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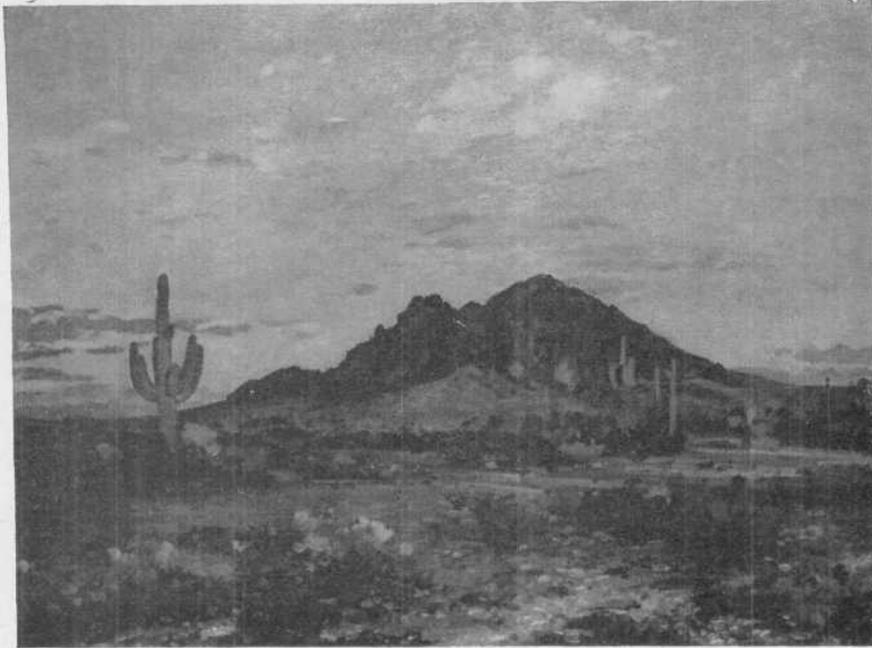
# Desert

M A G A Z I N E



JANUARY, 1944

25 CENTS



*Camelback Mountain, near Phoenix, Arizona. Color lithograph by Lon Megargee.*

### OUR RAINY SEASON

By EMMA J. C. DAVIS  
San Bernardino, California

Slowly—day after day—grey mists arise,  
Veiling our mountain peaks, our turquoise skies,  
'Til comes a night, dark, starless, overcast  
When we awake, to hear at last—at last,  
The little rain-drums, beating through the hours,  
Ceaseless reveille to the sleeping flowers.

Day after day, for us who dwell below,  
The welcome rain; while on far heights we  
know  
Falls silently the ever deepening snow,  
Filling our winter storehouse all unseen,  
With treasure trove to keep our summers  
green.

Swiftly, majestically, swept aside,  
The vast cloud curtains part some eventide;  
Wide-flung celestial gates, that to our eyes  
Disclose a radiant earthly paradise;  
With rainbow colors softly snow-emppearled;  
A re-created and transfigured world!

Ensanguined in the ruddy sunset glow,  
Saints Bernardino and Gorgonio,  
Shoulder to shoulder stand,  
And greet, across the land,  
Lone, lordly, shining San Antonio.  
"Sangre de Cristo!" Blood of Christ! one  
cried,  
Seeing some distant range so glorified.

Kaleidoscopic in the low sun's rays,  
Shifting and scintillating as we gaze,  
Ruby and emerald and chrysoprase,  
A fire opal great, that glimmering gleams,  
Mysterious San Jacinto sleeps—and dreams!

### DESERT NIGHT

By ENOLA CHAMBERLIN  
Pacific Beach, California

The shadows, hungry wolves that eat the light,  
Slip from the shelter of the rocks and brush  
And creep across the sand until  
They merge and take it captive with a rush.

A wind half wakes and whimpers in the chill;  
The greasewood rustles, stirring up a brew  
Of poignant incense. Nighthawks dip.  
And a loneliness tears the heart in two.

### BEAUTIFUL ALIENS

By CECILE J. RANSOME  
Riverside, California

Great is the loveliness revealed  
At noon where the stately egrets pose  
Deep in the riant barley field.

Shimmering whiteness unconcealed,  
Rigid as statuettes in rows,  
Great is the loveliness revealed.

Carven like lilies on a shield  
Mother of pearl that faintly glows  
Deep in the riant barley field.

All of their folded wings are steeled  
To soar the roughest wind that blows,  
Great is the loveliness revealed.

Strange that this desert land appealed  
To birds of water wise as those  
Deep in the riant barley field!

Beauty like this has always healed  
The heart of all its futile woes;  
Great is the loveliness revealed  
Deep in the riant barley field.

### WELCOME THE WIND

By EMILY PATTERSON SPEAR  
Seattle, Washington

Welcome the wind, it tells me of its roamings,  
It brings me stories I might never know.  
Today it came, a wild and searching presence,  
Bringing the praise of virgin fields of snow.

It seemed in reckless haste to sweep the valley,  
It bent tall slender saplings to the ground,  
Then lifted them and brushed their flying  
tresses,  
And left them with a beauty newly found.

Tomorrow it may tell of tided oceans,  
Or deserts where horizons meet the sun,  
Or how the deserts, prodigal of beauty,  
The glory of the cacti wooed and won.

Welcome the wind, and if in boisterous  
greeting,  
On windharps tuned to waiting desert tale,  
Or scarcely heard when rain is softly falling,  
Or silver shod it come on moonlit trail,  
Welcome the wind.

## Camelback Mountain

By NANCY ZUE SPANGLER  
Warren, Arizona

Kneeling, patiently waiting,  
For the master that never will come,  
Looming tall in the wastes of grey brown sand,  
'Neath the glare of the desert sun.

Hewed by a chisel and hammer,  
The tools of the wind and storm,  
Silently waiting through pages of time,  
A broken and weary form.

The form of a camel, head bent low,  
Outlined against the sky,  
Hewed from a mound of age-old rock,  
The art of a Power on high.

### RENDEZVOUS WITH PEACE

By WILLIAM CARUTHERS  
Ontario, California

Sing me no song of asphalt lanes  
And regimented thrills.  
For me a desert canyon leads  
Into the timbered hills.

Sing me no song of carnival  
Along a great white way—  
The masquerade of harried souls  
In cocoons of decay.

For me a silvered stream leaps down  
From crags to gorge below,  
To send along the kiss of life  
Where white-belled flowers grow.

Sing me no song of seething rant  
Where slave and master meet,  
For I have seen the padded chains  
That mute the leaden feet.

I'll let you drain its vapid dregs,  
Blow bubbles from its froth.  
And you may beat your wings against  
The flames that kill the moth.

For me, a virgin trail that winds  
Where far horizons call.  
And far from patterned life, a tryst  
Beside a waterfall.

A rock that lifts, a log that leans,  
A willow-scented breeze,  
Dark pools that keep a holy hush  
In temples of the trees.

And foolish though my dreams may be—  
The universe my lease—  
I'll watch the world go by and keep  
A rendezvous with peace.

### SNOWSTORM ON THE MOJAVE

By S/Sgt. MARCUS Z. LYTTLE  
San Diego, California

The desert waits beneath a furry sky  
To shear the clouds' deep winter coats;  
A cold wet wind brings their protesting cry  
As down the mesa, fluffy ermine floats.

### CREED OF THE DESERT

By JUNE LEMERT PAXTON  
Yucca Valley California

The "cock of the desert" is a name oft  
applied  
To sleek roadrunner, light hearted and  
free.  
With his tail as a guide, down a hill he  
can glide,  
And scarcely a creature can run fast  
as he.

**DESERT**

*Close-Ups*

• This month's cover is a portrait of Miriam Marmon, beautiful Laguna Indian girl who has been the model for a number of photographers. She has served as principal of the government Indian school in her home town of Laguna Pueblo, New Mexico. She also taught in the Indian school at Dulce and on the Jicarilla Apache reservation in north-western New Mexico. Her dress is authentic Laguna.

• Desert's editor, who has been sending his "Just Between You and Me" page from Africa for almost a year, is turning into a Desert fan. He rates his favorite fare as follows: 1—Letters, 2—Close-Ups, 3—Marshal South. So this month's Desert, in deference to his number one choice, is carrying two full pages of Letters.

• Although he is an army signal corps photographer stationed at Fort Bliss, Texas, George McClellan Bradt and his wife Sis continue studying their hobby of birds. They not only spend every spare minute tracking down illusive desert birds but they have aroused both the interest and participation of other Fort Bliss personnel. This month's story on Roadrunners is illustrated with the best photographs of this member of the Cuckoo family which have ever come to this office.

• Clifford Bond, who has furnished many beautiful photographs for Desert including covers for August issues of 1940 and 1941, now is Pho. M 2/c USN. He also wrote the pictorial article "Magic of the Navajo Medicine Man" in August, 1940, issue.

• Jerry Laudermilk, who wrote this month's story on Sand, isn't just a professor who translates a technical subject into ordinary language. Desert readers have noticed the pen-and-ink and wash drawings with which he has illustrated his stories during the past year on the Yucca Moth, Geodes and Thundereggs, Desert Color, Mirages and Petrified Wood. At one time Jerry made art his profession but he confesses, "I didn't do very well because I couldn't get along with the arty and empty-headed people whose patronage I was supposed to cultivate." But his pen and ink drawings were collected by such notables as Ruth St. Denis and Lord Dunsany, the playwright. Although he quit the world of art, as a business, he never let himself get out of practice with his pen.

• Charles Kelly has another article for Desert readers, to appear in the February issue. The setting is lonely Fremont Island, in the Great Salt Lake, Utah. It is the unusual story of a family who were forced to abandon a gay social life on the mainland, to make their home on the five-mile long crescent-shaped island for five years. It will be accompanied by a map drawn by Norton Allen.



Volume 7

JANUARY, 1944

Number 3

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# Rubbery Milkweed Clan

By MARY BEAL

NOT LONG ago the Milkweeds were looked upon as weeds, some of them even classed as noxious pests—a term few of them really deserve. In the family are several which have earned the respect now accorded any plant containing an appreciable amount of rubber.

Many native plants have been investigated as rubber producers, even before the present emergency. Among those discovered to rank high in rubber content are several species of Milkweed which belong to the genus *Asclepias*—a genus named for the Greek god of healing, Asklepios, alias Aesculapius in ancient Rome. Of the several species used in the government milkweed experimentation tests, the common Desert Milkweed (*Asclepias erosa*) stands at the head of the list. Most of the specimens averaged 7 to 11 percent latex, some yielding over 13 percent. The leaves contain 90 percent of the rubber. Maximum content is reached at maturity in the fall.

With their usual ingenuity the Indians used the fresh milky juice as a remedy for warts and also made a chewing gum of it. Perhaps you think it would be a sticky mess sure to glue up the teeth, but the collection of sap was kept until it solidified and had a rubbery consistency, chewable for some time. It might not suit your taste but the Indians liked it.

## *Asclepias erosa*

Mature plants of this herbaceous perennial average 3 or 4 feet in height. Well-favored individuals may shoot up into six-footers. Tall or short they are noticeable. The stout, sparsely-branched, erect stems may be few or numerous, up to 20 from one root. The plant starts out finely coated with white down, which wears off in age so it is practically hairless when mature. The numerous ovate-lanceolate leaves, in opposite pairs, are 6 to 8½ inches long, somewhat chewed along the margins. The flowers are pale cream or greenish, borne in umbels at the end of the shoots. They display the usual complex structure of the Milkweed family, the stamens and style united into a column surrounded by a crown of hood-like appendages, with horns protruding from the hoods, curving over the center. This elaborate arrangement rises above the turned-down corolla lobes. The pods are 2½ to 3¼ inches long, covered with fine white hairs, the flat seeds tipped by a tuft of silky hairs.

Native only in the arid regions of the Southwest, it ranges from Mexico northward through Arizona, the Colorado and Mojave deserts, beyond the Death Valley area into Nevada and Utah. It has a tendency to scatter about in groups of a dozen, more or less, along dry gravelly stream beds and shallow washes, and on low hills, from low elevations up to 5000 feet. Sometimes it assembles in greater numbers, 50 to 75 individuals in a group, a series of these groups perhaps extending for miles, following the depressions along highways and railway embankments.

## *Asclepias mexicana*

Known as Mexican Whorled Milkweed also as Narrow-Leaf Milkweed, this is No. 2. Milkweed in rubber potentiality. Give it due credit for that valuable economic possibility because it is also on the Black List of plants definitely proven to be dangerously poisonous to livestock, especially sheep. Fortunately it has a bad taste, so grazing animals pass it by unless other forage is very scarce. Sometimes it invades hayfields where it becomes a menace, because in drying much of the disagreeable taste is lost, but not the poisonous properties.

It is identified easily by its slender smooth stems and narrow leaves in whorls of 3 to 6 at the nodes. The erect stems rise 2 to 6 feet from a woody base above a deep extensive root system, putting out stout horizontal branches deep underground. The leaves are linear or narrowly lance-shaped, 2 to 6 inches long,



Mexican Whorled, or Narrow-leaf Milkweed. Number 2 rubber producer among the milkweeds.

Photo by the author.

often folded together. The numerous small flowers are greenish-white or purplish, soft short-hairy, in long-stalked, umbrella-shaped clusters at the stem ends or in the upper leaf axils. Above the 5 down-turned corolla lobes, the crown of 5 erect open hoods encircles the stamen tube, the long, linear horns projecting from the hoods. The smooth narrow pods are somewhat spindle-shaped and erect, 2 to 4 inches long, the flat brown seeds having the usual silky tuft of hairs. The Indians developed an adhesive gum from the white sap.

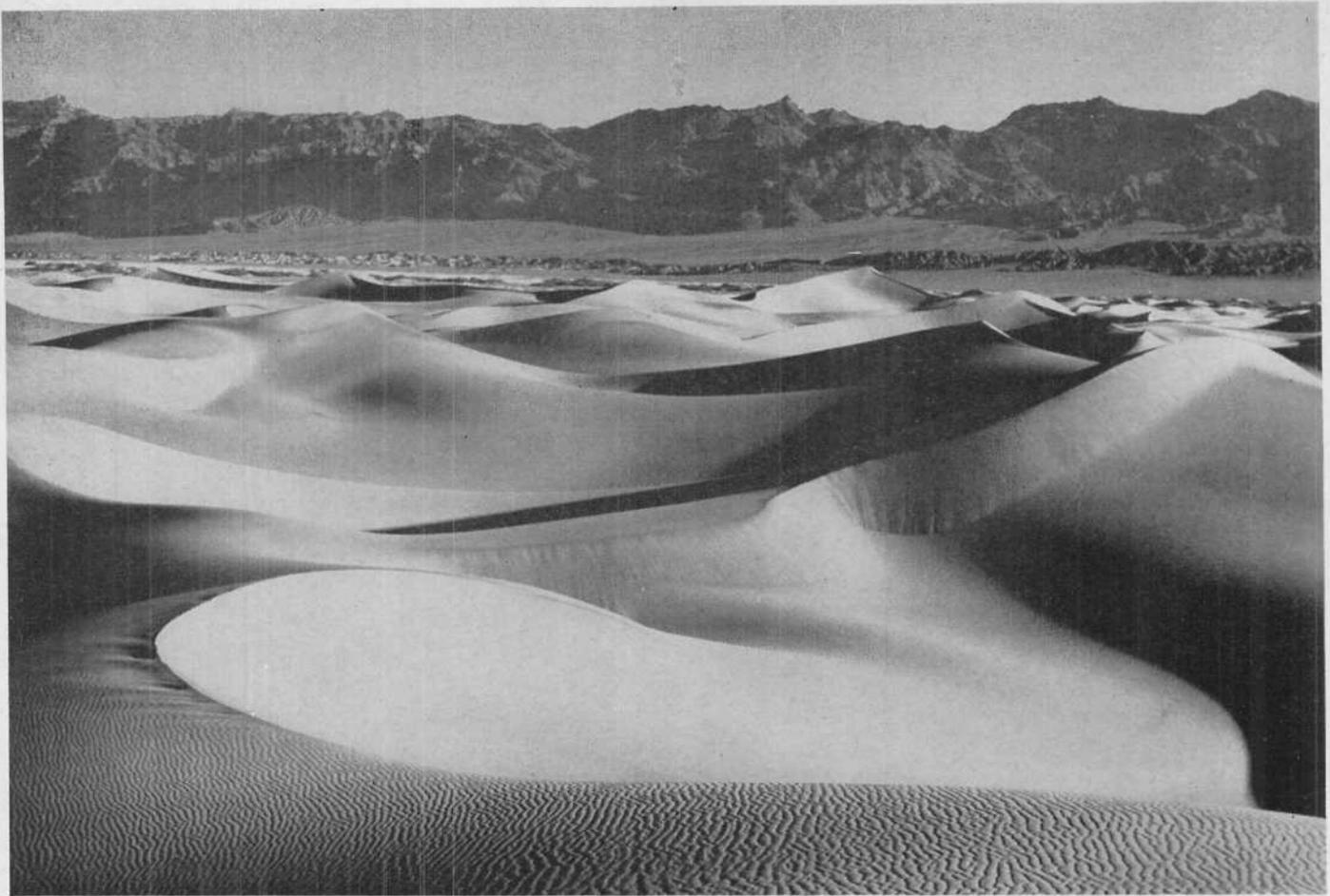
It inhabits dry plains and foothills in sandy, gravelly, rocky soils, thriving on newly disturbed or eroded areas, from Mexico (where it first was collected) northward through interior California and western Arizona to Nevada and Utah, from low up to rather high elevations.

## *Asclepias subulata*

Bush Milkweed is quite an innovation, its clumps of naked stems apparently masquerading as a rush, until a closer look discloses the family characteristics. Its many stems, usually 20 or more, rise erectly 3 to 8 feet, greenish-white and rush-like. For a very short time in early spring a few thread-like leaves may be found but they die young and soon disappear. Atop each stem are several umbels, liberally flowered. The greenish-white or yellowish corollas are crowned by elongated hoods folded together at the sides and flaring rather widely above, barely showing the sharp tip of the wing-like horn. The slender pods vary from 2 to 5½ inches in length, tapering to a long-pointed apex. The many-stemmed clumps of this promising rubber-producing milkweed may be found in bloom from May to October along washes on dry slopes, mesas and plains in the Colorado and eastern Mojave deserts, southern Arizona and Mexico. Below the Border the milky juice is valued for medicinal purposes.

## *Asclepias albicans*

Known also as White-Stemmed Milkweed and doubtless the most conspicuous. Its waxy-white upright stems not infrequently grow up 10 feet, but average 5 to 8 feet, almost or entirely naked for most of the year. Sometimes as many as 50 of these tough stems, pliant as whips, spring from one root, favoring dry volcanic slopes and rocky wash banks, especially striking on steep craggy masses of boulders. It vies with the Rush Milkweed in its stingy allotment of short-lived, very narrow leaves. The flowers are disposed in terminal panicles, the corollas white, tinged with purple or brownish, the short pouch-like hoods yellowish, the slender horns just peeking out. Waxy too are the slender pods, about 4 inches long. It grows in the southeastern Mojave and Colorado deserts, southwestern Arizona and northwestern Mexico.



Death Valley Sand Dunes. Photo by W. G. Martin, Huntington Park, California.

## *Sand--Why Take It for Granted?*

Those who come to the desert occasionally or merely admire it from a distance generally associate with it the beautiful curve of the dunes or the infinite variety of wind-rippled patterns in the sand. Desert dwellers are likely to have a less picturesque reaction, for they have felt the stinging cutting violence of a sand storm. But whether one's attitude is romantic or realistic, the nature of sand too often is taken for granted. Jerry Laudermilk's purpose this month is to give Desert's readers, rockhounds and others, a scientific basis for the appreciation of sand. Jerry believes that the more one knows about this "ground up rock that looks sorta like sugar" the more one will enjoy the beauty of the desert's most advertised feature.

By JERRY LAUDERMILK  
Drawings by the author

**S**AND! There were acres of it—ridges, dunes and mountains of it. Miles of it! On both sides of the road the sand stretched away like a sea of solid water in wind-cut waves as monotonous as a landscape in burlap. Monotonous—but there is magic in this common stuff. Mystery and the power to fascinate are part of each tiny grain, like sorcery in some magic jewel.

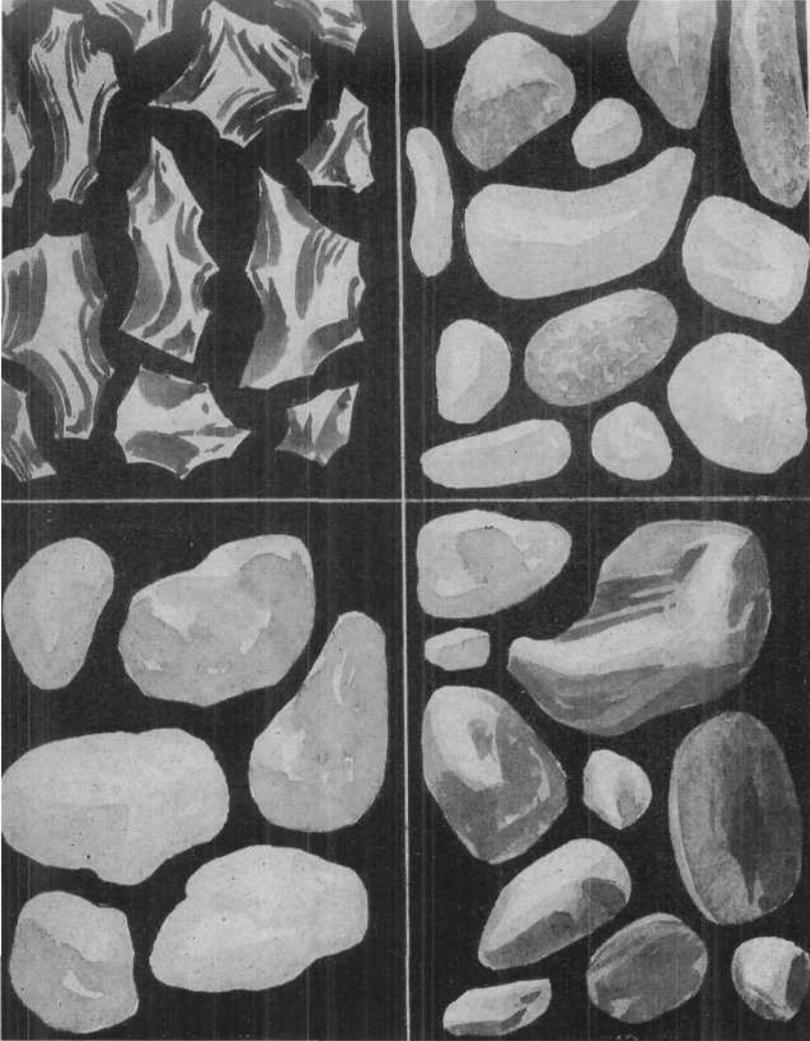
I looked at a handful gathered at random. My microscope showed me a throng of rounded grains like the faces of a mob or the tops of ten thousand bald heads. Each grain had a personality of its own, stamped with the marks of its history. This was dune sand at the height of an active career. But there are other kinds— young, inexperienced sands and old, retired sands with a past.

We are likely to take sand too much for granted. Ask someone what he means by "sand" and the chances are, unless he is a rockhound, he will be puzzled for an answer. Generally, his reply goes about like this, "Why sand is *sand*, little pieces of ground up rock that looks sorta like sugar." Crowd him further and he may counter with, "Well, all right, what is sand?"

Sand, to be precise, refers to small pieces of rock of any kind, not more than 1.5 nor less than .05 millimeter in diameter. One and a half millimeters is roughly the diameter of the lead in an ordinary pencil, five hundredths is just visible against a dark background. Anything above the top limit is classed as fine gravel, anything below the lower figure qualifies as silt or clay. The name has nothing to do with the mineralogy of the grains but unless otherwise specified, quartz sand is understood since this is the most common variety.

### Shape of Sand Grains

Like so many other things sand has to be understood to be appreciated. Under the microscope sand always is interesting and sometimes beautiful. Any sample will fit into one of three categories as to grain shape. The shape of the particles tells



Four characteristic types of sand. Upper left—Volcanic sand in sharply angular grains, from near Ogilby, California. Upper right—Aeolian sand from Pisgab crater, California. Lower left—River sand from near Whitewater, California. Lower right—Dune sand from near Riverside, California.

Or they may be smooth and polished, then they are described as rounded. This sounds simple, and the impulse is to say, "And so what?"

Well, the plot thickens a little. Sands with angular grains are either the result of disintegration due to slow decay or of fragmentation from violence—commonly volcanic action. Sand with angular grains has not been transported far by either wind or water. This is young sand with no experience, the raw material from which the other types are made. Disintegration sand is common in the mountains and near weathered masses of granite but may occur wherever rocks fall to pieces from natural decay.

The source of disintegration sand usually is granite but it may be a gneiss or other coarse-grained rock. The remaining grains of quartz, tourmaline, magnetite, garnet, etc., represent the most resistant parts of the rock-mass and have kept their chemical identity while the rest of the rock went to pieces.

Sub-angular grains are the result of moderate handling of disintegration sand by either wind or water. Glacial sand also shows sub-angular grains. This is especially true of glacial sand that has been transported.

Rounded grains are the result of long-continued polishing of grain against grain by either wind or water—especially wind. Roundness indicates an old experienced sand. Rounded sands are common on dunes which have traveled far, as in the Sahara. Sands of any of the three types may be mixed. When this has happened it indicates that more than one factor has been an agent in its deposition.

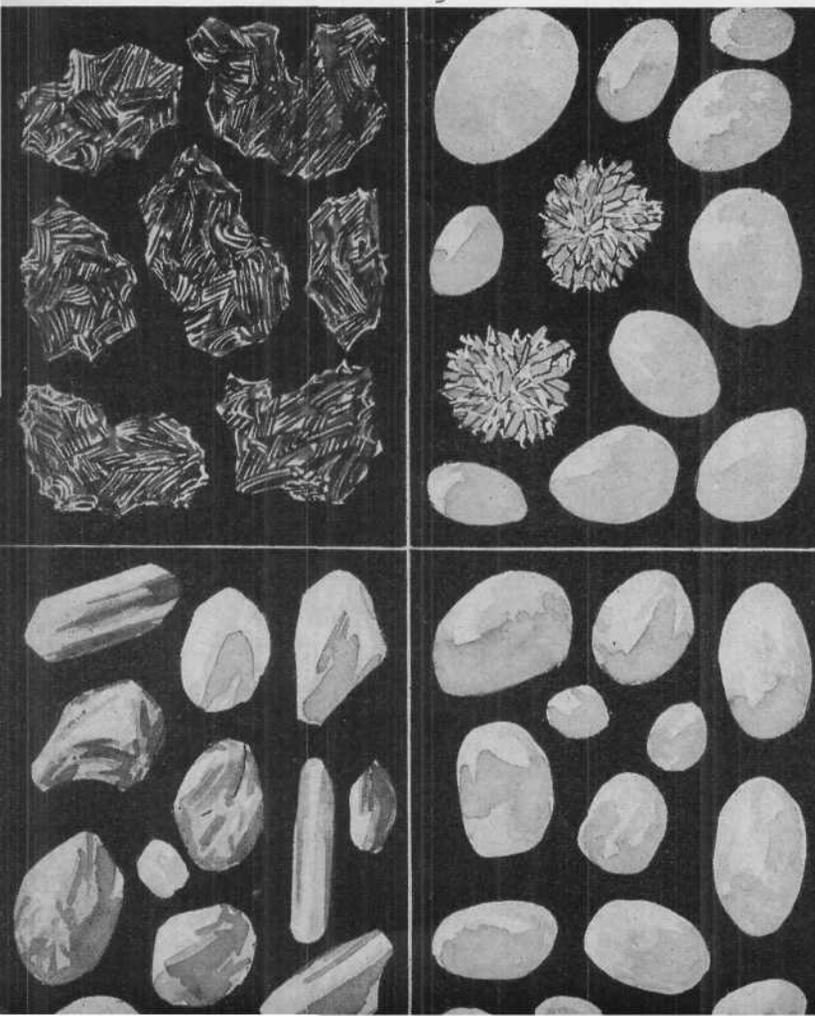
There is a limit to the amount of polishing a sand grain can take. This is the result of size. In water, any grain less than .72 millimeter cannot be rounded further. Angular particles of this size or less remain angular. This polishing limit is the result of the weight of the grains and the buoyancy of the water. The grains tend to stay in suspension when the water is in motion and the impact of grain against grain is cushioned by intervening layers of water. The size limit to wind-polishing is .15 millimeter since the dust blast is effective down to that small size. It generally is true that any well-rounded grain less than .75 millimeter is wind-polished, or aeolian sand. Under a high magnification the surface of aeolian sand frequently shows frosting due to battering, and grains may be chipped by knocking together, showing typical conchoidal fractures on a minute scale.

