. Tragic errors and brilliant horse sense decisions were all in a day's work for the early judges.

Lily Langtry, whom Bean so admired, accepted his invitation to visit the town named for her, but after the death of the Judge.

LIFE ON THE DESERT

FLASH FLOOD!

When the vagrant rains come all at once, the dry washes quickly overflow their banks and become madly rushing rivers. For the Tripps, flash flood had meant a few washed-out roads and an uprooted shrub or two—until the summer cloudburst filled the canyons above their home and sent a surging torrent upon them.

By DEE TRIPP

THE MOON was shining brightly over the Arizona desert that warm summer evening several years ago—an evening I shall never forget.

My husband Roger, our 11-year-old daughter, Barbara, and I had gone for a refreshing swim in one of the stock ponds on our ranch. They were overflowing with the precious liquid usually so scarce on the desert, for the summer rainy season had begun. At midnight we returned to the ranch house, removed the canvas covers from our outdoor beds and climbed in.

Another wonderful day had ended, I thought. This was the kind of life we had dreamed of living during the cold foggy days and nights we spent in San Francisco before buying the ranch. Our home was 35 miles from Phoenix, the last 10, rough dusty miles from Highway 80.

It had been love at first sight for both Roger and I when we found this 160-acre piece. The land looked as though it had been lying here through the ages waiting for us. The valley stretched before it, as level as a table for miles and miles to the hazy mountains in the distance that formed a rainbow-shaped range around us. To the east were the highest of these mountains, the Estrellas, and like the others they were hazy, barren and blue except when gilded by the desert sunrise.

We constructed a simple wooden dwelling on the bank of the Waterman Wash which cut through our property, and now our small ranch was our home.

About two o'clock that morning we were awakened by big raindrops pelting our faces. We scrambled out of our cots, covered them with a tarp and ran laughing into the house. Rain was a blessing to this arid land. By the flashes of lightning through our windows we groped our way to our bedrooms and soon were lulled back to sleep by the soothing sound of rain.

At four that morning we were

startled by what sounded like ocean waves breaking against the house! Instantly the same thought crossed our minds. Friends and neighbors had warned us about building our home close to the wash and we had assured them that the water was never more than a few feet deep even after the heaviest rainfall. But, they countered, Waterman Wash had in the past overrun its banks—and we had ignored this admonition.

And now the wash was a raging river and with each flash of lightning we saw the rising water threatening us with increasing fury. The river's roar grew in intensity, and instinct dictated our next move.

Barbara was awake now, sitting up in bed with wonder in her eyes. Roger, with a composed and assured voice, told her that we were going to wade out to the road and that everything would be all right. He spoke in the same tone he used for telling bed time stories.

Her first thought was for the new dress I had just finished for her and she sprang out of bed and ran to her closet. With a determined fling she tossed the dress atop a pile of boxes I had stacked in a corner, and then took my hand.

I glanced quietly around the room. My eyes fell on each cherished possession. Roger turned to me and asked that I join him in prayer. We asked God to protect our home and to spare our lives.

Flashlight in hand, Roger led us out the back door into waist-high water. With Barbara between us we pushed forward toward higher ground and the road, less than a mile away.

At once a strong current caught us and swept Barbara off her feet. I lost my grip on her hand and in the darkness she was gone. My scream was lost in the flood's din and Roger could not hear me. But then, in a flash of lightning, I saw Roger with his arm

around Barbara's waist, holding on to her tossing body until she regained her footing. Her little wet hand was more precious to me now than ever and she held on with all her strength.

We struggled forward a few more yards and then the awful realization that we would not be able to walk to high ground came to us. The current was too strong—the trail too treacherous. We would have to turn back, but where could we go? The house still was standing, but it would have been too dangerous to re-enter. A flash of lightning silhouetted it and the big tree in the back yard. Tree and house looked as if they had been companions for ages and were now joined as one in a desperate struggle for survival.

The tree! If it could survive, so could we! It was our only hope. We waded toward it. Our cocker spaniel, whom we had completely forgotten prior to this moment, swam up to us and I took her in my arms. Then we climbed the tree. Darkness and rain entombed us. We could not see one another except when the lightning flashed.

After what seemed an eternity, signs of daybreak lightened the eastern horizon beyond the Estrella Mountains. In the dim light of the new day, a familiar shrub growing in the yard caught my eye. I watched it as if it would run away if I turned my head. Soon more of its leaves and stems came into view and I knew the waters were receding.

At six o'clock we climbed out of the tree and waded to solid ground. Surveying the wet world around us, we realized just how close we had come to death. Trees much larger than the one we had been in were tumbling and tossing madly in the water. Why had our tree remained firm and sure? Why was our frail little home still on its foundation? How did we escape with our lives? We had prayed; we had asked God for these things and He answered our prayers.



The author and his wife study their roadmap.

Vacation In Baja California

It is a long and rugged road from the U.S. border to Santa Rosalia in Baja California but for those who can accept in good spirit the bumps on the highway, and look beyond the discomforts of primitive living to the beauty and majesty of the landscape, it is high adventure—one of those experiences you would not want to repeat every day, but that would remain always a pleasant memory. Here is the story of what you would find along the way.

By C. R. APPLEBY
Photographs by the author
Map by Norton Allen

AS PARTISANS of the wild desert peninsula of Baja California, my wife and I have been taking our annual vacations there for many years now.

We belong to that legion of Americans who have only two weeks of vacation each year, and in the past we had flown to Santa Rosalia, Loreto or La Paz and depended on local transportation to take us to neighboring pueblos.

Last year we drove down. For the two-week tourist, driving this anything-but-smooth peninsular road presents a dilemma: Either you drive over its bounding surface night and day and have no time to enjoy the country, which is no vacation; or you drive in easy stages and fail to reach those delightful oasis towns south of the Vizcaino Desert, 500 road miles below the border.

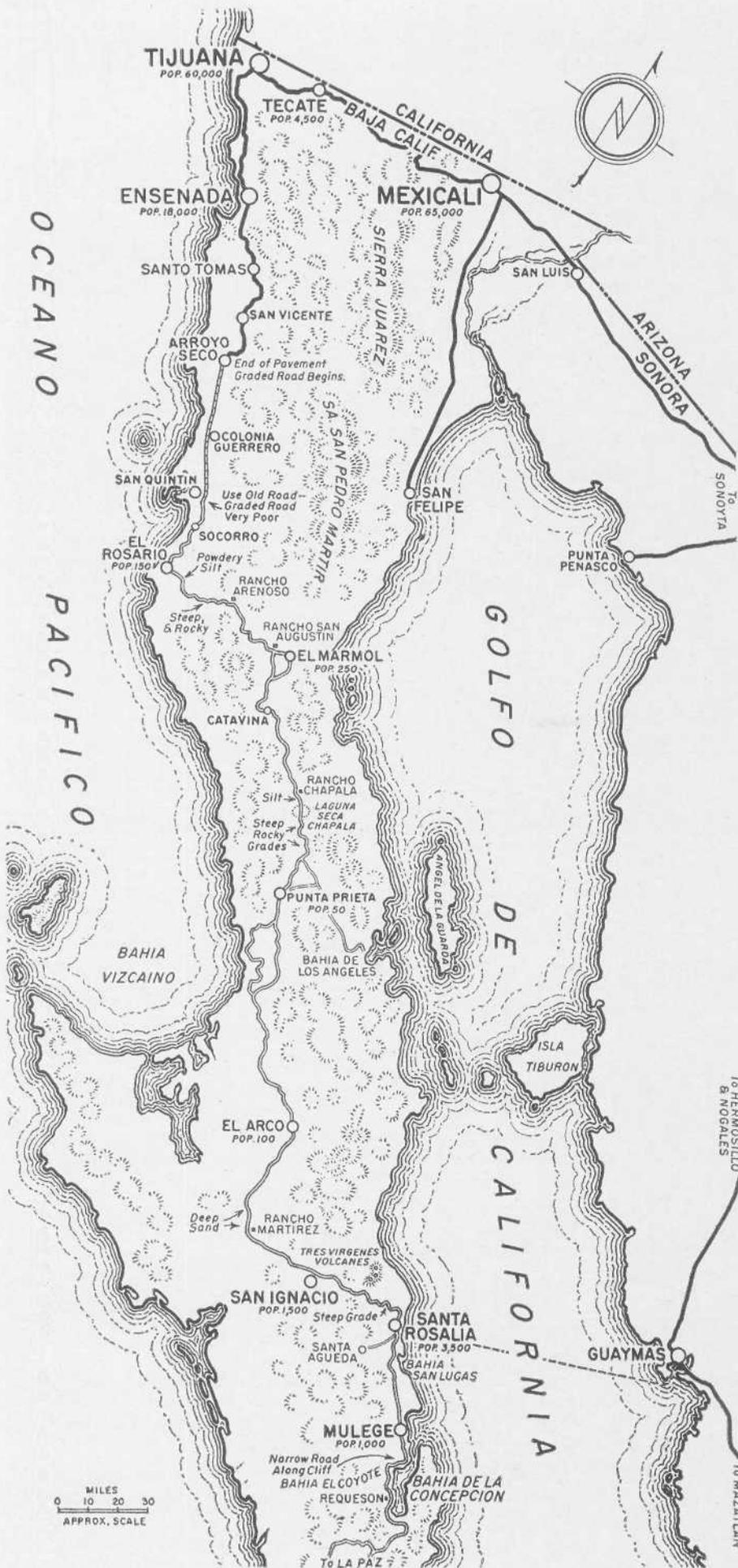
We reconciled these alternatives. In

our two weeks we drove from near Los Angeles to Concepcion Bay, 700 miles south of San Diego, and back—and still had time for fishing, exploration and relaxation. We did this by having good luck on the road and by crossing by boat the Gulf of California from Santa Rosalia on the peninsula to Guaymas on the mainland.

We made the trip from the U. S. border to Santa Rosalia in six days. The return drive from Guaymas to the border took us six hours! This graphically illustrates the difference between highway travel on the mainland of Mexico and byway travel in Baja.

Not that the peninsula jaunt is such an odyssey. It has been made by truck, car, motorcycle, bicycle and mule. One hardy youth, Alan Zock, walked it all the way from La Paz.

But, Lower California's highway should not be taken too lightly. It is



possibly the worst regularly-traveled thoroughfare for its length on the North American Continent. Its pavement ends at Arroyo Seco, 145 miles south of the border. From here southward is a potpourri of washboard, sand, powdery silt, immense cobblestones and jagged granite. It tests the mettle of any vehicle and driver.

Ahead of us, we were told by the rancheros we passed, was another party of Americans. They were two hours away, then five, then half a day, then two hours. We caught up with them at San Ignacio.

They had been driving 18 hours a day. Blowouts had plagued them. Tires had been shredded and were replaced at prime effort and cost. There was engine trouble. One of the women in their party observed, "We broke our rear axle. And we only had one extra!"

We, on the other hand, had as good fortune as they had bad. We blew only one tire and our '53 Ford pickup came through in perfect shape. We did get stuck four times, through a want of four-wheel drive, wide tires and good judgment, but kindly Mexican truckers either pulled us or helped us dig out.

We met from two to five vehicles a day. The meeting often called for a chat. People encountered in the peninsular desert are friendly, honest and helpful without motive.

For years travelers on the road have been assisted by persons like Senora Anita Grosso Espinosa, a lady of education and excellent command of English who runs the store at El Rosario. Or the Kenneth Browns at El Marmol. Or Manuel Ortiz at Punta Prieta. Or Col. Harvey Greenlaw, who has in a varied career of soldiering been a British pilot, a U. S. cavalry officer, chief of staff of the famous Flying Tigers under General Chennault, a major general in the Nationalist Chinese Army, and who now watches over his mining interests in the bleak hamlet of El Arco. Or Dr. C. S. MacKinnon at Santa Rosalia, who has lived in Baja for more than 35 years and knows the central peninsula as few men ever have.

Ensenada is the last stop for supplies other than necessities. The pavement ends 80 miles south of here. Before it reaches the coastal town of El Rosario the road becomes a river of dry silt.

Beyond El Rosario the Camino Real turns east and wanders down the interior of the peninsula. The terrain offers a new experience to the desert fancier. The cirio forest begins, bizarre stands of thorny plants resembling great up-ended carrots (*Desert, Oct.*

'55). Here the giant cardons (*Desert*, Dec. '56) grow in profusion and the elephant trees (*Desert*, Nov. '56) appear.

Camping was a delight in the cool and quiet evenings with firelight restlessly playing on the pillars of the huge cardons. The morning sun, however, was slow to break through the thick Pacific Ocean fog.

In this country we found that a name on the map is usually a ranch house or at most a cluster of adobes.

Just as the bleak mesas of the Vizcaino Desert become oppressive in their monotony, the road drops into a palm-lined arroyo of glinting blue lagoons, orchards, fields and quiet streets, dominated by the tower of a magnificent mission. This splendidly preserved edifice, begun by the Jesuits in 1728, gives the town of San Ignacio its name.

Half a century ago the adventurer Arthur Walbridge North, whose two books on Baja are regional classics, stumbled into the arroyo. He had run out of water crossing the Vizcaino and was nearly demented with thirst. "At the bottom of the chasm, five or six hundred feet below, lay a long narrow valley of perhaps 2000 acres, with water—pools of fine, rippling water flowing through green masses of sedge—and palms—thousands of tall, graceful palms, shading numerous thatched houses . . ." I doubt if there is a traveler who enters San Ignacio after crossing the Vizcaino who does not share in some measure North's emotions at first sight of this lovely isolated inland town.

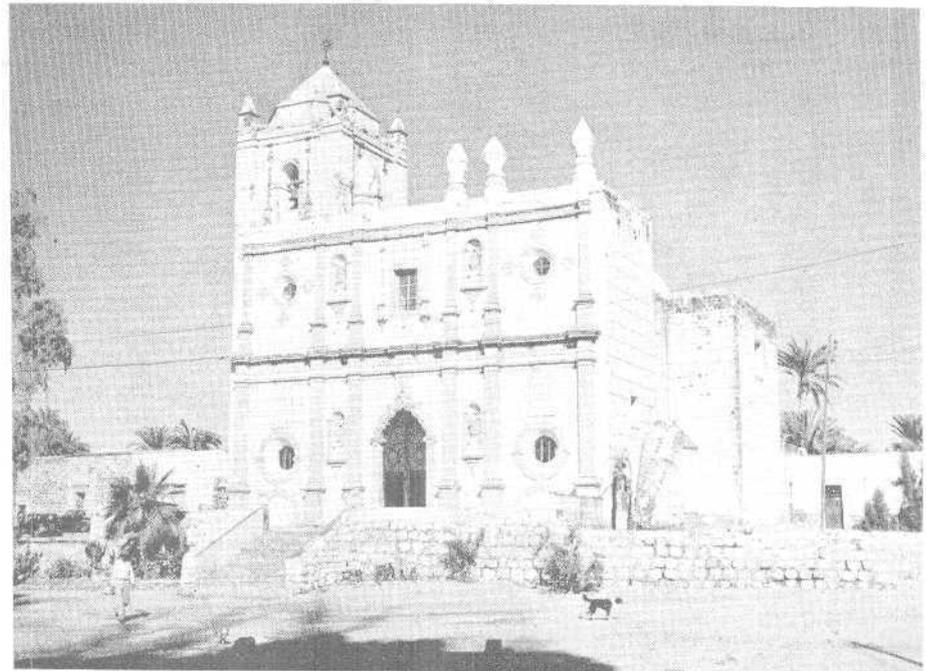
Rooms are available here at Casa Leree and we paid 10 pesos, or 80 cents. Frank Fischer and his son, Oscar, operate a garage in the pueblo, and are competent auto mechanics.

Southeast from San Ignacio the road

Top—A bay within a bay is exquisite El Coyote. It is carved from the west shore of Bahía de la Concepción and, as legend has it, once served as a haven for pirates and smugglers.

Center — The splendid mission at San Ignacio, begun by the Jesuits in 1728 and completed by their Dominican successors. The pueblo is 570 miles south of the border and the first major settlement south of Ensenada.

Bottom—A portion of Baja's principal highway. Here on the Vizcaino Desert the sandy roadbed is reinforced by stalks of cardon and yucca. A little farther south, where the sand is just as deep, but there are no cross-ties, the author got stuck.



climbs over a pass near the volcanic peaks known as the Tres Virgenes, and then drops down to the shores of the azure Sea of Cortez. A few miles beyond is the town of Santa Rosalia, a faded clapboard monument to economic imperialism.

The great copper deposits around Santa Rosalia were developed 60 years ago by European capital. A French company, El Boleo, laid tracks, built smelters, docks and offices, and in the arroyo laid out rows of wooden houses. They dismantled an iron church at a European exposition and shipped it to Santa Rosalia.

We were repelled by our first sight of the town. Instead of the adobe walls, courtyards and rambling streets characteristic of Mexico, we found a line of decayed wood tenements. Instead of the bell tower of an antique mission, there was the prefabricated church of iron.

But Santa Rosalia is not as bad as first impressions would have it. It has, in fact, considerable charm. The people are the same here as in other pueblos. The fishing is good and can be pursued at nominal expense. The French have gone and Mexicans operate the mines, but about the veranda

of the little hotel on French Mesa there lingers a Gallic evanescence. Perhaps it is in the odors that rise from the kitchen where the hotel's French proprietress supervises the finest cookery between Ensenada and La Paz.

South of Santa Rosalia 42 miles we entered a village reminiscent of San Ignacio. It has the same small jungle of date palms, grapes, pomegranates, figs, mangoes and bananas lining a fresh water lagoon which meets an estuary and mingles with the salt water of the Gulf. Rare is a view of the waterway that does not include a mullet or two flashing above the surface.

This is Mulege, as pretty a spot as can be found on the peninsula.

Two hundred and fifty-three years ago two robust Jesuit fathers, Francisco Maria Picolo and Juan Basaldua, were attracted to the river valley as their superior, Juan Salvatierra, had been two years earlier. Here they built a mission, Santa Rosalia de Mulege, and its record book, a registry of births and deaths from 1718 to 1845, is a fruitful source of peninsular history.

