Desert

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Camels For Uncle Sam's Army
Hi-Jolly's Noble Experiment

Water Conservation
Imperative of the Desert

Oregon's John Day Country
and the Chinese Medicine Man

Harris'
The Aristocrat of Hawks
(see page 8)

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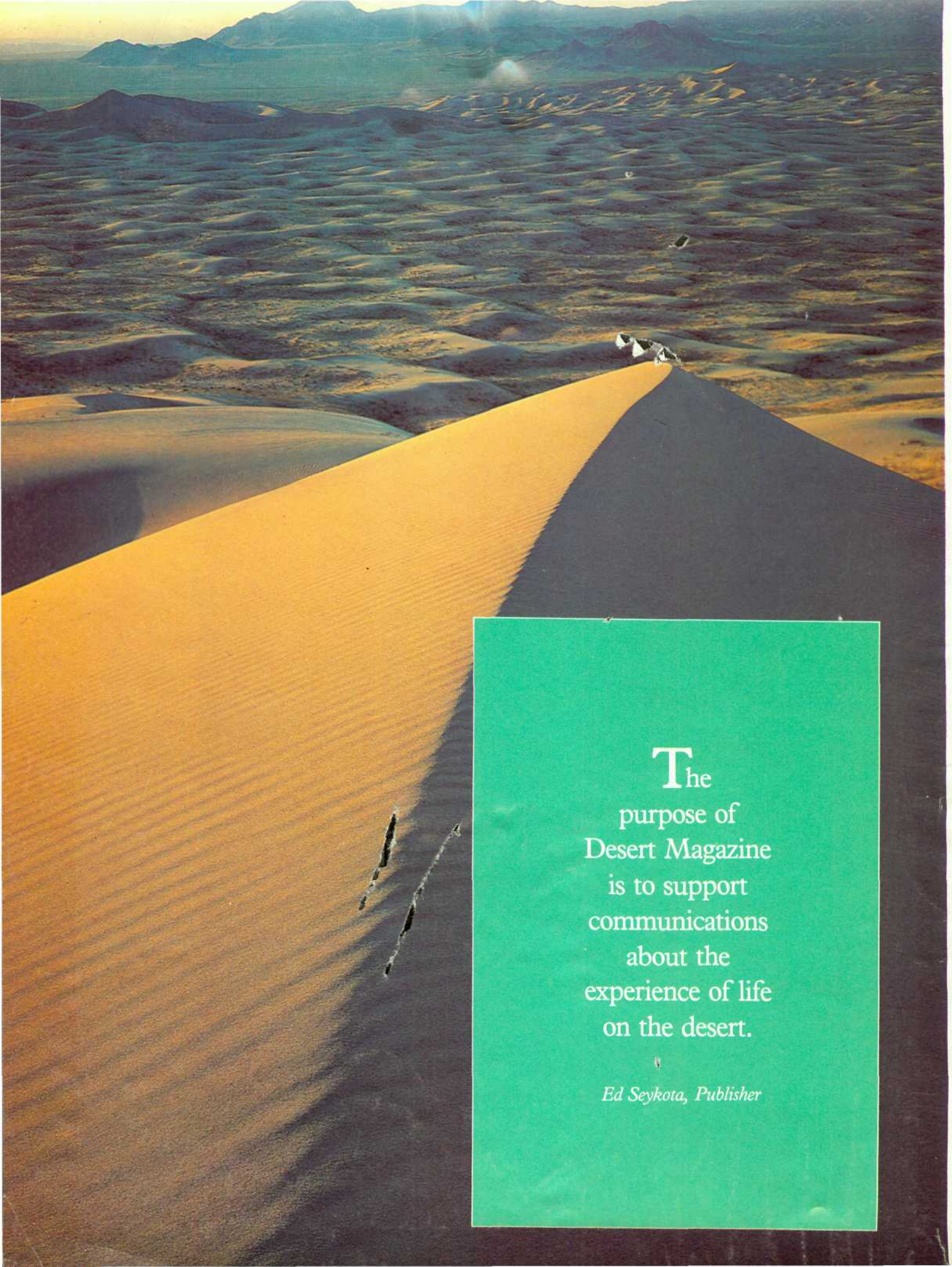
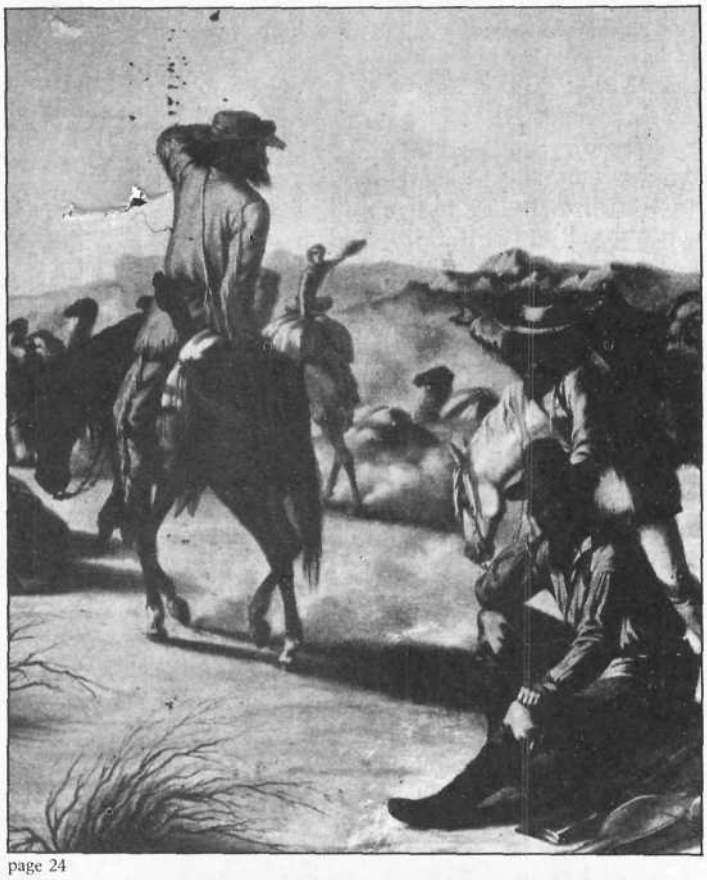