#### Production of Sand

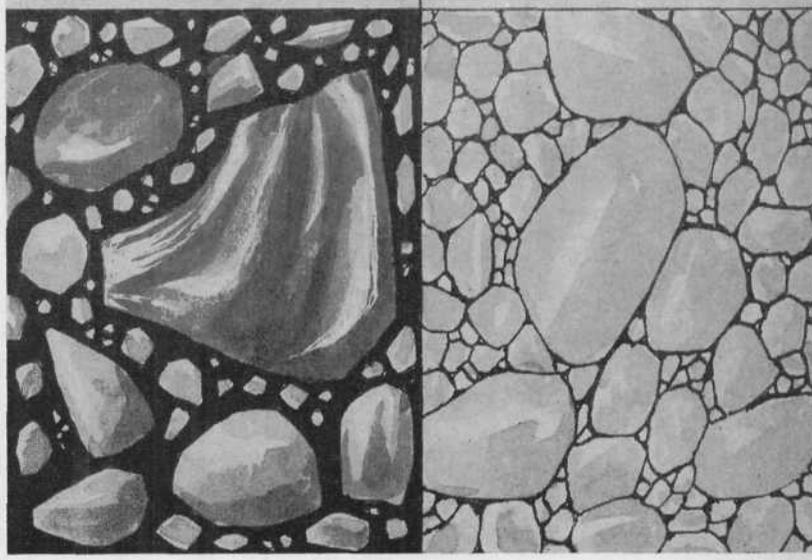
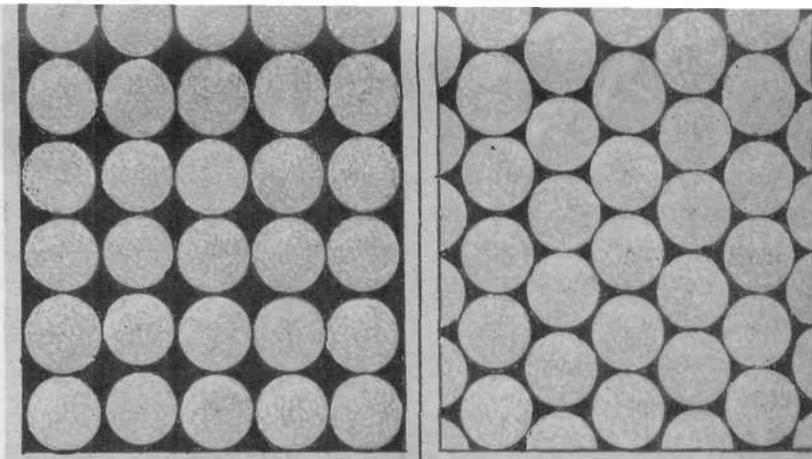
One of the most effective ways by which mineral fragments are released to form sand is through weathering, or rock-rot. A solid block of granite kept in a vacuum at a very low temperature probably would last forever. This condition exists in the case of the rocks on the moon's surface. Selenographers know with a fair degree of certitude, the general types of lunar rocks. They determine this from the way in which lunar rocks behave when photographed by ultra-violet and infra-red light. Terrestrial rocks of the same types react in the same way. But under ordinary conditions, rock-rot begins to some extent soon after a fresh surface is exposed to atmospheric action. Without doubt, the most effective large-scale factor is vegetation. Vegetation

Unusual types of sand. Upper left—Disintegration sand from devitrification of obsidian, from near Newberry, California. Upper right—Aeolian sand from Zion national park. Clumps of crystals are gypsum. Lower left—Sand from a sand crystal with conchoidal fractures. Lower right—Aeolian sand from Syrian desert, Palestine.

much about the adventures encountered by them after having left the parent rock-mass. Either the grains will be clean-cut with sharp edges and corners, or angular. Or they may be slightly rounded with indications of the angularity, or sub-angular.



*Porosity and packing of sand grains. Upper left—Open arrangement of ideally spherical grains. Porosity is 47.64 percent. Upper right—Close arrangement, porosity 26 percent. Lower left—Unsorted sand from concretion. Lower right—Mosaic arrangement of same type sand showing small porosity. Sand grains mosaic when wet.*



from a microbe to a giant redwood can contribute to the demolition of a solid granite boulder.

All rocks contain joints or cracks or will develop them after passage of time. Eventually, water seeps into these weak places, leading to final breakup of the rock-mass. Plants secrete carbonic acid as a by-product of their growth. Water containing this acid becomes a powerful agent in dissolving out iron, manganese, lime, the alkalis and other elements from the feldspars, micas, chlorite, etc. So whenever either colonies of bacteria or roots of higher plants penetrate the cracks and fissures, breakup begins. Lichens also help in this work. We can imagine a granite boulder being broken up and partly dissolved on the inside by root acids while its outside, attacked by lichens, constantly is being scaled off in flakes exposing fresh surfaces to further action.

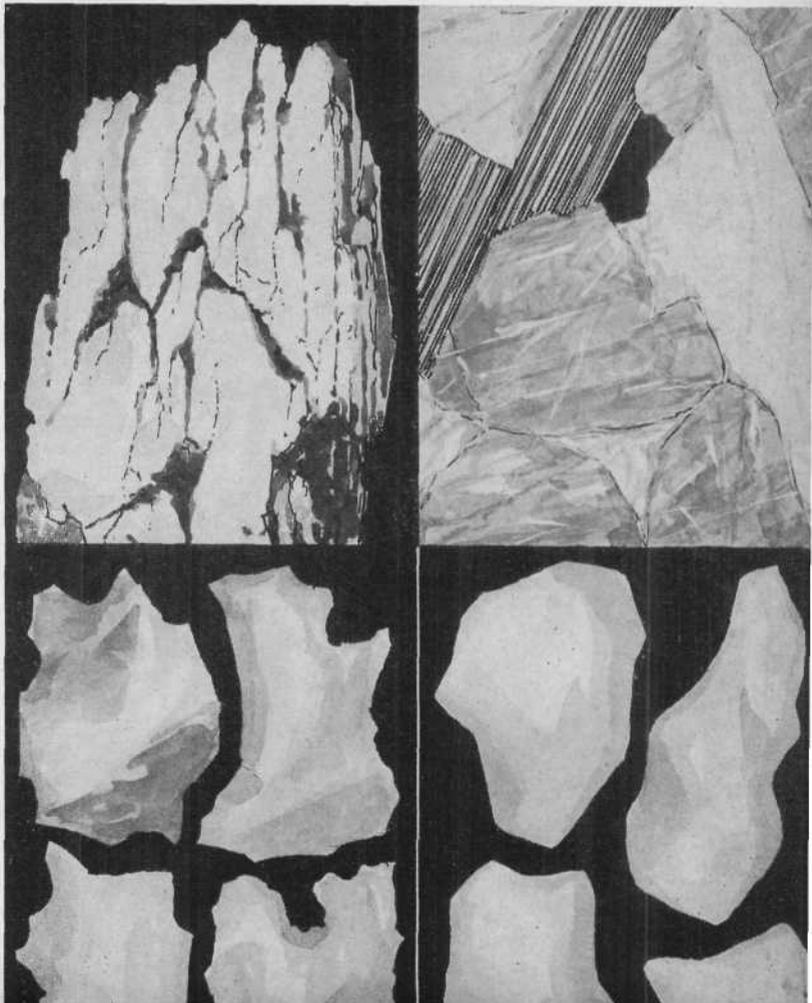
The final product of rock-rot is a pile of decomposed granite. If decomposition has reached the limit, all that remains is a lot of clay from the breakdown of the feldspar and angular fragments of disintegration sand from the quartz. Ordinarily rock-rot doesn't go so far in one operation. Crystalline rocks like granite, granite porphyry, pegmatite, etc., are likely simply to crumble, much of the quartz and feldspar being left intact to form sand.

The chemistry and mechanics of rock-rot are interesting. In fresh rock, crystals of quartz and feldspar will be mixed in every possible combination. The crystals are not held together by any cementing substance but simply cling together through the effect of cohesion of the molecules of adjacent crystal faces. These interfaces are the weakest part of the rock and while they press together so closely they may not show even a microscopic joint, water can creep in between the crystals. When this takes place between quartz and feldspar and the water contains carbonic acid, the surface layers of the feldspar crystals are attacked and softened to a tremendously thin film. Sometimes pebbles and cobbles from ancient flood plains have decomposed in place so slowly that although they appear perfectly sound they actually are rotten all the way through and can be crushed with the bare hands. Sand which has resulted in such cases frequently will show signs of the original crystalline structure of the grains.

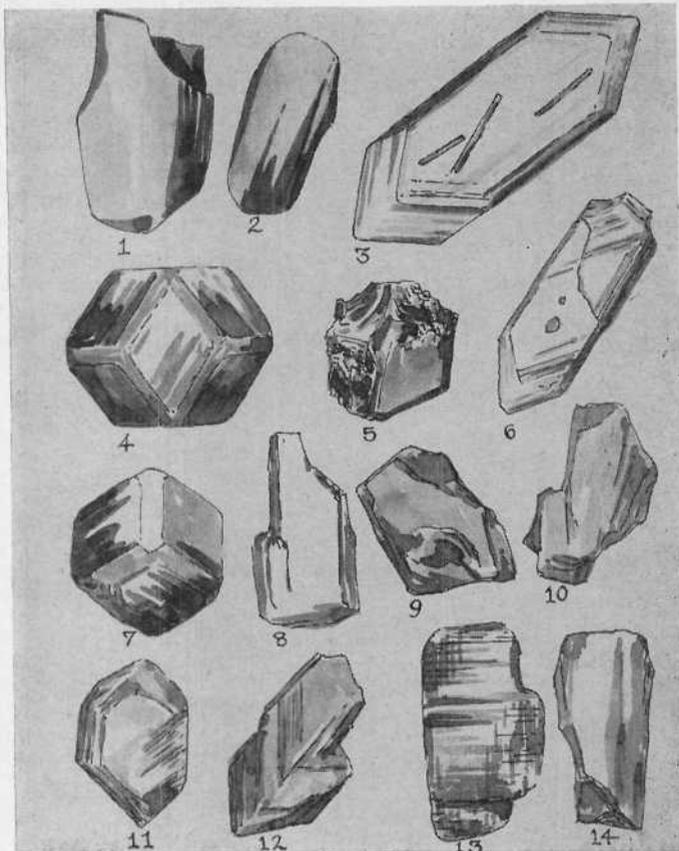
Not only is rock-rot the result largely of chemical action but the mechanical effect of pressure by growing roots which have forced their way into cracks also is effective in furthering disintegration. Hydration of certain minerals sometimes causes the surface layers of a boulder actually to swell and shell off in large flat pieces. This effect is called exfoliation. Another agent thought by some to be effective is insolation, or alternate chilling and heating of a rock so that its structure is weakened. Cold also does much work in certain climates. In Canada polished granite monuments do not last long because during the winter, moisture that has penetrated the outer layers freezes and the surface scales away in flakes. In any of these cases the final result is disintegration sand.

When, from any cause, disintegration sand finds its way into

a stream bed some rounding soon begins but does not go far until the water has had a long time to get in its work. At first sub-angular grains form but eventually the running water makes rounded grains. The round, highly polished grains are typical of wind action. When grains of this type are found mixed with sands of other types they probably have been transported



*Granite-and-sand story. Upper left—Decomposed granite crumbling from solution of feldspar. Upper right—Thin-section of fresh granite. White areas are quartz, grey are feldspar and striped areas are biotite mica. Breakup of granite releases quartz unchanged as disintegration sand. Lower left—Disintegration sand. Lower right—Sand slightly rounded by beginning of stream action.*

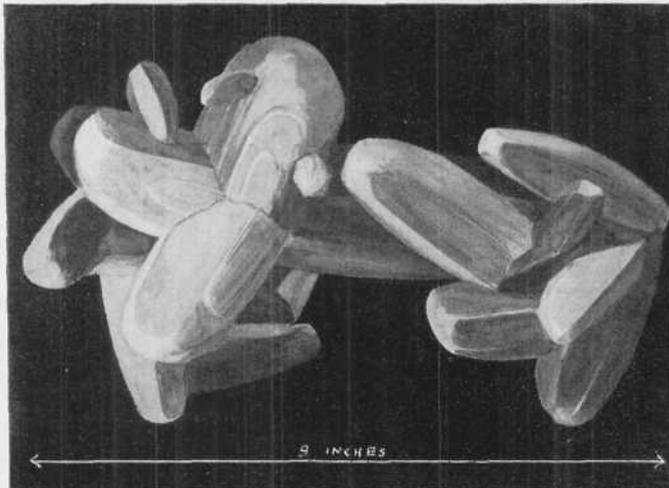


Minerals from a black sand after removal of magnetite. 1 and 2 are Tourmaline. 3 and 6 Zircon. 4, 5, 7 and 8 Garnet. 9 and 10 Epidote. 11 Sphene. 12 Rutile. 13 Microcline. 14 Zoisite.

from a foreign source. This is not always true. Sometimes sand on the dry, upper part of a beach may be tossed about by the wind and the grains rounded, and this later may be mixed with the sub-angular grains of the wet beach.

Sand formation probably has gone on continuously since dry land first appeared. Well rounded quartz pebbles less than a quarter of an inch in diameter occur in some of the pre-Cambrian formations of Utah and it is reasonable to suppose that the same rounding process applied to sand grains in favor-

*Cluster of sand crystals. Sometimes when calcite crystallizes from solution in presence of much free sand, crystals may be composed largely of sand grains enclosed in crystal structure. Specimen shown, from Snake Butte, Montana, contains 71.42 percent sand.*



able situations. Aeolian sand undoubtedly was formed as far back as the Silurian period.

### Distribution of Sand

The vast accumulations of sand in the Sahara and other deserts is of continental origin—not the remains of old sea-bottoms as is sometimes thought. In fact, deserts are normal features of the earth's surface. As Weldon Heald says in his paper "Why Deserts?" (Desert Magazine, August, 1942) they probably have existed some place during every geological age. Like all surface features of the earth, the Sahara is filled with contradictions. There was a Sahara as far back as the Silurian, yet as late as the last Ice Age the Sahara was well watered. Its present state is the result of prolonged desiccation and erosion of the old rocks which themselves, as E. F. Gautier in his work "Sahara the Great Desert" shows, mainly were sandstones made up from even more ancient deposits.

The dunes of our own Colorado desert are sand from the ancient delta of the Colorado and, to a smaller extent, from the sands of ancient lakes. The wind has been the most important factor in this case as it is in all desert deposits.

Light winds merely roll the rounded grains up the gentler slope of the dune or at most lift it but a few inches. But high winds carry both dust and fine sand great distances and aeolian sand may be found in deposits far from its place of origin. One night in the winter of 1915 at Kansas City, Missouri, there were three falls of snow. Sandwiched in between two white layers was a layer of red snow more than an inch thick. I collected a dishpanful of this and recovered much brick-red sediment. Microscopic examination showed it to consist of sand and dust rich in hematite. Later, its source was traced to the iron mine region of Minnesota about 500 miles away. Besides transporting sand through the air, the wind moves enormous volumes more slowly as dune sand.

### Composition of Sand

Several paragraphs back I said that quartz was the principal mineral in any sand. This is so, first because silicon and oxygen are the two most abundant elements on the earth's surface, and second because silicon dioxide (quartz) is unchanged by weathering. J. W. Retgers in 1892 made a study of the dune sands of Holland and found 23 minerals to be present. In most cases 95 percent of the grains were quartz. In places where there was a concentration of heavy minerals, it was possible to walk along the strand and distinguish areas red with garnet and others black with magnetite. Enrichment by heavy minerals is common and the concentrates generally are dark due to iron oxide but sometimes to hornblende.

If one of these black sands is spread out on a piece of smooth paper and a magnet applied beneath, the magnetic fraction can be segregated and the residue is likely to be astonishingly beautiful under the microscope. Viewed by reflected light it may show glittering, highly colored fragments and crystals of garnet, tourmaline, epidote, zircon, vesuvianite and other minerals.

Light colored sand like the silvery tan sand of the Hassayampa river of Arizona generally shows much mica. Tenderteet sometimes have been fooled by this mineral. Biotite, when looked upon with eyes of hope, frequently resembles gold, especially if seen through a layer of water. I once was called upon to act as technical referee in a gold recovery scheme where the end product was a nice showing of biotite. Even a fire-assay failed to convince these people that their's was but "fool's gold." In fact, I was accused by all interested parties of having jinxed the demonstration by "holding bad thoughts."

### Geology Clues in Sand

Aside from mica, other minerals may tell much about a sand's origin. The mica in the Hassayampa has, in all probability, weathered out of the granites of the Bradshaw mountains and doubtless an expert in sedimentary petrography could by a study of the sands give a reliable description of the geology of the country upstream.

*Thin-sections of sandstone and quartzite. Upper left—Red sandstone from Yermo, California. Color due to particles of earthy material between the grains in the cementing material. Upper right—Pink sandstone from Yermo. Angular grains, probably volcanic, are cemented as a mosaic by calcite containing scattered particles of claylike material. Lower left—Banded Uinta sandstone, Utah. Dark area shows part of one of the red bands. The red particles occur in evenly spaced layers among the aeolian grains. Lower right—Pink quartzite from Yermo. Sand in this area evidently is from an ancient beach. The rounded grains are firmly cemented with silica.*

Some minerals such as gypsum and calcite are too soft to be transported far. Their presence in a sand indicates nearness of the parent rock-mass. Minerals like tourmaline and staurolite always indicate a derivation from metamorphic rocks which may be far away since these minerals will bear much transportation.

Tracing an unusual mineral to its source sometimes is a matter of importance. One case in my experience concerned certain crystals of ruby (corundum). Once ruby of gem quality had been found. Other corundum of low grade was frequent. As I worked my way up stream the mineral became more common and pebbles of corundum syenite began to occur. These finally gave place to boulders and then, abruptly, there were no more traces of the mineral. This indicated that I had passed the tributary which carried the float into the main wash.

The canyon finally was located. It was very small but had abundant traces. I was making encouraging headway until again there were no more traces nor any place for a tributary canyon. Finally the source was located high up on the side of the canyon as a wet-weather waterfall.

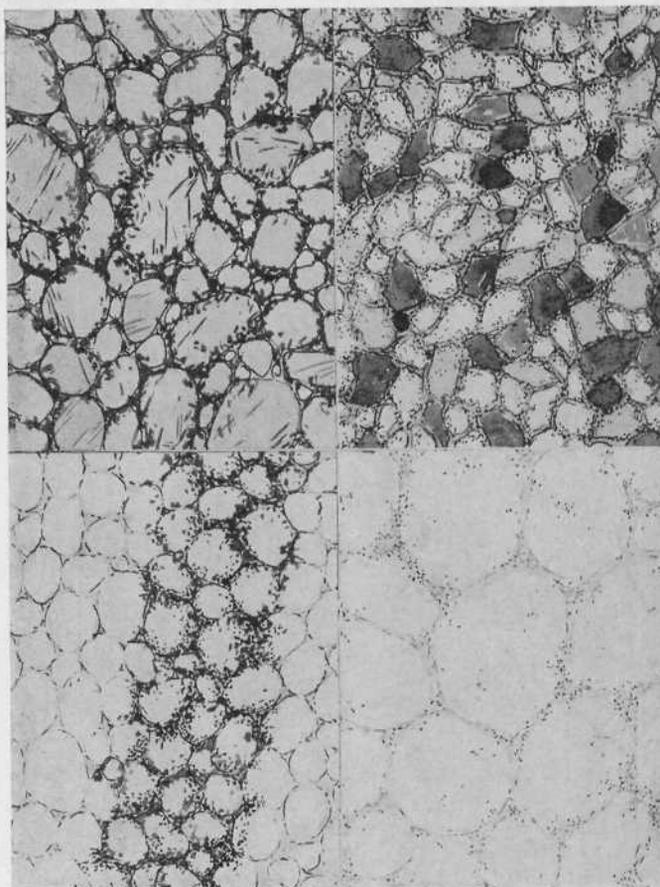
Scaling this took me to a higher stretch of canyon, which was steep, wild and rugged but full of corundum which reached its greatest abundance at the foot of a landslide where this debouched into the main canyon. Farther on there were no more traces but up the slope in the direction indicated by the slide was the source. One coming upon it from any other approach easily might have overlooked the interesting nature of the rock since it was thickly overgrown by brush and the outcrop itself covered with moss and lichens.

Sands which are typical from the presence of some unusual mineral will be recognized later if once they have been studied carefully. This is important in some criminal cases where the scene of a crime must be located by identification of the type of soil. I once was called upon to identify the previous place of concealment of a cadaver which had been found in a gunny sack. The only type material I had was about half a teaspoonful of sand which accidentally had been scraped up between the pages of a book the victim had had with her at the time of the murder. The sand finally was traced to a spot known to have been frequented by the victim.

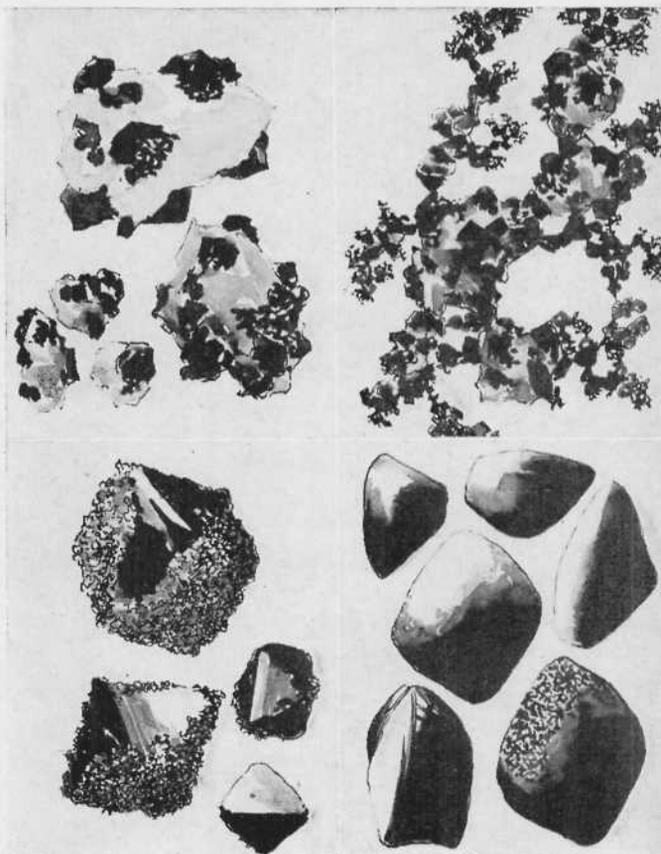
#### Porosity of Sand

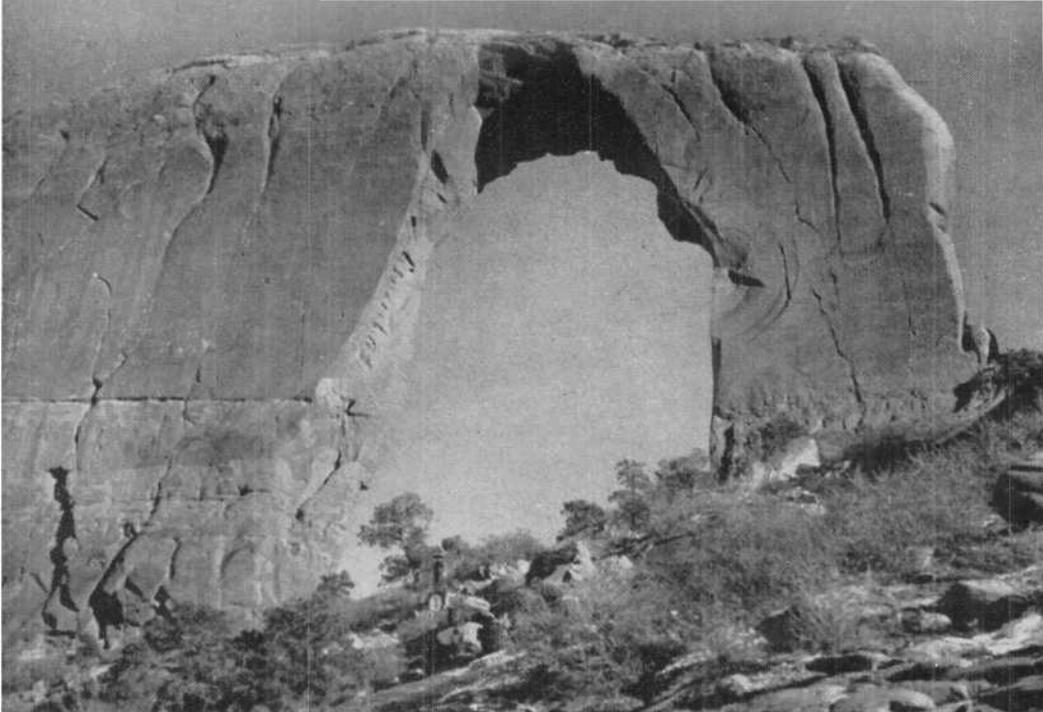
One more interesting feature about sand has to do with porosity and water storage capacity. A sand of uniformly spherical grains can pack only in one of two ways. Either each grain is bounded by six adjacent grains stacked one above the other like eggs in a crate or they stack with each grain over the space left between three adjacent grains like stacking cannonballs. In the first system the porosity or space between the

*Magnetite. Upper left—Crystals of magnetite "panned" from decomposed granite. Crystals partly embedded in grains of quartz. Upper right—Clumps of self-magnetic grains of magnetite from disintegrated granite. Lower left—Octahedral crystals of magnetite from disintegration sand. Lower right—Rounded grains from typical black sand.*



grains amounts to about 47 percent of the total volume. In the second system it amounts to about 26 percent. The remarkable feature is that the size of the individual grains makes no difference. If they all are spherical and of the same size the porosity for any volume of sand, whether the grains are large, medium or even microscopic, remains the same.





*Queen of the Red Sandstones is Ben Wittick natural arch, sometimes called Royal Arch. Carved in red Chinle sandstone, it rises some 300 feet above the sheer walls of Prayer Stick canyon. Photo by the author.*

# Black Horse of the Red Rocks

Black Horse hated white men as passionately as he hated Mexicans, who had killed and enslaved his kinsmen. Never did he submit to the law of the Bilakana, not even when Kit Carson, 70 years ago, rounded up his people and drove them to Bosque Redondo in New Mexico. He and a band of young warriors escaped into the little known Red Sandstone country of northeastern Arizona. After the Navajo were allowed to return home, the first school for Navajo was built at Fort Defiance, and white men began to "steal" the Indian children to take them to school. Then it was that Black Horse came out of his Red Rocks, again to defy the white men who, he fiercely claimed, had put irons on their children's legs and brutally whipped them. This is the story of how Black Horse, hater of white men, was instrumental in bringing about a humane and intelligent supervision of Indian education—as told to the author by a Navajo who rode with Black Horse into the Red Rock refuge.

By RICHARD VAN VALKENBURGH

THREE of us camped under the long shadows of Round Rock near the old trading post at *Bisdotlizbi des'abi* the Blue Clay Point in northeastern Arizona. Across the flickering firelight sat Jerry, my interpreter. Squatting beside him was Hastin Tsoi, one of the oldsters who for a square meal and plenty of "smokes" delighted in telling of the lore of their country.

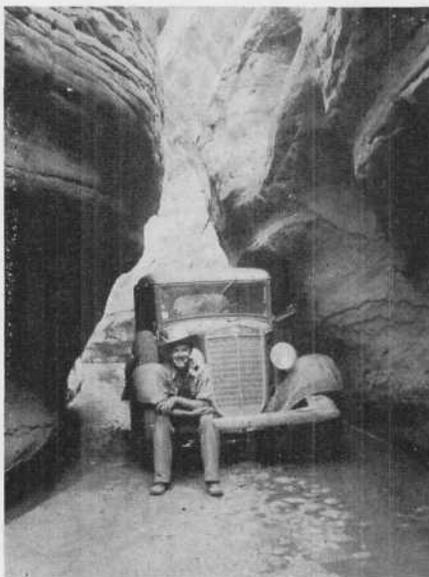
At twilight the old *bastui* had started with mystical tales of local monsters and heroes. Then he told of the Navajo-Mexican fights over slaves and plunder. When the fire died and the gleaming coals cast red shadows on his leathery face, his eyes gleamed as he told the story of *Bili lizbin*, the old chief whom white men called Black Horse.

"*Bili lizbin* never liked white men. He placed them with the Mexicans who had killed his old grandfather and made slaves of his kinswomen. As a young man he helped the chief Francisco Capitan keep the gold hunters out of the Carrizo mountains. For the old-time Navajo believed that digging holes in sacred mountains would bring bad luck to the tribe.