During the Mexican War of 1846-48 Mulege became a center of Baja California resistance against United States soldiery. When La Paz welcomed an occupation by two U. S. companies under Col. Henry Burton in 1847, outraged patriots set up a provisional government at Mulege. An American sloop of war sailed north from La Paz and landed 80 Marines near the mouth of the estuary. The Marines marched into town, stayed a few hours and then returned to the ship. The rebels were little impressed by the maneuver and immediately marched south to attack the Americans at La Paz.

Mulege was then known by the full name of its mission, Santa Rosalia de Mulege. But when copper began to be dug 42 miles to the north, the mine operators appropriated all of the able-bodied Mulegenos they could lure and the name Santa Rosalia as well.

Mulege is the site of the territorial prison. Few penal institutions in the world are governed by such an enlightened policy, either from the standpoint of the felons or the taxpayers. The convicts sleep in the prison, but most are freed at daybreak to work and earn their board in town. Some have their families with them. There is a comfortable lodge here called Club Mulege, which offers full facilities to sportsmen.

South again from Mulege is vast Bahia de la Concepcion. Its beautiful bays and beaches marked the southern terminus of our trip. From here we had only to return to Santa Rosalia

Reports Indicate Near Normal Flow for Southwest Rivers . . .

Generally favorable river runoff forecasts were made this month by the U. S. Weather Bureau for the major streams of the Southwest. Most of the watershed areas received near average rainfall in March to offset the below-average precipitation of the previous month.

Total rainfall since last September over the upper Colorado Basin has been above normal over the extreme headwaters of the Colorado River near Granby Reservoir, over the upper drainage of the Gunnison River and over the Taylor River basin in Colorado. The seasonal precipitation has averaged below normal over the Uncompahgre and Dolores Basins in Colorado. Near average to above average streamflow is forecast for the basin except for the Dolores and Uncompahgre rivers for which runoff near 80 percent of the 1938-52 average is expected. The Colorado near Cisco, Utah, is forecast to have an April to September streamflow of 4,450,000 acre-feet, or 99 percent of average.

Streamflow of the Yampa and White Rivers in Colorado is expected to be near, or slightly above, the 15-year average. The Green River at the Utah-Wyoming border is forecast to have streamflow about 15 percent less than average. The outlook for the Duchesne River in Utah is for near average flow in the extreme headwater area, with near 70 percent of average flow predicted for the lower reaches. For the Green River at Green River, Utah, April to September runoff is forecast to be 3,350,000 acre-feet or 95 percent of the 1938-52 average. Runoff of the San Juan near Bluff, Utah, is expected to be 1,680,000 acre-feet for the period April through September, or 113 percent of the 15-year average.

Rainfall during March was above normal over the upper Gila Basin, near normal over the headwaters of the Salt and Little Colorado Basins in Arizona, and below normal over the Verde River Basin. The November to June runoff of the Little Colorado at Woodruff, Arizona, is forecast to be 79 percent of average. Near 115 percent of average runoff is expected for the creeks near Winslow, Arizona. The water-supply outlook for the upper Gila Basin continues to be very poor, with forecasts ranging from 19 to 48 percent of streamflow average. The Verde Basin should have a 35 percent of average runoff.

March precipitation averaged above normal over the Rio Grande Basin. Near, to slightly above average April through September runoff is expected for the tributaries in Colorado along the San Juan Mountains and for the extreme upper Rio Grande. Forecasts of April to September streamflow are lower for the eastern tributaries, ranging from 65 to 80 percent of the 1938-52 average flow.

The water-supply outlook for the Great Salt Lake Basin ranges from favorable to poor. Forecasts for the April to September streamflow are: upper Provo and Weber rivers and for the Blacksmith Fork in Utah, 95 percent of average; lower Provo and Weber Rivers and the Logan and Ogden rivers in Utah, 85 percent of average; upper Sevier Basin, less than 50 percent; lower basin of Sevier, 60 percent; Beaver River, 70 percent; Humboldt River Basin, 50 percent; Walker and Carson rivers, 65 percent; Owens River in California, 73 percent.

Outlook for the Mojave Basin in California is poor with less than half the normal streamflow expected.

and catch the boat for Guaymas whose schedule calls for two Gulf crossings weekly. But sometimes the boat runs less regularly. Facilities on board permit one automobile to be carried each trip and the vehicle should not be too long. Our pickup truck extended out over the deck railings on both sides.

If you plan a trip to Santa Rosalia allow sufficient time to retrace your route in the event the boat is not running on schedule or cannot carry more cargo. Arrangements for passage can be made in Santa Rosalia with Rigoberto E. Garayzar, the shipping agent, or with the helpful dentist, Dr. C. S. MacKinnon. Fare is approximately \$50.

On our way down the peninsula we might have included a 90-mile side trip to that anglers' Elysium, the Bay of Los Angeles. Or we could have gone a little farther south to the delightful pueblos of La Purisima and Comondonu. But, we were afraid of stretching our schedule. We had come 700 road miles from the border and now had time to fish, swim and relax.

Those who plan to travel Lower California's main thoroughfare should consider the venture from three aspects:

(1) *Vehicle.* Take something rugged and with plenty of clearance. A jeep or pickup are best. Four-wheel drive, while not necessary, is desirable. Making the trip in the company of another vehicle also is desirable and contributes to one's peace of mind. Include three spare tires.

(2) *Supplies.* Camping equipment, provisions, auto parts and repair gear depend on individual taste. Canned goods and occasionally eggs can be purchased in the villages, but emergency rations are recommended. Include a minimum of five gallons of water (plus halazone tablets) and 15 to 20 gallons of extra gasoline. An axe, long-handled shovel, tow chain and a chamois and funnel for filtering gasoline may be needed. On the inside back cover of "Log of Lower California," published by the Automobile Club of Southern California, is an excellent check list of supplies.

(3) *Attitude.* "An adventure is only an inconvenience rightly considered," wrote G. K. Chesterton. "An inconvenience is only an adventure wrongly considered." Something of Chesterton's philosophy is helpful in negotiat-

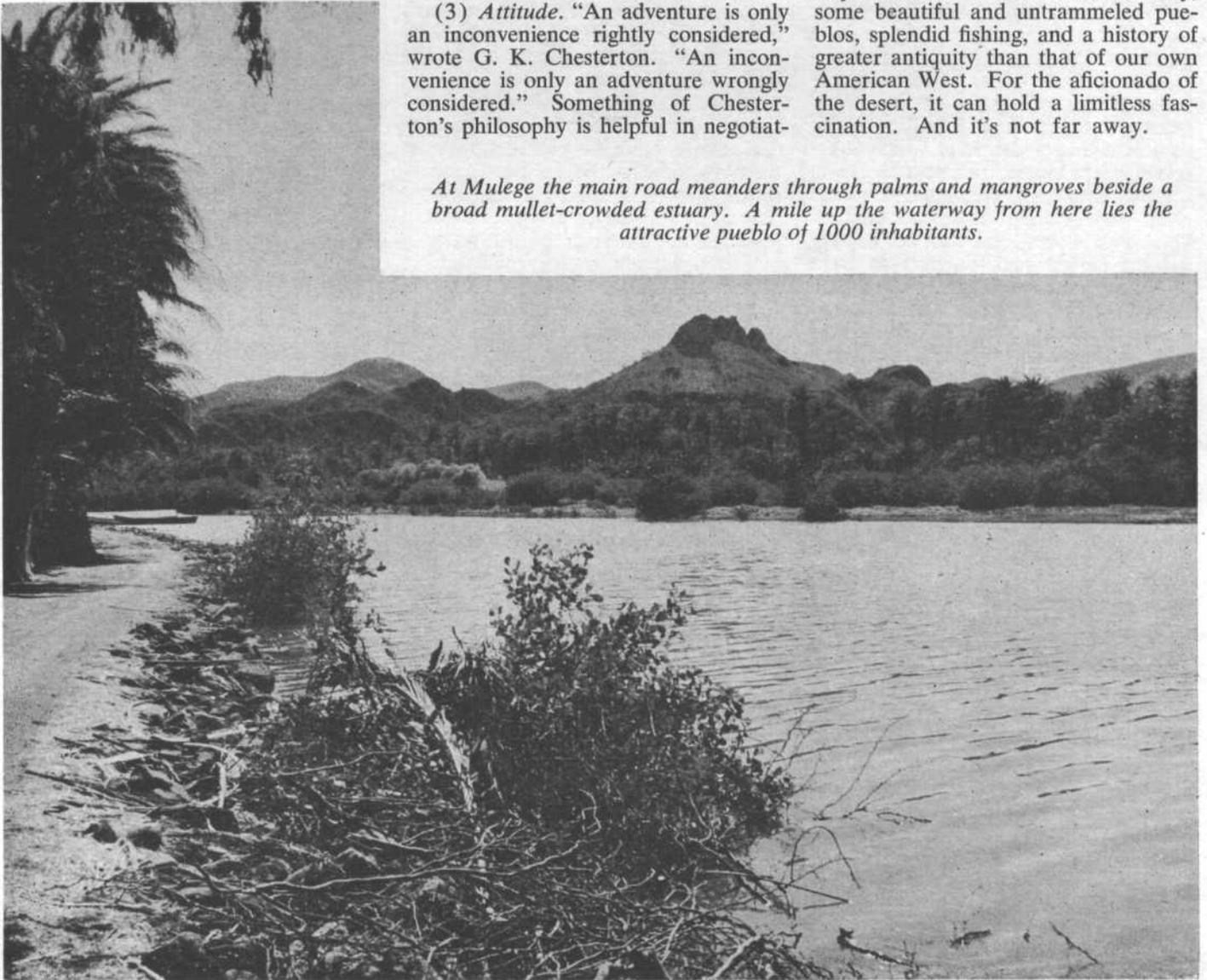
ing Baja's terrain. Remember that even though you may have had experience with miserable roads, driving them for six hours is one thing and driving them for six days is quite another. Don't cram your schedule to the point where it won't admit delays. Plan for mishaps. Then if they are minor, you can rejoice.

The summer months can be uncomfortably hot in Baja and occasional winter rains make the roads impassable in certain sections. Therefore the best time to make a trip is in the spring or fall.

American citizens will need a Tourist Card to drive south of the border towns. Proof of U. S. citizenship, such as a birth certificate, and payment of \$3 are the only requirements. They are obtainable at any Mexican consulate and are good for six-month visits. The Baja traveler should have a smallpox vaccination certificate to show the U. S. border officials upon re-entering this country.

For those who accept its challenge, Baja California offers a vast country, some beautiful and untrammelled pueblos, splendid fishing, and a history of greater antiquity than that of our own American West. For the aficionado of the desert, it can hold a limitless fascination. And it's not far away.

At Mulege the main road meanders through palms and mangroves beside a broad mullet-crowded estuary. A mile up the waterway from here lies the attractive pueblo of 1000 inhabitants.



The Upside Down Mojave River ...

What it lacks in size, the Mojave River makes up in a fascinating array of unusual attributes that have long caused travelers, explorers and scientists to speculate and theorize. This month Dr. Jaeger takes us down the broad sandy bed of this underground-flowing stream to explain some of these phenomena.

By EDMUND C. JAEGER, D.Sc.
 Curator of Plants
 Riverside Municipal Museum
 Map by Norton Allen

THE MOJAVE River of California, a mere pygmy among streams, presents many queer contradictions and wide variances from the usual ways of rivers that have earned for it such apt names as "River of Mysteries," "The Inconstant River," and "Upside Down River."

Unlike most rivers it is largest near its source. At its beginning it is a perennial stream; at its mouth an intermittent or dry one. It flows north-eastward for nearly 140 miles, away from the ocean, and for 90 miles it crosses a thirsty desert in which it receives not a single tributary.

This is a perverse, super-imposed river, not obeying the usual laws of flowing streams. Instead of flowing around buried rock barriers as most rivers do, it has persistently cut a path through them to form several steep-walled narrows along its established way. It has been able to do this because the whole region it traverses was elevated with extreme slowness. Its currents at flood tide shift restlessly like a vagrant from side to side, scouring its banks rather than its broad flat bed.

For over half its length, this strange impoverished river flows underground, just beneath the moist sands that hide its precious water from the onslaught of desert sun. "Upside Down River" it is in truth.

Finally it vanishes completely through a double mouth into two sinks or dry lake beds deep in the desert's interior, Cronise Dry Lake and Soda Lake, the latter sometimes called the Sink of the Mojave.

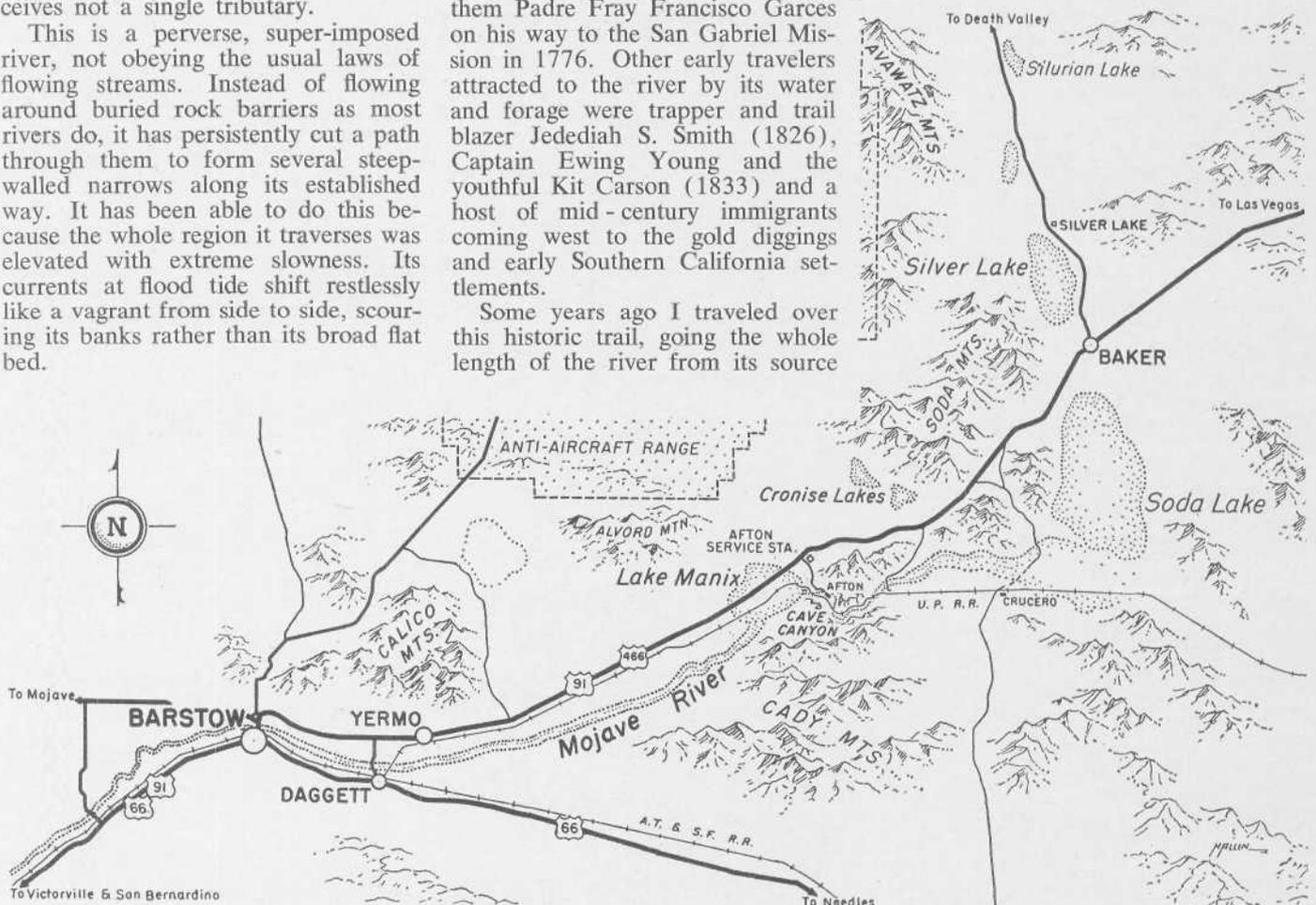
Along the Mojave River's broad sandy bottom traveled in years long past many colorful pioneers, among them Padre Fray Francisco Garces on his way to the San Gabriel Mission in 1776. Other early travelers attracted to the river by its water and forage were trapper and trail blazer Jedediah S. Smith (1826), Captain Ewing Young and the youthful Kit Carson (1833) and a host of mid-century immigrants coming west to the gold diggings and early Southern California settlements.

Some years ago I traveled over this historic trail, going the whole length of the river from its source

in the San Bernardino Mountains to Soda Lake far out on the Mojave Desert. I saw the same sights along the tree-bordered sands of this enchanted river that they saw and in a sense relived their experiences. I have traveled by foot and jeep every scenic mile of it, and of all the fascinating sights, Cave Canyon, where the river flows between the Cave and Cady Mountains, is the most outstanding.

Fray Garces euphoniously named it *Arroyo de los Martiers*, the Canyon of Martyrs. Why he gave it this foreboding name is a mystery. He spoke of it as a place where "grows the wild grape; where there is much grass; also mesquite and trees that grow the screw."

Cave Canyon gets its present name from the three natural caves in its steep metamorphic conglomerate walls at a point where the river sweeps around a sudden circular course and makes a kind of U-bend about a half mile east of Afton Station. According



to the late Elmo Proctor, one of these caves was destroyed in 1904 when the Los Angeles and Salt Lake (now the Union Pacific) Railroad bored a 542 foot tunnel here to avoid going around the river loop. A portion of this cave, it is said, still exists but is walled off by the timbers lining the tunnel.

The other two caves I visited twice. They are shallow but high-ceilinged crypts in the south canyon wall about a quarter of a mile farther south. They are close together and each might offer shelter in inclement weather to a dozen or more men. Since they are the only natural shelters for miles around, it can be presumed that they often were used by both Indian and white travelers. The roof of one still is black with the soot of many old campfires. Each cave is about 15 feet deep and as high. In high floods, water carrying debris comes in and partially covers their floors. High athel trees grow in front of these caves today.