The purpose of Desert Magazine is to support communications about the experience of life on the desert.

Ed Seykota, Publisher

Desert

VOLUME 44 NUMBER 5 June, 1981



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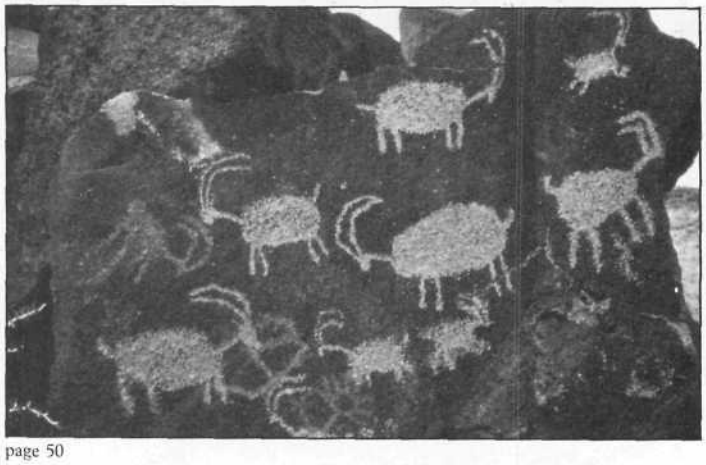

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Departments

Our Cover:
Andrew Steuer III was known to us as an accomplished photographer (*Desert*, February 1981, page 55) so it was a pleasant surprise when he brought in his exquisite watercolor of the Harris' or bay-wing hawk. Look for more of his work on future covers.

Desert

Magazine • Since 1937

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EDITORIAL

For Whom the Bell Tolls

THE DAY is surely coming when the Federal Office of Endangered Species, its equivalents in the various states and the taxpayers who support these bureaucracies, who are you and I as well as Sierra Club members, must sit down together and, without rancor, evaluate the goal. Specifically, are we trying to play God?

One way to put this thought into perspective is to imagine our civilization transplanted back in time to when dinosaurs and other gigantic exotics roamed the earth. We'd be scurrying about, conferring and raising money in an attempt to save them, despite the fact that their day had come. They became outmoded in nature's (or God's) scheme of things.

Another perspective is the price we must be prepared to pay to save present life forms whose day, for whatever reason, has come. An updated figure at 1981 prices to maintain the 1,400 tigers of all species now in the world's zoos is $7,409,500 per year. That is just one specie in a quantity thought sufficient to safely maintain it in captivity.

There are currently 279 endangered or threatened mammals on the United States Government's list alone, perhaps twice as many internationally. Then, each state has its own list, even though the same or quite similar species might thrive in a neighboring state. The total for all living things currently on the U.S. list, including plants, is 740.

Tigers cost $14.50 a day to keep; your calculation for the entire list (remember, scientists consider the 25 kinds of endangered clams to be as romantic as the tiger) would be as accurate as mine. I do know that if the world's existing zoos elected between them to maintain 500 of each of 2,000 species, the bill for 20 years would be $25 billion!

The improbability of obtaining funds of this magnitude has prompted the American Association of Zoological Parks and Aquariums to begin work on a much more modest species survival plan. Six species—five mammals and one bird plus an alternate reptile—have been chosen for study. These are the Amur tiger, gaur, golden lion tamarin, Mongolian wild horse, Barasinga deer and Rothschild's mynah. The alternate reptile is the Chinese alligator.

The best brains in zoology are now calculating the necessary populations, space and financing that will be required for this pilot program. Each species will have its designated manager. The animals were chosen because each needs immediate attention, each has already demonstrated itself as able to reproduce in captivity, and sufficient records exist to establish a base for study.