"Just 73 years ago *Aadlobi*, the Lassoer, whom the *Bilakana* called Kit Carson, came to "round up" the Navajo. *Bili lizbin* and a band of young warriors got

away from him. They moved their women and sheep into the Red Sandstones and hid that winter. In the summer they moved up

*No car travels across the Red Sandstones. Deep canyons soon pinch in to halt car travel. Navajo horsetrails cut deep in the slick sandstone are the only routes from Chinle valley to Shiprock region.*



into the deep forests of the Lukachukai mountains."

"Which Red Sandstones, Grandfather?" I asked.

"Right up there," answered the old Navajo as he pursed his lips eastward towards the main massif of the Red Rock strip rising to line out a sharp black horizon against the pale blue blanket of the evening sky.

Not well known to the casual traveler of Navajoland, Black Horse's hiding place has been explored only by a few natives and archaeologists. The 30-mile strip of weathered and bared Chinle sandstone which links the spruce and aspen covered Lukachukai mountains with the Carrizo range appears from the vicinity of Round Rock in the Chinle valley like a smooth sea of rolling rock punctuated by eroded and spired monuments.

Actually steep-walled box canyons slash deep into the sandstones. Tucked in high walls are numerous *Anasazib* folk cliff dwellings. In the vicinity of these simple monuments to the long-vanished hunters and farmers green oases mark tiny springs that seep forth from seams in the sandstone.

Cut deep in the slick sandstone Navajo horse trails traverse the strip from the Chinle valley to the Shiprock region.



Fort Defiance. Photo taken soon after Round Rock melee. It was the mistreatment of Navajo children in large building on left that caused Black Horse to attack Agent Dana Shipley at Round Rock in 1892.

Winding over bald ridges they rise and drop abruptly in and out of bowl-shaped parks where scant mantles of earth give precarious footing to vegetation. It still is a wild country!

Old Tsosi went on with his story:

"Black Horse and his band hid from the *Nago dildoni* those-who-shoot-from-the-side. Then after four years the Lassoer let all the Navajo walk home from Hwelte at Fort Sumner way over in New Mexico. They were badly cowed and did just what Washington told them to do.

"But to Black Horse it was just the same as in the free days. Sometimes he led his band across the San Juan river to steal horses from the Mormons and greasy Pahute. When the bluecoats came down from Fort Lewis his trail faded into the Red Sandstones.

"Sixty years ago they built a stone school house at Fort Defiance. Then the agent sent out word that the Navajo must send in all of their children between six and 16 summers. Some of the Navajo did but most of them were scrubs. They kept the good ones home to herd sheep.

"About 50 years ago an agent called *Tlizi Chon*, Smelly Billy Goat, started to steal our children. The white men called him Dana Shipley. News came that he had gone down on the Rio Puerco and had stolen some children. When Black Horse heard about this he called for a war council at a place called *Kabizbi*, Barrel Cacti. Today the white men call it Cove.

"Navajo rode in from everywhere—even as far as Ganado. Horses swarmed and great clouds of dust rolled over the country. Smoke spirals arose all over the mountains. All the chiefs gathered inside of Black Horse's summer hogan. Everyone was talking about war.

"A man named Rope Thrower from Lizard springs near Ganado spoke to Black Horse, 'I've heard great things about Black Horse. They say he has war magic. It is said he is going on the war trail. He says he is going to swallow all the white men. I want to be sure before I go to war. Swallow my head first, right now!'

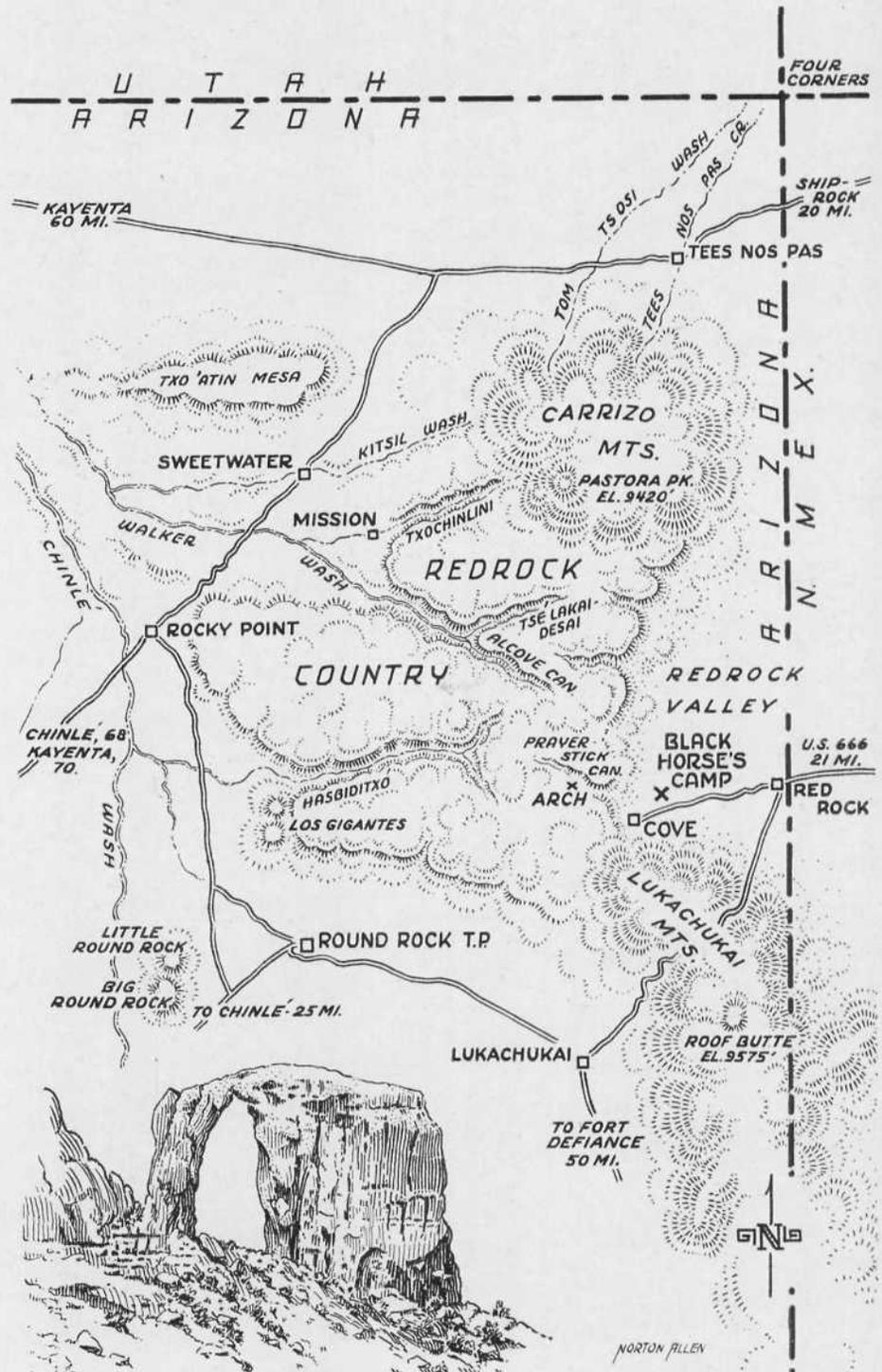
"Black Horse answered, 'Aaa, haa! I

hesitate to hurt you. I will save my magic until we go against the white men!'

"Black Horse was ready when Smelly Goat came. With him were Chee Dodge, a missionary named Alfred Hardy, and seven Navajo policemen. On the swell right here the Navajo sat on their horses and watched. When Smelly Goat started to take away 30 of our children, Black Horse yelled, 'Let those children go right now!'

"Black Horse then moved near. The agent said, 'Let's go inside and talk it over.'

"So they started a council inside the store. Smelly Goat, Alfred Hardy, and





*In the summer Black Horse hid his women and sheep from Kit Carson's Utes and Mexicans in the spruce-covered heights of Lukachukai mountains of northeastern Arizona. Photo by Milton Snow.*

Charley Hubbell the storekeeper were the only white men there. Soon the store was filled with Navajo. After they quieted, Smelly Goat said, 'I came for these children. I am going to take them back to school at Fort Defiance today!'

'Black Horse yelled, 'I'll close that school. I am going to run all of you white men out of the Navajo country. I hate them all and will kill any of them that come into the Red Sandstones!'

'Everyone got madder. They talked louder. Then they started to yell. They talked so fast that even Chee Dodge could not interpret. So they did not know what the other said. The Navajo started moving around. Then all at once they grabbed Smelly Goat and pulled him outdoors yelling, 'Kill Smelly Goat—kill all the white men! Don't leave one to tell the story!'

'Then they all tried to kill the agent. He was beaten with sticks and stones. But the Navajo piled on top of him so thick that they were hitting each other. All at

once someone yelled, 'Look! A policeman is riding in!'

'The Navajo all jumped off and scattered out. Black Horse sent some men after the agent. He did not want him to get away to tell the soldiers who were camped on Tsalee creek. When they looked for the agent he was gone . . .'

Hastin Tsosi paused. While he rattled around the canteens for a drink I remembered the version of Shipley's escape as told me long before by Henry Chee Dodge:

'It looked bad for Shipley. After Black Horse dragged him out the door Charley Hubbell and I barricaded the window and doors of the post. We got ready to make a stand. The only weapons we could find was a carbine with 50 rounds and a small revolver with one load.

'Tall Policeman and I looked out the window. Black Horse's band was piled on top the agent. All we could see was his

shoes sticking out from under the pile of howling Navajo.

'Tall Policeman slipped out the door. He grabbed Shipley's legs and had him inside before the infuriated Navajo knew what happened. The agent's nose was smashed and he was bruised all over. Tall Policeman had severe head wounds, but he had saved Shipley's life.'

The low voice of Hastin Tsosi interrupted my thoughts as he picked up the threads of his story—

'Black Horse's men moved across the creek from here. They held council. Knowing that there were guns in the store they hesitated to make a direct attack. They did not want too many killed. So they waited around until night. Then they got ready to set the roof on fire. That would drive the white men out and then they could kill them.

'They got ready to attack. Someone looked southeast towards Tsalee butte. A line of horsemen strung out against the sky. When they drew near they saw that they were soldiers. Black Horse said, 'Let me talk to them alone—before they hear the other side and the agent's lies.'

'So Black Horse rode right into the middle of the soldiers. From their hiding places in the rocks his men could see him sit down with the captain. Black Horse said, 'This agent you have at Fort Defiance will have to go away. He is causing too much trouble.'

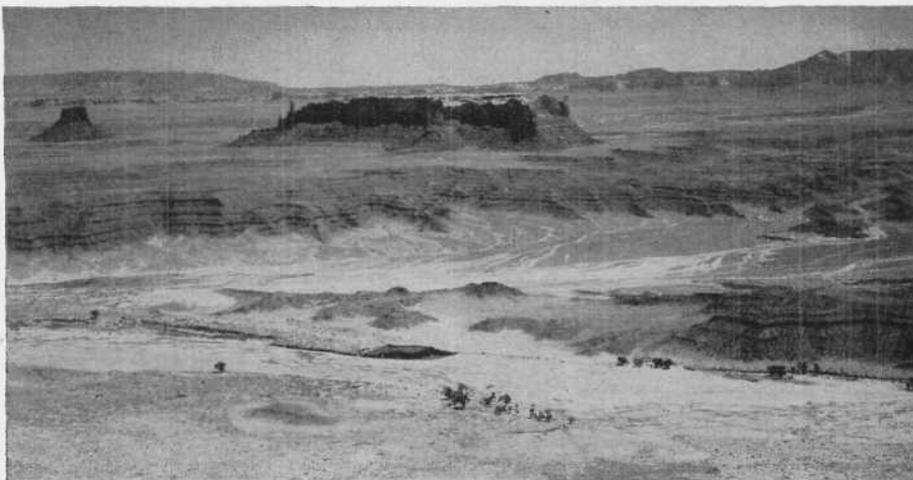
'The soldier captain was not excited as he told Black Horse, 'You had ought to be more peaceful. The bluecoats might come again and run all over you like they did 30 years ago. You had better let Smelly Goat take the children down to Fort Defiance. Then come in—we will hold a council with the number one soldier at Fort Wingate.'

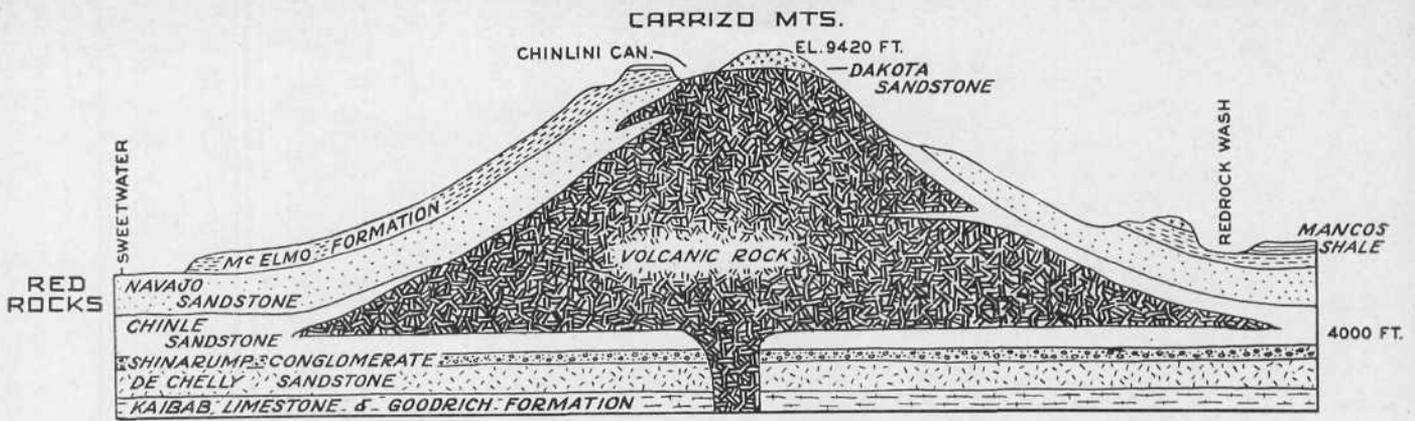
'Believing that there might be more soldiers around, Black Horse let the agent start off with the children. Then he promised the captain that he would come into Fort Defiance for council. But he did this only to get away. Followed by his band, he went up the *Haspiditxo*, the Dove Water canyon, and disappeared in the Red Sandstones.

'Later two Navajo came into the Red Stones and told Black Horse that he was to come in to Fort Defiance for a council. But he was too smart. He knew they wanted to throw him in jail—maybe hang him. He said, 'No! I'll stay right here—let them come to me. Then a lot of us will be dead!'

'So the army officers from Fort Wingate held a council with Ganado Mucho, Marriana, Gordo and Chee Dodge, who then were the head men of the tribe. Everyone was mad at the school. The chiefs feared that another war would start and a lot of Navajo would be hurt. They all said Black Horse was right in many ways—for the school was a bad place, children had

*Red Sandstone country from Chinle valley. Round Rock in foreground. Thirty-mile saddle of Red Sandstone strip, background, that links the 11,000-foot Carrizo and Lukachukai mountains.*





GEOLOGICAL FORMATION OF CARRIZO MOUNTAINS AND RED ROCK COUNTRY.

*Dakota sandstone*—Conglomerate with quartzite pebbles of buff, grey and red, contains petrified wood.

*Mancos shale*—Grey calcareous shales changing to buff and drab, contains fossils.

*McElmo formation*—Light colored sandstone, massive and cross-bedded.

*Navajo sandstone*—Red sandstone, massive, excessively cross-bedded.

*Chinle sandstone*—Chocolate colored shales at base, succeeded by purple, lavender, green and red shale, contains fossil forests.

*Shinarump conglomerate*—Conglomerate of quartzite pebbles, contains petrified wood.

*De Chelly sandstone*—Massive, excessively cross-bedded brown sandstone.

*Goodrich formation*—Bedded buff and brown limestone and sandstone. After Gregory.

irons put on their legs, and were brutally whipped.

"Then Gordo got up and spoke, 'When we put our little children in school it is like giving our hearts up. When the agent abuses them, it hurts very much. We Navajo do not whip children. The name we have given this agent is *Tlizi Chon*, Smelly Billy Goat. For a billy goat is always butting the rest of the sheep and pushing them around. We think that is a good name for him!'

"Soon after the council Smelly Billy Goat got fired. An army officer took his place. He was a better man. He made the school good. Then the Navajo did not worry about sending their little children in. But Black Horse showed that they would never be forced to."

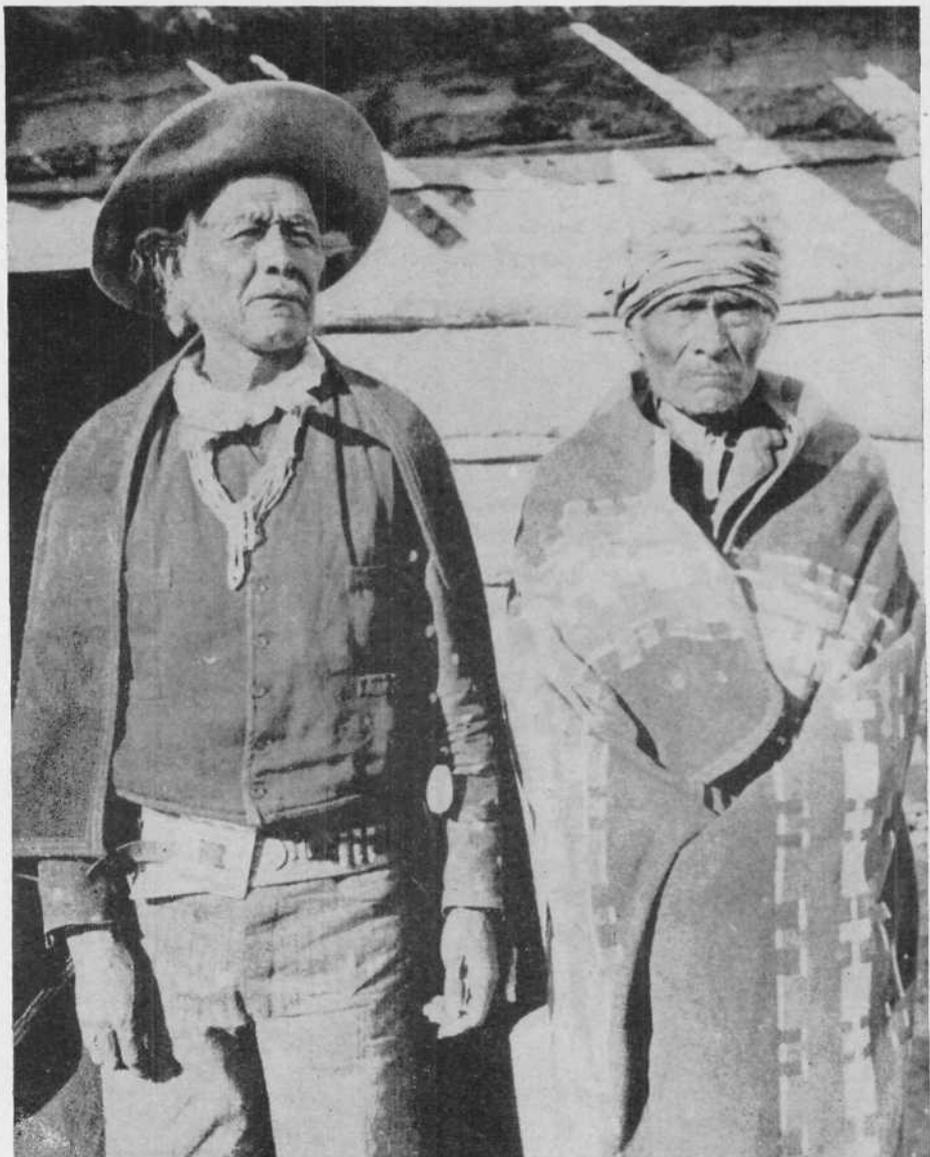
"Did Black Horse ever give up, Grandfather?" I asked.

"*Dota!* Never," answered Hastin Tsosi as he stretched out and curled up in his robe. "He stayed up there in the Red Sandstones. Until he died a few years ago he never liked white men!"

Browsing there under the Red Sandstones and on the scene of the Round Rock melee, I realized that for all his bad reputation, Black Horse in his hatred of white men unwittingly had brought about great good for his people. His attack on Dana Shipley had ended a vicious practice. And from that time began the slow development towards humane and intelligent education for the Navajo.

Looking across the dying fire to where Hastin Tsosi was a bump under his robe, an afterthought came to me. I asked, "Grandfather, how come you know so much about this affair?"

The old Navajo poked his head out and raised to his elbow as he answered, "I should! For I rode with Black Horse!"



*Black Horse and Taioni one of his followers. Courtesy Franciscan Fathers.*

# LETTERS . . .

## Welcome to Iceland Spar Prospectors Camp Wood, Arizona

Dear Desert Magazine:

Here are two subscription orders. I tried to buy Desert in Prescott but for the last four months straight they had sold out like hot cakes.

I notice in your November issue, page 34, the item about iceland spar. My claims, at the Arrowhead mine, are iceland spar claims although they also contain other minerals. I know of iceland spar deposits in 10 different sections in this township. It is isolated, and I would be glad to see other miners and prospectors come in. I would be glad to show others where locations may be had if they will contact me (no charge).

Also opal could be mined here by the ton—not all fire opal but some of it is alive with fire.

MRS. BERTHA E. SCHELL

## Asks Aid in Petroglyph Record . . .

La Jolla, California

Dear Sirs:

The letter describing vandalism and destruction of petroglyphs (November issue, page 17) prompts me to do something I have intended for some time. For several years I have been photographing and collecting information regarding petroglyphs and pictographs in the Southwest. These activities are out now, but I hope to resume them when the war is over.

In the meantime I would like to collect as much information as possible regarding locations of petroglyphs. Probably many of your readers in the course of their desert travels have found Indian inscriptions. I would appreciate the use of your columns to ask them to send me any information they might have.

It would be most helpful if the information covered the following items: details on how to reach the site, whether inscriptions are petroglyphs or pictographs, type of rock on which they occur and general direction in which inscriptions face. Any other details and a small snapshot would be very useful.

I hope in time to have a complete and representative collection, and am anxious to photograph as many as possible before they are forever lost through vandalism.

FELIX SAUNDERS

## Desert Picture Worth More . . .

Chandler, Arizona

Desert Crafts Shop:

Thank you for sending "Sunlight on the Mountain" color lithograph. The picture certainly is worth more than the price.

1st LT. LEROY J. ANDERSON

## Salute to Dad and Son . . .

Escondido, California

Dear Miss Harris:

I was thrilled when I found the Just Between You and Me written by Rand Henderson of the U.S.M.C. in the December issue, as I have been looking for something from him ever since he left the staff to join our armed forces. More power to Rand, and I hope we hear more from him. Liked the new sketch by Norton Allen for Randall Henderson's regular page. More power to both Dad and Son.

FLOYD D. RICHARDSON

## Want Geology Correspondents . . .

Ann Arbor, Michigan

Dear Miss Harris:

My son and nephew who are now in the service are students of geology and mineralogy, and would find much relaxation in corresponding with others on those subjects. My nephew Jack Foster, in the marine corps, has just finished a radar course at Harvard, having studied geology at Dartmouth. Our son Richard was in University of Colorado until last July, when he was sent to University of New Mexico V-12 navy course. Both will soon have changes of address, but any correspondence with them may be sent to me for forwarding.

MRS. FRED BEIDLEMAN

## Souths Welcomed Home . . .

Santa Monica, California

Dear Miss Harris:

It was good news to learn that after a year spent in search of a new Shangri La, the Marshal Souths had returned to their beloved Yaquitepec.

Although we have enjoyed vicariously all their adventures in new desert country, there remained in the hearts of many friends a sympathetic pang for that little deserted home among the junipers and boulders on top of Ghost mountain. And I wonder if the force of this thought had something to do with our little family of nature lovers turning their backs on further adventure and causing them to retrace their steps to the peace and beauty of Yaquitepec, a home they built and dedicated to the love and enjoyment of glorious sunrises, golden sunsets and radiant panoramas of desert scenery.

I take this opportunity to send them a hearty welcome, with a prayer that the rain gods will send a bountiful supply of water. I also send greetings to Mr. Henderson in his far away African camp and hope before another year closes he will be back at his desk in his own beloved desert.

KATHRYNE LAWYER

## December Cover is "Ugly" . . .

Tucson, Arizona

Dear Editors:

I write to make a vigorous protest about the December cover picture. By no stretch of the imagination can I see it as a cover subject any time, much less December. It is nothing but some scattered shadows, not the slightest bit of interest, good design or suggestion of Christmas. Never have I seen such an ugly thing. Surely you could do better. Many abandoned buildings are beautiful but you will have to talk mighty fast to prove that one is.

For some reason your December issues have about the only poor covers you ever put out. Last year's was good but far more suited to the vacation season than December. An old desert church or shrine, an Indian mother and baby, even animals and their young, make beautiful December covers.

MRS. WILLIAM McFARLAND

## Rebuttal from Fuzzy Thinkers . . .

San Diego, California

Desert Magazine:

All my life I have had a sneaking suspicion there was something very wrong with me. At last I know what it is—I am a "fuzzy" thinker. It took Mr. Merritt Boyer's letter in the November issue to show me the light.

If other readers and true friends of Desert felt as I did on reading Mr. Boyer's letter, they sputtered and tumbled periodically for the next week. Most of them, after subsiding to occasional subterranean rumblings, will reread the letter, as I did, and decide it was a sincere criticism. They will strive to construct a worthy rebuttal.

I have been acquainted too short a time with Desert to do a bang-up job, but I would like to put in my two cents' worth for the "defense." The informed atmosphere you have achieved and maintained through the personal approach to desert life with its many facets is delightful—near perfect. I should not like to see Desert become fictional. Equally would I dislike it frozen into an encyclopedia of facts. Just keep brewing your magic formula and you will continue to find a growing host of friends.

MARY E. McVICKER

## Paging Norton Allen . . .

Oakland, California

Dear Editor:

When I receive my monthly copy of Desert, I quickly glance through it to be sure Norton Allen has a map there. Then I take a deep breath, and settle down to enjoy each page, secure in the knowledge that after this war old friends once again will gather around the campfire in the desert, recalling past experiences, telling tall tales and dreaming of tomorrow's find.

GERTRUDE LOFGREN

### Fears Boyer Has Factomania . . .

Gambier, Ohio

Dear DM:

A few lines in answer to Merritt W. Boyer's unjust and harsh judgment. If my diagnosis is correct, Mr. Boyer is seriously afflicted with Factomania. I can picture him reading and devouring page after page of the Congressional Record, or some other such unseasoned recording of facts.

Mr. Boyer's ideas of good composition are grossly contrariwise to authoritative concepts of successful nonfiction. According to no less an authority than Professor Walter S. Campbell, University of Oklahoma, the fundamental prerequisite of successful nonfiction is to "present fact with passion, or to present your words in such a way as to arouse the emotions of the reader."

Majority of DM's readers are more or less emotional, and our love for the desert is a passionate one. We can recall many times when a writer presented his subject to harmonize with our own emotions or memories, thus making the presentation far more than one of mere words or facts, something to treasure and cherish.

Haven't we all turned back to read and reread well written nonfiction? Don't we first leaf through a new magazine for a title appealing to our personal fancy? And aren't we disappointed if the author's rendition is purely factual and void of emotion-provoking properties? With few exceptions, I would say that DM's editing policy strikes a "happy medium."

B. J. PURDY

### Congratulates Boyer Criticism . . .

Pasadena, California

Editor Desert Magazine:

May I congratulate Mr. Boyer on his letter in the November issue and Desert Magazine for publishing it. We hope you go one step further and do something about it.

The account of Willie Boy is a matter of historical record and should be viewed as such by the readers of DM. Those who do not care for Willie Boy may skip him and turn to Marshal South's pattern for living.

HELEN SCHWARTZ

### Money Well Spent . . .

Yuma, Arizona

Dear Friends:

Enclosed is \$4.50 for two year's subscription. I really get more pleasure out of reading Desert than any other magazine—and I've read a lot of them since 1879. I can truthfully say I get more pleasure, entertainment and profit out of the money I spend for Desert than for a like amount spent on any other form of entertainment in the whole U.S.A.

JOHN L. WALTERS

### Another Request for Facts . . .

Los Angeles, California

Dear Miss Harris:

I am glad you published Merritt W. Boyer's letter in your November issue. I agree with him, but feel that he is lacking in sympathetic understanding of the difficulties you may face in getting high class material. He did not show appreciation, either, for the fine photographs you print, nor the interesting items under Mines and Mining, and Here and There on the Desert.