Recently two companions and I camped in the canyon on a night when the moon was bright so we could look at the cliffs in the eerie light. Next day we explored the canyon proper and found it not to be very long, only about four miles, nor is it very deep, the highest walls being not over 300 or 400 feet high. But, what it lacks in extensiveness it makes up in dignity and sublimity. It is a place of great scenic grandeur which sharply contrasts to the rather dull country of low barren hills and broad plains upriver. A sort of land of yesterday. An antediluvian looking place where the scenery is at once austere and highly colorful. At evening, just at sunset, the strikingly beautiful banks of buff and red conglomerates glow with vivid shades of golden bronze, ruddy browns and brilliant magentas.

South of the river, near where it enters the canyon, are a series of steep cliffs made up of the greenish sediments of prehistoric Lake Manix lying beneath the thin layers of more recent alluvial deposits. Some are eroded to form fantastic columns, buttresses and battlements of unusual scenic splendor. On the western side of the canyon are especially beautiful beds of buff and red conglomerates.

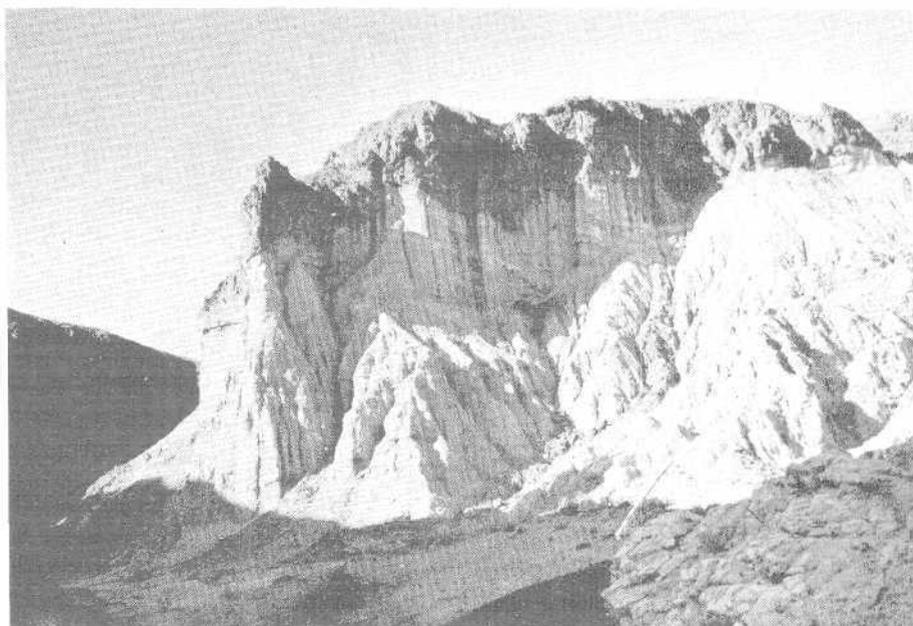
About a mile and a half east of Afton Station where the gorge makes its rather abrupt turn to the north, there is a spectacular and beautiful area of pink, green, yellow, blue-gray and whitish rocks on the east side of the canyon. Here we found a deposit of magnesite which once was mined. Some of the old mine machinery and adjoining structures of wood are perched high on the canyon wall. Ore was transported to the railroad in cars hung from a high cable and a large

coil of that cable now lies rusting on the ground across the canyon near the railroad. The mine has not been worked for many years.

Cutting back through the deep and extensive lake clay deposits are a number of minor canyons. Several run in tortuous north-south directions to end in colorful deposits of lava-capped minerals in the higher parts of the surrounding mountains. Of these canyons, Cathedral Gorge, emerging just south of the railroad bridge upstream from Afton Station, is perhaps the most beautiful. Everywhere in this side-canyon splendid views abound. Here too, we observed to advantage the ways of cliff-dwelling birds. Nests of rock

also in summer when the stream furnishes the only watering place in a wide region of almost total drouth. Among the resident birds I have observed ravens, Brewer blackbirds, red-winged blackbirds, Baird wrens, house finches and English sparrows. During the migratory season I saw Savannah and Lincoln sparrows, western robins and many warblers. Among stream-frequenting birds were killdeers, a wood ibis, a white-faced glossy ibis, an Anthony green heron, several egrets and the black-crowned night heron.

For many years until reduced by hunters, a rather large band of desert sheep dwelling in the nearby barren



In many places the light-colored soils in Cave Canyon are overlaid by near-black lava caps. Photo by the author.

wrens, ravens and prairie falcons, Say phoebes and turkey vultures are in the crevices, niches, pot holes and shelving caves of the vertical conglomerate walls.

An emerging bed of rock near the beginning of the Cave Canyon gorge brings the Mojave's underground waters to the surface for the last time. The small stream runs throughout the year as a "rapid rivulet, its clear waters making melody with the pebbly shore." It is bordered by green meadows of carex, salt and wire grasses and cattails. Even in midsummer there is a steady flow. Here are scattered growths of trees and shrubs: screwbeans, willow, sweet odored baccharis and mesquite. Their greenness always lends to the place a lively atmosphere of cheer and friendliness.

It is a spot, as may be imagined, much frequented by birds, both land and stream-loving species. Not only in migratory season do they come, but

mountains came here to drink. Many of their old trails leading off into the heights still can be seen, especially on the eastern side of the canyon. Above the river bluffs are several rock blinds erected by Indian hunters.

In the water of the Cave Canyon streamlet we were surprised to find not only the California mud turtle (*Clemmys californica*), but several species of small gray minnows. These probably are descendants of fishes which have inhabited the river since Pleistocene times. The waters of the present Mojave River, connected into a single flowing stream only during times of floods, contain only two species of native fish. Both are minnows belonging to the fish family Cyprinidae. The Mojave River chub (*Siphateles mohavenis*), adapted to life in the ancient lakes of geological times, has persisted to the present time and now occurs regularly with the stream minnow *Gila orcuttii*. The two fishes

have interbred freely so that many hybrid individuals, not too closely resembling either parent stock, are found. Some larger fishes such as the catfish have been introduced and are occasionally seen.

Along the stream running through Cave Canyon's sandy bottom is one of the best places to get acquainted with that remarkable small thorny-branched tree, the screwbean mesquite, "the tree that grows the screw" of Father Garces. In winter its gray bark and long sharp silvery thorns are very

conspicuous as are the big clusters of tightly-twisted small inch-long beans still hanging on from the previous summer. The screwbeans comprise the most noticeable woody growth in the canyon, comparatively few willows, cottonwoods and honey mesquites being present. There are low thickets of flowering salt cedars in many places. When these pink-flowered shrubs are in blossom they present a colorful sight indeed.

The Union Pacific Railroad runs the entire length of Cave Canyon. On the

time tables they once advertised this as Rainbow Gorge and for several years attached special roofless observation cars to several of their passenger trains so passengers could better view the scenic splendors of this wonderful gorge.

There is a road of sorts from Afton Service Station on Highway 91-466 to the canyon entrance, about four miles distant. From then on it is mostly a case of foot travel, although jeeps can go farther if they drive through sand and water.

Low Bid for Glen Canyon Dam Is \$27,600,000 Below Estimate

A New York company, Merritt-Chapman and Scott Corporation, was awarded a contract for construction of Glen Canyon Dam on a low bid of \$107,955,522. It was \$10,380,954 under those submitted by three other contracting firms and \$27,652,648 under the estimate of \$135,608,170 made by U. S. Bureau of Reclamation engineers.

At the same time, the Bureau advised agencies of lower Colorado River Basin states that larger gates capable of annually passing the entire flow of the river—even in high runoff years—will be installed in the left diversion tunnel. The Lower Basin agencies had voiced concern that the plan for closure outlined in the bid specifications might be detrimental to downstream interests.

The prime contract is the largest single construction contract in the history of the Bureau, more than doubling the largest previous contracts of \$48,928,100 for the Trinity Dam and \$48,890,995 for Hoover Dam.

Glen Canyon Dam will be the third highest dam in the world, rising about 700 feet above lowest bedrock. Hoover Dam is 726 feet high, and when completed the Mauvoisin Dam in Switzerland will be 780 feet in height.

Glen Canyon Dam will exceed Hoover Dam in volume of concrete. With 4,770,000 cubic yards of concrete in the dam proper, and a total of 5,200,000 yards in the dam and appurtenant works, it will be one of the largest concrete dams in the world.

The 900,000 kilowatt power plant to be installed at Glen Canyon Dam will be the seventh largest in the world.

The contractors will have 2500 days—nearly seven years—to complete the dam, but Construction Engineer L. F. Wylie believes the dam may be finished

well under seven years if all goes well. He said at least one of the eight generators may be in operation by mid-1962.

The major items of work included under the prime contract are (1) drilling of left diversion tunnel, (2) lining both left and right diversion tunnels, (3) building two coffer dams of earth to divert the river around the damsite during construction, (4) constructing the concrete dam from bedrock to crest, (5) constructing the powerhouse and related features, (6) drilling and lining the spillway tunnels and building the spillways.

The remote location of Glen Canyon Dam is one of the major circumstances to be met during its construction, according to the Bureau of Reclamation. The nearest town, Kanab, Utah, is 76 miles from the damsite and the nearest railroad at Flagstaff is 135 miles away. A railhead also is available at Marysvale, Utah, 190 miles from the Glen Canyon damsite.

The cement and pozzolons (volcanic ash materials) used in the concrete would require delivery of a 20-ton truckload to the damsite continuously for every hour of every day for about four and a half years. The steel in reinforcing the concrete, in penstocks and outlets, and in many other installations, will total 35,340 tons, enough steel to produce more than 20,000 automobiles.

Here are some other statistics on the dam: its height will be 700 feet above bedrock and 580 feet above downstream river level; crest length is 1500 feet on the arc of the crest—about 1200 feet in a straight line from rim to rim at abutments; base width is 300 feet; reservoir capacity: 20,040,000 acre-feet extending 186 miles up the Colorado River and 71 miles up the

San Juan; reservoir area: 164,000 acres or 256 square miles; elevation of crest: 3715 feet; maximum water surface elevation: 3711 feet; normal water surface elevation: 3700 feet; maximum downstream river level: 3183 feet; difference in elevation, crest of dam and Glen Canyon Bridge, 113 feet.

THE *Desert* MAGAZINE CLOSE-UPS

"I don't like crowded cities and have always spent every possible minute outdoors," writes Warner G. Tilsher, author of this month's "Garnets in the Inkopah Gorge."

An industrial and management engineer in the East, he gave up his business to move to California where he started a small wood-working shop and went into free-lance photography. He and his wife live in South San Gabriel and their home is surrounded by fruit, berry, vegetable and flower gardens. Their son is in the Army reserve and their daughter is married to a Naval officer.

* * *

Dee Tripp, author of this month's Life on the Desert feature, "Flash Flood!" was born in Savannah, Georgia, and educated in Tampa. She studied short story and article writing under Sanders M. Cummings of Colorado Springs, Colorado. The Tripps now live in Tucson.

* * *

Cucamonga, California, is the home of C. R. Appleby, author of this month's "Vacation in Baja California." Both he and his wife are graduates of U.C.L.A. and both served in the U.S. Marine Corps.

Appleby is associated with *The Daily Report*, published in nearby Ontario. His firm affection for the desert country began 10 years ago during his first newspaper job in the Coachella Valley.



Inkopah Gorge. View is from the top of the ridge above the scarred mountain. At lower right is the old highway which leads to the third garnet field visited by the author.

Garnets in the Inkopah Gorge ...

By WARNER G. TILSHER
 Photographs by the author
 Map by Norton Allen

MID-WAY between San Diego and El Centro, California, scenic U. S. Highway 80 dips southward almost to the Baja California border. In this area and almost at the highway's edge is a favored spot where red garnets in untold numbers await the collectors. I have stopped at these fields for many years now, and the supply of gem stones never seems to run out.

On our most recent visit, we drove east from San Diego, and 75 miles from that city passed through the bright little resort spa of Jacumba—"Hut-by-the-water." It was pleasant

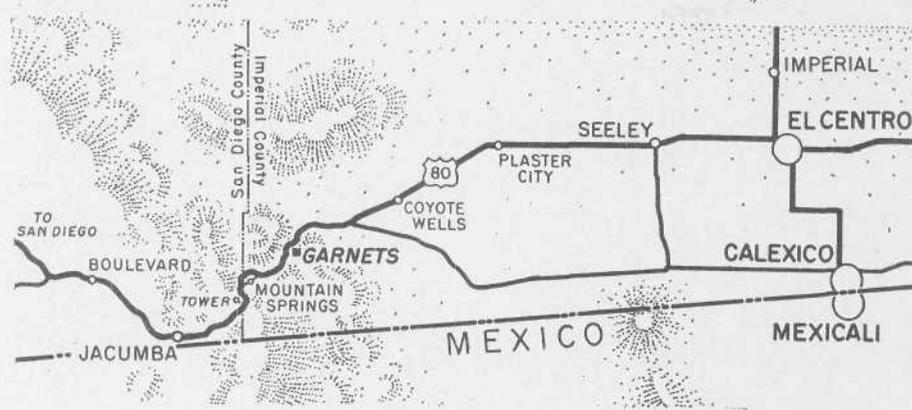
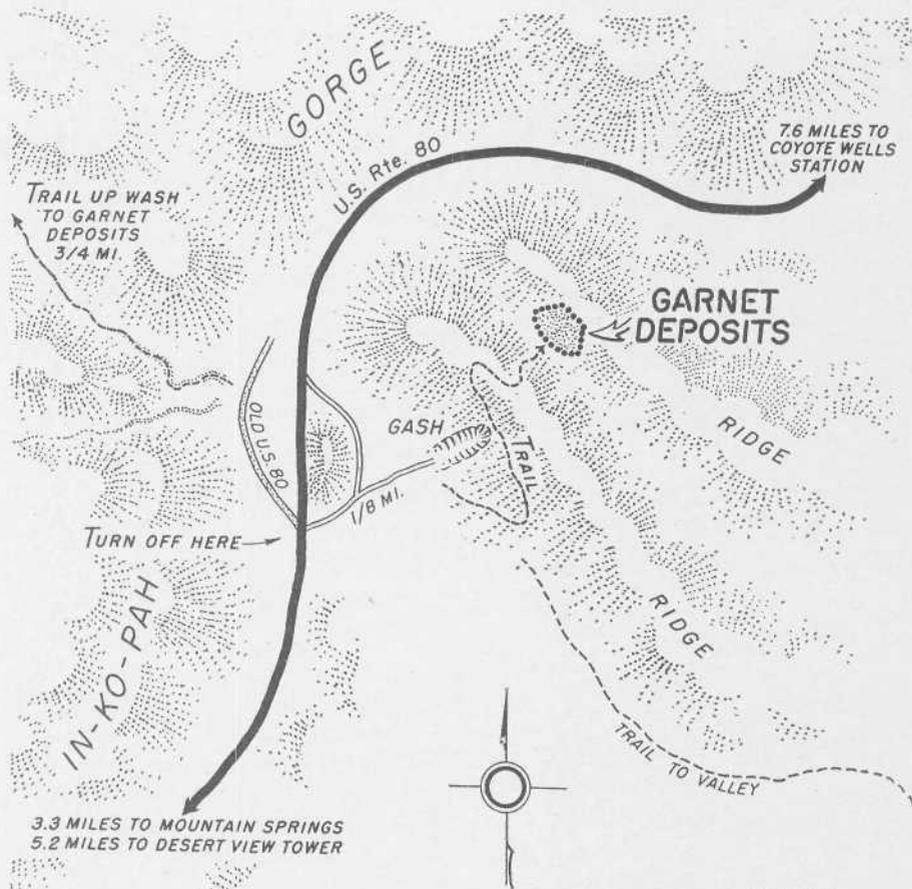
Whether you prefer to collect gem stones near the roadside or to hike up cactus-studded hillsides for them, there is outdoor adventure for all in the Inkopah Gorge on the western slopes of Imperial County, California. For a field trip not only rewarding in red garnet crystals, but in lovely botanical displays and thrilling desert vistas, follow the author's trails in the Inkopah country.

indeed, and what a welcome sight it must have been to the desert-weary men and donkeys of the Yuma mail line. And here it was, over 100 years ago, that a rugged citizen, James McCoy, built a fort from which he held off 400 attacking Indians.

Leaving Jacumba the highway climbs a long but easy grade which levels off at 3000 feet. Just beyond the Desert Tower the road starts its long glide down through the fabulous Inkopah Gorge to the floor of the Colorado desert.

One glance at the rugged terrain told us why this highway was looked upon as a major feat of engineering when finished in 1913. At each twist and turn of this rocky bob-sled run, the desert stretched out below us to the bluish haze of the far off mountains.

A few miles down the gorge the highway curves around Mountain Springs, cool and invitingly green in its nest of giant boulders. We parked here, crossed the road and climbed



underneath the loose rocks. Garnet-bearing rock runs all through these mountains and there probably are many outstanding gems waiting for the rockhound with time and ambition to find them.

Some of the adjacent mining property is being worked by a new company, Tyce Engineering of Chula Vista, and the usual no trespassing signs are up. However, Tyce told me that as long as rockhounds did not bother anyone at the mine or its equipment, they have his permission to explore the garnet deposits.

The second trail at the gash—the one into the hidden valley—brought us into a botanical wonderland. This is a warm and pleasant valley with a moonscape look, where one can wander for an hour or a day, kicking off some of your worries along the sandy washes.

This beautiful garden is so neat and orderly, it looks like it was planted and tended by a phantom caretaker. Here grew the greatest variety of desert natives I had ever seen for such a small area.

A little fish-hook cactus crouched behind the apron of a big tough barrel cactus; staghorns that asked for and gave no quarter; agaves shooting their flower stalks straight up into the blue; the desert's armored upside down octopus, the ocotillo; and dozens of other plants—each busy with its personal struggle for survival.

Fascinating at all times, the desert garden really had its hour of glory on this spring day. Dull and gray the rest of the year, the ocotillo flung out its flaming red flags against the brilliant sky while the thorny ground-huggers spruced out in boutonnières which, quite unlike anything else on this earth, look as if Nature had made them from shavings of delicately colored wax.

There is a third garnet field in the vicinity that we visited that day. We crossed Highway 80 a little north of the turn-off at the hill and picked up the old road. Where this road starts to bend around to the right, two washes almost meet after angling down from the mountains to the west. We hiked up the wash on the right which twists through a maze of boulders and

over the bank. Almost immediately we saw the white outcroppings of rock and found some red garnets imbedded in the quartz. They were small, but nice specimens. Some extra fine gem quality stones have been found in the essonite deposits in this area.

But this was only a preview of what awaited us that day. We returned to the car and continued down grade, keeping a sharp eye to the hills on our right. Our landmark was a long white gash on the face of the mountain, left over from a mining operation. The scar runs from the bottom of the hill to about half way up the side and is hard to miss. But, drive slowly for by the time you sight it, you will have just enough leeway to make the sharp right

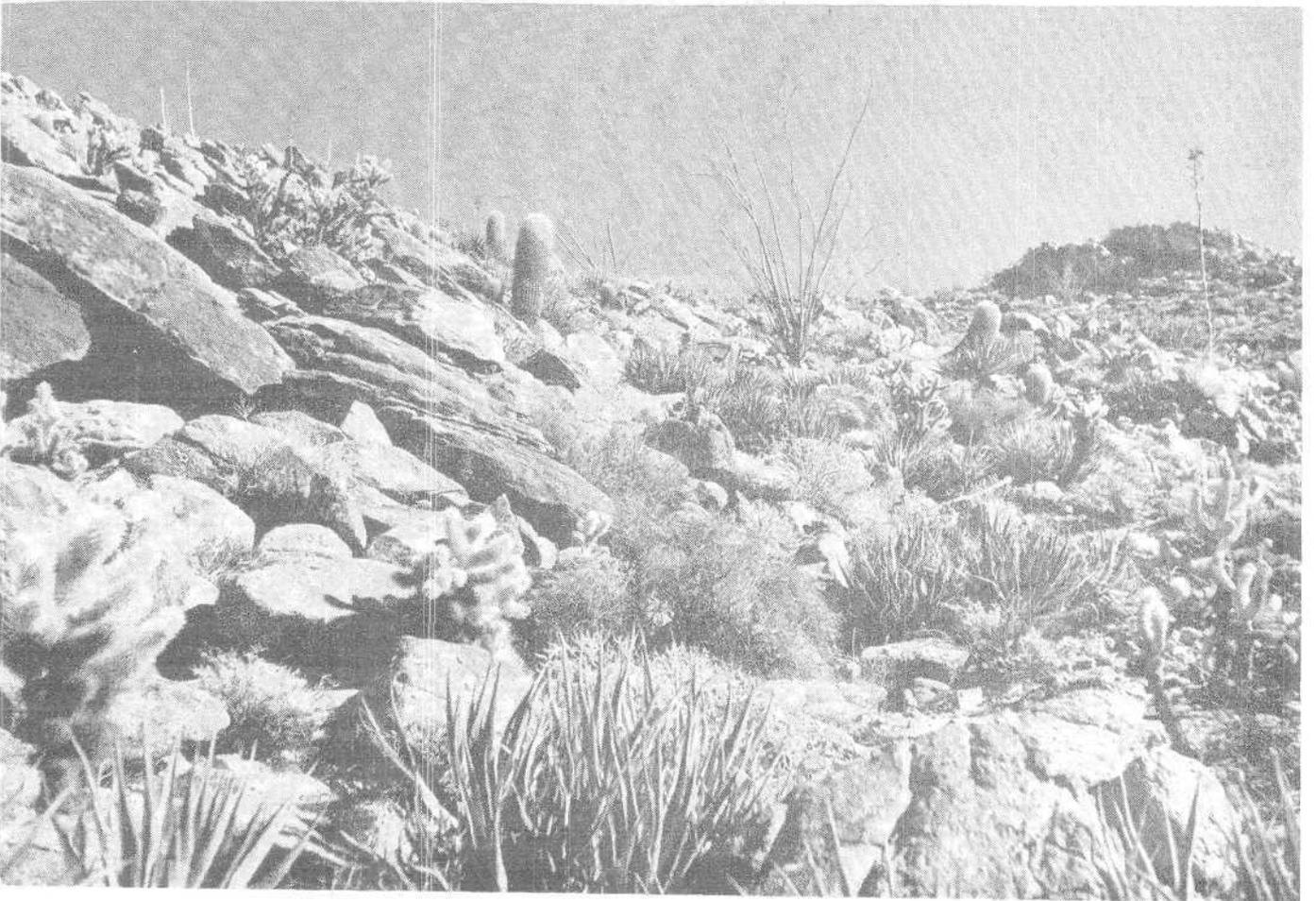
turn down the short dirt road which leads directly to the foot of the gash.

If you are driving from the direction of El Centro, start looking for the gash after passing Shepard's Bridge, a few miles west of Coyote Wells.

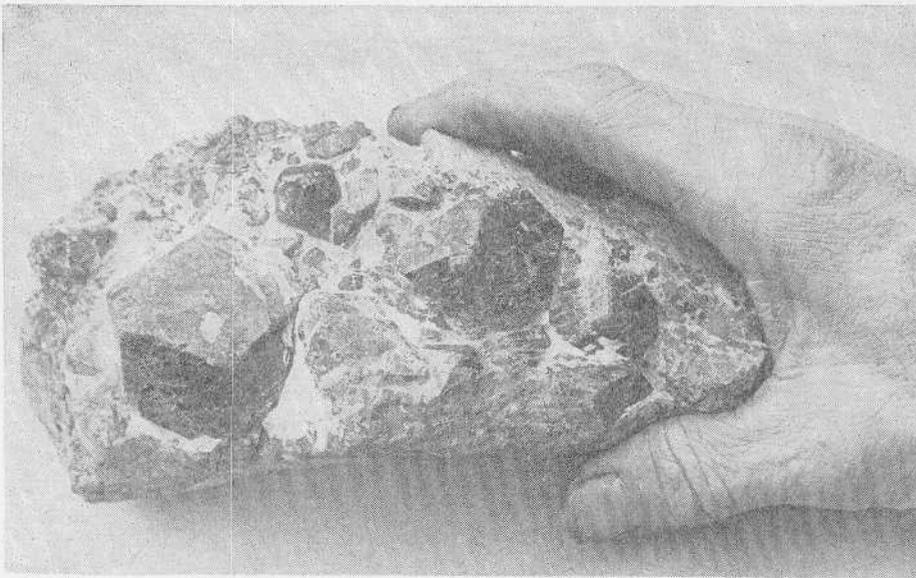
To the right of the gash are two trails—one twists left up the hill and the other leads off to the right into a hidden valley. The hill trail is easy walking and directly over the top it drops off into a gully. Part way up the other side of the next ridge is another garnet field. Crystals by the handful are everywhere. Those lying loose are a nice amber brown color, but are weathered and crack easily. With a bit of work we had little trouble prying out some good specimens from

Top—The garnet is found in the light-colored outcroppings along the ridges.

Bottom—A gem in its own right is this rare desert garden in the hidden valley.



JUNE, 1957



Cluster of garnets from the Inkopah diggings.

leads up to a warm cactus-studded hillside.

Choice garnet crystals are scattered over the hillsides here and we collected some nice cabinet specimens. But, equally rewarding is the grand vista from this high perch. Being way

up here makes a fellow feel pretty good inside. Looking up at a towering redwood tree makes most of us shrink a bit — looking down from a desert mountain tells you up—especially if you make it up there on your own two legs.

Cash for Desert Photographs . . .

Wherever your travels take you in the Southwest, unlimited camera subjects await you. Add to this the region's sun-filled days and shadow-etched backgrounds and the combination of setting and subject is matchless. If you are a desert enthusiast who regards a camera as standard travel equipment, Desert Magazine's monthly photo contest can add both enjoyment and cash profit to your hobby. It's a simple contest to enter and is open to both professionals and amateurs.

Entries for the June contest must be sent to the Desert Magazine office, Palm Desert, California, and postmarked not later than June 18. Winning prints will appear in the August issue. Pictures which arrive too late for one contest are held over for the next month. First prize is \$10; second prize \$5. For non-winning pictures accepted for publication \$3 each will be paid.

HERE ARE THE RULES

- 1—Prints must be black and white, 5x7 or larger, on glossy paper.
- 2—Each photograph submitted should be fully labeled as to subject, time and place. Also technical data: camera, shutter speed, hour of day, etc.
- 3—PRINTS WILL BE RETURNED WHEN RETURN POSTAGE IS ENCLOSED.
- 4—Entries must be in the Desert Magazine office by the 20th of the contest month.
- 5—Contests are open to both amateur and professional photographers. Desert Magazine requires first publication rights only of prize winning pictures.
- 6—Time and place of photograph are immaterial, except that it must be from the desert Southwest.
- 7—Judges will be selected from Desert's editorial staff, and awards will be made immediately after the close of the contest each month.

Address All Entries to Photo Editor

The Desert Magazine

PALM DESERT, CALIFORNIA

LETTERS

Test for Doodle Bug Engineers

Los Angeles, California

Desert:

During my many years in mining and prospecting circles and more especially since the appearance of my story, "We Lost a Ledge of Gold," in the September, 1955, *Desert*, I have had many dealings with Doodle Bug Engineers.

A Doodle Bug is a contraption that usually is hung on a string or wire and manipulated by the engineer who holds the other end of the line in his outstretched hand. In essence they all work the same—supposedly swinging toward the metal, vein or object desired with pendulum motions, or in circles when directly over the desired object.

The engineer usually claims that he has an excess of static electricity in his body that gives him this power to make the Bug function. After the Bug has "located" the treasure, the engineer often estimates depth and amount of treasure—but seldom takes his coat off and helps with the digging.

The Bugs are all different, most are home-made—and none shown to me could pass a simple test I set up for them. I pass this test on to your readers so they will not be misled by these miracle machines.

Go to a metal salvage yard and buy a five or 10 pound piece of pure copper as compact as possible. For silver go to your bank and ask for 25 or 30 silver dollars. These two metals usually are enough, but if you must use gold, you can rent it from a dentist or jeweler's supply smelter. Be sure it is 1000 fine, however, and do not use old watch cases. Another possible metal to use is zinc. All four metals are non-magnetic. Do not use steel, iron or anything else that is magnetic for this test. And do not make this test in your backyard, for the Engineer will claim that your neighbor's silver and gold is confusing the Doodle Bug.

Bury your metals in separate holes, about two feet deep, along a 50-foot line stretched between two broomstick handles. Be careful not to leave signs on top of the ground of your diggings—I usually rake the whole 50 feet under the line to eliminate all traces.

And when this is ready, ask the Doodle Bug man to walk along the plumb line and locate the separate metals. Be sure to ask him before the test if he can locate five or 10 pound deposits for his first excuse will be

that his machine is set for larger bodies of ore.

I have never found a Doodle Bug that could pass this simple test.

Enjoy yourself on your desert trips. If you find an unusually heavy rock, quartz vein or anything else of interest, send it to a qualified assayer. He will determine if the find is worth working—and if it is, you can hire a qualified field engineer to supervise this work. But, don't dig holes on Doodle Bug swings.

ASA M. RUSSELL
5143½ Almaden Drive

Memories of the Early Desert . . .

San Clemente, California

Desert:

While enjoying the sun in a delightful spot in your desert area recently my thoughts drifted back 45 years to the day when my mother and I arrived in Lancaster on the high Mojave country and opened a real estate office in an abandoned saloon. Not a paved road within 40 miles, no electricity and for water we piped into a neighbor's water tank.

Through the years both the faint and stout of heart took up the battle with a resisting desert and its allies of wind, cold and heat. Now, nearly a half century later, big machines that rip and tear out brush have replaced the railroad iron with a team hitched to each end, and powerful land planes flatten out a sand dune in a day—a challenge that would have taken a rugged early day rancher weeks or even months with his team and fresno scraper.

Courage and vision, together with our matchless progress in engineering, have conquered the desert. The radio beside me at this desert spa gives the slogan of an engineering firm: "Progress is our most important product." What a wonderful world this would be if, through the years, we had made the same progress in love and understanding — in being neighborly and unselfish. It was the sharing with others of our work, equipment and know how—of just being friends with people — that remain as our most pleasant memories of the early desert days.

FRANK B. RUTLEDGE

Good News for Avery Moss . . .

Weed Heights, Nevada

Desert:

I wonder if any of your readers can help me locate Avery Moss, who was in the cattle and meat business in Arizona. Last time I saw him he was at Yuma 15 years ago. I have a check for him, in payment for an interest in some mining claims.

THOMAS W. BRETT

More on Tamarisks, Tamaracks . . . Twentynine Palms, California Desert:

What goes on with this tamarack-tamarisk business? In the March letters, C. N. Clinesmith refers to "Harold O. Weight's calling your desert tree the tamarisk a tamarack."

I never have called the tamarisk a tamarack. And *Desert Magazine* more than once (and apparently unsuccessfully) has attempted to dispel the tamarisk-tamarack confusion.

For the record, in identifying a turn-off to a field trip I mentioned the Tamarack District. The Tamarack District is named for the Tamarack Ranch. As the editor of *Desert* pointed out, both are old and well-known place names in Imperial Valley. They will be found on official road signs, private

ranch signs and the maps of the Automobile Club of Southern California. It would have been silly and confusing for me to attempt to change the spelling to Tamarisk Ranch. Also it would have been wrong.

The Tamarack Ranch was not named for a tamarisk tree. It was named for a large tree still growing on the ranch, which Lucile and Eva Wilson believe to be a Casuarina, an Australian tree named for its resemblance to the drooping feathers of the Cassowary bird. Casuarinas are not relatives of the tamarisk—but, according to botanists, they are "easily mistaken for pines." That probably explains the reason for the Tamarack name, and takes the question entirely away from the tamarisks—I hope.

HAROLD O. WEIGHT

TRUE OR FALSE:

If you are one of those unfortunate persons who find it painful to be wrong, then do not take this test. For unless you are some kind of a prodigy you will miss some of these questions. But if you don't mind making a mistake, then True or False will be fun, and perhaps you'll learn something from it. If your score is 13 to 15 you have a fair knowledge of the Southwest desert. Sixteen to 18 is excellent. Very few people have a breadth of knowledge which will enable them to score over 18. Answers are on page 34.

- 1—An arrastre was used by pre-historic Indians to kill buffalo. True..... False.....
- 2—Smoke trees commonly grow on sand dunes. True..... False.....
- 3—Blossom of Larrea, commonly known as creosote or greasewood, is yellow. True..... False.....
- 4—Brigham Young was leader of the westward Mormon trek to Utah. True..... False.....
- 5—Scotty's Castle in Death Valley is a reconstructed prehistoric Indian ruin. True..... False.....
- 6—The chief industry of Searchlight, Nevada, is sheep-raising. True..... False.....
- 7—Camelback Mountain is visible from Phoenix, Arizona. True..... False.....
- 8—California's Salton Sea was a popular watering place for prospectors prior to 1900. True..... False.....
- 9—The Indian Pueblo, San Ildefonso, is located in New Mexico. True..... False.....
- 10—Going west on Highway 66 through Arizona, the motorist would pass through Holbrook before coming to Flagstaff. True..... False.....
- 11—Meteorites often contain nickel. True..... False.....
- 12—The Havasupai Indians sell pottery at little roadside stands along the road leading into their village. True..... False.....
- 13—The Chaparral Cock and the Road Runner are two names for the same bird. True..... False.....
- 14—Intake on Lake Havasu for the Metropolitan water aqueduct is upstream from Parker, Arizona. True..... False.....
- 15—Hopi Indians use only rattlesnakes in their annual Snake Dances on the Hopi Mesas. True..... False.....
- 16—Mohs' scale is a system for classifying the hardness of minerals. True..... False.....
- 17—The King snake is non-poisonous. True..... False.....
- 18—Kit Carson helped Wyatt Earp clean out the lawless element in Tombstone, Arizona. True..... False.....
- 19—No human being has ever stood on the top of Rainbow Natural Bridge. True..... False.....
- 20—The Valley of the Goblins is in the Painted Desert of Arizona. True..... False.....

Indians and the Good Earth . . .

Aurora, Illinois

Desert:

After reading your April editorial I am inclined to believe that the Indians who killed the two prospectors for desecrating the Good Earth mentioned by Harry Goulding are far different than the Indians of today.

We have made many trips throughout the West and have always felt kindly toward the Indians, in spite of a couple of disappointing experiences with them.

I am one who loves to spend his vacations with his family on trips to the Indian country. I have an inexpensive movie camera and while traveling through Arizona recently I stopped at a hogan and asked the Indian children in front of it if I could take their

pictures. One of them went into the hogan and a moment later returned and said, "Yes, you can take the pictures if you pay us \$5.00." I did not feel that I could afford such a luxury, so drove on.

Another instance, and more to the point raised earlier in this letter, was the roadside scene near an Indian Reservation. There were hundreds of tin beer cans and bottles strewn along the highway for several miles—but only on one side of the highway—the one the Indians drove on their way home from the nearby town. The other side of the road was free of litter.

If this isn't desecrating the Good Earth, then digging a few prospect holes isn't either.

But, I hesitate to point my finger at the Indian whose lands were not only desecrated by many white people, but

actually stolen from them. I am ashamed at the way we have treated the Indians.

We point with scorn at those nations who would subject the people of other countries to their will, while we are guilty of so much injustice ourselves.

CLAUDE VALENTINE

Dear Mr. Valentine:

You and Harry Goulding are both right. Harry was talking about the older generation—your experience was with the new generation.

Indians are human beings—just like you and me. There are good ones and bad ones—honest and dishonest. They are all going through a critical period of change. Americans are doing the same—and it is true all over the world for that matter.

Young people generally have a different set of values than old people—and that is true on the Indian reservations no less than in our American cities.

The final test of every situation—of every marriage, of every fraternal or civic organization, of every form of government, and every ideology and religion, is whether it brings out the best or the worst in the human beings who come within its influence.