I would like to see more material under Desert Books, with some mention of older books with which readers may not be familiar. Perhaps the readers would like a list of books each month which would constitute a reading course on some phase of desert lore. How about an article on the games played by Indians?

I liked the personal accounts of exploration of little-known spots on the desert. But would like more factual articles too. Although I think Mr. Boyer's criticism is severe, I agree with him that space in Desert Magazine should not be wasted on ecstatic descriptions of the beauties of nature. That's something you either feel or don't feel—and reading about it doesn't help those who don't feel—and annoys the ones who do.

I hope while Mr. Henderson is in the army he will take a special interest in all the equipment and material which can be adapted to desert travel and camping, especially light-weight stuff for walking trips. Is it too soon to start a little column about equipment and ideas for camping for those of us who are day dreaming about desert trips.

Your poetry is pretty lousy. It isn't more than rhyme. But if others like it, I won't object too much.

HELEN KNUPP

### Says Boyer Insults Readers Too . . .

Fultonville, New York

Dear Miss Harris:

I want to register a great big, unladylike and emphatic RATS! in answer to Merritt W. Boyer, in November Letters page. There are plenty of facts between its covers. Seems to me he used a lot of words to find fault not only with the magazine but the readers as well. How does he know the readers are "fuzzy" thinkers. That letter riled my Dutch temper.

DM can't always suit everyone. But the magazine is one anyone could be proud of. If Mr. Boyer wants "Willy Boy" stories, there are plenty on the market.

I'll be sending my check soon for renewal to the magazine Mr. Boyer thinks needs more facts. But how many want it turned into a scientific magazine. Not I. I enjoy it too much as it is. (Better send Mr. Boyer a list of your fact books.)

MRS. ANNA C. BOSTWICK

### Not Enough Snakes, Spiders . . .

Boulder City, Nevada

Editor Desert Magazine:

I agree with Mr. M. W. Boyer's letter in November issue that there are not enough articles or pictures of desert life.

I came to the desert last May, a stranger to desert life, and naturally I bought Desert Magazine to learn more about plants, cacti, bugs, etc., but up to now there has been very little. We need more on desert life—such as poisonous snakes, spiders, lizards, cacti and flowers and general conditions on the desert. Our friends all have the same complaint. We need more stories on the beauty of sunsets and how the birds, rats, snakes, foxes, etc., manage to live on a dry sandy waste. Stories telling about people making a home on the desert—with all the modern conveniences—are not good reading for those who like the desert "as is."

MRS. VEVA BERRY

### DM is "Ice Cream, not Potatoes" . . .

Salt Lake City, Utah

Editor Desert Magazine:

I can sympathize with Mr. Boyer (November issue) to a certain extent when he asks for more "facts" and less hokum in DM. I like facts. Yet, while I sometimes smile inwardly at the ultra-enthusiasm of some of the writers, I like that enthusiasm, too. What if we do gush a little and overcolor the thrills, dangers and hardships? That is part of the fun! We must have a little escape valve for the romanticism that is in all of us.

There are plenty of sources for hard-boiled facts if one prefers the intellectual side of it. Even if there were not, DM does a very good job in itself, supplying a wide range of informative articles and many excellent pictures to hold up Nature's end of the story. I regard DM not as an encyclopedia, supplying a diet of meat and potatoes to the intellect, but as a rich dessert to be savored, rolled about on the tongue and enjoyed as a sheer luxury. DM is the ice cream of the meal. Like ice cream, it is lapped up all too soon. But it has this advantage over ice cream: it can be brought out in a few months and be enjoyed all over again. With an entirely friendly wave to Mr. Boyer, I'll take my DM unchanged.

RUFUS D. JOHNSON

### Back to the Desert . . .

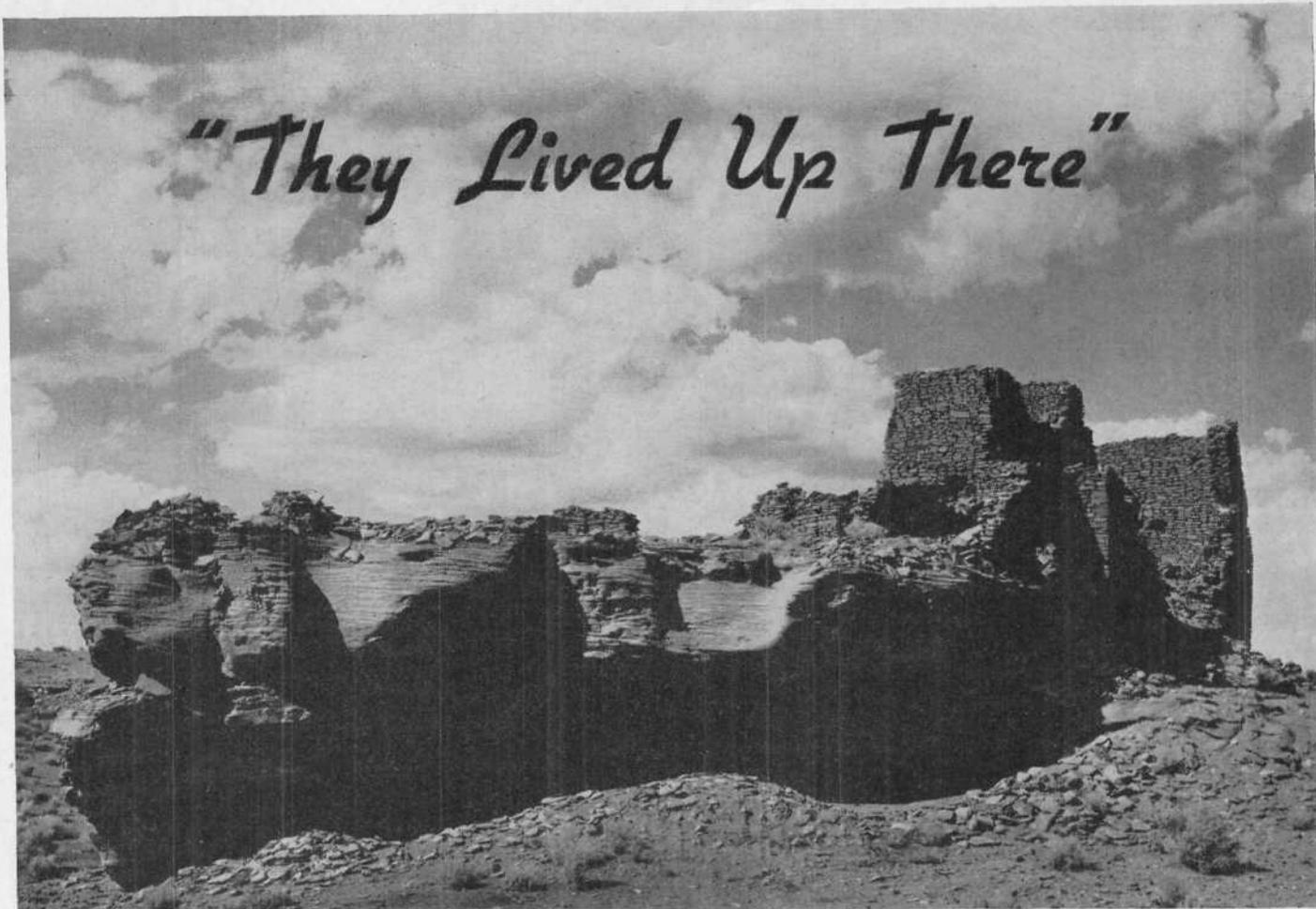
South Bend, Indiana

Dear Sirs:

Your magazine is one of the best I have ever run across. The pictures and stories make me homesick for the desert. I am coming back to live in the desert when the war is over—and hope to meet some of the rockhounds out there. I worked two years on Boulder dam.

REES ZIRKLE

# "They Lived Up There"



*The walls of Wukoki tower at one end of a red sandstone ledge, overlooking the Little Colorado river and the Painted Desert to the north.*

Remote and quiet and empty are the cities "up there." Sheltered high in deep cut caves of sheer canyon walls, towering fortress-like on mesa tops, these dwellings of ancient peoples remain as the only evidence of a civilization which came to an abrupt end about 1300 A. D. There are few clues to the mystery of the sudden exodus of the former inhabitants. The most definite evidence has come from applying the tree ring dating method developed by Prof. A. E. Douglass of the University of Arizona. This aid has led to the belief that a 23-year drought, from 1276 to 1299, forced the Pueblo people to migrate to the southward. Each year, as more excavation is being done, additional material is being uncovered—bits of evidence that gradually are being fitted into the picture of the Great Pueblo period. These remarkably preserved cliff dwellings extend through much of the Southwest, some of the finest examples being found in northern Arizona, southern Utah and southwestern Colorado.

By JOYCE ROCKWOOD MUENCH  
Photographs by Josef Muench

**N**ORTH of Flagstaff, Arizona, past spectacular Sunset Crater, is Wupatki national monument. Against a black basalt background are the ruins of red sandstone pueblos. Several thousand habitation sites have been located in the area, most of which are believed to have been occupied between the 11th and 12th centuries. They were discovered in 1851 by Captain Lorenzo Sitgreaves who was on a mission from Washington

to determine whether the Zuñi and Little Colorado rivers were navigable to the sea.

Less known but in some ways more remarkable than the main Wupatki group is the structure called by the Hopi, "Wukoki," or Big House. Its three stories stand perilously on the edge of a red sandstone ledge. Once Wukoki covered the entire rock. Now the remains of crumbled walls lie all about. It apparently was used both as living quarters and as a watch tower.

Its strategic position affords a broad view of the Little Colorado to the north, and the Painted Desert far beyond.

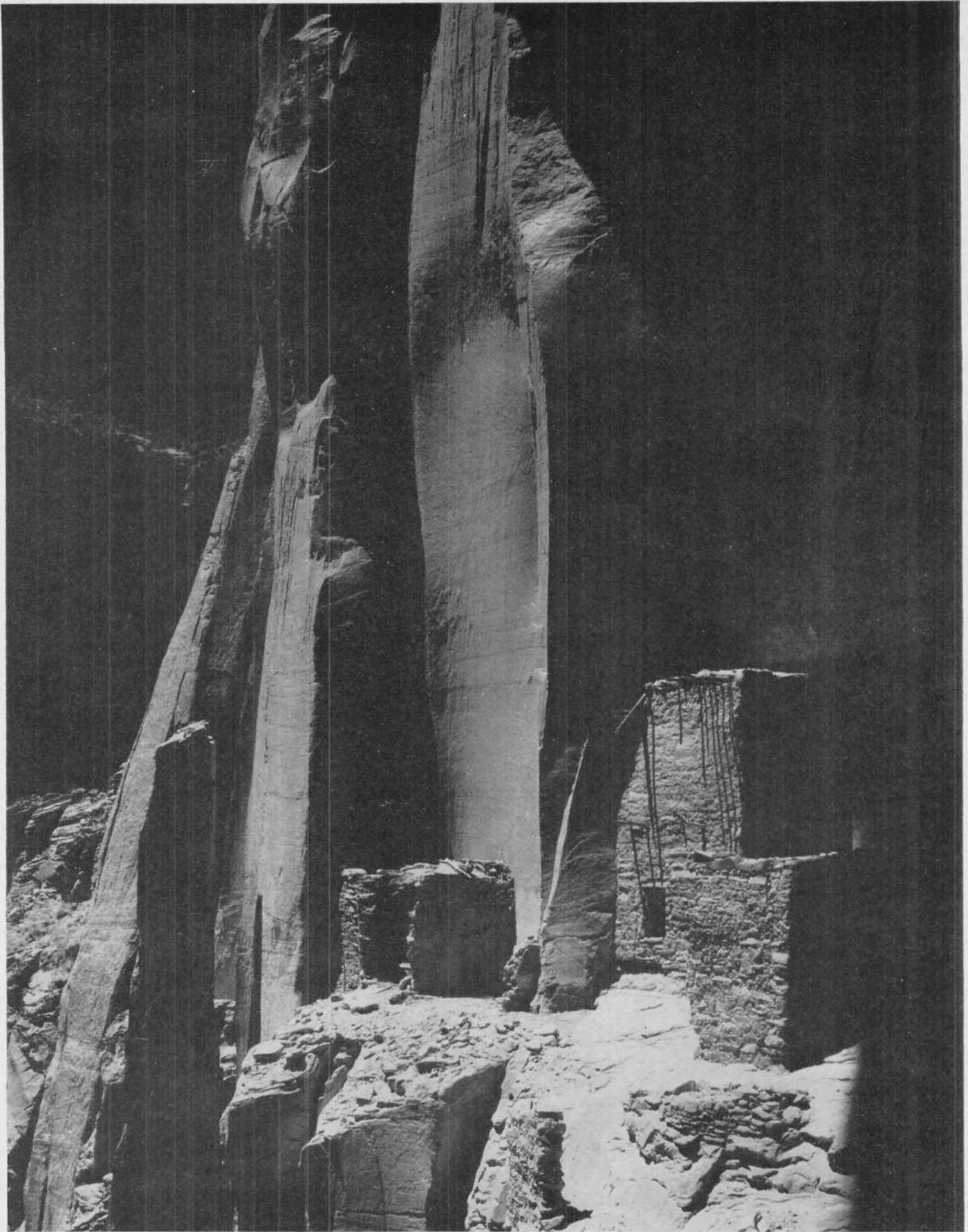
It was after the eruption of Sunset Crater, 885 A. D., that the "Old Ones" came to this area. The Havasupai claim it as their ancestral home. Hopi Indians of the Snake clan say it has an important part in their mythology, and some Hopi say it was a traditional stopping place for the Parrot clan of the Zuñi tribe.

This latter is especially interesting since ceremonially buried parrots and macaws were found in some of the excavations. Although parrots are known to range into the Chiricahua mountains of southeastern Arizona it is believed that macaws were traded in from Old Mexico. Copper bells of known Mexican origin were found, as well as pottery, wood, turquoise, shell and textiles.

Navajo Indians believe the Wupatki pueblos were destroyed by "rain, lightning and whirlwinds" as punishment for greed.

## Houses in the Rock Shelf

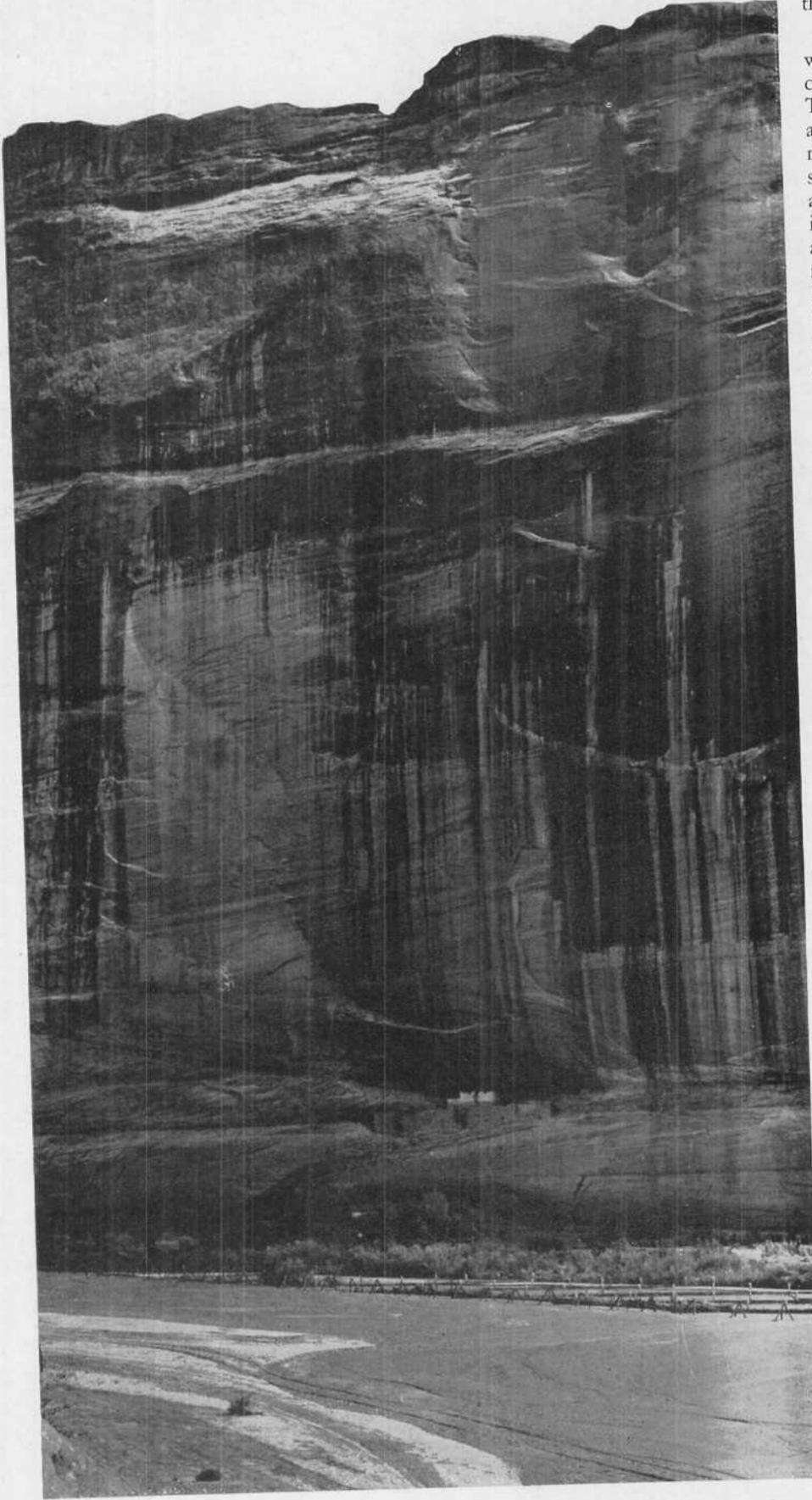
The peace of the ages lies upon Betatakin, Houses in the Rock Shelf. In moonlight it is a never-to-be-forgotten dream city. The bold black shadows are deepened by the silver streams of light on the sand-



### *Ruins of Betatakin*

Photo by JOSEF MUENCH  
Santa Barbara, California

Betatakin by moonlight is sheer magic. The black and silver walls blend with the strange stillness to form a recipe for a delightful kind of madness, a spell from which there is no escape.



*The red sandstone cliffs of Canyon de Chelly rise a sheer 1200 feet, dwarfing the White House ruins nestled in a lower ledge. Ruins seen at base of cliff once were connected by a roof-and-ladder system to upper ruins, which now are inaccessible.*

stone verticals. It is motionless and timeless, untouched by struggle or change in the world about it.

Betatakin is a great arched cave which, when discovered in 1909, was found to contain the remains of some 130 rooms. They were abandoned about 800 years ago. The cave is 450 feet long with a maximum depth of 150 feet. A heavy rain-storm brings a curtain of water down across the face of the canyon without falling into the cave. On the face of the cliff are paintings of a horned animal and of a mythical being called by the Navajo, the Bat Woman. This ruin, with Keetseel and Inscription House, comprise the three major ruins located in Navajo national monument, in northeastern Arizona.

#### **Ruins of Deserted Valley**

Hovenweep, from the Ute meaning Hidden or Deserted valley, is a delightful group of ruins built around the heads of several small box canyons in San Juan county, Utah, almost on the Colorado line. A remarkable state of preservation can be noted in the building seen across the canyon, as well as in the one to the right of foreground.

Its name is an appropriate one, for in all directions a dreary sage plain stretches, interspersed with scattered pinyon and juniper. But once, more than 600 years ago, it supported a large population. Evidences show that the inhabitants were skilled farmers who built dams and irrigation ditches to water their fields of corn. In the ruins were found kitchen ware, including stone knives. Corn still remained in some of the rooms.

Most of the Hovenweep buildings are in Ruin canyon, sometimes called Square Tower, which drains into San Juan river. It is a steep-walled little canyon, dropping abruptly 300 to 500 feet. The ruins are along the ledge of the mesa, in coves of the canyon wall and along its base. The "Deserted" ruins were passed by Padre Escalante in 1776, and they were rediscovered a century later by the Hayden expedition.

#### **White House Cliff Ruins**

Far to the east, almost to the New Mexican border, is Canyon de Chelly. Across the great sandy floor of the sheer-walled canyon, White House ruins are visible high in the "wall pocket." The group of ruins is so-named from the top tier of rooms, whose whitewashed walls are in striking contrast to the red sandstone of the canyon sides.

Today the cliff ruins are inaccessible. But formerly the ruins at the base of the cliff were probably four or five stories high, and ladders extended from the roof to the upper building. The towering walls, which form their background, are 1200

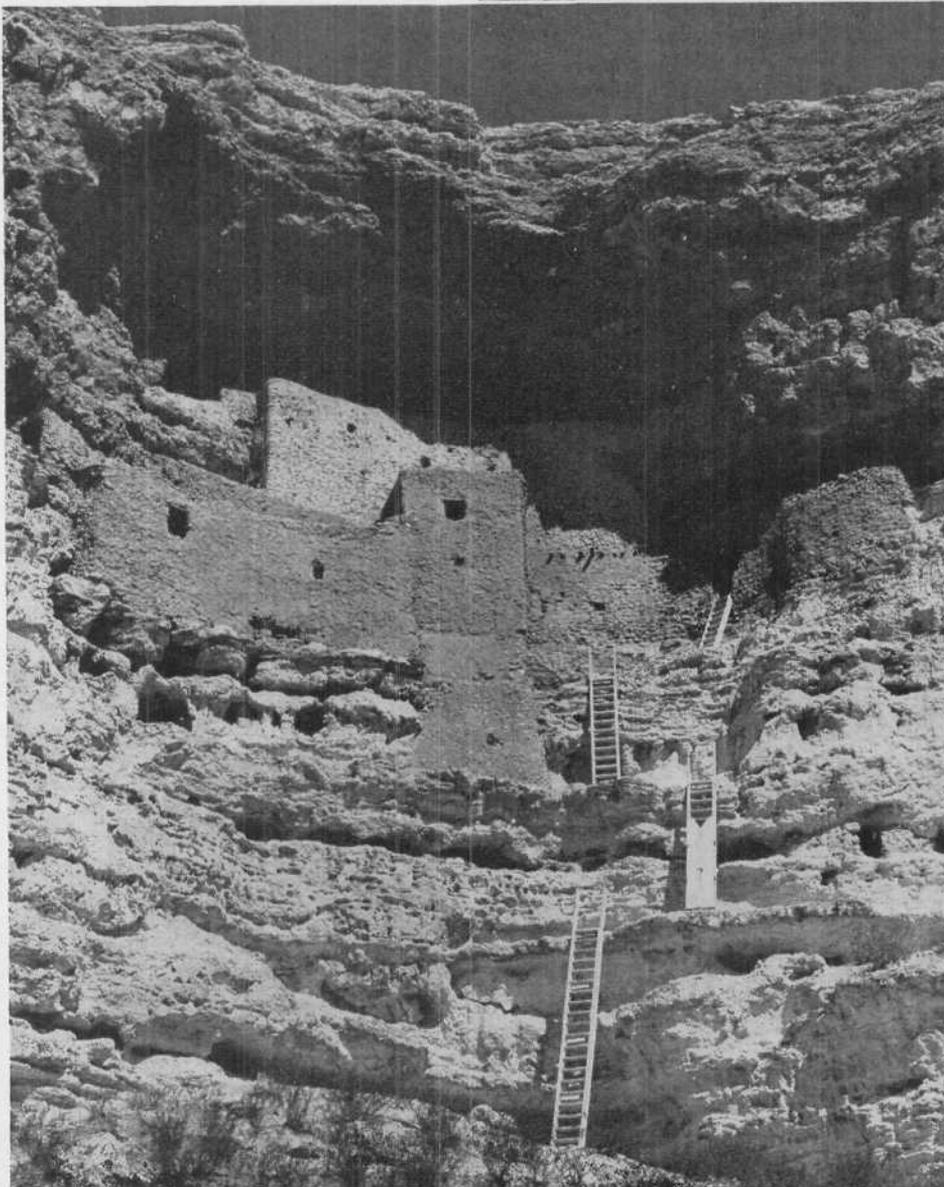
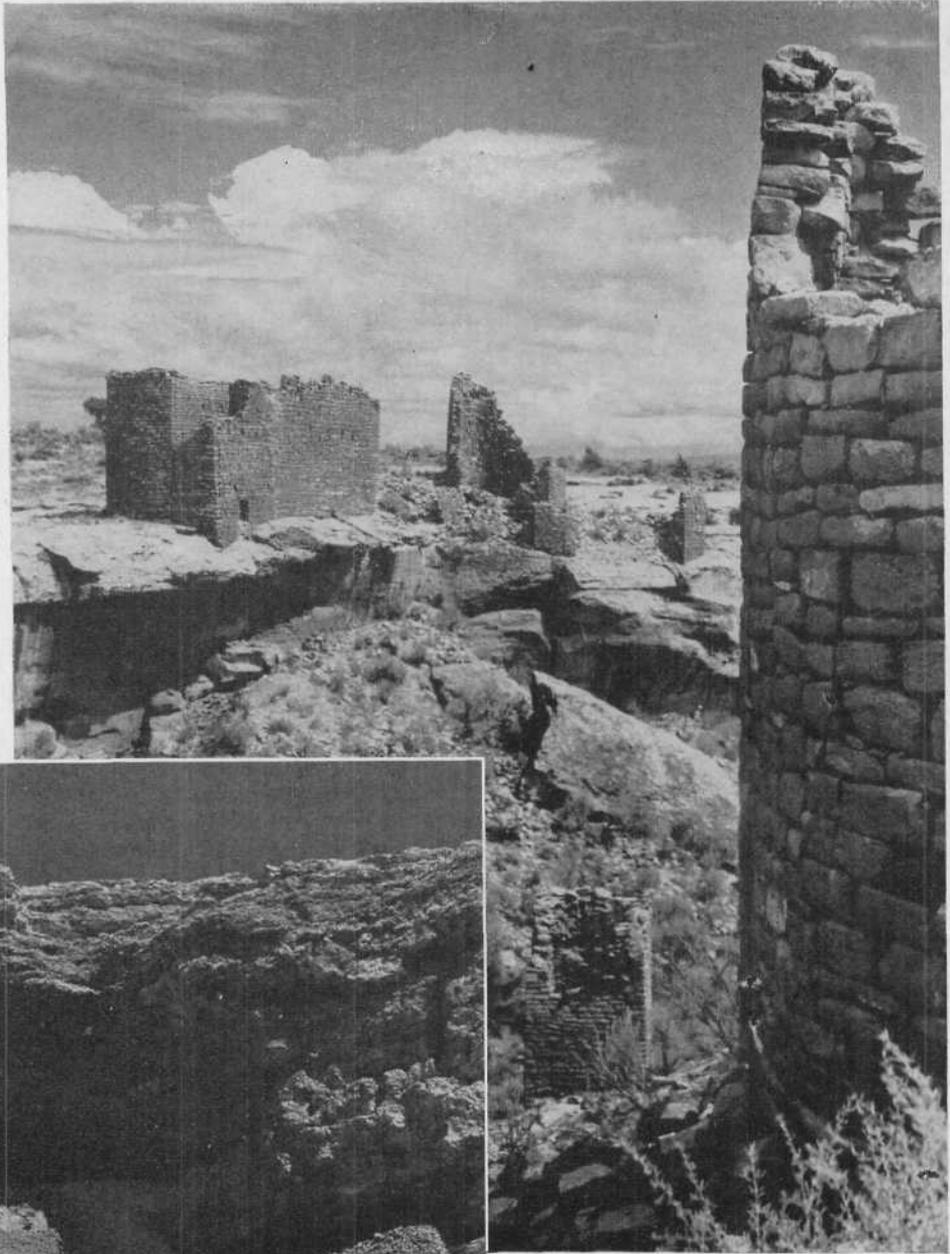
feet high, and as straight as a plumb line would make them. One of the earliest dated timbers in the Southwest was found in this ruin—348 A. D. Later dates in the same group were from the 13th century.

### Montezuma's Pink Castle

Montezuma's Castle, one of the best preserved of all the Southwest ruins, causes confusion because of its name which was given erroneously by some early settler or visitor. It should not be associated with the Aztecs for their culture did not reach this part of the country.