Certainly the white man's liquor is not bringing out the best in the Indians, any more than it does in white Americans. Perhaps it is too soon yet to form a conclusion as to whether the white man's civilization as a whole is good medicine for the Indians or not. I do not know the answer.—R.H.

• • •

Program for Meteor Hunters . . .

Sedona, Arizona

Desert:

Paul Linsley's letter in the April *Desert* suggesting the formation of a Meteorite Hunting Club surely merits consideration. I hope the following suggestions prove helpful:

Meteorites are very rare among the rocks on our planet and all organized efforts to find them should include sufficiently broad programs so that no excursion will prove entirely fruitless. I can predict with confidence that many searches will fail to turn up meteorites, but they can be planned so they will be interesting and educational whether meteorites are found or not.

Meteorite hunters should make special studies of those varieties of terrestrial rocks which are most often mistaken for meteorites. A collection of pseudo-meteorites should be made and studied along with various kinds

Hard Rock Shorty of Death Valley



A lone prospector, dust-covered and dragging his feet with weariness as he plodded behind his burro, trudged down the sandy trail toward Inferno store.

"Huh!" said Hard Rock Shorty, perched on the bench under the leanto porch of the dilapidated frame building. "Guess Ol' Pisgah Bill ain't found his mine yet. He'd be steppin' along spryer 'n that if he had any gold in his poke."

The well-tailored tourist who had stopped for a tank of gas, waited for Shorty to go on with his story. Finally, he could restrain his curiosity no longer. "You mean he's got a gold mine out in those hills?" he asked.

Shorty's only response was a grunt. But the tourist wanted to hear more about that gold mine, and kept asking questions. Finally Shorty, seeing there was no other way out, continued.

"Yu see it was this way, stranger. It all started with that bee cave up Eight Ball crick. Wasn't much sugar durin' the war, and Pisgah'd lost his ration book anyway, so one day he took his burro an' went up the crick to rob a wild bee hive. He filled a couple of them cement bags, which he'd cleaned out, an' hung

'em over the pack saddle. But the paper wuzn't as strong as Bill thought, an' on the way home one o' them bags busted an' leaked honey all over the burro. It wuz an awful mess, an' when Bill got back he turned the burro loose fer a few days.

"When that burro didn't show up fer a week Bill went out lookin' fer 'im. Finally found him up the canyon near them soda springs. The hair o' the animal wuz all caked with sand where he'd been rollin' in the gravel. As Bill wuz lookin' the beast over tryin' to figger how to get rid o' that sand an' honey, he saw somethin' shinin' on the side o' the burro. It was a speck o' gold. So Bill scraped all the sand he could get off'n that burro's hide an' brought it back to camp an' panned it out. That sand wuz lousy with color.

"Somewhere out around this desert that burro did his rollin' in a rich placer field. It might be two miles away or twenty, and Bill hasn't any notion which direction. He's blame near wore hisself out this winter pannin' gravel all over Death Valley and its side canyons—but I know by his looks he didn't find it today."

of true meteorites. The Club headquarters could maintain a growing collection of iron concretions, sulphide nodules (found in shale and coal beds), basaltic pebbles and boulders, oxidized bits of artificial steel, etc.

An important activity of such a club should be laboratory examinations and tests on all kinds of suspected specimens. (A series of such tests is described in my book, *A Comet Strikes the Earth*, pp. 51-60). Our museum is always glad to assist with identifications that prove too difficult for those less experienced.

Encouragement for Linsley's suggestion may be found in the fact that nearly all of the meteorites discovered in the United States during the past 30 years have been recognized by individuals who had received such instruction as I have outlined above either in a lecture or by visits to museums where meteorites are displayed.

H. H. NININGER

American Meteorite Museum

• • •

Calcified Wood in Utah . . .

Atascadero, California

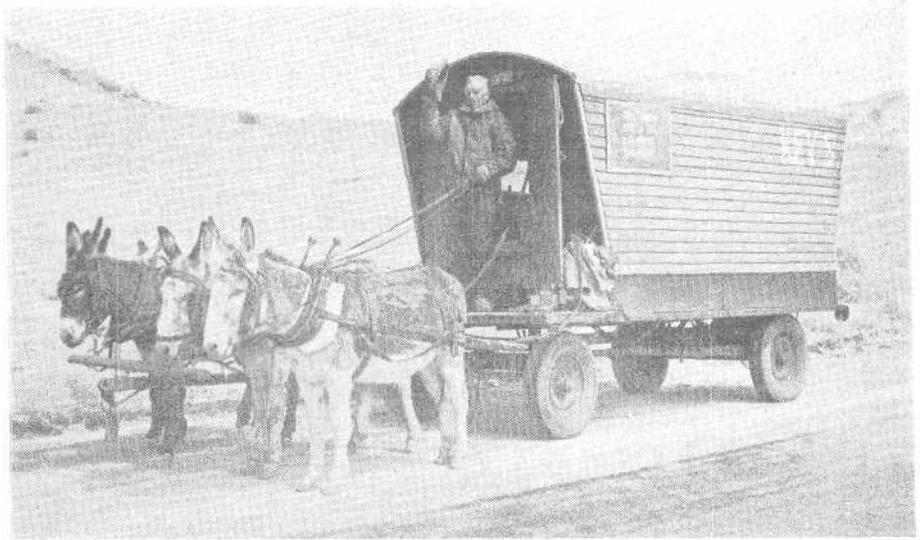
Desert:

Thanks to *Desert Magazine*, my wife and I have become very interested in rockhounding. The thing that came most forcibly to mind while attending a recent gem and mineral show were the times during my youth in Utah that I kicked aside or ignored many treasures at my feet. I discovered geodes by the score and found a plateau covered with petrified wood. Some day I hope to return to see if I can relocate some of these collecting areas.

My terminology may be wrong, but among the specimens I saw as a boy were calcified branches. Many people probably are wondering how these branches became calcified. At Woodside, which is approximately half way between Price and Greenriver, on Highway 50, a wildcat driller sank a hole in search of oil and then abandoned it when it proved unsuccessful. Soon afterwards it began to spout water regularly in 10 to 12 foot geysers. I remember many people stopping beside the dusty road to marvel at this little Old Faithful.

Before long vegetation began growing around the dampened edge of the geyser's sink. Dead branches were coated with this highly mineralized water and when I returned to the geyser after an absence of several years the ground was covered by these hardened and beautiful formations. I knocked off a piece and brought it home to show my parents. We admired it and then tossed it aside. How foolish and thoughtless I was.

LAURENCE CHRISTENSEN



Chris Hansen waves from his burromobile.

He Goes By Burromobile . . .

Four miles an hour is average speed for Chris Hansen's burromobile—but, it's fast enough for this genial locksmith of the Southern California back roads . . .

By VERNE RANDALL

SHOULD YOU happen to be driving along one of the desert highways in Southern California and suddenly hear the tinkle of tiny bells, you might imagine that Kris Kringle and his celebrated reindeer are somewhere in the vicinity. But, it is more likely to be Chris Hansen in his quaint red rubber-tired rig being pulled along by his four Spanish burros, Pete, Suzy, Pedro and Poncho, with small brass bells jingling around their necks.

I met Chris and his burros moving along at the unsensational speed of four miles an hour on the Mojave desert between Mojave and Monolith. However, you are likely to meet Chris and his strange rig as far north as Bakersfield or as far south as Indio and the Salton Sea.

Chris is a native of Denmark and came to this country in 1911. He is a medium-sized elderly man of stocky build whose ruddy complexion, twinkling-blue eyes and gray-blond hair together with his amiable smile and native accent give evidence of his Scandinavian heritage. A bachelor, he has been an itinerant tool-grinder for 30 years.

His only companions on his travels are his burros. They also furnish the motive power for his vehicle. In addition to tool-grinding, Chris files saws, sharpens scissors and lawn mowers and makes duplicate keys.

His quaint rig serves as home, shop

and transportation and his address is wherever he happens to be. The wagon is stocked with the tools of his trade including a small gasoline motor to turn his grindstone. There is a bunk at the rear, a small butane gas range used both for cooking and heating, an ice box, a small table and a butane gas lamp.

Chris' unique rig not only rides on rubber tires, but his burros walk on rubber as well. He has found that it is less expensive to keep his burros shod with horseshoes fashioned out of old rubber tires. Besides the longer wear with less noise, they give better traction to the animals.

About 10 years ago Chris used a motor truck, but now finds his present means of transportation more economical and satisfactory. "I don't like to stay in one place very long—got to be on the move—see things, meet people, and be my own boss—besides it's less expensive," he told me.

Chris feeds his burros twice a day on barley and hay, and sometimes they are left to forage for themselves on the desert vegetation which grows alongside the highways. A bale of hay is usually slung to the back of the wagon just in case they should run out of feed between towns. As an itinerant tool-grinder Chris provides a useful service to the farmers and ranchers living in the desert as well as to the people in the small towns through which he passes.

The sight of four plodding shaggy burros jingling tiny bells as they slowly pull a quaint little red rig along is the unique trademark of Chris Hansen's occupation and way of life—a striking contrast to our present era of supersonic speed and acceleration.

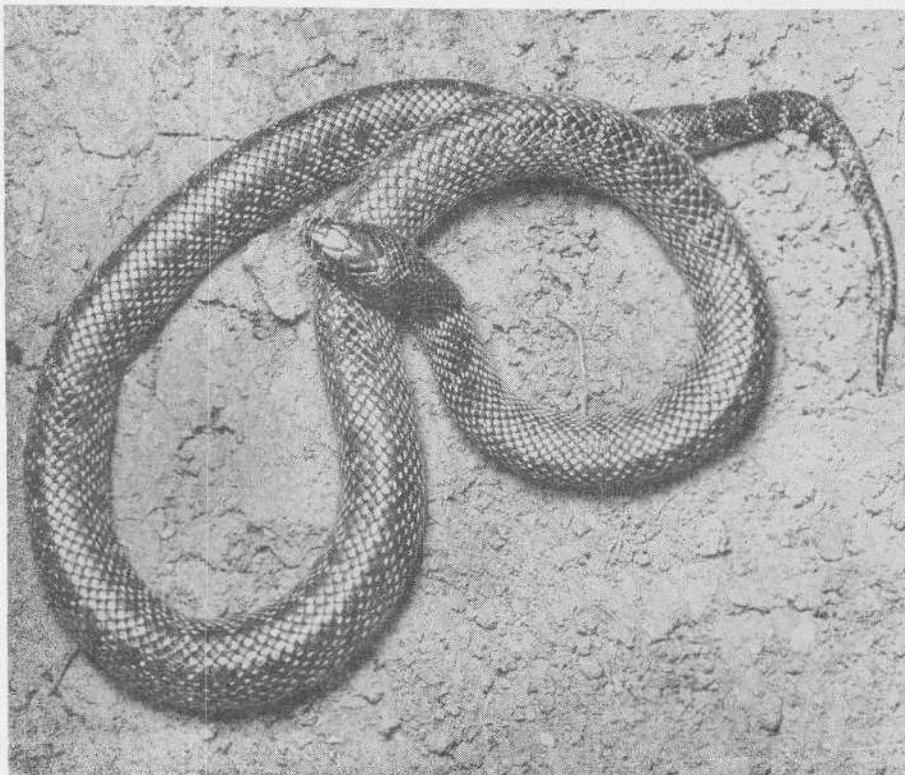
King Snake is Immune to Poison

The two serpents pictured on this page, although bearing strikingly different markings, are members of the same family. Part of the diet of these and other King snakes are any other snakes that happen along—including rattlers, moccasins and poisonous corals—for the King snake is relatively immune to their venom.

By GEORGE M. BRADT
Photographs by the author

KING SNAKES (Genus *Lampropeltis*) are distinguished by their striking markings, satinsmooth scales, short tails and practice of eating other snakes. This last trait is particularly interesting when we consider that even the poisonous coral, moccasin and rattlesnakes are among its victims. The popular belief that King snakes purposely seek out poisonous species is, however, untrue. They simply eat any snake they happen to find. If the prey is poisonous, the King snake's amazing degree of immunity to snake venom protects it from serious consequences.

Sonoran King Snake (Lampropeltis getulus splendida). This handsome shiny black creature with a bright yellow dot on each scale, ranges from northern Mexico into southeastern Arizona and western New Mexico.



Banded King Snake (Lampropeltis pyromelana) or Arizona Mountain King Snake. This gorgeous species has bright white rings separated by black bands split with vivid red. Its whitish snout differentiates it from its near relative, the Coral King snake. It is found from northern Mexico through Arizona and New Mexico into Utah.

This resistance to venom is upwards to 100 times greater than in mammals of similar size.

Snakes are all carnivorous predators. Most species are of an opportunistic nature and eat a varied fare: small mammals, birds and eggs, insects, amphibians and reptiles. Their prey is detected by sight, bodily warmth, smell

or by merely bumping into it. When food is plentiful a snake's appetite is prodigious; yet the same snake that stuffs itself on two dozen mice at one feeding can survive an entire year on three or four large meals. Snakes cannot live without water, however, and they drink much as a horse does, with nose under the surface of the water.

For a limbless and comparatively helpless animal, snakes have solved the problem of capturing live and elusive prey admirably. Some species seize their victims in their mouths and immediately swallow them. Others hold their prey down with body coils until subdued, or constrict it, or poison it.

While the first method seems the easiest, it precludes the taking of large or active prey. The second method is used only by fairly long and heavy types such as the whipsnakes and racers. The third by species sufficiently powerful to stop their victim's heart action by squeezing as do the boas and pythons, and our own bull, pine and King snakes. The fourth is used solely by species possessing the necessary poison-producing apparatus.

King snakes make interesting pets. While individuals may strike and bite when first captured, they usually become quite docile. Not only for their snake diet are these fine snakes beneficial to man. They help farmers by eating destructive rodents. They should be protected wherever found, not only as an ally in man's war against rodent pests and poisonous snakes, but as a beautiful member of American wildlife.

Here and There on the Desert . . .

ARIZONA

Glen Canyon Study Planned . . .

FLAGSTAFF—Several groups of scientists soon will begin a race against time to make all the archeological discoveries possible in Glen Canyon before water rising behind the projected dam engulfs the area. Miss Gene Foster, an associate of the Northern Arizona Museum, is scheduled to head three separate month-long expeditions this summer along the Colorado River. Traveling by boat from a point above the upper reaches of the lake which will eventually form behind the dam, the expeditions will explore all possible sites of prehistoric dwellings, burials, etc. William C. Miller of Mount Palomar, California, also a museum associate, will conduct a similar search in Navajo Canyon. Federal law requires that such a search be conducted before the land becomes inundated and the Department of Interior has contracted with the museum for the actual survey work.—*Phoenix Gazette*

Drouth Is Over, Expert Says . . .

TUCSON—The two-year Arizona drouth has ended, believes Dr. Robert R. Humphrey, associate professor of range management at the University of Arizona. It was the opinion of many that prior to the winter rains, the state was in the worst dry cycle in 700 years. Ranchers rated range prospects as "excellent."—*Phoenix Gazette*

Plans New Canyon Trail . . .

GRAND CANYON—D. F. Hamblin of Kanab, Utah, operator of a guide service and lodge on the north rim of the Grand Canyon, reported that he is planning to make a new trail to the bottom of the canyon. The proposed trail would take off from the South Saddle Mountain. — *Southern Utah News*

State Creates Parks Board . . .

PHOENIX—A bill creating a state park board was signed into law by the governor. The controversial measure is described as a compromise between the Arizona Parks Association, cattle interests and the Legislature. A director, to receive a salary not more than \$8400 annually, will supervise the Parks Department activities under the bill. Of the seven board members, one would automatically be the state land commissioner, with the other six appointed by the governor. The board could acquire up to 160 acres of land for each park.—*Yuma Sun*

Elk Kill Totals 302 . . .

PHOENIX—Hunters killed 302 elk during the 1956 season, the state Game and Fish Department reported. Hunter success average was 19.1 percent compared to 29.3 percent in 1955.—*Safford Guardian Farmer*

Bracero Wage Demands Made . . .

NOGALES, Mexico—A strong demand for the national minimum wage of \$1 an hour for Mexican braceros working on American farms was made by Mexican and U. S. union leaders at a three-day labor conference in April. The resolution passed said the present section of the international bracero agreement calling for payment of "prevailing wages" was "ambiguous" and "permits the payment of wages which fall far below the requirements of the American people's concept of adequate wages for a healthy economy."—*Yuma Sun*

Solar Heat Prizes Offered . . .

PHOENIX — The Association for Applied Solar Energy announced it will award \$5250 in prizes to winning architects of its international contest to obtain designs for a solar-heated Phoenix climate house. Contest closes August 15 and entries should be sent to James M. Hunter, 1126 Spruce St., Boulder, Colorado. The winning residence will be constructed at Sundown Ranch in Paradise Valley and will be the focal point of the 1958 solar house symposium.—*Phoenix Gazette*

Hohokam Ruins Found . . .

FORT HUACHUCA—The remains of a village of the Hohokam Indian tribe, one of the oldest Indian people to have lived in the Southwest, were discovered at the mouth of Garden Canyon on the Army Electronic Proving Ground at Fort Huachuca. Various artifacts including pottery, grinding stones and other stone implements and arrowheads, both bone and stone, marked the site of the village found by two Fort Huachuca soldiers.—*Tombstone Epitaph*

CALIFORNIA

Salton Corvina Again Spawn . . .

SALTON SEA — Ocean corvina transplanted in Salton Sea from the Gulf of California again have spawned, adding to the bright hope for good future fishing. Department of Fish and Game research workers report netting of three-inch baby corvina. — *Inyo Register*

Death Valley Loop Road Asked . . .

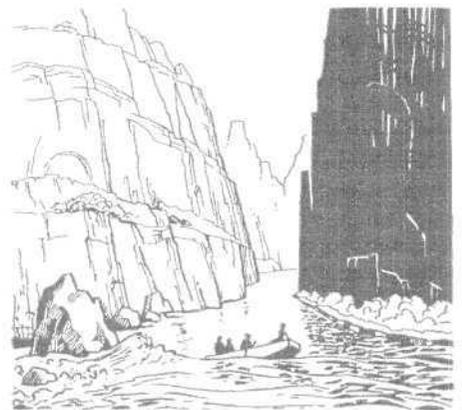
DEATH VALLEY — Inyo Associates voted in favor of a proposal to complete the road northward out of Death Valley National Monument to connect with Westgard Pass and Big Pine. About 30 miles of the road are yet to be completed, six miles of which are within the monument.—*Inyo Register*

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SECTIONIZED COUNTY maps — San Bernardino \$1; Riverside \$1; Imperial 50c; San Diego 50c; Inyo 75c; other California counties \$1.25 each. Nevada counties \$1 each. Topographic maps of all mapped areas. Westwide Maps Co., 114 W. Third St., Los Angeles, California.

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MISCELLANEOUS

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Museum Construction Seen . . .

DEATH VALLEY — Early construction of a museum in Death Valley National Monument is assured through an agreement between the National Park Service and the State Division of Beaches and Parks. The state will erect the building and own it, but the National Park Service will provide plans and will, when the structure is complete, handle museum administration without cost to the state. The museum, to be built on a 50-acre site adjoining Furnace Creek Camp donated by the Pacific Coast Borax Co., will contain, in addition to exhibit space, an auditorium large enough to seat 700 persons.—*Indian Wells Valley Independent*

State Seeks River Refuge . . .

EL CENTRO — California's Fish and Game Commission favors asking the Federal government for a 5100 acre strip of "no man's land" along the Colorado River near Yuma to serve as a wildlife refuge. Everett Horn, executive officer of the Wildlife Conservation Board, told the Commission that Arizona has shown no interest in the land in its negotiations with California to redraw the boundary between the two states which was obscured by the course-changing river.—*Yuma Sun*

Glamis Road Work Begun . . .

EL CENTRO—Surveying and engineering on the new highway connecting link between Palo Verde and Imperial valleys was due to start in early April, Imperial County officials announced. The county has received the long-overdue check for \$660,000

which the government has paid as compensation for the Navy's closing of the road across the Chocolate Mountain Gunnery Range. This money, it is estimated, will construct the road from Orita across seven miles of sand hills and the All-American canal extension into Glamis. Imperial County proposes to complete a passable route to the town of Palo Verde. — *Palo Verde Valley Times*

Goler Canyon Highway Studied . . .

RIDGECREST — Cross Country Highway Association officials plan an inspection tour of Goler Canyon, south of the ghost town of Ballarat, to study the possibility of routing the projected highway through there. At present, one of the development's most serious problems is to find a suitable right-of-way across the Panamint Mountain range east of Trona. The Nevada end of the highway, which runs to the California line near Shoshone, has been completed for two years. The original route across the Panamints is blocked by the Navy's gunnery range. — *Indian Wells Valley Independent*

NEVADA

Navy Drops Black Rock Plans . . .

FALLON — Full use of Sahwave gunnery range in Pershing county and substitution of the Air Force's Tonopah range for the Black Rock range by the Navy for aerial gunnery practice was indicated in announcements from Washington, D.C. According to Senator Alan Bible, the Tonopah Bombing Range will be put to immediate use by the Navy. It will utilize the range by flying 4000 sorties annually, to be stepped up to 16,000 at the first of next year. The Navy announcement climaxes a long battle to block further Navy land grabs in Northern Nevada and to force the armed services to share in part some of their land facilities.

Comstock Monument Funds . . .

CARSON CITY—The Nevada legislature passed a bill which provides \$2000 appropriation for construction of a monument commemorating the discovery of silver on the Comstock in 1859. Plans call for completion of the monument in time for unveiling at the start of the year-long celebration of Nevada's Silver Centennial Year in 1959. — *Territorial Enterprise*

Lehman Caves Hours Given . . .

LEHMAN CAVES—Raymon Sellers, park ranger in charge of Lehman Caves National Monument, announced the following hours for tourist visits: daily tours start at intervals from 9 a.m. to 4 p.m. Mountain standard time. — *Ely Record*

Predatory Control Asked . . .

WASHINGTON, D. C. — Senator George W. Malone urged the Senate to increase its appropriation for predatory animal control in Nevada. A shortage of jackrabbits has caused coyotes, bobcats and mountain lions, deprived of their customary source of food, to turn their attention to lambs and sheep, it was claimed. The government, which owns 87 percent of Nevada, has contributed approximately \$50,000 a year for predatory animal control over the past 10 years. — *Reese River Reveille*

Antelope Placed on Range . . .

LOVELOCK — Ninety antelope were imported from Yellowstone National Park and released in Pershing and Mineral counties. The current program calls for a total of 275 animals to be brought to the Nevada ranges from Yellowstone. — *Reese River Reveille*

First Litterbug Signs Appear . . .

GARDNERVILLE — First signs warning motorists traveling Nevada Highways to "Don't Be a Litterbug" were erected in Douglas County recently. The attractive orange signs depicting a vicious-looking litterbug were provided by the Nevada Department of Highways. — *Record-Courier*

NEW MEXICO

State Raises Speed Limit . . .

SANTA FE—State police have received instructions to allow speeds up to 70 miles an hour on four-lane highways and the wider modern two-lane routes, but to crack down on speeds over 60 miles an hour on old, narrow highways. — *New Mexican*

Porcupine Hunter Sought . . .

SANTA FE—The State Employment Service will hire a hunter to live in the high country to track down and destroy porcupines in the state's pine forests. Porcupines have been multiplying rapidly for the past 15 years in New Mexico and are causing increasingly heavy losses among young pine trees, the state reported. — *New Mexican*

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State Seeks Land Transfer . . .

SANTA FE—State Land Commissioner Murray E. Morgan has begun a long-range campaign that he hopes will result in the transfer of 14,500,000 acres of land from the Bureau of Land Management to the state of New Mexico. He contends that the lands administered by the BLM belong to

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the state; that the state could do a better job of handling them; and that possession of the lands would "make New Mexico solvent." He likens his campaign to the successful efforts of Texas, Louisiana and California to obtain title to tideland oil lands. — *New Mexican*

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Observatory Open to Public . . .

CLOUDCROFT—The world's largest solar observatory will be open to the public every Sunday this summer. The observatory houses the world's biggest instrument for observing the sun — a 16-inch coronagraph, twice the size of the next largest one at Pic du Midi, in the Pyrenees Mountains of southern France. The instrument is on Sacramento Peak, 17 miles south of Cloudcroft, at an altitude of 9,200 feet.

Much Farm Lands Idle . . .

SANTA FE—About three-fifths of New Mexico's entire farm land acreage will be taken out of cultivation this year, much of it to remain unfarmed for the next 10 years, the Agricultural Stabilization and Conservation Committee announced. Officials said 575,000 acres — mostly dry farming country—had been signed under the conservation reserve phase of the Soil Bank.—*New Mexican*

Pecos Project Approved . . .

WASHINGTON, D. C.—A bill to authorize construction of \$2,750,000 worth of water conservation projects in the Pecos River Basin of New Mexico and Texas has the approval of the Interior Department. The basin is now experiencing one of the most severe drouths on record. Pending bills contain a Reclamation Bureau project to provide a 16-mile diversion of Pecos River waters from near Artesia, New Mexico, to McMillan Reservoir. The object is to salvage water now lost through evaporation and transpiration from 13,500 acres of salt cedar and other water-using scrub vegetation. In addition, the inflow of saline water from salt springs would be short-circuited by installing pumps to transport the brine into the Queen Lake depression.—*New Mexican*

UTAH

Park Tour Dates Announced . . .

CEDAR CITY—Utah Parks Company tours will begin June 16 and run daily through September 4, it was announced. Seven different bus tours are scheduled to leave Cedar City each day bound for Zion, Bryce Canyon and Grand Canyon National Parks. Stops are also included on the loop tours in Bryce Canyon National Park and Cedar Breaks National Monument.—*Iron County Record*

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Write KENT FROST, Monticello, Utah.

Golden Spike Historic Site . . .

PROMONTORY — A seven-acre tract at Promontory has been designated the Golden Spike National Historic Site. The original Golden Spike ceremony held here 88 years ago, celebrated completion of the first transcontinental railroad. The site will be administered as a non-federal project, with the Golden Spike Association of Box Elder County and the Utah Historical Society charged with preservation and administration.

Tribesmen Win Court Decision . . .

SALT LAKE CITY—A group of southeastern Utah Navajo Indians was awarded 30 individual judgments totaling \$186,017 in U. S. District Court for loss of 101 horses and 39 burros in a range land controversy. The judgment came four years and five district court proceedings after the Indians brought suit against the United States of America. Each of the 30 tribesmen will receive \$3500 for loss of livestock plus other amounts for "harrassment and intimidation" on the part of government agents in rounding up the Indians' stock and allegedly attempting to rid the range of the animals.

Glen Dam Road Estimates . . .

KANAB — Making Glen Canyon accessible to vehicular travel from both sides of the river is going to cost in excess of \$10,000,000, the Bureau of Reclamation estimates. A general breakdown shows that more than \$4,000,000 will be spent in Arizona building the Bitter Springs route from U. S. 89 to the damsite. Utah is spending or will spend over \$5,000,000 on the road from Kanab to the dam. The Arizona road is expected to be finished several months before the Kanab-Glen Canyon road.—*Southern Utah News*

Indians Win Bureau Appointments

FORT DUCHESNE — Three men of Indian descent were involved in position changes recently announced by the Indian Bureau. Darrell Fleming, who had been superintendent at Fort Belknap Agency, Harlem, Montana, for nearly five years, took over the Ouray Agency, Fort Duchesne, replacing John O. Crow who transferred to the Bureau's Washington office as a program officer. At Fort Belknap, Fleming was succeeded by Howard Dushane, former program officer at the Portland, Oregon, office since 1955.

122,585 Deer Killed in '56 . . .

SALT LAKE CITY—Deer hunters in Utah killed 122,585 animals during the 1956 hunting seasons, according to the Fish and Game Department. This marks an increase of 10,678 deer over the previous year's harvest.

MINES and MINING

Alpine County, California . . .

Plans are underway to re-open the famed Mogul Mines of Alpine County, the Alpine Eureka Mining Corporation announced. The Mogul mining district lies directly south of the Comstock Lode. Last work on the property, following its discovery in 1863, was in the early 1900s and terminated in 1922. The Mogul ore is so complex and holds so many minerals that special smelting is required.—*Eureka Sentinel*

Washington, D. C. . . .

A novel method of ore treatment—some-what similar to making coffee in a percolator—has been successfully used to recover manganese from certain low grade ores of Arizona and Nevada, the Bureau of Mines reported. Known technically as "percolation leaching," the process recovered from 78 to 97 percent of the manganese from soft, wad-type ores which could not be handled by conventional gravity concentration or flotation methods. In the new treatment methods, sulphur dioxide gas is passed upward through piles of crushed ore, and then water is percolated downward.—*Phoenix Gazette*

Grand Valley, Colorado . . .

Hopes for the development of the vast Green River oil shale deposits in eastern Utah and western Wyoming rose sharply with the announcement by Union Oil Company of California that it will construct a \$4,000,000 processing plant near Grand Valley. The company's reserve is estimated to contain five billion barrels of recoverable oil. The company is completing a retort capable of handling 300 tons of shale daily. Meanwhile, the U. S. Geological Survey increased its estimate of the oil contained only in the richer shales (15 gallons of oil to the ton or more) to 900 billion barrels in western Colorado alone, which means a trillion barrels or more in the entire formation extending into Utah and Wyoming.—*Vernal Express*

Salt Lake City . . .

Bureau of Mines research workers in Salt Lake City have developed a "do it yourself" kit for detection of selenium, a valuable element in high demand by the electronics industry. The Bureau said the new kit and procedures for using it are so simple that a person unskilled in metallurgy or chemistry can detect the presence of minute amounts of selenium.—*Salt Lake Tribune*

Blythe, California . . .

Construction was scheduled to start June 1 on a \$195,000 rockwool plant in Blythe, Woolstone, Inc., announced. The new firm controls 1800 acres of ore-bearing lands in the Big Maria Mountains, east of Midland. The plant has a projected capacity of 50 tons of spun rockwool per day.—*Palo Verde Valley Times*



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Farmington, New Mexico . . .

Shell Oil Company announced formation of the Farmington production division headed by R. R. Robison, Bakersfield, California. The company confirmed a huge drilling program for the Paradox and San Juan Basins aimed at filling a new crude oil line to be built to the Los Angeles area from the Four Corners area. Shell said it "planned a big development program" that may run up to 100 wells this year.

Salt Lake City . . .

The Utah attorney general has ruled that volcanic cinders are considered to be "mineral" and, in consequence, state land containing cinders cannot be sold by the State Land Board. Sand and gravel deposits can be sold, but mineral deposits must be leased by the state.—*Salt Lake Tribune*

Washington, D. C. . . .

The Supreme Court ruled that the U. S. retained rights to minerals under the lands it gave the Union Pacific Railroad for its right-of-way. The decision involves about 1000 linear miles of right-of-way or about 50,000 acres. Some government legal experts immediately interpreted the Court decision as broad enough to cover other railroad right-of-way grants by acts of Congress between 1862 and 1871. If true, the government may own the mineral rights to 450,000 acres of land.—*Salt Lake Tribune*

Oakland, California . . .

Kaiser Steel Corporation announced an additional \$81,000,000 expansion program to its current \$113,000,000 capital additions plan. The added expenditures will hike Kaiser Steel's ingot capacity from 1,536,000 to about 3,000,000 tons annually. Among the planned projects are improvements at the company's Eagle Mountain, California, iron ore mine and at the Sunnyside, Utah, and Raton, New Mexico, coal mines.—*Salt Lake Tribune*

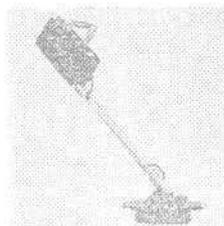
Grand Canyon, Arizona . . .

What veteran steelmen describe as the most arduous job of its kind they have ever tackled in 40 years, an aerial cableway across the Colorado River was due for completion in May. When finished it will be the longest single span freight tramway in the world and will run from the top of the precipitous south rim of Grand Canyon to the northerly side. The span will be 8377 feet in length. The tramway will be used by New Pacific Coal and Oils, Ltd., of Toronto, Canada, to transport bat guano from Bat Cave, about 600 feet above the Colorado River at a point near the headwaters of Lake Mead. An estimated 100,000 tons of the valuable fertilizer is contained in the explored portions of the cave.—*Mohave Miner*

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Ignacio, Colorado . . .

Increased oil drilling activity in Southwestern Colorado is forecast following bids by major oil concerns of \$4,358,000 for rights to drill on 46,000 acres of Mountain Ute tribal land. Twenty companies participated in the bidding. The Mountain Utes apparently will accept these bids on their land, but there was some doubt that the Southern Utes will accept the bulk of the bids on their tracts which, with only two exceptions, brought less than \$10.11 per acre. Average offer for Mountain Ute land use was \$92 per acre, plus a 12½ percent royalty on all production and \$1.25 per acre annual rental. The leases are for a 10-year period or as much longer as oil production continues.—*Dove Creek Press*

Atomic Treated Coal Powers Rio Grande Train

The successful use of coal irradiated with atomic energy as diesel fuel was announced by the Rio Grande Railroad. Finely ground Colorado coal was treated with waste products from atomic reactors, mixed with oil and burned as fuel.

The impact of the radiation is to reduce the coal into a dust so fine that it floats in air like smoke. When mixed with oil it increases the energy content as diesel fuel, a company official said.—*Salt Lake Tribune*

Formal Opening Set for Compton Rock Shop

Mamie Iandiorio, owner, announced June 15-16 formal opening dates for the Compton Rock Shop's new location at 1405 So. Long Beach Blvd., Compton, California. Hours for the opening are 9 a.m. to 9 p.m. on the 15th and 9 to 6 on the 16th. Open house will continue throughout the following week.

URANIUM NEWS

URANIUM ORE SHORTAGE ENDS; AEC TO REVISE OPERATIONS . . .

The nation is no longer faced with uranium shortages and operations of the Atomic Energy Commission must be changed in this light, Allen E. Jones, manager of the Grand Junction Operations Center for AEC declared. Uranium processing plants are now treating ore at a rate of about 3,250,000 tons a year and mining and milling are about in balance, he said.

"In fact, in one recent month, more ore was processed than was produced and delivered by the miners," Jones added.

The important objectives of the new AEC domestic procurement program, according to Jones, are to assure an adequate supply of uranium to meet the government's requirements during the next 10 years and to have a strong domestic uranium industry to support the nation's future industrial needs. This means maintenance of adequate ore reserves and long-range planning on the part of uranium producers.

Therefore, it is the AEC's objective to provide a market for ores through private milling contracts which will permit the government to withdraw from its ore purchasing program at the earliest date to assure an orderly transfer from a guaranteed ore price to a guaranteed concentrate price in 1962.

"The operation of ore buying stations and the accumulation of ore stockpiles in excess of current mill requirements no

longer can be justified on the basis of a military emergency," Jones said.

For these reasons, the Marysville, Utah, and Globe, Arizona, buying stations were closed. The White Canyon, Utah, station is expected to be closed within the next few months. But, David D. Baker, director of the mining division of the AEC's Grand Junction office, assured independent producers they would not suffer from the Commission's program to fit the pace of domestic ore production into the needs of its new uranium concentrates buying program.

"In order to encourage continued prospecting and exploration by the independent ore producers and prospectors, the AEC has sought to provide a future market for the small producer and for newly discovered ore by writing into milling contracts the provision that the milling companies must buy some part of their requirements from independent producers," Baker said.

As a result, anyone who makes a big find will, by apparent necessity, be forced to associate himself with an integrated milling firm or else limit himself to a smaller monthly production than anticipated.—*Salt Lake Tribune*

TRUE OR FALSE ANSWERS

Questions are on page 25

- 1—False. An arrastre is a crude mill for grinding ore.
- 2—False. Smoke trees grow in the arroyos.
- 3—True. 4—True.
- 5—False. Scotty's Castle was built under the direction of Albert Johnson for himself and Death Valley Scotty.
- 6—False. Searchlight is a mining town.
- 7—True.
- 8—False. There was no Salton Sea before 1905.
- 9—True. 10—True. 11—True.
- 12—False. The Havasupai reside in a remote canyon inaccessible by road.
- 13—True. 14—True.
- 15—False. The Hopi gather all species of snakes for their ceremonial.
- 16—True. 17—True.
- 18—False. Kit Carson lived in an earlier generation.
- 19—False. Many rock climbers have reached the top of Rainbow Bridge.
- 20—False. Valley of the Goblins is in Utah.