It has a superficial resemblance to the mud walls of a hornet's nest. The structure sets above a 46-foot talus slope and includes about 20 rooms. The ash-pink adobe castle is reached by a series of ladders. The roofs were constructed with syc-

*Far from traveled roads in the midst of a dreary sage plain is the little group of ruins known as Hovenweep, or Deserted Valley.*

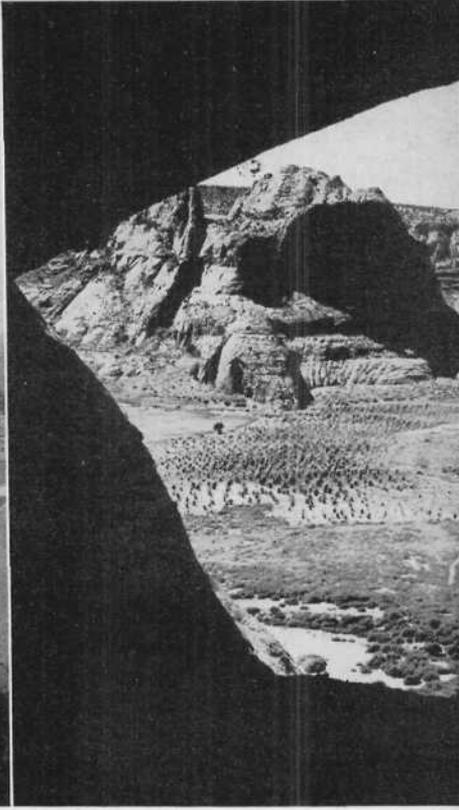
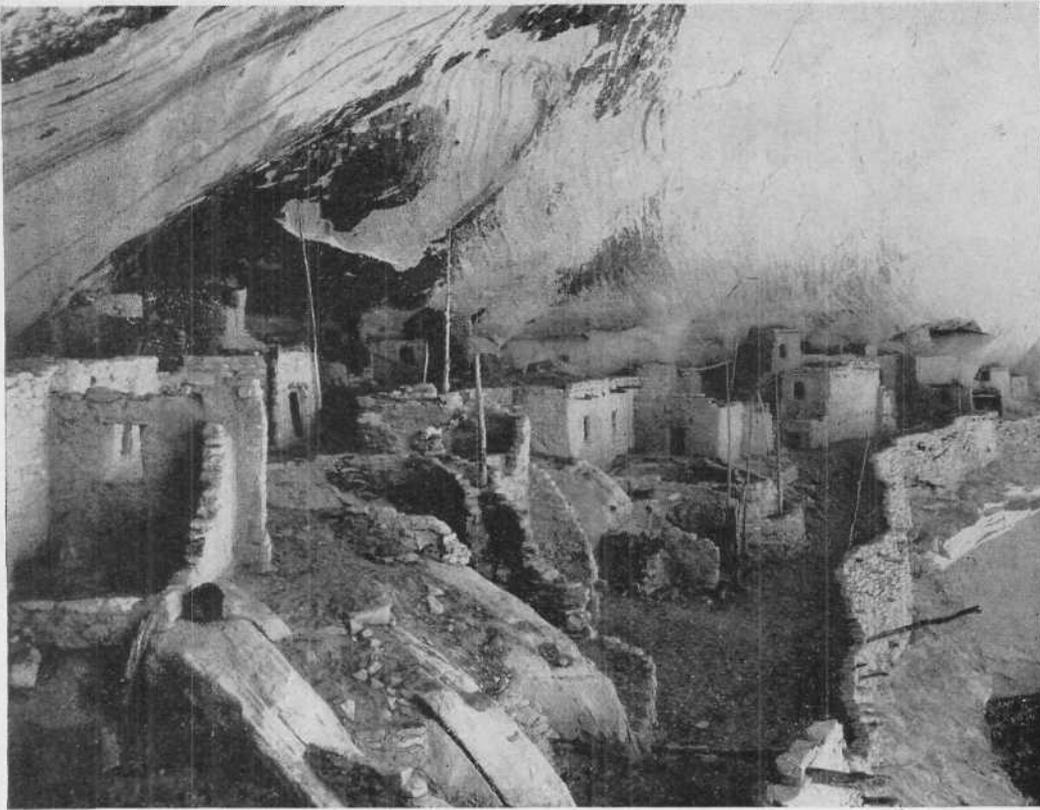


more beams and successive toppings of small sticks, reeds and a thick layer of adobe—this served as the floor of the story above. The whole building is about 40 feet high, the fifth story reaching the very top of the natural cave.

There is evidence of five periods of successive occupation and construction. Perhaps 100 people lived in this "apartment house" as early as 1100 A. D. It is believed to have been abandoned about 1425 A. D., or before the Spanish invasion.

The story goes that a cowpuncher once traded his saddle horse for Montezuma's Castle, then swapped it off for two saddle ponies.

*The Southwest has its "Brooklyn bridge story" too. Story goes that a cowpuncher once traded his saddle horse for Montezuma's Castle, then swapped it off for two saddle ponies.*



*Above, left to right—Keetseel, Nitsie canyon, Inscription House.*

#### **Cave of the Broken Pottery**

Little sunlight ever penetrates the shadows of Keetseel, Cave of the Broken Pottery. High on the ledge of a remote canyon in Navajo national monument, John Wetherill, veteran archaeologist and Indian trader, first discovered this beautiful ruin. Some of the pottery found here still may be seen in the room to the left.

There are 250 rooms in the cave, which is 350 feet long and but 50 feet deep. It is nine miles, over a rough trail, from Betatakin ruin.

#### **Inscription House Ruins**

Third of the major ruins of Navajo national monument is Inscription House, named for an unidentified inscription found there. It usually is written as "S-hapeiro Ano Dom 1661," and is believed to have been left by some Spanish explorer or missionary.

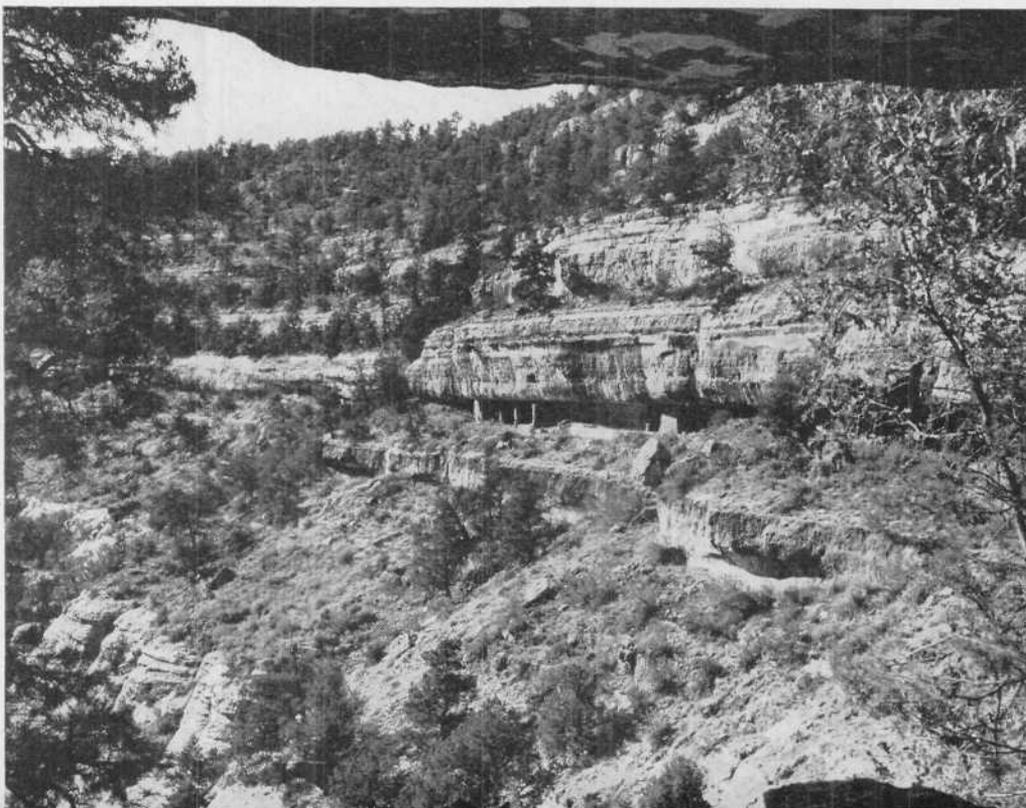
With the dark cave entrance, at the extreme end of Inscription house ruin, as a frame one may view a section of sleepy little Nitsie canyon. Its scattered fields of sparse corn are punctuated occasionally

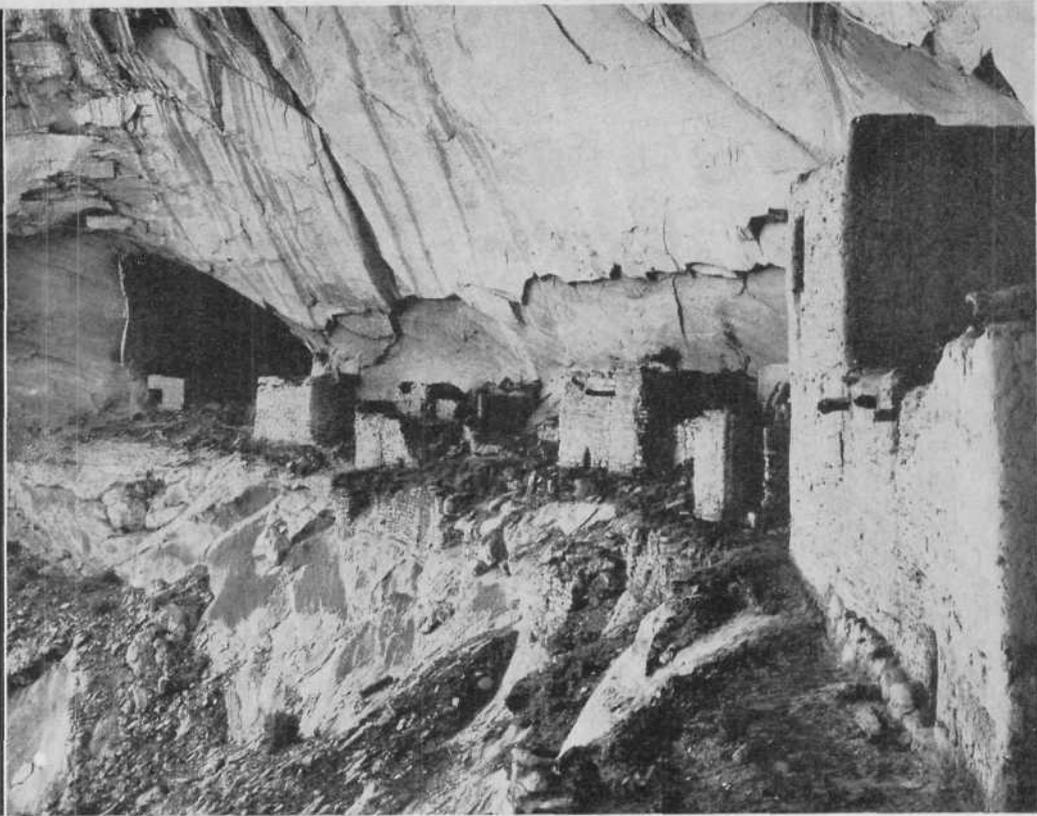
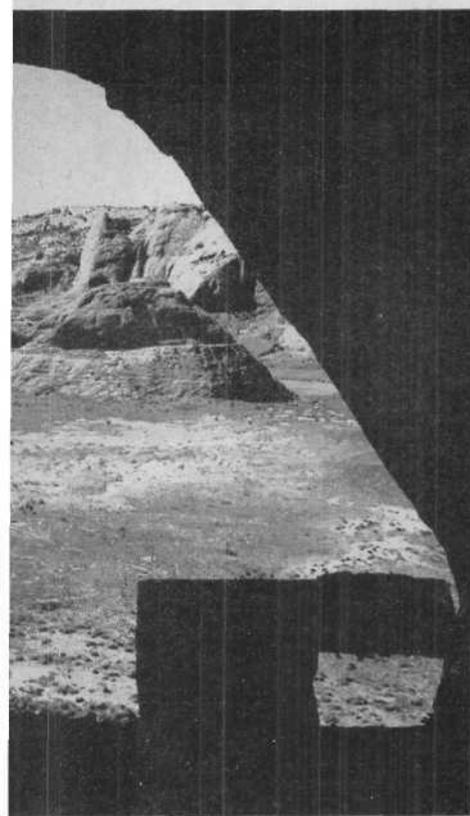
with the crude summer shelter of modern Navajo Indians. One such hogan is faintly distinguishable in the middle of the accompanying photograph.

#### **Caves of Walnut Canyon**

In 20-mile-long Walnut canyon near Flagstaff, Arizona, ruins of 300 one-story houses have been found. They are built in shallow limestone caves, protected by narrow over-hanging ledges. Remains of forts on five promontories in the canyon also have been found.

Timbers from the cave section have given the occupation dates of 900 to 1100





A. D. Bits of broken stone hoes still are found in the little fields which once were cultivated in the open spaces of the juniper forest surrounding the area.

#### Restoration of Kinishba

The restored walls of ancient Kinishba rise from the dust of White River valley, in northeastern Arizona. Dr. Byron Cummings, who directed the restoration work, is seen in lower center photograph pointing out some interesting rock construction to Joyce Muench.

The pueblo people who built Kinishba, formerly known as Fort Apache ruin, had been preceded by an earlier people upon

whose homes they built. At least three distinct cultures have been revealed.

The wealth of material found here has made this an excellent training ground for archaeology students of the University of Arizona, who have done most of the excavating. Fourteen kinds of pottery, more than 1000 gypsum pendants, abundant shell jewelry, inlaid shell pendants, turquoise and coral and other ornaments have been uncovered.

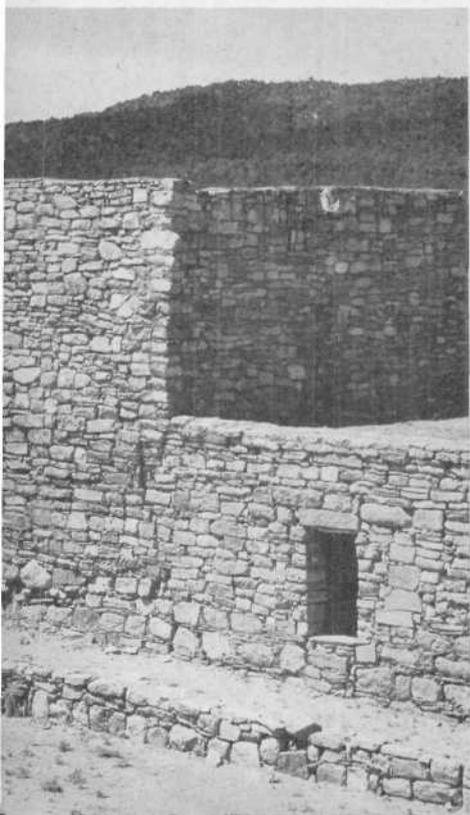
The evidence of sudden abandonment would indicate some major catastrophe. Apache legend says it was an earthquake.

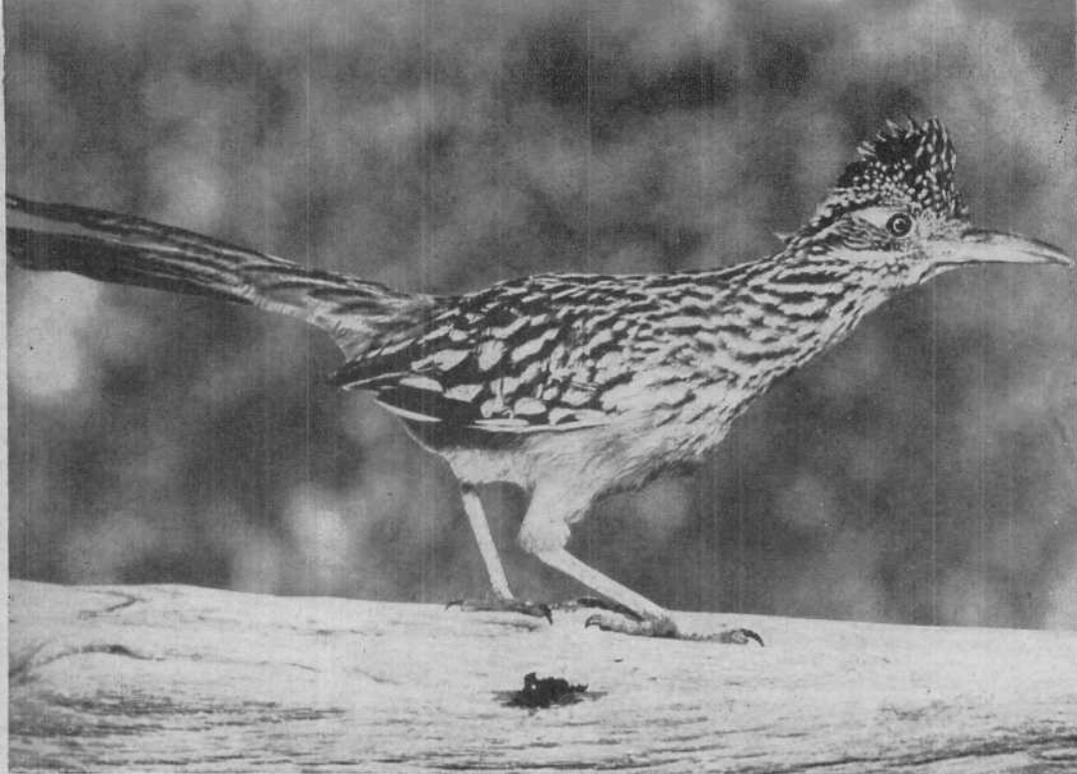
#### Spruce Tree House

When Josef Muench took the photograph of Spruce Tree House, it was raining, yet the cave was entirely protected. Spruce Tree House, shown partially restored, is in Mesa Verde national park, southwestern Colorado.

The round structures are outlines of kivas, or ceremonial chambers, one for each of the clans. Records found in this area indicate habitation extending from as early as 2000 years ago to about 1300 A. D.

*Below, left to right—Walnut canyon ruins, Kinishba, Spruce Tree House.*





Here he is—call him roadrunner, chaparral cock, snake-killer, churca, ground cuckoo, correacamino, lizard-bird, paisano—or what you will.

## Desert's Cuckoo Bird

By GEORGE McCLELLAN BRADT

Photos by the author

**H**AVE you ever seen a small, two-legged cloud of dust racing down a desert road? Or a large feathered lizard dashing through the desert thickets? If you have you've seen a roadrunner. If not—you've missed the most fascinating bird of them all.

You won't believe the first one you see. "There just ain't no such bird." He's half tail, half body, and all of him about two

*Below left—Six large white eggs lay on the nest's thin lining of dry grasses. Right—It's hard work breaking out of a shell. Note tiny wings and large foot typical of terrestrial roadrunner.*

feet long. His unbirdlike wings are short and rounded, his pale blue legs long and thin. Almost directly behind a pinocchio-beak are brilliant yellow-brown eyes surrounded by areas of naked blue and orange skin. A dark, bristly crest adorns his head. Brown, black, olive, purple and whitish feathers, all of a coarse quality, clothe his slim body. He looks like a bird whose mother had been badly frightened by a large striped snake when he was but an egg.

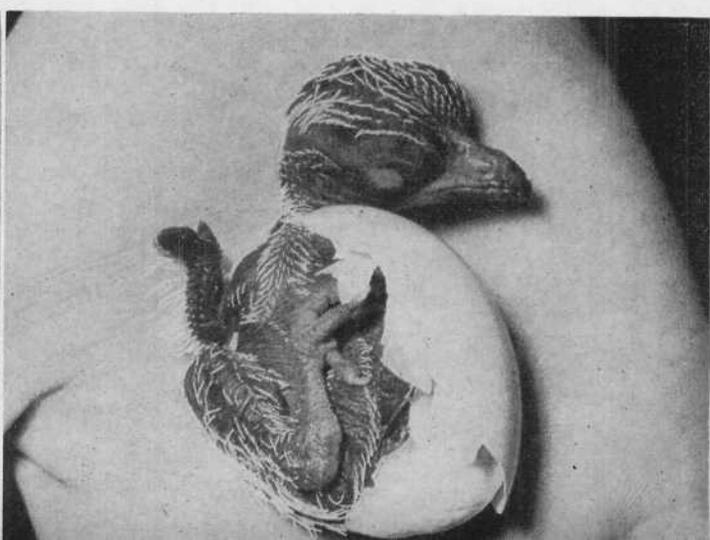
The roadrunner's feeding and nesting habits are quite as outlandish as his personal appearance. Practically omnivorous, his diet consists of about everything from snakes and mice to tarantulas and bird's eggs. Occasionally it is varied with insects,

Roadrunners belong to the Family Cuculidae, which also includes the Cuckoos and Anis. The roadrunner really is a ground cuckoo. Some of the European species of cuckoos are notoriously parasitic, laying their eggs in the nests of other birds. The American species are not so inclined. The roadrunner should be protected, for although he at times does steal eggs and young birds, these forays seldom are of harmful proportions. As a unique member of our Southwestern bird life he should be given every consideration. Egg dates for California are from the middle of March into July.

fruits and seeds. But whatever the fare it usually is swallowed whole. This habit makes the ingestion of a snake or lizard a lengthy and spectacular process. A sworn enemy of desert reptiles the roadrunner accounts for many a small but deadly rattler. But that he builds a cactus corral about the unlucky vipers, wherein they wear themselves out and fall easy prey to their captor, is pure "yarn."

The roadrunner's strange meals are captured on foot, for seldom does this fantastic bird take to the air. He prefers to remain on the ground, to run about the desert on his skinny legs, and save his capable wings for instant flight in case of danger. He stalks his prey over the sandy cactus wastes as silently as a cat. Cautiously sneaking up to within a few yards of his proposed victim he suddenly makes a final, fatal sprint which usually ends with the quarry held firmly in his stout beak. A little efficient hammering on the hard ground renders the captive unconscious, and the swallowing process is begun.

While a roadrunner's physical appearance and food tastes may be learned from a little quiet observation beneath a shady mesquite, a knowledge of the bird's nesting activities can be acquired only by con-



siderable field work and much patience. This we learned after tramping many a sandy mile among the spiny yuccas. During two desert nesting seasons we discovered the occupied nests of three pairs of these elusive creatures. The nests were located within a few miles of each other north of Fabens, Texas, some 40 miles east of El Paso. Since roadrunners range from Kansas westward to northern California and south into central Mexico, our notes on their nesting habits apply fairly generally to the species wherever found.

The discovery date of our first nest was March 30, 1942. It was well hidden among the prickly leaves of a low yucca about four feet above the desert floor. The rough structure was made of small twigs, dead leaves and rootlets. Six large white eggs lay close together on a thin lining of dry grasses. Hurriedly we photographed the find and left the area to let the adults return to incubate their precious roadrunners-to-be.

So far from home was the nest and so rough part of the road, it was not until April 15 that we had an opportunity to return to the nest-yucca. So instead of the shiny white eggs the nest now contained a half dozen black-skinned baby birds. They were probably about a week old. Their pale blue-grey feet and legs were extremely weak, their eyes still were closed, their oily-looking black skin naked except for stiff white hairs and a few blood quills in wings and tail. They were far from pretty babies but there was something appealing about them. Perhaps it was because they were so helpless and alone. The only protection they had from the enemies that roamed the desert day and night was their home's secret location.

Two days later we returned. Of the six babies only one remained! Here was a pathetic example of the struggle for survival on the desert.

Another two days passed and we again visited the baby roadrunner. As on all previous visits we failed to see an adult bird, however quietly we approached.

On the 26th, we found the little fellow already sprouting soft brown and white feathers on wings and tail. The moment he



*Adult roadrunner incubating. Beneath warm feathers the baby roadrunner the author later photographed in the process of hatching lies well protected.*

sighted us he tried to hide by flattening himself in the nest and "freezing." Not a feather or muscle moved. Although we watched for five long minutes not once did he take his dark, unblinking eyes off ours. His color pattern was an admirable example of avian camouflage. Thanks to his mottled plumage he lost all semblance of shape. Had we not known of his existence I doubt if we could have seen him.

Our last trip to the nest was made four days later, one month after the discovery of the eggs. Our little friend was now well fledged and about ready to leave home. When he saw us approaching this last time he didn't bother to hide in the nest but nimbly hopped out and landed in a feathery heap on the sand. Apparently slightly skeptical of the efficacy of camouflage he had decided to trust to his long legs instead. The moment he hit the ground he scrambled to his feet and disappeared headlong into the mass of dead yucca leaves surrounding the base of the plant.

Before endeavoring to retrieve him we set up the camera. Then I began to pull him backwards out of his prickly hide-away by his thin legs. Although he didn't struggle much he did let out one harsh, rattly, rasping sound of such an unexpected and startling nature that I almost threw him bodily from me in my eagerness to put as much desert as possible between me and that unearthly sound. I've handled some funny things in my desert wanderings but that was the first, and I hope last, time I ever had grabbed a noise covered with feathers. As he continued this racket until he had been redeposited in his nest we were able to find out that he made the uncanny sound by rubbing together his hard mandibles.

When we started to take his final pic-

*Below left—Where white shining eggs had been now black-skinned, white-haired baby roadrunners huddled together. Single survivor of a desert tragedy. Well-feathered birdling almost ready to leave nest.*



ture we faced a problem. So well did his queer plumage blend with his surroundings it would have been a photographic impossibility to have shown just where roadrunner began and nest left off. The problem was partially solved by placing the bird on an old glove to give the proper separation between subject and background. As soon as we had the picture we left nest and birding for the last time. Although we returned a week later for a final check and to look for other nests we did not expect to find the nest occupied. It wasn't.

This final trip did net us another roadrunner nest however. Not more than three miles from the first we found this second one also in a low yucca. It was completely hidden from view by the plant's cruel leaves. We happened to find it only because we flushed an adult from the nest. Since the only way to reach it was from the ground directly below it was quite impossible to photograph it without first removing the greater part of the protecting foliage. We contented ourselves with a peek at the nest and its occupants. It contained one young bird almost fully fledged and ready to leave the nest, one tiny black baby, and one unhatched egg. We had read about the staggered laying of the roadrunners, but this was the first time we had seen an example of it.

The third nest of our study was discovered last spring. Late one afternoon in April, just before Retreat, I received a terse message from my bird-conscious friends, the Signal Corps Pigeoneers. In the form of a short note left for me at the photo lab it read: "We've a hawk nest for you, see Sgt. Jones." The first thing I did next morning was to "see Sgt. Jones." Bobby Jones, along with Jim Caspar and the other pigeoneers had professed undying hatred for all hawks, believing that they killed their precious pigeons. But after I had pressed upon them several books on hawks and shown them my trained ones they did a splendid about face and ceased hunting our valuable birds of prey.

As soon as I had tracked Jones to the pigeon loft he began telling me about the great find. Several of his men had taken their birds out to our lonely yucca area to give them a test flight to the Post. There they had found the nest. As they approached it a dark bird had hopped to the ground nearby. Apparently in an effort to lure the soldiers away it feigned mortal injury. But they were not to be fooled and went on to the nest which contained four white eggs.

Except for the mention of the bird's strange actions near the nest it did sound as if they really might have found a hawk's nest. But when I asked Jones if the nest

were in a yucca and received for an answer, "No, it's in an old shed near a windmill," I knew something was queer. A hawk's nest in a covered building was something I had to see for myself. To be certain of locating this eighth wonder of the bird world I had Jones draw a detailed map of the area complete with intersections, cattle-guards, arroyos and other landmarks.

The nest had been discovered April 23. Six days later Sis and I drove to the old roadrunner area late in the afternoon and managed to decipher the map sufficiently to find the shed and windmill. At the base of the whirring mill was a large iron tank into which water was pumped for the cattle that frequented the country roundabout. The little shed, old and well-weathered by desert winds and sand, was covered with a rusted corrugated iron roof, and housed a small pump.

As we approached the shed we noticed two strange sets of tracks in the sand. Each print resembled a small letter "x." It was impossible to tell from looking at the impressions the direction their maker had been traveling. What wouldn't a murderer give for feet like these. From his footprints you couldn't tell whether he was coming or going. But these prints were made by feet belonging to no criminal. They were the yoke-toed feet of an adult roadrunner. His four toes are paired—two point forward, two backward.

On reaching the shed we peered around one corner to try to find the nest without flushing the adult. It took some few minutes to accustom our eyes to the semi-darkness within, and a few more to locate the nest. Little more than a platform of coarse sticks wedged between a couple of old beams, it lay only a few inches below the sun-baked roof. On it sat a large dark bird—the pigeoneers' "hawk"—an adult roadrunner.

While the brooding bird had seen us long before we had discovered it, we approached to within six feet of the nest before it hopped off and disappeared through a hole in the back of the shed. The nest contained three eggs and one baby roadrunner. Since it was impossible to photograph the nest's occupants because of its inaccessible position we decided to concentrate on a picture of an adult bird at a later date. To get it we would need our remote control set-up plus a good many free daylight hours in the vicinity.

Sunday, May 2, found us again at the nest-shed. When we arrived we crept in quietly to get another look at the incubating parent. But neither adult was to be seen. In the nest now were two baby roadrunners and two unhatched eggs. No wonder the adults were not on the nest. Hungry infants such as these had to be fed

often and the necessary lizards were to be found only far afield. For a few minutes we watched the little black creatures stretch their thin necks, open pink mouths, and cry unavailingly for food.

Just before we left to set up our camera equipment a faint ticking sound riveted our attention on the nest. A second later a thin black crack appeared in one of the remaining eggs. Fascinated we watched the crack lengthen and widen until we were able to see the naked birdling within. At this point the little prisoner took time out—it's hard work breaking out of a shell, especially if you're no stronger than a baby roadrunner.

After a short siesta he fell to work again. Before he stopped a second time he succeeded in poking his blunt beak through the shell. Then appeared in rapid succession the rest of his blind, scantily-haired head, one shoulder, a tiny claw-like wing, thigh, leg, and bluish foot. This maneuver accounted for the better part of half an hour. The shell was hard and the protecting membranous lining tough. At this point I gently lifted the little fellow out of the nest and placed him on Sis' hand. We shot his picture, replaced him, and left the shed to arrange for photographing a parent bird.

In the sketchy shade of an old mesquite we watched the underbrush about the windmill, shed and tank for signs of an adult roadrunner. Two hours passed before our vigil was rewarded with a distant view of an approaching "Paisano," as he is affectionately known in northern Mexico. Over the hot sands he raced, his head and tail held low in a straight line with the rest of his body. A few yards from the windmill he halted and carefully reconnoitered the little strip of no-man's-land between him and his shed. Compared with his reptilian appearance while running he now looked like a totally different bird. His head was held high and the coarse feathers of his crest stood on end like the plumes of an ancient helmet. Every second or two he flicked his long tail, while holding it at a rakish angle.

Satisfied that no enemy lurked in his path he lowered head and tail and dashed for the shed. As the camera was focused to include only a brooding bird we were forced to wait until the feeding was completed before releasing the shutter. But as soon as the adult settled onto the nest we shot the picture.

This wound up our business with the roadrunner family. Knowing that by late afternoon the adults would have three babies to feed we left the area to give them a free hand. If they were going to capture enough food for their hungry offspring they would have little time for cameras or prying ornithologists.

Ross Santee couldn't sell even a ten dollar sketch down editorial lane, and he couldn't earn his beans washing dishes in New York. So he bummed his way to the wild western state of Arizona to learn to be a cowboy—and forget all about art. But one day while wrangling horses out on the range he started sketching for fun, forgetting the art teachers, the Big Names, the editors and critics . . . That was 30 years ago. Since then he has produced some 30,000 sketches of horses and cowboys and Indians. They are drawn with a simplicity, a remarkable perspective and a deep understanding which Oren Arnold says no other artist in black-and-white media ever has exceeded.

## He Did It For Fun

By OREN ARNOLD  
Sketches by Ross Santee

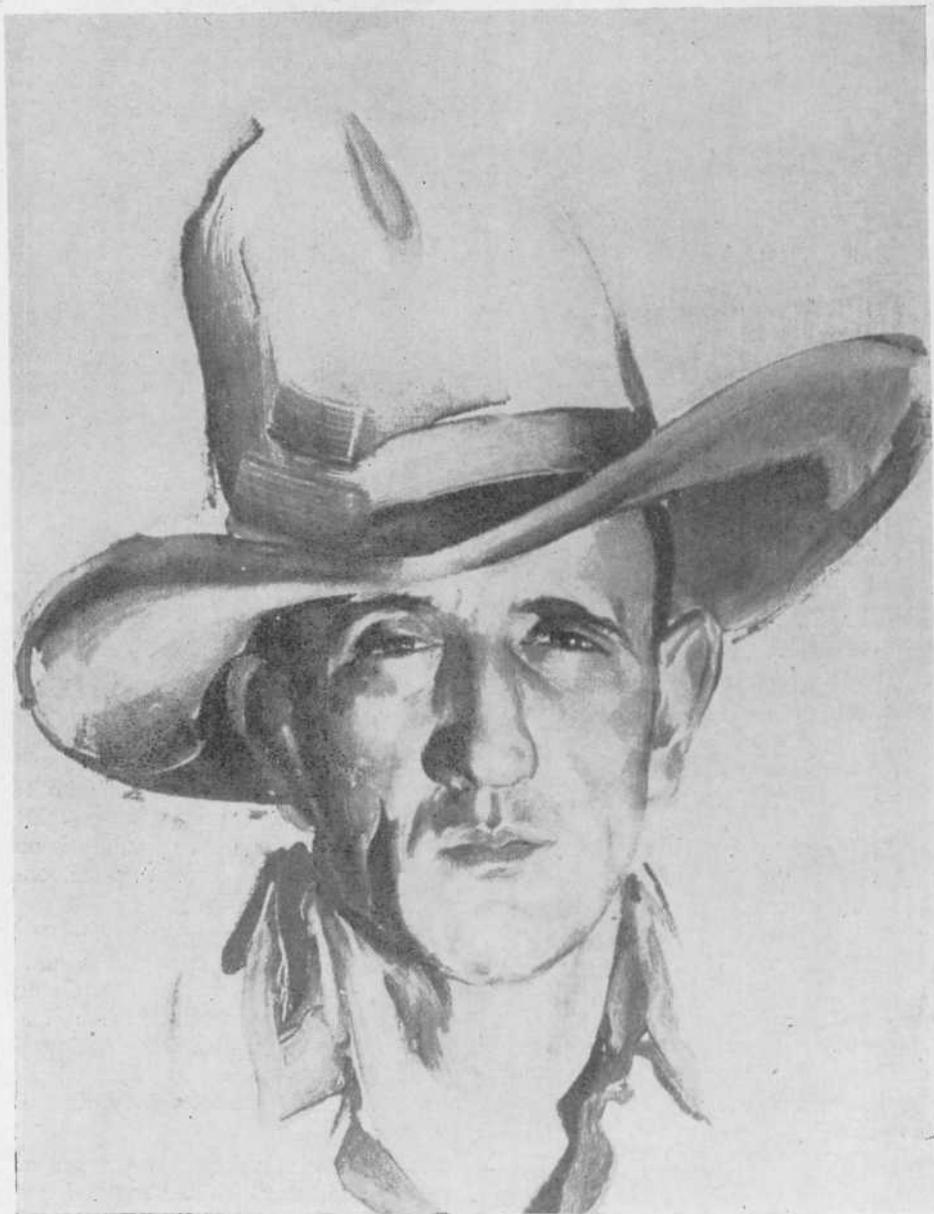
**R**OSS Santee was having trouble lighting his cigarette. The tobacco was damp with sweat. The match burned short before he puffed it out but he didn't toss it away. One leg was curled up around the saddle horn. He was wearing new chaps of light tan. With the black match he began sketching.

He wasn't consciously sketching. He was watching a young stallion toss his head, shake his mane, snort and paw up the soil. It was a bit of beauty and Ross wanted to preserve it. The burned match went down, but in five minutes there on the chaparajos was a perfect drawing.

"Hmmm!" grunted Ross, in a new satisfaction.

He looked off at the 100 horses he was wrangling. He looked back down toward his knee with critical eye. The sketch was original. It had honesty, subtle touches of his own. He felt an inward glow, the incomparable zest of creation.

In the 30 years that have elapsed since that morning Ross Santee must have made 30,000 sketches of horses. He has thrown away all except a handful, but each one has been as original as that first, each has had Santee individuality to set it apart. Ross Santee today is one of the noted Western



*Ross Santee—a perfect likeness of a rather severe cowboy in a 10-gallon hat.*

artists, a product of the desert region which has spawned many individualists.

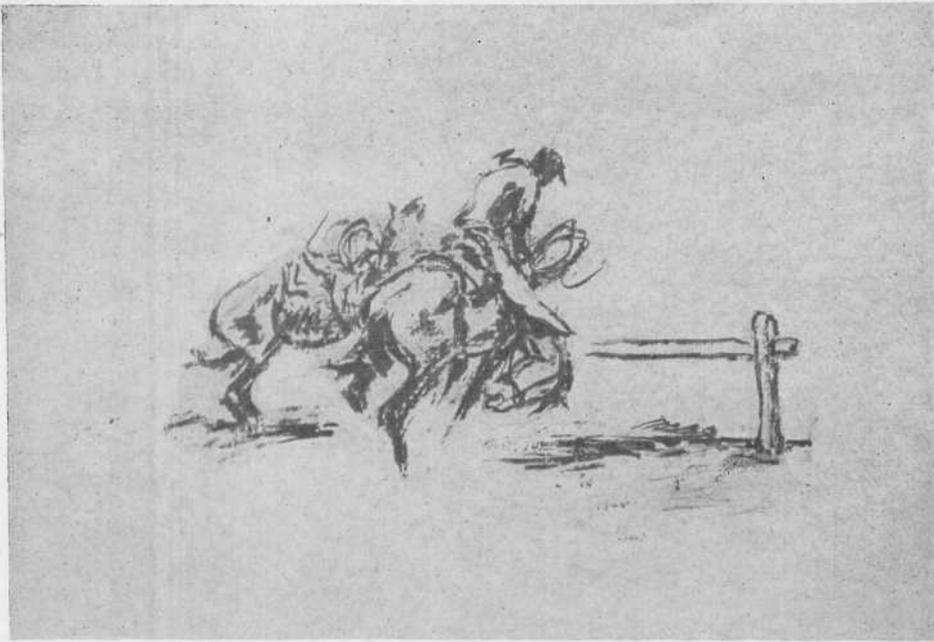
Arizona can claim Santee. Most of the scenes he has depicted are of Arizona life, and most of them are of cowboys and horses and Indians in the desert areas drained by the Gila river and the Salt. No artist in black-and-white ever has exceeded him in depicting these characters, and perhaps only one ever has equaled him. That one is the late Will James, whose range was far to the north. The two men had much in common.

Three characteristics of Santee sketches attract both the trained critic and the layman. First is the utter simplicity. Santee has no flourishes, no wasted motions or supports or lines. Each drawing is as compact and condensed as an article in Reader's Digest—indeed his sketches often suffer from too much simplicity. But it is characteristic of the man himself, as I have learned from months of working beside him and from traveling long days

with him. He is the most direct man I ever have known.

Second is his remarkable flair for perspective. A little Santee sketch on the flap of an envelope can lead your eye back across 50 miles of desert plains and mountains. This reveals that he has observed perspective in the desert land itself. Because of our heights and skies and crystal-line air, the far horizons out here are picturesque. We are awed by the apparent closeness of a mountain that actually is hours of travel away. We can stand on an eminence and look into neighboring states. We can read a cattle brand across a canyon, and feel companionship with a lone butte far off in the sunset, and count runaway horses moving like ants a mile below. These things Ross Santee captures with a few quick lines and shadows.

Finally, Santee drawings have another quality which all can admire. It is his abiding love for the lowly people, the men who live close to the rocks and moun-



... the things of a typical ranch that color a cowboy's life ...

tains and have loneliness for their daily fare. You see it in his sympathetic handling of some old Indian humped over against the rain, or a horse wrangler day dreaming on the saddle horn. You sense it even in his sketches of a crumbling wind-battered house where some homesteader lived. Ross loves to draw one little shack standing defiantly on the open desert, a black spot surrounded with great areas of white paper. In such a thing he manages to convey great feeling—hope and courage and laughter and sorrow and frustration and pain.

Beyond that he depicts the things he knows best and loves best from everyday living—and this means the things of a typical ranch that color a cowboy's life. For Ross Santee is first and forever a cowboy.

He was not always such. He was born in Thornburg, Iowa, August 16, 1889, apparently destined for a business man's career. Even as a kid in knee breeches he objected to persons who tried to mold his life for him, and at the same time he built up his own ideas of what was desirable and good. Sketching began when he saw a prize winner at a county fair. It was a black crayon of a horse's head, copied from the Breeder's Gazette.

"I could do a picture better'n that," Ross scoffed.

His pal, Butch Watson, challenged, "Why don't you, then? You ain't tied down."

Ross went to work on a drawing of a Hereford bull, copied also from the Gazette. When finished, he showed it to his pal in triumphant pride.

Butch eyed it critically, spat to one side and said in effect, "It ain't worth a damn."

That saved Ross from the first threat

of egotism. Later a sign painter "inspired" him by claiming to be a friend of John T. McCutcheon, great cartoonist of that time. He talked to Ross, spreading it on rather thick. Then Ross took up cartooning.

"Failures swarmed around me like flies around a dead horse," Ross admits now. "I had a sum total of no talent. Going through Moline, Illinois, high school, one of the subjects I flunked was drawing. I gave up art work again and devoted my serious energies to perfecting my game of pool.

"Then chance took me to Chicago to see a football game. It led me and two friends into the Chicago Art Institute

where I unexpectedly came onto an original McCutcheon cartoon. All at once the old urge hit me anew. Then and there I swore to go to the Institute myself and learn cartooning. Somehow or other I managed it. It was the first real art schooling I ever had."

The "somehow or other" included earning his own expenses. This required him to sweep acres of classrooms, wait on tables, wash dishes, usher in a theater and handle stage scenery. He scarcely had heard of Arizona and the desert then. His goal was the goal of all art students—New York.

In time he arrived in New York. The city did not open its golden arms. It required Ross Santee, long and gangly and very Middle Western, to peddle his cartoons humbly up and down editorial lane. A fellow student from Chicago, Rolf Armstrong, encouraged him to be persistent, and this kept him from actual hunger. He sold one cartoon, astonishingly unfunny, to the editor of Collier's. It brought \$10. He sold a few more to Judge, then a good comic magazine. Life, a rival comic, couldn't see him at all.

Armstrong began clicking. So did other friends, including Neysa McMein, Lucille Patterson, and Anita Parkhurst. But still another friend, the now famous Tom Benton, was having as hard a time as Ross and being just as hard-headed about it. Each one was licked at that moment, and neither would admit it. One day Tom saw some of Santee's sketches on the floor.

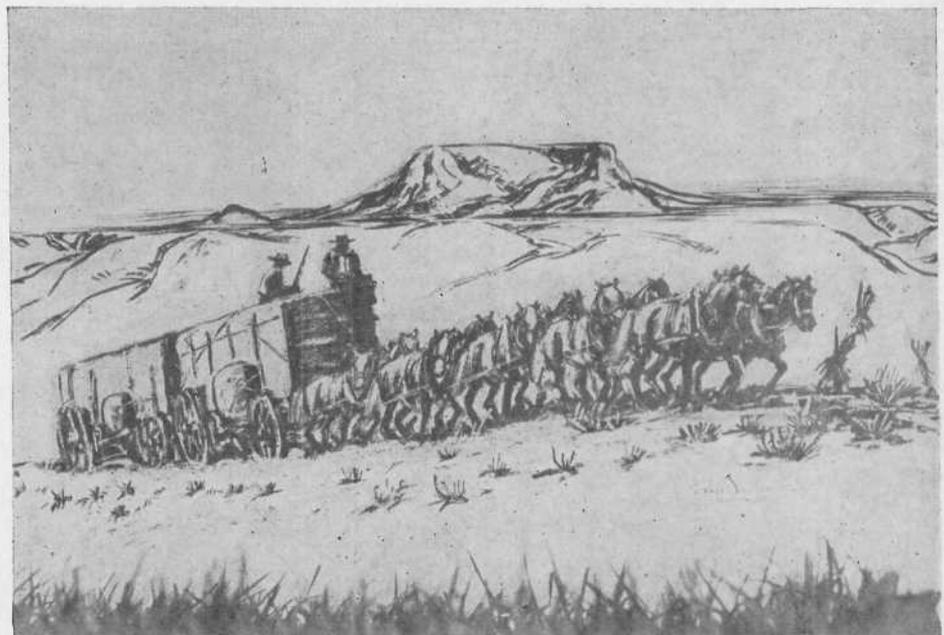
"That doesn't look like your style," Tom mentioned.

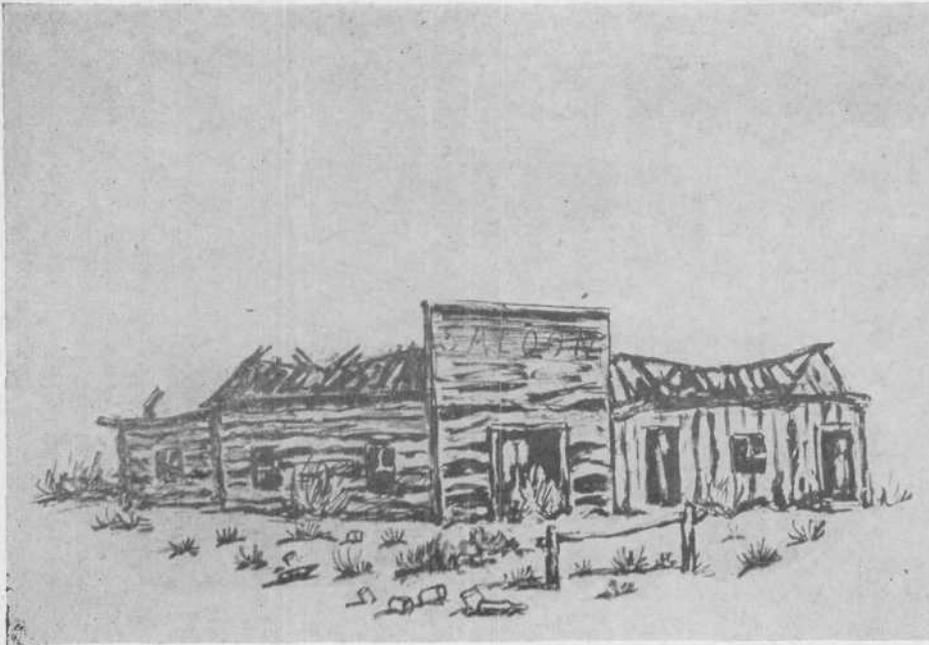
"Nope," said Ross.

"At the Institute, they taught us to imitate the successful artists, and not to bother to work out something of your own."

"I tried," Ross admitted. "But shucks,

... no flourishes, no wasted motions or supports or lines ...





... one little shack standing defiant on the open desert ...

I was just doing these for fun. Not for selling."

Tom Benton considered that. "All right, then. You go to the library and get a book of drawings by Daumier. He sketched for fun, too; not imitating anybody, ever."

Santee got the book. Daumier was a great individualist. Ross Santee instantly sensed a kinship. He did not imitate Daumier but began to draw as he wished to draw, avoiding the precedents set by McCutcheon and other Big Names. Moreover, he swore never to copy anybody again, from the Breeder's Gazette on up or down!

But he soon found he couldn't sell a sketch for even \$10, and he couldn't earn beans washing dishes in New York. Disheartened, he fell back on an old boyhood yearning, a kind of last grasp at happiness—he'd just bum his way out West, dadgum it, and learn to be a cowboy.

The Cross S ranch in the wild western state of Arizona could use a horse wrangler. It does not take an experienced hand for this job. Any kid who can stay in a saddle soon can learn to keep the horses in hand. Even a dude can learn it. Ross got the job.

There was no glamour. There seldom is to cowboying. There was much hard work, much loneliness, much doing without the things of luxury. But Ross Santee was bull-headed as usual. His old trade with pen and ink now held no lure. He wanted to forget all that time wasted on "art."

He began to like cowboying—as any real man will like it. The song of the hills became audible to him, and the spell of the range crept into his heart. Money? He got 40 bucks a month and grub. What more did any man need. He had friends. They were uncouth but loyal fellows of good

humor and generous minds. He had found a place where he felt he belonged. Maybe in decades to come he could amount to something. And that's about the time he made the sketch of the stallion on his brand new chaparajos, using a burned match.

"It was the first art work I'd done in five years," Ross confessed. "But the urge for it all poured back on me in five minutes. That night I sent some money in to town by one of the boys. He brought me back some brushes and ink that a Chinese had used to mark laundry.

"I was happy to get them. I found some paper and went to work. That first week I must have made a thousand drawings.

I had to stop twice and whup hell out of two of my friends who joshed me to distraction, but they didn't stay mad and neither did I. I threw all those drawings away, about as fast as I made them. But they were mine. Mine! I wasn't imitating. I was drawing exactly what I wanted to draw with no thought of what any critical fellow student, instructor or art editor would say. I was drawing solely because it was fun."

Ross Santee had found himself and knew it. He continued to express himself in pen and brush without inhibitions or restraint. The St. Louis Post-Dispatch "discovered" him, printing some of his drawings. Other editors saw them. Life magazine (the old Life, which was an important periodical much like England's Punch) bought drawings—not cartoons—from him just 11 years after he had first tried to peddle his work there. Century took some. Then Boy's Life, then Leslie's. Also it was Boy's Life and Leslie's which started him writing stories of the range to go with his drawings.

Since then there have been many personal ups and downs, but the Santee star has continued rising. Many fine short stories have come from his pen—literally, for he does not use a typewriter—and at least one short short, called "Water," was included in the O'Brien prize story collection after its appearance in Collier's. Last one I saw was in the Red Book for January, 1943. Also on my desk are the Santee books to which I turn periodically for salty simple lore of the rangeland, for vicarious adventure and thrill. These include "Men and Horses," "Cowboy," "Spike," "Sleepy Black" and "The Bar X Gold Course." Best portrait I have of Ross is the one drawn by his old friend Rolf Armstrong, and used a few years ago

... the things he knows best and loves best from everyday living ...



on the cover of The Saturday Evening Post. It is a perfect likeness of a rather severe cowboy in a 10-gallon hat.

Another portrait I have of him is on 8 mm. movie film, taken in color when he and I were touring Arizona together in his coupe, before the war. We went from Phoenix to the northern boundary, along the Utah line. Then we went to Yuma. We traveled de luxe. When we wanted to stop, we did so. We cut across the Navajo and Hopi Indian reservations and chinned with the natives. We stayed in hotels or auto courts and we ate by the side of the road if we felt like it, and we were in no hurry at all. It was on this trip that I got acquainted with Ross Santee, and learned to like him all the way through.

I can testify that he is the best traveling and camping companion anybody could want. He embarrassed me by wanting to over-do generosity. His idea of a fifty-fifty trip was for him to bear four-fifths of all costs and camp duties.

His conversation sparkles as brilliantly as his sketching and his writing. On that trip, he told me enough good true stories to make a dozen books-of-the-month, and periodically since then I have bawled him out for not writing them. He is always going to, but literary laziness is his foremost sin. This is partly because he would rather draw pictures that sing than use verbs that do so.

## Sez Hard Rock Shorty of Death Valley

By LON GARRISON



"You remember old Ike Aldershot used to live over next to the blacksmith shop?" asked Hard Rock Shorty. "Alkali Ike they used to call 'im an' he was the fellér from Montana that was always hot an' always sweatin' an' never minded lettin' ever'body know how uncomfortable he was."

"I can't remember Ike without seein' him moppin' his face an' cussin' the weather an' wishin' he was up at the North Pole but still not makin' any plans to get there.

"Then one day he was over to the Fried Egg Canyon dude hotel lay-out an' with a few shots of tangle-foot aboard he wandered back in the cold storage room an' somehow fell

in the ice tank. Wasn't nobody around an' the first they knowed it, was when they pulled the ice an' there was old Ike, cooled off at last, smilin' as happy as could be an' froze up solid in a block o' ice.

"Well, sir, the hotel wasn't ornery about it at all—they let his wife buy the ice with Ike in it an' even deducted Ike's weight off of it. But the problem of buryin' really split the community! Some thought she'd ought to build a coffin around the whole thing, some voted to thaw 'im out, but the final plan was to plant 'im just as was.

"The funeral was really somethin' to see! The calaboose was full o' guys that tried to knock chunks out o' Ike's ice to take home, an' all the kids follered along hopin' the pall bearer's tongs'd slip. But they got 'im put away all right an' even put up a tombstone. You can still read it down in the old Inferno cemetery if your eyes are good—

"Sacred to the Memory of 500 Pounds of KRYSTAL KLEAR ICE Containin' all what was mortal of old Isaac Aldershot He's playin' on his harp of gold— Goodbye Ike—Your tale is told."

## Achievement . . .

- On October 15, 1943, purchase of the electrical properties of the California Electric Power Company in Imperial Valley and the area in Coachella Valley destined to be served by the All-American Canal was completed, and Imperial Valley Irrigation District became the sole distributing agency for electrical energy in these areas.
- Thus was achieved a goal toward which the people of Imperial and Coachella Valleys have united their efforts for a quarter of a century. Full development of the power resources on the great All-American Canal now seems assured and both water and power will be put to the common usage of developing these two fertile reclaimed desert valleys.

SHARING THE BENEFITS OF WATER AND THE PROFITS OF POWER, IMPERIAL AND COACHELLA VALLEYS ARE IN TRUTH GOOD NEIGHBORS LINKED BY BONDS OF MUTUAL INTERESTS AND NECESSITIES.

### Imperial Irrigation District



Use Your Own Power—Make it Pay for the All American Canal

First task to claim attention of the South family, when they returned to their home on Ghost mountain after a year's vain search for a more ideal location in the desert, was to carry water up the steep trail. Now that cold weather is due, according to the calendar, they are spending their time gathering mescal butts and dead juniper wood for winter fires. And they have taken on the new job of building a storage house, combining the construction ideas of the ancient Indian pit houses and the Navajo hogan. Marshal tells how he and Rider and Rudyard are building their composite pit-hogan.

## Desert Refuge

By MARSHAL SOUTH

OUR desert world marches on through fall and toward winter. Already the gusty storm gods have made preliminary attacks upon Ghost mountain, and the cliff-edge junipers have breasted their windy clamor with threshing, defiant branches. But the heavy weather, if there is to be any this winter, is not yet.

This may be an exceptionally severe winter, as has been predicted, or it may be quite the reverse. But we can take no chances. Every spare moment these days, Tanya and the two boys trail off across the ridges and return carrying high piled baskets of dead mescal butts and sagging shoulder-loads of their tall, dry flower stalks. And on every possible occasion Rider and I fare forth with ropes and pack boards to those distant sections of the mountain where dead juniper wood still may be found.

There are compensations, though, which far outweigh the labor involved. There is a fountain of health in vigorous outdoor exercise that far exceeds the virtues of any nostrum dispensed in bottles or capsules. Especially when such exercise can be taken without the body-choking impediment of clothing. Work and sweat are healthy honest things. And when free beings labor with their own hands to supply their own simple wants there is no slavery even in the hardest toil.

There is another joy to fuel gathering too. For it is on these expeditions that we come very close to the heart of the desert. And the heart of the desert is deep and full of constant surprises. No matter how much you think you know a particular locality you discover something new each time you visit it. Maybe not a dinosaur's egg or the lost Pegleg mine. But something which will thrill you. For instance the carefully concealed bird's nest in the summit of the old storm-gnarled juniper.

We had passed that spot a score of times and each time had admired the old tree, its tints of green, its sturdy ruggedness and the fantastic shapes into which the winds of hundreds of years had twisted its branches. We had even loitered beside it, picking and munching sweet dry juniper berries from it and peering about the limbs and trunks for bits of exuded, amber-colored gum.

But we never had seen the bird's nest. And it had been there all the time. It was left for Rudyard, who has a positive genius for finding things, from lost pins to desert snails, to make the discovery. He announced the find one day with a startled shout that brought us running. It was a beautifully constructed last



*The storage house the Souths are building is a combination pit house and Navajo hogan. Rider tamps the mud while Rudyard plasters it on the wall.*

season's nest of a cactus wren. It was the first cactus wren's nest that we had seen in a juniper. Its camouflage was perfect. Even after we had touched it and admired it we could step back a pace or two and completely lose it again. It was this fact that particularly intrigued us. Before a bit of art like that human efforts at camouflage are clumsy.

Most of the Ghost mountain days still are balmy and delightful despite the official season of the year. Delicate little white butterflies with brown and black wing decorations hover here and there above the ramarillo bushes. Nimble lizards stalk flies upon the warm surface of sun-bleached granite boulders. Curtsyng rock wrens hop from point to point on the stern welter of jumbled stone that surrounds the house. And their sisters, the canyon wrens, give us occasional trills of sweet song as they perch upon the topmost twigs of junipers or flit, like tiny grey shadows, from tree to tree. Ghost mountain always has been, to a certain extent, an "island." Many quirks and variations of climate are exclusively its own.

But "if winter comes" so also comes Christmas. We were reminded of this important fact when an earnest, eager-faced deputation came this morning to remind us that it was about time we were giving some thought to bringing in the Christmas tree. "You know, daddy," said the spokesman, "last year we were on the trail. It wasn't a really-truly Christmas. But now that we're home again—and you remember, that tree just down from the top of the ridge?"