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Atlas to Close \$9,000,000 Delta Mine in June

In what apparently amounts to a \$7,000,000 loss, Atlas Corporation's Delta Mine will be closed by June of this year, Floyd B. Odlum announced.

In two years of operations, the mine will have shipped 100,000 tons of ore worth about \$2,000,000. Atlas purchased the property from Vernon Pick for \$9,000,000 in August, 1954. The property has been written down on the books to \$160,000.

An Atlas spokesman said depletion allowances and losses attributable to the Delta venture served a useful purpose in offsetting profits from other company operations. Thus Atlas had a net income of \$2,991,036 in 1956 which is not subject to federal income taxes because of the offsetting losses carried forward in connection with the merger into Atlas of five formerly affiliated companies.—*Salt Lake Tribune*

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Colorado Land Rush Expected On Reclassified U-Lands

Colorado Bureau of Land Management officials believe the July 20 opening of 98,976 acres of land to mining claims may produce one of the biggest land rushes this nation has ever seen.

The potential uranium land is in southwestern Colorado in Montrose and San Miguel counties. It was withdrawn from public domain by the AEC for exploration for fissionable materials, between 1948 and 1955. The BLM said the AEC has requested restoration of the areas following completion of its surveys. On July 20 the Grand Junction office of the AEC will make available for public inspection exploration data of the area, which will include drilling logs and other pertinent information.

Scaled maps of the exact areas to be opened are being made available at \$1 each, and can be obtained from the Manager, Land Office, Room 357, New Customs House, 19th and Stout Sts., Denver 1.—*Reese River Reveille*

Chemist Develops Electrolysis Process for Uranium Recovery

Theodore Crawford, a Los Alamos, New Mexico, chemist, has evolved a new method for extracting uranium from ore which could replace all present methods if it proves out.

At present, uranium is extracted from ore by a laborious process of crushing the ore to powder and slowly leaching the metals with acids and other chemicals. Crawford's process is to extract the metal by electrolysis—that is, a current passing through a solution of crushed ore and boiling water carries the uranium metal from the solution and deposits it on steel plates. These plates are cleansed in vats of nitric acid. This solution is then evaporated and what is left is "yellow cake."

According to independent tests, this process yields 95 percent extraction of available uranium in the ore and "cake" of better than 90 percent purity—far higher percentages than current processes are obtaining.—*New Mexican*

Faster, Cheaper Uranium Assay Method Developed

Three University of Nevada chemists have developed a rapid method of assaying for uranium. Their method of assay makes use of the modern ion exchange resins, and is adopted from original investigations by resin manufacturers.

The resin absorbs, or attracts and holds dissolved particles of the uranium, while other metals pass through the resin, thus separating it from unwanted metals in the ore. After thorough washing, the uranium held on the resin is extracted with a certain type of acid, and the uranium content therein is determined colorimetrically—that is, by depth of color through use of a

standard sodium-hydroxide, hydrogen peroxide method.

The chemists are Dr. H. J. Seim, Dr. Robert J. Morris and graduate student D. W. Frew.

The new assay method has proved cheaper and quicker than older methods, and one man can make 20 analyses per day, two times more than by the previously used tests.—*Nevada State Journal*

NEW PRODUCTS FOR DESERT LIVING

New Bed-Table Accessory For Station Wagons

A new accessory for station wagons that doubles as a sleeping platform and picnic table was announced by the GorDag Industries of 2808D Fosshay Tower, Minneapolis, Minnesota.

Basically, the "Over-niter" is a large sheet of 3/8-inch plywood framed in oak. Four adjustable arms reach out and fit into the window sills. Thus while traveling the space at the rear of the station wagon can be divided into upper and lower compartments.

In its open position, the "Over-niter" makes the rear of the wagon into six-foot upper and lower bunk beds to provide comfortable sleeping accommodations for four. And it can be set up out of the car as a table.

The table-bed platform weighs 45 pounds and fits all station wagons.

Lightweight, Insect-Proof Tent Weighs Only 36 Pounds

Morsan Tents of 10-27 50th Avenue, Long Island City, New York, has designed a new lightweight family cottage tent with four-way ventilation, the company announced.

The new tent has roll-up walls with insect netting and the entire front is insect-proofed with a full size zippered door.

The tent's rear wall has a large insect-proof window. In addition the tent has a sewed-in floor. The tent weighs only 36 pounds in the 9'6" x 9'6" small family size. Also available is a 10'6" x 12' large family size. A free catalog and handbook is offered by the concern.

Prospectors' Headquarters

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"Minerals for Atomic Energy" by Ninger	7.50
"Let's Go Prospecting" by Edward Arthur	3.50

MAPS

Map and Geology (Uranium and Mineral Districts of California)	1.50
Map of Kern County (New Section and Township)	1.50
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G E M S A N D M I N E R A L S

Federation Asks Early Gem-O-Rama Registrations

Advance registration of California Federation of Mineralogical Society members who plan to attend the July 5-7 Gem-O-Rama was called for by officials in charge of the show.

All clubs and societies were asked to send in lists of members who will attend along with the \$1 registration fee for each. A name badge, which will serve as an admittance ticket for the three days, will be prepared for all who request advance registration and will be available at the registration desk at the show. Non-member admission

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is 90 cents per day. The show will be held at the Great Western Show Building in Los Angeles.

Hotel reservations for those attending Gem-O-Rama are being handled by the New Hotel Clark, 426 So. Hill St., Los Angeles. Five Hundred rooms are reserved for rockhounds and their families and room requests should be made as soon as possible, officials added.

Space for 100 trailers or cabanas on the Great Western Show Grounds has been made available at a charge of \$1 per day per space. Tents will not be permitted on the show grounds. Sanitary facilities and showers are in the building. Requests for trailer space should be sent to J. C. Coon, 15521 So. Harris, Compton, California.

The Display Committee has set up space for 400 cases of competitive displays and deadline for all entries is June 1. Display information is obtainable from H. R. Rhoads, 648 E. 87th St., Los Angeles 2.

Also planned are 32 cases of special displays and exhibits including George Ashley's carved bowls from crystals; the Smithsonian 20 pound rubellite tourmaline; and an outstanding diamond collection.

A club bulletin editor's breakfast is scheduled for July 6 at 8 a.m. at the Hotel Clark. Cost is \$1.75 per person. At 10 that morning the federation convention will officially open its regular meeting and the day will end with a banquet at the show grounds for which a charge of \$3 will be made.

Those desiring information on the special tours to Disneyland, Knotts Berry Farm, La Brea Tar Pits and Marineland should write to Ardis Mahan, 11650 Virginia, Lynwood, California.

The San Francisco, California, Gem and Mineral Society announced October 19 and 20 dates for its annual show this year. The Scottish Rite Auditorium has been reserved for the event.—*The Mineralog*

DROUTH INDIRECTLY CAUSES CLOSING OF GEM FIELD

Another well known collecting field has been closed to rockhounds with the posting of the great Diamond A Ranch properties near Engle, New Mexico. Large quantities of carnelian agate, jasper and vari-colored petrified wood have been secured from this area in the past. Reason for the closure, according to the management, is that the cattle on the property have been fed from automobiles and trucks during the recent drouth and now follow all vehicles driven onto the property. This causes a loss of weight, a very important consideration in the raising of beef animals.—El Paso, Texas, Rockhounds' *The Voice*

SURFACE SPEED OF BLADE DETERMINES EFFICIENCY

Diamond abrasive cut-off wheels as used in lapidary work should be operated at from 2000 SFPM (surface feet per minute) to 2550 SFPM. Thus the revolutions per minute of a six-inch wheel should be approximately 1550; eight-inch wheel: 1150 rpm; 10-inch wheel: 925 rpm; 12-inch wheel: 775 rpm; 16-inch wheel: 550 rpm; and 18-inch wheel: 500 rpm.

It is essential that an adequate flow of coolant be provided at the point of blade entry and on blade sides at all times. When cutting materials of extreme hardness and density, such as agate, recommended coolants and lubricants are: light flushing oil; kerosene and lubricating oil mixed 1 to 1; or a mineral base soluble oil mixed in the proportion of one part oil to eight or 10 parts water. Use a motor of ample power which does not allow the blade to slow down during the cut. Variations in blade rpm destroy accuracy, reduce cutting efficiency and dull cutting edges of blade. The operator should use light but firm pressure. Too much pressure dulls the blade and reduces cutting speed and efficiency.

Grinding wheels operated at higher speeds have much less tendency to become bumpy. Thus when an eight-inch wheel is worn down to six-inches, motor speed must be increased to about 3900 rpm to get the same SFPM as before. However, no grinding wheel should be operated at speeds greater than the maximum recommended by the manufacturer which usually is 3600 rpm for an eight-inch wheel and 4140 rpm for a six-inch wheel. The safety factor increases as the diameter of the wheel decreases.

Crystolon grinding wheels should be operated at speeds that give maximum efficiency. An eight-inch wheel should run at about 3000 rpm which produces 6400 SFPM. To obtain the same SFPM, run a six-inch wheel at 3900 rpm.—Contra Costa, California, Mineral and Gem Society *Bulletin*

Jet is a black variety of brown coal or lignite. The best specimens are uniformly black, compact and will take a beautiful velvety polish. Its hardness is 3 to 4 on Mohs' scale. Jet has been used since Roman times as mourning jewelry and also had a flurry of popularity in the late 19th Century. Because jet is coal, it will burn, giving a sooty flame.—Evansville, Indiana, Lapidary Society's *News Letter*

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Many Summer Gem-Mineral Shows Beckon Vacationing Rockhounds...

The following gem and mineral shows have been announced for the summer months.

May 31-June 2—Lewiston, Idaho. Second annual Hells Canyon gem show.

June 1-2 — Grand Junction, Colorado. Annual show of the Mineralogical Society.

June 7-9—Casper, Wyoming. State mineral and gem show.

June 8-9—Anderson, California. 1st Annual Rock Swap at Coleman Fish Hatchery. Shasta Gem and Mineral Society.

June 8-9—Brookings, Oregon. Mt. Emily Gem and Mineral Club's annual show.

June 8-9 — Roseburg, Oregon. Annual show of the Umpqua Mineral Club.

June 15-16—Paradise, California. Annual show of the Gem and Mineral Club.

June 21-22 — Emmett, Idaho. Gem County rock and mineral show in conjunction with the Cherry Festival.

STAINLESS STEEL SEEN AS GOOD SILVER SUBSTITUTE

A. L. Patterson of El Paso believes thin sheet stainless steel is as good or better than silver for making bases for mounting cemented gems on bolo tie slides and other jewelry pieces.

The gem base, if an irregular baroque shape, should be lapped flat on a horizontal lap or wheel, using 220 grit and left rough so as to give the cement good holding surface.

The gem then is placed on a thin sheet of stainless steel and using a sharp-pointed tool such as an ice pick, the outline of the gem is made on the smooth surface of the metal. Next cut the metal nearly to the line with tin snips and then finished to the mark with a small metal file, beveling from the bottom side. Stainless steel is easily soft soldered to the piece upon which the gem is to be mounted. After the piece has cooled, place cement on the steel and the gem and then set. The steel is as light or lighter than sterling silver, never tarnishes and is much less expensive. — El Paso, Texas, Rockhounds' *The Voice*

June 22-23—Grants Pass, Oregon. 5th annual show of the Rogue Gem and Geology Club.

June 22-23—Lake Almanor, California. 5th annual rock swap, sponsored by the Lassen Rocks and Minerals Society.

June 27-30—Platteville, Wisconsin. Midwest field trip convention.

July 4-6—Bend, Oregon. Annual show of the Deschutes Geology Club.

July 4-7—Ellensburg, Washington. Annual All Rockhounds Pow Wow.

July 5-7—East Los Angeles, 18th Annual convention and show of the California Federation of Mineralogical Societies, Great Western Fair Grounds.

July 13-17 — Buhl, Idaho. 7th annual show of the Magic Valley Gem Club.

July 19-28—Santa Rosa, California. Redwood Gem and Mineral Society show, Sonoma County Fairgrounds.

July 20-21—Reno. Second annual All Nevada gem and mineral show, Idlewild Park.

July 21—Placerville, California. Third Annual Stifle Memorial mineral and gem auction, sponsored by the El Dorado County Mineral and Gem Society and the Sacramento Mineral Society, at Stifle Memorial Park.

July 27-28—Delake, Oregon. 15th annual show of the North Lincoln Agate Society.

August 10-11—Bayfield, Colorado. Annual rock show of the Navajo Trails Gem and Mineral Club.

August 17-18—Hermosa Beach, California. 8th annual show of the South Bay Lapidary and Mineral Society, Clark Stadium.

August 29-September 1—Old Point Comfort, Virginia. 7th annual convention and show of the Eastern Federation of Mineralogical and Lapidary Societies.

August 29-September 2 — Northridge, California. Mineral Dealers show, Devonshire Downs Fairground.

August 31-September 2—Tacoma, Washington. Northwest Federation convention and show.

September 14-15 — Antioch, California. Lapidary Club's annual hobby show.

PLANS DRAWN FOR NEVADA GEM SHOW, JULY 20-21

Scheduled for July 20 and 21 is the Nevada Gem and Mineral Show at Idlewild Park, Reno.

Individual rockhounds and gem and mineral clubs throughout the state were invited to exhibit at the show. Those interested should write to Claude R. Mowry, 3325 Smith Drive, Reno.

Already planning exhibits are the Washoe Gem and Mineral Society and Pyramid Gem and Mineral Club, both of Reno; and the Lahontan Gem and Mineral Club of Fallon.—*Gardnerville Record-Courier*

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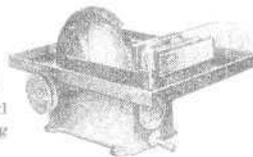
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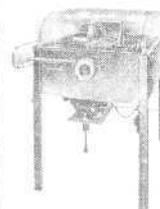
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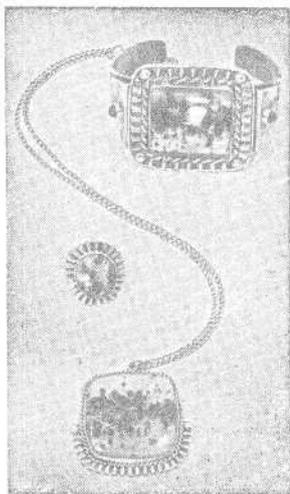
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TEN POINTS TO REMEMBER WHEN DISPLAYING IN A SHOW

Gordon Bowser of the Ventura, California, Gem and Mineral Society, outlines the following 10 point program for displaying gems and minerals:

1. Specimen is most important part of the display; quality rather than size should be determining characteristic. Factors of quality are good crystal terminations, clean specimens and complete examples. Color also is important. Best examples of color rather than washed-out specimens should be used. Matrix sometimes sets off a specimen.

2. Use balance in your lay-out. Work from the center out, and intermix dull pieces with more colorful ones.

3. Set off your display with a good background. Contrasting and colorful, but not gaudy colors work best. Don't use stripes or sharp designs. Where possible, place the specimens in their natural element — cut stones or jewelry in sand and crystals standing in small gravel. Plastic foam bases give good contrast, are easy to shape and specimens can be pushed into them so they stand upright.

4. Lighting. Use front and top lights without glare. Place lights so they will not

heat the case glass and possibly burn a viewer. Ventilate the case and keep glare off of it.

5. Care should be exercised from collecting the specimen to cleaning, packing and displaying it. Use "Please do not handle" signs if necessary and do not yourself handle the specimen at a show for others will think they can be just as careful as you were.

6. Labeling. Use standard labels and give accurately name and location of specimen. With small specimens, use numbers and a key sheet.

7. Position of case is important. Proper height so the viewers need not stoop adds to the display. Keep it away from doors which may become congested, and pay attention to possible glare from windows, doorways or overhead lights.

8. Attend your display and answer questions.

9. Remember: competition is friendly.

10. Always try to improve quality and size of your display.—Rockhound Rambling

CALCITE IS SECOND MOST ABUNDANT MINERAL ON EARTH

Next to quartz, calcite is the most abundant of all minerals, and occurs in an almost endless variety of forms over 300 of which have been described. Crystals may be flat plates a foot across (Palm Wash, California), golden scalenohedrons two feet long (Missouri, Kansas, Oklahoma lead district), or transparent masses a foot thick (Iceland). Marble, cave formations, travertine and onyx are all calcite varieties.

Calcite effervesces when hydrochloric acid is dropped upon it. An interesting feature is its marked property of deflecting light rays, so that a line or object placed behind a piece of clear calcite appears double.

Calcite's physical properties are: hardness 3; specific gravity 2.7; colorless to white or when impure, yellow, brown, green, red or blue; luster vitreous to dull; transparent on thin edges.—Miami Florida, Mineral and Gem Society's *Chips and Facets*

New officers of the Eastern Federation of Mineralogical and Lapidary Societies are: Henry B. Graves, Miami, Florida, Mineral and Gem Society, president; Paul E. Desautels, Baltimore Mineral Society, vice-president; Mrs. B. E. Hunt, Gem and Mineral Society of Virginia Peninsula, executive vice president; Mrs. Elsie Kane White, Gem Cutters Guild of Baltimore, secretary; and Louis Eaton Shaw, Newark Lapidary Society, treasurer.—*Chips and Facets*

Arizona's commercial gem stone production jumped from \$97,000 in 1955 to \$120,000 last year, the Bureau of Mines reported. Gila County, with 45 percent of the output total, accounted for the largest portion of the total value. Turquoise headed the list of gem stones collected.—*Pioche Record*

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STEEL HAND LAP GIVES FLAT SURFACES BETTER FINISH

Flat surfaces such as specimen slabs, book ends, etc., can be given a better finish by lapping than by sanding. If you have only an occasional piece to work, there is no need to invest in expensive equipment. A piece of cast iron machined flat on one side or even a piece of plate glass supported on a wooden block will do just as well.