Yes, I remembered the tree. It was only a few days after we had returned to Yaquitepec that they had picked it out—looking forward, even then, to the most wonderful day of the year. It was a big, sprawly tree, possessing several large symmetrical branches which, as Victoria cannily observed, "thee twee won't, not never, miss."

Yaquitepec Christmas trees never entail the destruction of a living juniper. The children, trained conservationists, would be horrified at such a thought. But we build our festal "trees" from

branches selected from trees that won't miss them, binding them together with concealed lashings until the finished product does duty as a complete tree.

We think Santa Claus doesn't mind this. And we are certain that the scheme is beneficial to our clan of Ghost mountain junipers—many of which were here before Columbus started the prows of plunder towards the New World. Perhaps our "composite" trees may even claim something, too, in the way of symbology. For the evergreen Christmas tree symbolizes everlasting life. And surely everlasting life is composite, built up of many conditions and experiences.

So in a few days we will go down and get the "tree." We will plant it in the old, weathered oaken tub which has done duty for several Christmases. And we will haul out the little box of carefully saved trimmings and decorations, which each year emerge from their obscurity, and we will trim it, with the silver star of Hope upon its topmost twig.

If Tanya and I, as we trim it, are conscious of the black shadow of sorrow which war has spread over the world, we will not let such thoughts dim the joy of those whose eager young fingers assist us. Sorrow comes early enough to everyone.

Gladly, if it were in our power, would we send forth the light of our Christmas candles and the message of the Star into all the world, to cheer and comfort the aching hearts of those of every creed and nation, that they might, in realization of their common brotherhood, cease their childish battlings and brutalities in the broad bond of an understanding peace. But this we cannot do. We shall strive therefore to build peace and understanding and joy and hope in those young lives which the Great Spirit has placed in our immediate keeping.

Our desert turtles have gone to sleep. Wearying of chewing up bunch grass and specially raised young wheat shoots and in taking long rambles over rocks—during which they often had to be rescued from up-ended tumbles upon their backs—they finally hunted themselves a nice warm spot under some old sacking, and pulled the bedclothes over their heads for the duration of the cold season. Along with bears and certain other creatures they are able to hibernate. Not an unhandy gift at times. But we miss them. Somehow they always had about them an air of profound wisdom. But perhaps it was just plain stupidity.

One of several new projects which have been added to the regular work since we returned to Yaquitepec is the building of a storage house. We have needed this for a long time. Now the job is well under way. For a construction plan, we hit upon a combination of the Navajo hogan and the ancient pit dwelling, a scheme which offers the maximum construction returns for the minimum of invested labor.

In a convenient earth hillock we started to dig a pit with a connecting entrance open cut. As the earth was loosened and dug up we mixed it with water, trampled and worked the mud thoroughly with our bare feet, as in the primitive preparation of earth for adobe bricks, then built the mud handful by handful up around the edges of the circular pit as mud walls. In this way the building progresses two ways at once—upwards and downwards.

This type of wall isn't quite as strong as one made of sun-baked adobe bricks, nor is it nearly as substantial as one made of damp earth rammed between wooden forms (which is the strongest of all earthen construction). But it is a method used in all arid countries. And the walls so built last surprisingly well. Some at Yaquitepec have stood ten years exposed to the elements with comparatively little damage.

We have added a little California fox to our list of Yaquitepec animal friends. A shy graceful little fellow who comes in

the early twilight and in the moonlight to forage for tid-bits of food upon the leveled earth terraces near the ramada. Yesterday evening he did not come, and the children, who look forward to his visits, were disappointed. "Somefing may have eated him up," Victoria said uneasily. She went to bed greatly worried.

About midnight I awoke. Unable to sleep I arose noiselessly, took a chair and went and sat by the window. There was a bright moon and its glow brimmed the bowl of the world in a luminous white mist of ghostly silence through which the savage granite ridges with their dotting of tumbled boulders and shadowy junipers lay against the sky like the unreal mountains in a dream. Black shadows of jutting beams made ebony patterns upon the outside walls of the house, each little hollow in the rough adobe a dark dimple in the white light, like hammer marks left by a silversmith in a beaten bowl. It was very still. The moonlight held everything in a flood of mystery, and through it, in the immensity of the sky, the stars gleamed upon a ghostly world of utter hush that might have been quite lifeless—a desert of hammered silver upon a planet dead and forgotten.

And then it was that I saw the fox. He came out of the shelter of a ramarillo bush and paused a moment upon the white surface of a granite boulder. His large ears were thrust forward, listening, his handsome, fluffy tail brush low, held with a grace that seemed to soften and accentuate every line of his slenderly fashioned body. His searching eyes were for a moment a flash of twin diamonds in the moonlight, and every hair of his coat seemed touched with frosted silver. Soundlessly like some desert wraith, he stepped down daintily upon the terrace, picked up the few scraps that had been laid there on an old plate for him and slipped away into the bushes with such swift, shadowy grace that it was an instant before I quite realized he was gone.

The moonlight beat down and the silence held everything in its cloak of phantom mystery. After awhile I went back to bed, feeling infinitely richer for my midnight session of window gazing. And in the morning I was able to make Victoria very happy with the knowledge that her little friend was quite safe and that no one had "eated him up."

Tanya is busily grinding flour. Rudyard has his nose wrinkled over a new sketch. Victoria is on the bed, an old dictionary held upside down in her hands, as she wrestles with the job of giving her doll, Barbara, what she calls "an eju-kashun." And Rider, with little screws and bolts and odds and ends and bits of tin and wood, is working with another of the mechanical inventions on which he spends every minute of his spare time. Rider is seemingly headed for the field of invention and engineering. But I am going to drag him away from his beloved bolts and screws presently. For we have to pack home some more loads of juniper wood from away off across the southern ridges.

• • •  
SUBSTANCE

*Form? What is form? 'Tis not enough!  
I seek the inner, spirit stuff,  
The highest height!  
Only the crest can satiate  
A hunger that will not abate  
For Truth and Light!*

*The wisest men were poor indeed,  
And never overmuch did heed  
The quirks of style.  
But how they prayed and toiled and strove  
To fill their lives with Light and Love—  
These are worth while!*

—Tanya South

# HERE AND THERE... on the Desert

## ARIZONA

### Seeking Desert Perfumes . . .

TUCSON—Study of perfumes and related compounds in more than 500 desert plants will be undertaken at University of Arizona. Fellowship grant of \$1,000 annually for two years from Hudnut and Warner research institutes of New York City will finance work, to be directed by Dr. T. F. Buehrer, professor of agricultural chemistry. Aromatic oils have been found in numerous desert plants during state experiment station's search for rubber producing species.

### Indians Without Feathers? . . .

WINDOW ROCK—When Sgt. Tim Touchin, Navajo hero of 25 bombing missions over Germany, returned home on furlough, his people wanted to know what the English thought of the Indians. He said they treated them with great respect but were curious to know "where the feathers were." Tim, who now wears the oak leaf cluster, has been serving as tail gunner in an army bomber which included Frankfurt and Schweinfurt as its targets.

### Search For Buried Treasure . . .

PHOENIX—Frank H. Trego of Hollywood, California, is planning to search for buried treasure "somewhere in Arizona." Being cautious, he is concerned about legal aspects should he discover it. He wrote to Joe Conway, Arizona attorney general, inquiring if one who finds buried treasure must place it in escrow or share it with state. He mentioned gold and silver bullion "buried by the Jesuits in the period of 1548-1658" at an undisclosed place.

### Plans for Postwar Air Travel . . .

NOGALES — William Beatus, new owner of Rancho Grande hotel and recently of U. S. ferry command, in announcing purchase of the large hotel property, visualized this border city as an important air base for international transportation. His belief in important role of postwar air transportation with the special advantage of Nogales' location, "was a big factor" in his purchase. He plans to welcome guests who fly to Nogales, provide facilities for storing and servicing their planes.

### It "Rains" Dust in Arizona . . .

LEUPP—Water of the Little Colorado river draining the 16,000,000-acre Navajo and Hopi reservations, is so muddy that when it pours over 600-foot Grand falls 18 miles west of here, it sends up a muddy spray. Moisture so quickly evaporates in dry desert air that particles of silt are suspended in a dust-cloud above the waterfall. Wind has blown the dust over a wide area, depositing it as loess.

### Gift to Geronimo in Museum . . .

TUCSON—Geronimo's beaded bag in which he carried his amulet and tinder, is now in Arizona's pioneer's society museum at University of Arizona, gift of Lt. Comdr. Delos H. Smith, Jr., Washington, D. C., whose father was stationed at Ft. Apache, Arizona, in 1877. The bag had been given the Apache chief in an attempt to persuade him to surrender. Decorated with beads and crude silver bangles, bag once carried the inscription, Geronimo, Chiricahua Apache, March 17, 1884.

### First Missionary to Navajo Dies . . .

TUBA CITY—William R. Johnston, called by the Navajo Kin-la-chee, died recently in Glendale, California, aged 92. One of the most devoted friends the Navajo ever had, he began his missionary work among them in 1896, continuing to drive his car over the reservation until he reached his ninetieth year. He had made many trips to Washington, D. C., visiting Indian department, White House and members of congress to seek aid to protect rights and interests of the Navajo.

### Gila 'Mums Go to White House . . .

RIVERS—From the Gila river war relocation center, Itaro Nakata has sent a box of chrysanthemums to Mrs. Eleanor Roosevelt, keeping a promise made during her visit last April. Although the climate here is too hot and dry, Nakata, one of the nation's outstanding growers of this flower, has 120 varieties under cultivation in a plot of less than one-tenth of an acre. One of the varieties is Golden Treasure which he spent seven years developing.

Carl Mayhew, owner of Oak Creek lodge near Flagstaff, died Nov. 4.



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PALM SPRINGS, CALIF.

### Cotton Gets Chemical Defoliation . . .

TUCSON—Mass removal of leaves from cotton plants by aerial dusting with calcium cyanimid has proved successful in its first test in Pima county. Chemical compound causes leaves to wither and drop, exposing cotton boll for easy, clean picking, and does not harm the plant.

### Drainage Canals for Gila Valley . . .

YUMA—Following complaint of damage to croplands in North Gila valley by seepage from Gila canal, work is expected to start soon on construction of drainage canals, says announcement by L. J. Foster, bureau of reclamation engineer in charge of Gila project construction.

Famed Hotel Westward Ho, near Phoenix, recently was sold to W. R. Wayland, managing director, John B. Mills, Dallas, and R. H. Hawn, Corpus Christi, transaction involving about one million dollars.

Examples of Hopi Indian arts and crafts, including a katchina doll, pottery and basketry, have been donated by Museum of Northern Arizona to Geneva Children's Museum, Alabama.

## CALIFORNIA

### Fires Burn San Jacinto Area . . .

PALM SPRINGS—Seven fires starting in May valley, swept over 8,000 acres on southwest slope of San Jacinto mountains in November. Mountain Center, Keen Camp and Tahquitz lodge, according to the Desert Sun were "burned to the ground." Flames were driven by 75-mile-per-hour gale, forcing 300 residents of Idyllwild to flee for their lives and imperiling summer homes of many local residents. Entire mountain and foothills, from Idyllwild to near bottom grade on both sides of highway 74 were burned, said the Sun.

### A Cube of Orange Juice, Please! . . .

BANNING—America may be taking its orange juice via cubes, if inventions of Ralph R. Sutherland are used by citrus industry to which plans have been submitted. Sutherland, who has invented juice extracting and rapid freezing machines each with eight-hour capacity of 25,000 gallons, claims frozen orange juice when thawed out is as full of flavor and rich in vitamins as freshly-extracted juice and that a cube filling an 8-ounce glass should cost but a nickel.

### Fire Ruins Willis Palms . . .

THOUSAND PALMS—Every native Washingtonia palm in Willis palm oasis one mile north of here was damaged early in November by a fire which started while a Universal studio motion picture company was working on a desert war picture in the vicinity. According to Harry Oliver, writer, who reported the fire, some of the trees were burned to their roots while others merely lost their fronds, but as Oliver expressed it, "a Washingtonia without its beard is like a lion without its mane."

### Water for More Desert Land . . .

BLYTHE—Owners of tracts on Palo Verde mesa and in Chuckawalla valley are considering annexation to Palo Verde irrigation district in effort to develop their land, according to district's attorney, Arvin B. Shaw, Jr. He stated he had been informed by Donald Dun and A. E. Nichols, officials of a group of desert landowners, that sufficient signers had been obtained to make formal application. Land in this area would have same rights to Colorado river water as that in Imperial Valley, it was said.

### Bill Chalfant is Mourned . . .

BISHOP—W. A. Chalfant, dean of western editors and historian of eastern California and Death Valley, died at his home here November 5. He had served his community for almost 60 years, editing the Register which he and his father started in 1885. He was born in Virginia City, Nevada, in 1868, son of P. A. Chalfant, member of Manly Death Valley party. Well known are his books, "Death Valley, the Facts," "Story of Inyo," "Outpost of Civilization" and "Tales of the Pioneers." (See Desert Magazine, April, 1943.)

### Desert Fur Crop . . .

BRAWLEY—Strange as it seems, desert Imperial Valley is a fur producing area. State game warden Frank Burns said recent survey showed catch of 5359 trapped animals valued at \$2995.03. Sand rats, variety of muskrat, led list with reported 4889 pelts averaging 53 cents each. Next on list were striped skunks, wild cats, coyotes, grey fox, opossum.

### East Mesa May Be Shelved . . .

CALEXICO—Although it was indicated by steps taken at November convention of American Legion in Indianapolis that the Legion's influence will be used to begin development of East Mesa desert, it is believed that Arizona will make strong attempt to impede such action at present. If Arizona succeeds in opening desert lands to be irrigated by Colorado river water before the East Mesa tracts are opened, it is believed that state could establish a strong priority claim to water supply.

## The Desert Trading Post

Classified advertising in this section costs five cents a word, \$1.00 minimum per issue—  
Actually about 1½ cents per thousand readers.

### MISCELLANEOUS

FOR SALE—12 beautiful perfect prehistoric Indian arrowheads, \$1; 10 tiny perfect translucent chalcedony bird arrowheads, \$1; 10 perfect arrowheads from 10 different states, \$1; perfect stone tomahawk, \$1; 4 perfect spearheads, \$1; 5 stone net sinkers, \$1; 10 perfect stemmed fish scalers, \$1; 7 stone line sinkers, \$1; 4 perfect agate bird arrows, \$1; 5 perfect flint drills, \$1; 7 perfect flint awls, \$1; 10 beautiful round head stunning arrowheads, \$1; 4 fine perfect saw edged arrowheads, \$1; 4 fine perfect flying bird arrowheads, \$1; 4 fine perfect drill-pointed arrowheads, \$1; 4 fine perfect queer shaped arrowheads, \$1; 4 rare perfect double notched above a barbed stem base arrowheads, \$1; 5 perfect double notched above a stemmed base arrowheads, \$1; 12 small perfect knife blades of flint, \$1; rare shaped ceremonial flint, \$1; 3 flint chisels, \$1; 7 quartz crystals from graves, \$1; 10 arrowheads of ten different materials including petrified wood, \$1. All of the above 23 offers for \$20. Locations given on all. 100 good grade assorted arrowheads, \$3.00 prepaid. 100 all perfect translucent chalcedony arrowheads in pinkish, red, creamy white, etc., at \$10.00. 100 very fine mixed arrowheads all perfect showy colors and including many rare shapes and types such as drill pointed, double notched, saw edged, queer shapes, etc., location and name of types given, \$25.00 prepaid. List of thousands of other items free. Caddo Trading Post, Glenwood, Arkansas.

25 Genuine Indian arrowheads, \$1.00; Tomahawk head, .50. Cat. of Indian relics, crystals and ore specimens. Geo. Holder, Glenwood, Ark.

FOR SALE—Year Round Resort Hotel and Cottages in excellent condition. 2 acres with family fruits. Hot water heat, Oil Burner. City water, finest in America. Completely furnished, kitchen modern. Paved road, right at city limits. Wonderful view of Columbia river and mountains. Old established business and needs younger owner. Plenty business right now. Price \$13,500. Address R. E. & Tom Scott, Hood River, Oregon.

MANUSCRIPTS WANTED—Books, stories, plays, articles, for domestic and foreign sale. Motion picture rights placed. Circular D-14 Free. OTIS ADELBERT KLINE, Literary Agent, 507 Fifth Avenue, New York 17, New York.

### LIVESTOCK

KARAKULS producers of Persian Lamb fur are easy to raise and adapted to the desert which is their native home. For further information write Addis Kelley, 4637 E. 52 Place, Maywood, California.

"Karakul Fur Sheep—America's Great Livestock Opportunity—You can be a part of this fascinating business and have your Karakuls cared for in California, by experienced ranchers. Write for details, James Yoakam, National Distributor, 1128 No. Hill Ave., Pasadena, California."

### REAL ESTATE

For Imperial Valley Farms —

W. E. HANCOCK

"The Farm Land Man"

Since 1914

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## NEVADA

### Heavy Duty Cars Head List . . .

CARSON CITY—Average age of Nevada passenger cars is 5.9 years, according to results of recent questionnaire of public roads administration. Occupational classification of cars showed 19.3 percent to be owned by persons engaging in construction and related maintenance. Next on list was transportation, communication and other public utilities, with 15 percent. Government vehicles accounted for 12.8 percent. Survey is to help government determine rationing procedures and secure spare parts inventories.

### New Colorado River Record . . .

BOULDER CITY — Harry Aleson, who has conducted many Colorado river boat expeditions, set a new record for upstream travel in November, when his party of three reached mile 218, between Diamond creek and Parashont wash. His companions were Ward Vickers and R. Moore, of Long Beach and the naval training unit at California institute of technology. Aleson, who hopes to go all the way to the Parashont later, carried loads of gasoline upstream, depositing it for later use on long-range upstream trips.

### Hunters—Save Those Feathers . . .

RENO—Now it's feathers that Nevada's hunters are asked to save for the war effort. Bernard Hartung, secretary state salvage committee, said feathers of ducks and geese were "urgently needed in manufacture of sleeping bags, vests and other warm clothing" for armed forces in Arctic areas.

### Mutton Crop Dwindles . . .

CARSON CITY—State sheep population for 1943 was less than one half million head, decrease of 27,500 over previous estimate. Reduction was blamed by department of agriculture on high prices of feed grain and hay and difficulty of obtaining them.

Latest estimate of Reno's population, based on ration book number four, is 25,520, increase of about 525 in 17 months.

Death came November 26 to C. L. Osterlund, pioneer of Ely, "typical Nevadan, who never overlooked an opportunity to help someone." He had engaged in mining since early "railroad days."

## NEW MEXICO

### Indian Traders to Be Aided . . .

GALLUP—Surety bonds for licensed Indian traders now will cost 25 percent less. Another advantage to traders will result if Navajo agency recommendation of five-year period licenses are granted. They now are on one to three year basis. Changes will affect some 100 traders on Navajo, Hopi and Zuni reservations.

## Nazis Fear Indian "Cannibals" . . .

ALBUQUERQUE — Associated Press story from North African Allied headquarters says one advantage held by "fighting 45th" division in Sicily was the war of nerves they were able to maintain over Nazis. Division is made up largely of men from New Mexico, Colorado and Oklahoma. More than 1,000 of them are Indians, of whom Germans have a particular dread, believing them to be cannibalistic. One Indian sergeant had the time of his life pretending to have a voracious appetite whenever new German prisoners were brought in. Sounds like Hitler's "new anthropology" is boomeranging.

### Rodeo Hand Turns "Radio Ham" . . .

TOHATCHI — When Edison Bowman, Navajo bronco buster, joined the army 18 months ago he reported he was a "rodeo hand." The officer nodded, repeating, "radio ham." Now he credits his western accent for his assignment as radio-man on a bomber.

### Ice Age Mammoths Once Here . . .

DEMING—Four-foot-long fossil bone recently found in gravel pit at army air field here has been identified by Dr. Stuart Northrup of University of New Mexico geology department as right thigh bone of a mammoth, probably the Colombian Mammoth, which roamed over North America near end of Ice Age. Animal attained height of 12 to 13 feet, had tusks about 13 feet long.

### Hopi-Navajo Land Contested . . .

GALLUP—Chambers of commerce of Winslow, Holbrook and Flagstaff are making an effort to increase grazing lands of Hopi Indians, at expense of the Navajo, according to James M. Stewart, superintendent Navajo Central agency. Original Hopi reservation, set up in 1882 by President Arthur, was about 2,000,000 acres larger than present Hopi grazing district No. 7 set up in 1937—a change to which Hopi never consented. Stewart said contested area now is occupied by 4,500 Navajo and 3,400 Hopi.

Black pottery of San Ildefonso made famous by Maria and Julian Martinez, still is signed "Maria and Julian" despite his death about a year ago.

## UTAH

### Utah Has Big Chemical Store . . .

OGDEN — Chemical ammunition stored at army service forces depot here is sufficient to meet any possible axis attack, according to information released in November. Other types of ammunition stored here are incendiary bombs for air forces, smoke screens, flame throwers and decontaminating apparatus.

## One of the Lost Mines? . . .

SALT LAKE CITY—Vision of gold and fabulous wealth dreamed for two men involved in Utah's "dream mine" fraud when sentences were upheld against Louis C. Deluke, Wilmington, Delaware, and Patrick T. Henry, Marysville, Utah, for misuse of mails and conspiracy to defraud. It was charged they had conspired to sell stock in a Utah mine that a theological student "had seen in a vision."

### Presses Must Roll . . .

SALT LAKE CITY—More than 100,000 readers of Tribune and Telegram newspapers received unique sheets during strike of Salt Lake Typographical Union No. 115, which suspended regular publication for first time in 50 years. Substitute was printed from full-page engravings made from typewritten copy and pasted-up photos. Walk-out involved 60 members of local union.

## A WESTERN THRILL

"Courage," a remarkable oil painting 20x60 feet, the Covered Wagon Train crossing the desert in '68. Over a year in painting. On display (free) at Knott's Berry Place where the Boysenberry was introduced to the world and famous for fried chicken dinners with luscious Boysenberry pie.

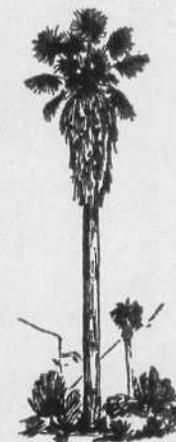
You'll want (1) A 4-color picture of this huge painting suitable for framing. (2) A 36-page handsomely illustrated souvenir, pictures and original drawings, of Ghost Town Village and story of this roadside stand which grew to a \$600,000 annual business. (3) Two years subscription (12 numbers) to our illustrated bi-monthly magazine of the West. True tales of the days of gold, achievements of westerners today and courageous thoughts for days to come. Mention this paper and enclose one dollar for all three and get authentic western facts. Postpaid. GHOST TOWN NEWS, BUENA PARK, CALIF.

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Reservations — write 29 Palms Inn at  
Twentynine Palms, Calif., or call any Travel  
Bureau or Automobile Club.



# Mines and Mining . .

## Washington, D. C. . . .

Silver manufacturers have been authorized to buy nearly 23,000,000 ounces of treasury silver since congress released this amount for consumptive purposes, Senator Green (D, Rhode Island) announced in November. Green, author of the controversial silver legislation enacted last July, made the statement based on information from war production board.

## Silver Peak, Nevada . . .

The 200-ton mining plant of Desert Silver, Inc., for the past five years Nevada's largest silver producer, was to be sold at auction in November. Actual cost of the plant was \$263,000. Shortage of manpower, and other war conditions forced stoppage of operations.

## Salt Lake City, Utah . . .

First plant to produce alumina from raw materials other than bauxite started production in November, according to announcement by J. M. Olin, vice-president of Olin corporation which controls several companies engaged in war production. Local plant of Kalunite, Inc., was constructed at cost of \$4,500,000 for Defense Plant corporation to determine economics of producing aluminum from domestic raw materials, thereby relieving United States of dependence on imported bauxite, from which bulk of nation's aluminum is made.

## Globe, Arizona . . .

That high grade iron-free Arizona asbestos soon will be serving in the war effort, was indicated in announcement by J. S. Coupal, director of state department mineral resources, that custom asbestos purchasing station and processing plant here have been assured by defense plant corporation and reconstruction finance corporation. Pine Top Asbestos company, directed by J. S. Michault of Globe, is to be provided funds by RFC to develop mines in the area, assist other prospective shippers and erect plant near here where all asbestos mined in the area can be sold and processed and graded for market.

## Los Angeles, California . . .

New process for refining 100-plus octane aviation gasoline from mineral extracted from white chalky clay from eastern Arizona was announced here by Filtrrol Corp., which originated process. The mineral, originally a volcanic ash, is in form of pellets which look like vitamin tablets. Process is being used in a Texas refinery; pellets are being made in California and Mississippi plants.

## Shiprock, New Mexico . . .

Government bureau of mines helium plant here has doubled capacity recently as result of new discoveries of helium bearing natural gas, it was disclosed late in November. Although discovery first was made more than two years ago, development started only last summer, when a large community of houses and plant buildings were erected here, and named for the Navajo Indians on whose land the wells are located. Besides helium, a non-explosive lighter-than-air gas, nitrogen, an explosive-inflammable gas also is produced.

## Hawthorne, Nevada . . .

Harry Eugene Springer, discoverer of brucite deposits of Gabbs valley, died November 11 at veterans hospital, Livermore, California. He had been engaged in Nevada mining business for many years. At time of his big discovery the Gabbs deposit is said to have been the only real white brucite to be found in America or Europe.

## Phoenix, Arizona . . .

Large mines and smelters head Arizona list of priority firms for essential workers, according to Henry K. Arneson, state director war manpower commission. Next in order are lumber companies and mills, Navajo ordnance depot, smaller mining establishments, manufacturing and fabricating firms. One exception is that "local" firms, such as manufacturers, have first priority on manpower in their specific areas.

## New York City . . .

Supply of vital metals has now been replaced by manpower shortage as number one war problem, according to Herald Tribune's economics analyst Raymond Hoadley. According to WPB, he said, magnesium now is "even coming out of our ears." Copper has reached stage of "rough balance" between supply and demand. Production of aluminum, lead, tin and zinc has allowed government to accumulate stockpiles.

## Washington, D. C. . . .

Federal Aids for War Mineral Production is 42-page bulletin issued by war production board, informing public how to get help from government for developing and increasing output of mineral properties. It includes chapters on war minerals and ores, prospecting and exploration assistance, machinery and supplies, priority assistance, reconstruction finance corporation mining loans, marketing assistance, priorities system, and lists regional and district offices of war production board.

## Lovelock, Nevada . . .

Option on what may prove to be one of the world's most valuable highgrade fluorspar properties was obtained late in November by Cooper Shapley, engineer for General Chemical company, subsidiary of Allied Chemical and Dye company, from R. T. Hamilton. Option covered 12 claims of acid spar in Black canyon where deposit was first discovered in 1929 by Joseph Witcher, a Southern Pacific dispatcher. Present price of material is \$40 to \$42, a 2000-pound ton. Post-war price predicted to be \$25. Principal source has been Kentucky and Illinois.

## San Francisco, California . . .

Kenneth C. Peer, chief chemist, and Donald E. Thorpe, associate chemist, of Raggoland-Broy Laboratories, 758 Natoma street, have written a paper of value to prospectors and developers of beryl ores. It is an aid to classifying and determining value of these ores, which are difficult for the average miner to identify. Most accurate determination discovered by the writers is through application of quantitative spectrographic methods.

## Virginia City, Nevada . . .

Deposits of scheelite, ore of tungsten, in Potosi district of Osgood range, again have been examined and maps brought up to date by geological survey, reports interior department. Deposit has been known since 1917 but little tungsten was produced until 1942, when part of a large gold mill was converted to tungsten treatment.

## Needles, California . . .

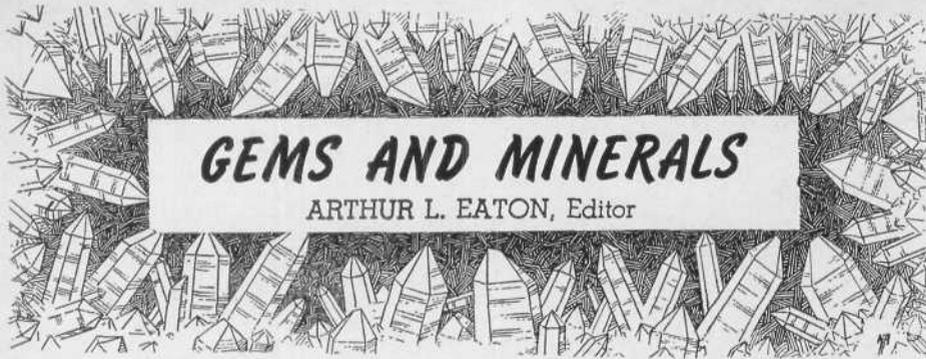
Four tungsten claims in New York mountains near here have been sold for \$150,000 to Warren T. Potter and Clarence S. Potter of Pasadena, according to former owner Joe Dorr whose family in 1920 homesteaded a 640-acre tract in the range.