To start with, be sure your saw will cut as smooth and as flat as possible. This will save a great deal of time at the lapping block. Begin lapping with 100 or 150 carborundum grit and water in a figure-eight motion. Keep the grit wet, never allowing the lap plate to dry off. Visual inspection will show you when the stone is flat. If the original surface was very uneven, it may be necessary to add new grit as the old grains break down. Large grit like 100 breaks down quite rapidly while the smaller sizes break down very little or hardly at all.

When no depressions from the sawed surface can be seen, flush the stone and lap thoroughly with water, and recharge with 320 grit. Very little pressure is required when using this and the smaller sized grits. Don't worry about any of the larger grit being embedded in the lap. These usually break down at once. By holding the work to a light you easily will see if the larger scratches and pits from the first lapping have been replaced by the finer ones from the 320. Again flush the stone and lap as before, and go to 600 grit. The resulting finish should be a series of fine pits which give a velvety smooth appearance.

Here and there, however, will be a scratch or two from grit that was embedded in the lap. These can be removed by using a lap of hardened steel held in the hand. A ground tool bit like those used in machine shops works nicely as does a piece of file with the teeth ground off. Any steel piece, in fact, that fits the hand will do so long as it is hardened and flat.

Use 600 grit and water and move the lap over the stone with a circular or figure-eight motion, using little pressure and keeping the grit wet. Examine with a good magnifying glass, tilting the stone at various angles to the light. When no scratches are visible, wash as before and lap with 1200 final lapping compound or one of the optical powders. Be careful not to let the grit dry out. Dry grit sticks together in masses which do not roll. They skid across the work surface producing scratches. When all scratches are removed, buff the piece. If it happens to be a good quality stone, the buff should produce a surface as smooth and flat as glass.

A pleasant "wheet wheet" sound is made by the steel lap when in operation causing

this technique to be known as the Wheet Wheet Method of Lapping.—Carroll Kelley in the Minnesota Mineral Club's *Rock Rustler's News*

True aventurine is green, red or brown quartz with flakes of mica or hematite. Chief world sources for this gem stone are India and Russia. By accidentally dropping copper fillings into molten glass, Venician glass makers discovered a striking material now called goldstone, but formerly known as aventurine. True aventurine and goldstone greatly resemble one another.—Evansville, Indiana, Lapidary Society's *News Letter*

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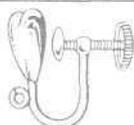
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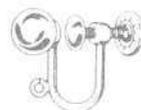
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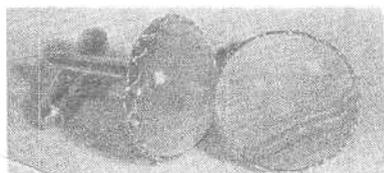
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JUREANO WOOD, gem quality, 65 cents plus postage. A. B. Cutler, Box 32, Salmon, Idaho. Slabs, tumbled, J. E. Cutler, Gearhart, Oregon.

TREAT 600 GRIT BEFORE LAST SANDING OF SLABS

For sheer beauty, nothing equals a perfectly polished slab. The most drab appearing rock often can be made into an object of beauty that could well grace the collection of the most discriminating person.

The final sanding before polishing is the most critical step in producing good flats. Usually 600 grit abrasive is used and often the amateur gem cutter will be plagued with scratches across the face of the stone. Here is how to produce grit that is truly 600 in size:

Place one tablespoon of water glass (silica gel) in a gallon of water. Pour in a pound of commercial grade 600 grit abrasive. Shake and stir until it rattles or is well mixed, whichever results first. Let stand 15 minutes. Siphon off water, leaving residue in bottom of container. Let siphoned water stand in second container for 30 minutes and that which settles to the bottom is real 600 grit. Inspect the coarse residue from the first step and you will see why scratches occur without this treatment to the grit. In this operation, silica gel acts as a wetting agent.—Dave Davis in the Contra Costa, California, Mineral and Gem Society's bulletin.

COLLECT METEORITES IN YOUR OWN ROOF GUTTER

An estimated 20,000,000 meteorites strike the earth's atmosphere every day and particles from some of them may be in your roof gutter. A. C. Carpenter of the Wichita, Kansas, Gem and Mineral Society recently removed a pint of mud from his roof gutter and with a magnet isolated a few small metallic spheres. The largest ones were about 0.25 mm. or 1/100 of an inch in diameter—mere dust to the naked eye.

With a powerful microscope, Carpenter saw that some of the particles were pear-shaped, suggesting that they had cooled before forming a true sphere as they sloughed off from the main meteorite.—*Quarry Quips*

AMATEUR GEM CUTTER

By DR. H. C. DAKE, Editor of The Mineralogist

The following article, the first of a two-part series which will be concluded next month, is the original translation made by Dr. Dake in 1925 of a paper published in Germany in 1913 by Dr. O. Dreher of the Idar agate cutting center. It deals with the artificial coloring of agates which up to that time had been a highly guarded secret. Practically all of the English papers published on this subject since were based on this article.

There will surely be much disapproval, from the gem-cutting industry, through the publication of this paper. While some of the technique given here may not be generally known, it is understood that the general principles are not a secret to those outside the industry. Further, one cannot learn the coloring of agates and other stones merely by reading a paper; practice plays an important part in gaining proper results.

An apprentice in the agate-cutting industry is often taught only the cutting and polishing, while the "secrets" of coloring as practiced by his master will be guarded from the student. The young cutter busies himself with experiments in new methods, and often introduces an improved technique. Therefore, I believe it would be of value to the industry in general if the apprentice cutter was fully informed on the standard means of coloring and heat treatment of ornamental stones.

The coloring of agates depends on the introduction of a coloring matter into their pores. Some layers of agate are less porous and therefore these will not absorb pigments, but remain wholly uncolored or only partially colored. The cutter calls the less porous layers in the agate hard. The layers or bands readily colored are termed soft. The skilled artisan can often judge the ability of an agate to absorb pigments, prior to the treatment.

The art of coloring agates and similar stones has been known to us for only a relatively short time. Long ago the Romans had learned the secret of the black colors, but they kept this secret for centuries. Finally in 1819 this old Roman technique was discovered by accident.

Along about 1813 some German cutters observed agates in the field, presumably colored by the action of sunlight. Agates which projected from the earth were often colored a carnelian or sard (reddish), while the remainder of the stone beneath would be entirely colorless. This led to the practice of "burning" colorless agates to produce the reddish colors.

Not all colorless agates will become reddish when given the heat treatment of "burning." It is thought that the agates which fail to respond are those lacking in iron compounds, present as an impurity. This was finally solved by soaking the agate in a soluble iron salt and then "burning" by oven treatment. In 1845 the method of

blue coloring was discovered and in 1853 green colorings were introduced, all the result of experiment by the lapidary.

The manner in which the coloring pigment is introduced into the agate varies according to the color desired. In all cases where a permanent color is attained, the coloring matter is not introduced in a dissolved form directly, but by the use of various chemical reactions; these take place within the agate.

In general there are two methods of coloring an agate. In one case the soluble metallic salt is permitted to soak into the pores of the agate. This soluble salt in turn is changed to a colored insoluble oxide by heating. In the other method two solutions or "baths" are used in succession, the second bath causing a colored precipitate of an insoluble metallic salt to be deposited within the agate.

The following will serve to illustrate how some of the colors can be obtained in an agate:

Red—Soaking stone in iron nitrate solution and then by "burning" an iron oxide is produced.

Bluish Green—Soaking in solution of chromic acid or ammonium bichromate, and heating to produce a chrome oxide.

Apple Green—Soak in nickel nitrate and "burn" to produce a nickel oxide.

Brown—Soak in a sugar solution and heat strongly to carbonize sugar to caramel.

Blue—Soak in bath of yellow prussiate of potassium and then in a solution of iron sulphate to precipitate "Berlin blue."

Blue—Soak in solution of red prussiate of potassium and then in solution of iron sulphate to precipitate "Turn-bull blue" in agate.

Black—Soak in sugar solution and then in sulphuric acid, to change sugar to carbon.

For completeness it may be mentioned that aniline dyes have been used to some extent in the artificial coloring of agates. The aniline colors, however, are not as permanent as the metallic oxides and precipitates described above. Aniline tends to fade when exposed to strong light.

Before the agate is colored it must be cleaned of all oil and impurities which may be adhering to or soaked into the stone. In the cutting of agates, oil or kerosene is used to lubricate the saws; and this must be first "extracted." The petroleum substances can be removed by boiling in a strong solution of sodium bicarbonate, or solvents like gasoline or some non-inflammable commercial cleaning fluid can be used "cold."

The agate may carry a small amount of iron and it is desired to remove this prior to "burning" for green colors, otherwise a dull or muddy green may be obtained. To remove iron compounds the stone is placed in warm nitric acid for two or three days and then placed in warm water for several days. The purpose of the nitric acid is to render any iron present soluble, so the water soaking may remove same. The warm water bath should be changed a number of times.

The knowledge of obtaining carnelian and sard (reddish) colors in agate by "dry burning" was first discovered in 1813, but the "bath" method of obtaining the red shades came later, and at uncertain date.

NOTE—The author here gives a lengthy detailed method of making a solution of iron nitrate by the use of iron nails and nitric acid. The formula calls for about half a pound of iron nails and about a quart of nitric acid. This method need not be followed for it is much more advisable to purchase the refined iron nitrate salt and dissolve same in water.

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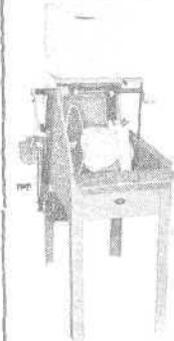


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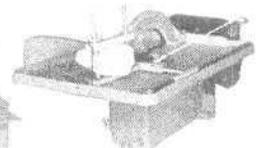
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By RANDALL HENDERSON

LATE IN THE 1920s a little group of California promoters came up with a get-rich-quick scheme which was a bonanza for them—until the California Real Estate commission stopped their racket.

They paid the Southern Pacific company from 50 cents to \$1.00 an acre for some of the rocky terrain the railroad company had acquired as part of its federal subsidy when it built the southern transcontinental railroad. The Southern Pacific had sold its best land, but there remained large tracts in the Chocolate and Little San Bernardino mountains in Riverside and Imperial counties of California, so rocky and inaccessible that no one wanted it—until the real estate promoters came along.

These men opened offices in coastal cities and began selling the land sight unseen at \$5.00 and \$10.00 an acre in 10-acre tracts. They printed glowing literature about "little desert estates only a few miles from the rich and fertile Imperial and Coachella Valleys." And of course they made no mention of the fact that the tracts were 1500 feet higher than the irrigation system, with a mountain range between.

Many hundreds of these tracts were sold, and since the lands were not worth the taxes, most of them soon became delinquent, and it cost the two counties many thousands of dollars to carry them through the tax sale procedure.

I became well acquainted with the racket when I spent three days climbing over the rocks and taking pictures of the "10-acre estates" on a reporter's assignment from the *Los Angeles Times*.

And now the U. S. Bureau of Land Management has embarked on a real estate promotion which in some respects is comparable to the swindle of 30 years ago. It is to Uncle Sam's credit that he has put out no misleading literature. But he is auctioning off some of the most unproductive of his desert terrain, in some instances to sight-unseen buyers at prices which have been much higher than the promoters of the '20s were asking. Most of it is rocky hillside land that has neither roads nor water—nor any immediate prospect of these essentials being available.

The federal government is doing virtually what the California Real Estate commission forbid many years ago. But the state authorities are powerless to do anything about it now because Uncle Sam owns the land.

It is to the credit of most Americans that they aspire to own a parcel of land—free of debt. And if the buyer in this instance knew exactly what he was getting, had the capital and the will to build roads and develop water, and create a tidy little home on the desert, then there could be no criticism.

But a public auction is not the way to select that kind of buyer. If the federal government persists in this policy, I am afraid it is going to bring endless woes to state and county officials—not to mention the disillusionment of

those who bought in good faith and then discovered it would require a small fortune to create the home of their dreams.

* * *

Arizona and California have long been feuding over their respective rights to Colorado River water—and the feud is not settled yet. But there's a new issue now in which they are fighting together in a common cause.

Both states are alarmed over the threat that in the filling of Glen Canyon reservoir, following the completion of the authorized new dam, the lower basin valleys will be deprived of an adequate water supply.

Reclamation Commissioner W. A. Dexeheimer says there will be no interference with the rights of downstream water-users. Nevertheless, California and Arizona representatives have joined in a request that no bids be let for the new dam until the program has been investigated by a congressional committee.

It is common knowledge that the Colorado River in recent years has not discharged enough water to keep Lake Mead at Hoover dam filled to a normal level. It is reported that the power plant at Hoover dam is operating 25 percent below capacity because of the water shortage.

In view of these facts, it is only natural that lower basin areas which depend on Colorado River water for both irrigation and domestic purposes, should be asking, "Where is the water coming from to fill a great new reservoir upstream in Glen Canyon?"

All of which gives emphasis to the very important truth that in the final analysis it is Mother Nature who governs the destinies of men. It is certain that as long as the present dry cycle in the Southwest continues, there will not be enough water to supply both the needs of the low basin and put storage water behind Glen Canyon dam. The tree ring records indicate that such cycles do occur. The coming of a wet cycle eventually will solve the problem, but in the meantime it is understandable that those of us who depend in a large measure on Colorado River water will guard zealously the rights we have to that water.

* * *

I like the title which Louise Werner has given to the mountaineering copy she writes for *Desert Magazine*—"Mountains are for Everyone." Not everyone can climb mountains in the physical sense. But every human can be a mountain climber intellectually and spiritually. It is an arduous trail. There is no easy route to the top of any mountain, whether you and I climb it on our own two feet, or through the medium of books and study and plain hard thinking. But it pays a tremendous reward. The world seen from the mountaintop is a much more stimulating and satisfying place than the world that is seen through a porthole. Each of us has the opportunity to make our own choice—whether we will view the world from the mountaintop—or the porthole.

BOOKS of the SOUTHWEST

LIFE IN WESTERN BOOM CAMPS TOLD IN NEW BOOK

It has been many years since the old prospectors and desert rats at their winter rendezvous in Death Valley have sung:

*We've roamed the hills and made new trails, our burros by our side;
We've looked for gold, but ain't found none, Old Timer don't you cry . . .*

But the memory of these bonanza days (1900-1920) is revived by Frank A. Crampton in his autobiography, *Deep Enough, a Working Stiff in the Western Mine Camps*.

At 16 years of age the author ran away from his wealthy New York parents and became a mining stiff in the boom camps of the west. The first lesson he learned from the two kindly hard rock miners who took him under wing was never to stay on a job after there was no more to learn from it. This usually took three months with the author and the result is an extremely mobile and interesting life.

From a top hard rock miner swelling with professional pride, Crampton became a self-taught surveyor and assayer and finally a mining engineer.

The uniqueness of this book stems from the fact that the author moved with equal ease among the working men as well as the mine management and owner levels. His youthful enthusiasm and sense of humor are reflected on every page.

Published by Sage Books, Denver, Colorado; with many historic old photos; 275 pages; \$4.00.

EARLY ARIZONA DESCRIBED WITH REPRINTED STORIES

" . . . the (Prescott) *Miner* cannot lower its dignity and character . . . by noting so contemptible a blockhead, dog-robber, liar and slanderer as we have, time and again, proven the conduct of the (Tucson) *Citizen* to be . . . Back dog to your kennel!"

This scurrilous 1871 editorial snatch sets the tenor for a collection of lively

Desert Best Seller List*

1. *Ghosts of the Glory Trail*
Nell Murbarger — \$5.75
2. *Geological Story of Death Valley*
Thomas Clements — \$1.50
3. *Lost Mines and Buried Treasure*
John Mitchell — \$5.00
4. *Poisonous Dwellers of the Desert*
Natt N. Dodge — \$.50
5. *Flowers of the Southwest Desert*
Natt N. Dodge — \$1.00

*Based on April sales by Desert Magazine Bookshop.

articles, reprinted almost exactly as they appeared in the early newspapers, that make up a new book, *Arizona: The Last Frontier*. Edited by Joseph Miller, who earlier used the same technique for *Arizona Story*, the selection is well made and provides an interesting journey through the last half of the 19th century on the Arizona frontier.

In common with all ages, unfortunately, the bad news made the headlines and the book gives emphasis to the lawlessness of the territory. But, also in keeping with the age, there is humor throughout.

Published by Hastings House, New York; with drawings by Ross Santee; index; 350 pages; \$6.00.

FULL STORY OF METEORITE CRATER RESEARCH TOLD

To Southwest readers the name Nininger is synonymous with scientific advances in the field of meteorology and more specifically with our increased understanding of spectacular Meteorite Crater in northern Arizona, one of the world's most accessible and best preserved collision craters.

And now Dr. H. H. Nininger of Sedona has written a book, *Arizona's Meteorite Crater*, which gives the complete story of all the research work undertaken at this 50,000 year-old crater by scientific observers in the past half century.

After early authorities examined the area and agreed that the crater was not of volcanic origin, the chief controversy has been whether the valuable nickel-iron fireball that struck here still is underground, or whether the force of the collision caused it to vaporize into the billions of tiny metallic particles found strewn for miles around. In his work during the past 17 years, Dr. Nininger has pretty well established that no nickel-iron mass exists underground.

Aside from the semi-technical scientific work described in the book, the reader is made aware that unless immediate federal park service action is taken to preserve this wonder of Nature, it will be loss beyond full potential scientific use. As a protected tourist attraction and scientific laboratory a National Monument here would benefit the residents of Arizona and the nation to a great extent, Dr. Nininger feels. The crater surely is as valuable as are the giant telescopes which probe space for the very phenomena that lies spoiling in the Arizona highlands.

Published by the American Meteorite Museum, Sedona, Arizona; 49 pages of illustrations; drawings, charts; bibliography; index; \$3.75.

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