## Tombstone, Arizona . . .

Charleston Lead mines company, seven miles from here, will go into immediate production of lead and zinc, it is announced. Company headquarters are in Pasadena, California; Superintendent is H. L. Zebold of Tombstone. Shattuck-Denn company of Bisbee will float the concentrates and separate the lead and zinc. Ore also carries some silver and copper.

## San Francisco, California . . .

California journal of mines and geology, January 1943 edition, just issued, includes survey of mines and mineral resources of Santa Cruz county with 15 pages halftone photos and two folding maps. Also included is current survey of strategic minerals of other counties, including Inyo, Kern, Mono, Riverside, San Bernardino, San Diego.



# GEMS AND MINERALS

ARTHUR L. EATON, Editor

## GOVERNMENT STILL WANTS GOOD QUARTZ CRYSTALS

Miscellaneous minerals division, war production board, temporary R building, Washington, D. C., again requests that they be notified if anyone owns or knows location of perfect quartz crystals at least one inch in diameter and three inches long. Crystals must be water clear and absolutely free from inclusions of any nature whatsoever, and free from all flaws and imperfections.

## QUARTZ IN WAR IS NEW JERSEY TOPIC

Dr. Elizabeth Armstrong of the Bell laboratories, one of the country's best qualified speakers on the subject, discussed the importance of quartz in wartime, at December 7 meeting of New Jersey mineralogical society, Plainfield. Lecture was illustrated with slides.

Plainfield library, where meeting was held, and Plainfield Trust company displayed quartz specimens the week preceding lecture, with invitation to the public.

## EAST BAY PROVIDES RIDES TO INSURE ATTENDANCE

George H. Needham, well known Pacific Coast microscopist, spoke on microscopic inclusions in minerals at Dec. 2 meeting of East Bay mineral society. Talk was illustrated with microscopes and special equipment furnished by the speaker.

Preholiday social meeting was scheduled for December 16, with entertainment, contests and mineral grab bag.

To insure continuance of good attendance record effort will be made to provide transportation for all members otherwise unable to attend. They are requested to phone President Geo. Higson or Secretary Ida Chittock.

Among the many interesting opal specimens from the state of Queretaro, Mexico, which attract attention of scientists are opals with inclusions. Commonest of these inclusions are large round cavities containing water, or carbon dioxide in water. This often coats the inner surface with a whitish tinge and offers materials for interesting cabochons. Other Queretaro opals contain slender, dark colored, acicular crystals of rutile. These are somewhat rare and much in demand, especially if the stone also shows a play of color. Some few specimens show what the natives declare to be "just sticks and grass."

Many "pecos diamonds," quartz crystals from the Pecos river valley of New Mexico, are almost snow-white in color. An analysis of these crystals shows that the whitish color is due to inclusions of dolomite, Ca Mg CO<sub>3</sub>. This is explained easily as the crystals formed in masses of dolomite along the present course of the river.

## EASY TEST FOR DOLOMITE . . .

Dolomite, calcium magnesium carbonate, Ca Mg (CO<sub>3</sub>)<sub>2</sub>, which is a close relative of calcite, can be easily distinguished from it by placing it in hydrochloric acid. Calcite effervesces instantly and fully in the cold acid. Dolomite reacts very little if at all in the cold acid. However, powder a small amount of the suspected dolomite, and place it in hot hydrochloric acid and the result is different. In the hot acid it effervesces fully as much as the calcite did in the cold acid.

## VERMICULITE

Vermiculite (from Latin *vernis*, worm) is practically a new metal, states Carl J. Travernman in Goldfield, Nev., News. It was not used commercially until 1924 when only two tons were produced in U. S.

Vermiculite or jefferisite is a greenish black mineral, composed of highly inflammable hydrogen and magnesium in combination with potash, aluminum and silica. The result is fireproof. When heated, vermiculite seems to come to life and wriggle like a worm. Remember the "snakes-in-grass" fireworks of your childhood?

The heated product is about six times as bulky as the raw mineral. It is used for insulation, to make wallboard, outside building board, cement, roofing, refrigerating equipment and in open hearth furnaces of steel mills. Used in house walls its insulating value equals a five-foot brick or seven-foot concrete wall. Nearly all talkies make use of vermiculite as it is sound proof and makes a room echoless. It is now being tested in airplane construction to deaden sound of the motors. Trade name is Zonolite.

Vermiculite is mined in Montana, North Carolina, Colorado, Wyoming and Pennsylvania. 26,000 tons were produced in 1937, but it is estimated that much more will be used this year. Montana is source of a large part of the mineral. In order to mine vermiculite a heavy uncommercial overburden is removed by bulldozers and fresnos, picks and shovels. Then a combined rotary screen and loader is backed into the face of the ore pile. The screened product is taken by truck to a milling plant, which ships both raw material and expanded product.

## SUGGESTED TABLE TO SHOW DIFFERENCES IN DIAMONDS

Much difference seems to develop in the degrees of hardness of diamonds of different colors and from different continents. The following table, to show this difference, has been suggested:

- Hardness (compared to Moh's scale).
- 36—Carbonado and colored diamonds.
- 37.8—Congo grey African diamonds.
- 41—Congo yellow diamonds.
- 42—Brazilian diamonds. Black diamonds.

## COLORFUL MINERALS

### CORUNDUM

Very little need be said about the general nature of corundum as it is already too well known as emery and sapphire. Its hardness of nine is second only to diamond, but it is the great range of colors of this fine stone that makes it notable. It produces every known shade of black and grey, red, pink, blue, green, purple, yellow, orange, etc. The black and grey varieties are used for corundum wheels and emery paper in industries, but the other colors produce many named varieties:

- Red—pigeon blood ruby.
- Light red—oriental ruby.
- Grass green—oriental emerald.
- Colorless—oriental sapphire.
- Dark blue—sapphire.
- Light blue—oriental aquamarine.
- Bright blue—corn flower.
- Yellow green—oriental chrysolite.
- Yellow brown—oriental topaz.
- Aurora red—oriental hyacinth.
- Violet red—oriental amethyst.

Note—the word oriental, as applied to these stones, means that it is a member of the sapphire family, not that it came from the Orient.

## Beautiful Fluorescent Rocks

with Tungsten, Powerlite, Green and White mixed. Makes rocks very pretty.  
\$1.00 PER POUND

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## Vreco Diamond Blades...

Give you better performance, longer life, faster cutting. Enjoy sawing with the new improved Vreco Blades.

6-in. Blade—\$ 4.50	8-in. Blade—\$ 5.50
10-in. Blade—\$ 6.80	12-in. Blade—\$ 8.75
14-in. Blade—\$11.00	16-in. Blade—\$13.75

Arbor Holes—1/2, 5/8, 3/4, 1 in.  
Postage and Insurance Extra

### BYFIELD FELT POLISHING BUFFS

We stock these fine Byfield Felt Buffs because of their superior quality.

SPANISH FELT BUFFS—6x1 in.—\$4.25 plus post. 2 lbs.—8x1 in.—\$7.25, post. 3 lbs.

HAIR FELT BUFFS—6x1 in.—\$2.25 plus post. 1 lb.—8x1 in.—\$3.75, post. 2lbs.

Arbor Holes—1/2, 5/8, 3/4, 1 in.

### ORIENTAL JADE POLISHING POWDER

This is a specialized polishing agent which will properly polish Jade, Lapis, Rhodonite, Onyx, Agate, Jasper, Tiger Eye, etc.

\$1.00 per lb. plus postage on 2 lbs.

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Randall Henderson writes from Africa that because army kits are limited to 55 pounds he must resist the temptation to gather rocks. One suspects, however, that he may jettison wearing apparel and acquire at least a few interesting specimens.

Charles Dirdak talked on diamonds and diamond cutting at November 17 meeting of Searles Lake gem and mineral society. Dirdak, a native of Holland, was in the diamond cutting industry in Amsterdam for ten years. A chryso-colla specimen was profitably auctioned.

## AMONG THE ROCK HUNTERS

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From Beautiful Colorado come to you six of her rock beauties. Prepaid six dollars. Specimens run from 3x3 or larger. Hand picked, every one different, every one full of color. In addition as a gift to you I will place six pre-historic lizard scales. You will be pleased with this miniature collection. Jack The Rockhound, P. O. Box 86, Carbondale, Colorado.

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Lapis Lazuli from Italian Mt., Colorado. Sawed slabs 3/16 inch thick with hard white matrix at \$2.00 per ounce. Finest quality sawed slabs deep ultramarine blue with matrix of gold pyrites at \$4.00 per ounce. Head of department geology of prominent university states, "This lapis compares most favorably with the best lapis lazuli in any country." Massive grossularite, green garnet, from the same locality, 2 ounces for \$1.00. Iceland Spar (calcite) crystals, an unusual collection of clear, pink and yellow each 1 inch by 1 inch. All three for \$1.00. High grade silver specimens, argentite, etc., for \$1.50 per ounce. Steel Galena, the high grade lead ore that looks like broken steel, 2 ounces for \$1.00. ENDNER'S, Gunnison, Colo.

Tourmaline matrix, in quartz crystals, \$1.00 to \$30.00, tourmaline pencils, 50c to \$5.00, Essonite garnet-green-clusters, 50c to \$3.00, unique specimens. Sagenite agate, \$1.00 to \$4.00, specimen rough nodules. Gem list 10c. Return specimens if not satisfactory. The Desert Rats Nest, 2667 E. Colorado St., East Pasadena, Calif.

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Minerals, Fossils, Gems, Stamps, Coins, Pistols, Glass, Bills, Indian Relics, Bead Work. Catalogue 5c. Vernon D. Lemley Curio Store, Las Cruces, New Mexico.

Montana Moss Agates in the rough for gem cutting \$1.00 per lb. plus postage. ELLIOTT'S GEM SHOP. Petrified Picture Wood and Moss Agate Jewelry Hand Made in Sterling Silver Mountings—Rings, Bracelets, Necklaces, Brooches, Tie Slides, etc. Mail orders filled anywhere in U.S.A. 25 Jergins Arcade, Long Beach, Calif.

Beautiful agate, flower jaspagate, picture jasper and dinosaur bone. Assorted lots of cutting material, gem quality, ten pound package \$10.00. Four pound package \$5.00. Send postage. Mrs. Richard Fischer, Box 555, Grand Junction, Colo.

**INTRODUCTORY OFFER—One dollar each lot. Five all different Fluorescent Agates—polished. Thirty rough Mexican Opals. Fifty nice pieces Turquoise. Twenty different polishing specimens. Postage ten cents. Minerals and gems on approval. DR. RALPH MUELLER, Professional Building, Kansas City, Missouri.**

A bulletin from New Jersey mineralogical society, Plainfield, New Jersey, states that war conditions have tremendously accelerated research in the field of phosphors, the tiny crystals that convert invisible radiations into visible light. Energy applied to phosphor crystals create light by changing the atomic structure of the crystals.

Bob Carlter, member of Searles Lake gem and mineral society, has sent the society a specimen of vivianite from somewhere in Alaska.

So far as is known at the moment, there are no quartz crystals in Arizona having desired piezo electric qualities.

Bill Shand, from California institute of technology, was speaker at November 12 meeting of Long Beach mineral society. Joint meeting of the old and new boards was held at the E. S. Bond home.

Robert K. Foster addressed Los Angeles Dana mineral clubs on minerals associated with different rock types at their dinner meeting November 12. Prizes were awarded in a game of identifying mineral specimens. Dana club meets every third Saturday for study. They are learning to identify minerals and rocks in view of future field trips.

British central scientific office, 907 Fifteenth street, Northwest, Washington 5, D. C., wants black tourmaline crystals at least one inch in their shortest diameter. The price offered is five dollars per pound.

Approximately 300 fine specimens have been added to the mineral collection of Mineralogical Society of Arizona.

W. Scott Lewis, 2500 N. Beachwood drive, Hollywood 28, in his October mineral bulletin lists a "season opener" special of blue fluorite crystals from New Mexico. Specimens also contain other minerals, notably barite.

Mineralogical Society of Arizona is continuing its course in determinative mineralogy. Speakers in November were Luther Steward and George G. McKhann.

At its December meeting Imperial Valley gem and mineral society began a series of 15-minute talks by Arthur L. Eaton on different minerals and means of identification.

The Texas mineral society will hold its monthly meeting in parlor two, Baker hotel, in Dallas, Texas, December 14. Each member and visitor is asked to bring a specimen wrapped in newspaper for an exchange of specimens. Prof. S. A. Lynch, from North Texas agricultural college at Arlington, will show pictures and lecture on the subject of mines.

Southeast hobby society, announces Mrs. A. E. Allard, will have an evening of entertainment January 25, 1944, for those interested in gems, minerals and conchology. Public is invited. Many beautiful specimens will be displayed. Meeting will be held 7:45 p. m. at Southeast Y.M.C.A., 3355 East Gage avenue, Huntington Park, California.

On a recent trip to Queretaro, Mexico, we were presented with a small piece of Mexican opal which may be the answer to many questions. This unpolished opal much resembles any colorless hyalite in its normal state. However, when this stone is left for an hour or two soaking in cold water, its appearance begins to change noticeably. It takes on a pale blue color, and at times, in the sunlight, shows a rather brilliant bluish fire or play of color which was not apparent in the dry stone.

Los Angeles mineralogical society, at its October meeting, unanimously elected the following officers: Richard R. F. Lehman, president; A. J. McArthur, first vice-president; Mrs. Fern Schwartz, second vice-president; S. G. Benedict, secretary; Ledona B. Koppen, treasurer; O. C. Barnes, field trip chairman; B. Gordon Funk, federation representative; R. R. Newell, business manager; Victor J. Robbins, editor.

Retta E. Enders, 3961 Third street, Riverside, California, reports finding near Riverside a specimen of rare green chalcotrichite, pseudomorph after amphibole. She describes the specimen as occurring in cavities filled with tiny grass green, hairlike crystals, which appear in clusters much like a sheaf of wheat. She is unwilling to break or divide the specimen, but anyone wishing to acquire a fine large cabinet specimen might be able to make a deal for the whole piece.

Officers of Texas mineral society, of Dallas, Texas, are Thomas D. Copeland, president, 2007 W. Tenth street; W. H. LaDew, vice-president, 7667 Forest Hill boulevard; Mrs. A. L. Jarvis, secretary-treasurer, 353 W. Jefferson avenue. All addresses are in Dallas, Texas.

October meeting of Los Angeles mineralogical society was held in Boos Bros. cafeteria, with Gordon Funk, retiring president presiding. The speaker of the month was B. S. Grany, engineer of the Los Angeles department of water and power. Grant gave an interesting talk illustrated with slides on operation and maintenance of Los Angeles aqueduct.

In the December issue of this column under heading "Scarcity of Large Quartz Crystals Explained," appeared the name Herkermire." This should read "Herkimer," a county in New York.

H. W. Pierce of Long Beach mineral club is bereaved by the recent death of his wife who once was an active member, sharing many field trips with her husband.

A special use of rutile and ilmenite, states W. Scott Lewis, is in the manufacture of titanium tetrachloride to produce smoke screens.

Dinuba lapidary class, instructor Charles Freeman, began meetings November 16. They will continue to meet at Dinuba, California, on Tuesdays, from seven to nine p. m.

Members Merritt and Clark invited Searles Lake gem and mineral club, California, to visit their mine in Sand canyon, November 26. Some azurite was found, as well as other types of minerals.

Magnesium is the fourth most abundant mineral in the world. It was first isolated in 1805 and first produced commercially in France in 1857. Electrolytic production dates from 1896. In 1915, the annual production in this country was 87,500 pounds, valued at \$5 a pound. Today, the price is 22½ cents per pound, and millions of pounds are produced.

## Cogitations . . .

### Of a Rockhound

By LOUISE EATON

When the Duration is over 'n our soldiers come back, they're all goin' to love U.S.A. better 'n ever. The more they sees of other places 'n ways of livin', th' more they likes their own home towns. It's not cause it's what they're used to, nor cause it's home where they grew up. It's just the feel of bein' an American on his own stampin' groun'. He may not know 'xactly what he wants, but he sure knows what he does not want—positively. He wouldn't trade one square inch of home for all th' rest of th' world.

Didja ever lissen to three folks a talkin' when one of 'em was a unrockhoun'? The unrockhoun' tactfully tries to switch th' conversation to something he knows about too. But the rockhouns is hardly ever polite, at least for very long. They just goes on comparin' notes about field trip locations, 'r specimens, 'r the rocks in sight, 'r what rocks some other fella's got, leavin' th' poor unrockhoun to his own thoughts, if he doesn't wanta lissen to rock talk.

It's sorta nice to be a rockhoun' in a small town where you knows everybody 'n his specimens. But it would be kinda interestin to live in a big place 'n meet new folks 'n trade for rocks from different localities that they've visited 'n you haven't.

### ROCKHOUN'D'S CREED

By CHAS. G. SCHWEITZER  
Los Angeles, California

"Here, take a lot of rocks," he said,  
And all too gladly I was led  
Where piles of rocks, a treasure store  
Of agates, nodules, quartz and more  
Were waiting for the cutter's wheel  
To fashion them with felt and steel.  
"So fill your sack, I like to start  
Just such as you in the cutting art;  
And think not I am over-kind,  
For there are many whom you find  
Will gladly share and gladly show  
The tricks of trade that you should know.  
One thing we pass on—don't forget,  
The more you give, the more you get."

Dr. Olaf P. Jenkins spoke on geological story of the Franciscan chert at November 4 meeting of East Bay mineral society, Oakland, California. Julian A. Smith discussed crystals and why they belong to particular crystal systems at November 10 meeting.

Leland S. Chapman acted as auctioneer at the annual rock auction of East Bay mineral society of Oakland. The auction netted the club \$35 which was donated to a local service organization.

Cleavage in iceland spar is so perfect that actual fractures are comparatively rare. Fine quality spar cleaves or breaks easily into almost perfect rhombohedrons, and even cloudy poor grade material shows the same cleavage. Many poor grade rhombohedrons show what apparently is a fracture, but the imperfection is due to weathering or injury done to the original mass of spar and not to the single crystal. Iceland spar has a hardness of only three, so that weathering, rubbing and scratching damage it easily.

New Jersey mineralogical society observed an exchange night November 9. Members took their surplus specimens for trade. The Wirtz collection of Hawthorne, New Jersey, specializing in zeolites, was offered for sale to members. An additional day, November 14, was devoted to sale of mineral specimens for members.

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GETTING ACQUAINTED WITH MINERALS, G. L. English. Fine introduction to mineralogy. 258 illus., 324 pp. . . . \$2.50

HANDBOOK FOR THE AMATEUR LAPIDARY, J. H. Howard. One of the best guides for the beginner, 140 pages. Good illustration. . . . \$2.00

QUARTZ FAMILY MINERALS, Dake, etc. New and authoritative handbook for the mineral collector. Illustrated. 304 pp. . . . \$2.50

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and polishing equipment. Lelande Quick, who conducts this department, is former president of the Los Angeles Lapidary society. He will be glad to answer questions in connection with your lapidary work. Queries should be addressed to Desert Magazine, El Centro, California.

By LELANDE QUICK

Merry Christmas to all! You CAN make it merry despite all that has happened and is happening for we still have the spirit of Christmas with us. This is our third "war" Christmas and the feeling is strong upon me that come next Christmas we shall be at peace again. I am hoping to spend Christmas away out on the desert if accommodations can be had. But in early November, as this is written, everyone says "sold out" so popular is the desert this year for "getting away from it all." The first Christmas was on the desert and I want to get that "feel" by being there on Christmas eve. Phillips Brooks had that idea once and went all the way to Bethlehem itself to get the true Christmas eve atmosphere. It put him in the mood so well that he wrote one of the most beautiful and enduring of all Christmas carols "O Little Town of Bethlehem."

It will not be a Christmas that brings many of the gifts we amateur gem cutters want to receive in the way of rocks and equipment because equipment is not to be had and good rocks are scarce items with the dealers. I do believe that many folks have equipment they would like to sell and the realization must have come to many that they have stored away more saw blades than they need, more sanding cloth than they can use and they would be willing to let some of their supplies go to someone else who needed them if they only knew where they were.

Elphage J. Mailloux of 9536 Otis street, Southgate, California, comes up with the splendid and unselfish idea that he will act as a clearing house for all exchange items. This is purely an altruistic endeavor on his part. He will sell nothing, he will buy nothing, he will act merely as go-between without charge to buyer or seller. If you have a saw blade you can spare, drop him a card and tell him so. If you want a saw blade, drop him a card and register your wish. Then Mr. Mailloux will write a card to Joe Jasper who has a blade for sale and tell him that George Geode wants to buy—and then he's out of the picture. Look around your shop and see what surplus material you can spare, perhaps a pulley belt or even a motor, some surplus grits or paper, some extra tin oxide or perhaps you want to sell the whole shebang because you're tired of the hobby or you're moving to the Virgin Islands. List it all with Mr. Mailloux and send him postage and wait and see. Perhaps you want to buy a lap wheel or a felt wheel or need a motor for some piece of equipment you do have. Cry on Mr. Mailloux' shoulder (with some postage) and register your wants and see what happens. Don't write to me or to Desert Magazine about it, write only to Mr. Mailloux who is deserving of the highest gratitude from the gem cutting fraternity for the generous contribution of his time. I feel that he is going to be busier than he wants to be.

Weather instead of climate has come to Redondo and the "moon stones" are churning on the beach so that those of us in the Los Angeles area can spend a Sunday afternoon scampering away from the waves as we try to retrieve a likely piece of gem material. If only the stuff looked as good when you get it home as it does when you get wet feet just because you must have that particular rock! I expect people to show their usual impatience with me when they show me a flower stone and I say "so what." I expect to come home with a sugar sack of pebbles that I'll never cut. I expect to

This page of Desert Magazine is for those who have, or aspire to have, their own gem cutting

catch a cold from the fog and wet feet but I wouldn't miss it for a bucket of gold.

There must be folks who like it because it is sold but I don't know why. I refer to lucite "jewelry," scrap pieces of lucite with scraps of gems imbedded. In my opinion the rings we used to make from horse shoe nails when I was a boy had more aesthetic value than these lucite baubles. What a way to desecrate an opal! I agree with the dealer who said "every time I sell a piece of it I can't digest my lunch." The stuff should be suppressed.

Have you been cutting any of the new Wyoming jade? It really is jade and it really is fine and because it is quality material the prices asked by the dealers are reasonable, although they are high in proportion to other materials. This find is important and it has commanded the attention of Big Business. The Wall Street Journal itself recently said, "discoveries of green and black jade (nephrite) in the vicinity of Lander, Wyoming, are reported by the bureau of mines to be so extensive that 'it is by no means improbable that after the war American jade will be exported to China.' Boulders of jade, some of which weigh almost a ton, have been reported in an area 20 miles long and three miles wide. The black jade occurs in granite, the green almost wholly in boulders. Burma has been one of the principal sources of jade for Chinese artisans."

**DID YOU KNOW . . .**

- There is lots of jasper in northern California too—on Red mountain at the head of Prospect peak in Trinity county; yellow and brown jasper at Shaw's Flat in Tuolumne county; red, brown and green jasper is common in the serpentine of San Francisco; banded red and green jasper is found west of Meadow valley in Plumas county; red jasper abounds on Mt. St. Helena in Napa county and on the Reed ranch in Marin county.

**LAPIDARY HELPS AND HINTS . . .**

(As told by Rudolph Von Huene of California Institute of Technology)

Brittle materials should be ground with loose and not fixed abrasive. In other words use a lap wheel instead of a sander for materials like obsidian.

Don't overcrowd the abrasive. The professional lapidary uses as much grit as would cover the thumbnail to do one stone; amateurs use as much as an ounce.

After many years of research on all materials at the California Institute of Technology it was decided that of all materials within reach of the amateur lapidary ordinary boiler plate was best for lap wheels.

Never run a lap wheel faster than 800 r.p.m. If you want to increase the cutting speed increase the diameter of the wheel rather than the r.p.m.

The drum sander is better for flats than the disc type because the waste material falls away and does not remain to cause scratches.



# Just Between You and Me



By RANDALL HENDERSON

WITH THE ALLIED FORCES IN AFRICA—To pre-war tourists, the narrow cobble-paved streets in the crowded North African city where I am now stationed were "picturesque." But to those of us who now find it necessary to drive U. S. army cars along these crooked streets, they are a headache. After bucking this traffic for a couple of months I would tackle the rockiest, sandiest, ruttiest trail on the great American desert—and call it a vacation.

These Arabs still are living in the horse and buggy age. Their horses are mostly skin and bones, and their "buggy" generally is a two-wheeled cart with jittery wheels. When the load is heavy and the hill steep, the driver and his helpers unload. Part of them push the cart, and the others pull the horse. Even then, they sometimes get stalled.

You can imagine the confusion when this happens in the middle of a narrow street, with a long procession of GI jeeps and recons and trucks and French jalopies strung out behind waiting for the Arabs to clear the right-of-way and honking their encouragement to the horse.

There are no stop and go signals here, and not many traffic cops. The pedestrian crouches on the curb, waiting for a chance to dodge through the parade to the other side of the street—just as it was in American cities in the old days when the motorist was king of the road and if those on foot did not get out of the way it was their own funeral.

Yes, even that tortuous washboard trail that winds through the dunes and rocks and greasewood up the canyon to Hidden Springs in Southern California's Orocochia mountains will be a restful jaunt after this experience.

\* \* \*

I never did care much for the city anyway. Just why these free born Arabs left the sheltering date palms of their oases on the great Sahara to come and huddle together along the dark alleys of the native quarter in this city, will always remain a mystery to me.

\* \* \*

The white-haired old lady who runs the French rooming house where I am billeted thinks I am the world's dumbest human because I cannot understand her language. I did take the trouble to learn a few words of French, but when I use one of them she immediately assumes I know the whole vocabulary and starts chattering away as if I were a long lost son just returned. And when I finally get her stopped, and explain in my meager phrases that I do not understand a word she says, she turns away in utter disgust. In her estimation, anyone who cannot understand French is either half-witted or wholly uncivilized. I doubt if the thought ever occurred to her that she might learn a few words of English.

\* \* \*

This region is the original home of the date. The natives were growing them thousands of years before America was dis-

covered by the white man. After seeing the way the fruit is handled and marketed over here I appreciate more than ever the fine job being done by the date growers in California's Coachella valley in the processing and packaging of their product. I have just about lost my appetite for the dates that come from the old world. But I am looking forward to the day when I can stop at Valerie Jean's and quench both my thirst and my hunger with one of those delicious date milk shakes and then stuff my pockets with the fruit that comes from Coachella's palms.

In fact I am sure the men and women in this expeditionary army would vote unanimously that we do everything a little better than it is done on this side of the globe. Despite the shortages of many things which Americans regard as essential, they still are living in a world of abundance compared with the civil population here in Africa. And Africa is a land of plenty compared with the occupied countries of Europe at the present time.

How we will all appreciate the good things of this earth when this conflict is ended.

\* \* \*

Often, when there is a lull in the day's routine, the boys who have been overseas for several months start telling about the things they will do first when they return home. Food generally is the No. 1 subject—the chicken dinners, the T-bone steaks, the pumpkin pies, the ice cream sundaes and the cokes.

Next in interest come the picnics and motor trips. They all are planning to take a trip to the lakes or mountains or go fishing before they settle down to the job. They have a yearning just to see and have the feel of being in American atmosphere—of having dinner cooked by the womenfolks at home and yelling "ham and eggs" at the waiter in the short-order restaurant, or "cherry coke" at the soda fountain. They want to motor over the hills and renew their contact with the good earth in the place they call Home.

Most of the Americans with whom I work are eastern or southern boys. Few of them ever have been as far west as New Mexico or Arizona. When it comes my turn to tell about the things I want to do when I return home, I mention my old jalopy and my sleeping bag and steaks barbecued over hot coals of ironwood, and the crisp mornings when I crawl out of my bedroll and hover around the fire while I lace my shoes, and then fry crisp bacon and eggs-over-easy. And then tramp along a strange arroyo looking for mineral specimens or petroglyphs or the first blossom on the beavertail cactus.

Having the typical easterner's ignorance of the real desert, my companions never are quite sure whether I am crazy or merely kidding them.

I get along very well on the army food. I never did like to wrestle with a T-bone in polite society where you have to use knives and forks. But I do sometimes have a great yearning for the sun and the sand and the solitude of the desert which is my home.

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