Robert O. Wagner, executive director of the association, flatly states that there is no way the world's zoos can ever save more than a small fraction of the list of presently endangered species. So, in addition to the species survival plan, plans are being formulated to establish sperm and tissue banks. Species will be recreated if and when their habitats can be restored.

I ask again: Are we trying to play God, or are we just feeling the guilt we place upon ourselves for, over the ages, usurping so much space in nature's kingdom? Perhaps now is the time to note that man wasn't too plentiful, he wasn't to blame at all, the day the last dinosaur expired.

Perhaps he's still not entirely to blame. Certainly cattlemen and ranchers over the years have shot more coyotes than mountain lions; yet the coyote thrives and the lion is threatened. It must have something to do with which is the more fit to survive. Perhaps the lion's days might have been numbered even had there been no men.

Don MacDonald

LETTERS

How Go the Flowers?

What is the prediction for desert flowers for this year, 1981? Where and when will they be in bloom? Is it a good year?
Kay Burrow
Eldridge, Calif.

It's been a poor year in the California, Arizona and Nevada deserts. We had a dry fall and also a dry early winter. Rainfall, while totalling close to normal in a late winter spurt, has been too erratic as, too, have been the temperatures. Thus the annuals, with the exception of sand verbena which thrives in conditions of blowing sand, simply did not germinate. Perrenials such as palo verde have fared better. However, no "carpets of flowers" have been reported anywhere.

Where's Ridgecrest

Please tell whoever drew your map of Death Valley National Monument (*Desert*, February 1981) that Ridgecrest, California, has not been wiped out like some of the other ghost towns around. It is alive and thriving, just a few miles due south of much smaller China Lake which you did show.
Patricia Farlander
Ridgecrest, Calif.

Our apologies to Ridgecrest Chamber of Commerce executive administrator Pat Farlander. Maybe we'll be welcomed back in town if we note Ridgecrest's popular High Desert Escapade, scheduled this year for May 2 and 3. These two weekend days are packed tight with your choice of exciting events, ranging from a tortoise race to desert tours. Check in at either gate to the Naval Weapons Center, obtain your temporary pass, and have fun.

The Bells of Fondeur

An article, "Spanish Treasure of the Unitahs," in *Desert*, July 1968, mentions an old Indian and a small brass mule bell with the inscription "1878—Saicnelegier, Chiantel, Fondeur" and two Spanish crosses. I have two of these bells which have been in our family for years, and am interested in learning more about them.
(Mrs.) Curly Alps
Madras, Oregan

I have a bell just like the one pictured on page 6, *Desert*, February 1971, inscribed "1878—Saicnelegier, Chiantel, Fondeur." I am interested if it has any great worth.
Ellen E. Pope
Bowman, N. Dakota

Three of our readers now account for four of these bells, not counting the one mentioned in the original article by Gale R. Rhodes. They seem relatively common, but the several dealers in western Americana we've asked about the bells have never seen one, can't find them catalogued, and thus hesitate to price them. We'll continue our attempt to trace the source.

Voice From Jacumba

I enjoyed Greg Prossor's article about the reopening of the Jacumba Hotel (*Desert*, February 1981). I lived in the town for several years in the mid-1920s when my father owned and operated the only other hotel there, the Carrizo Gorge, which burned to the ground long ago. Prossor's right about the many summer visitors trying to escape the heat of the Imperial Valley. My dad used to sell beer from nearby Mexico to his guests, a risky venture in those Prohibition days. The only misinformation in the article was that Jacumba was on the old Butterfield Stage route. The nearest it and the other old trails came to Jacumba was about 30 miles to the east.
Ralph Willis
Hemet, Calif.

Lost Gold of Huachuca

A few years ago I read quite a story about Ft. Huachuca. Some black soldiers were stationed there and one of them in his wanderings slipped and fell into a hole which proved to be the entrance to an underground mine or cave. Inside he found a stack of gold bars, and brought one out and had it assayed.

The bar was genuine and the soldier sold it, keeping the location a secret. He later told the Army about it, and they went in with heavy equipment but could never locate the cave due to the soldier's vague directions. I've never read any more about the Ft. Huachuca gold since, but verification was reasonably good at the time. What ever happened to this gold?
Victor M. Parachini, Sr.
Antioch, Calif.

You'll find out, Mr. Parachini, in a near-future issue of *Desert*.

Pesky Labels

I am a new subscriber to *Desert* and enjoy it very much. I think the cover is important, not only for the nice picture but for the titles of the features inside. They are the first things I look at but unfortunately, most times, they are covered up by the mailing label. Why don't you put the label on the back cover?
Den Rietz
Tempe, Ariz.

I don't understand why you persist in spoiling the front cover of your magazine with the mailing label stuck right over the titles of articles and picture. Surely in this computer age there should be enough ingenuity to find a better way.
Dick Crowe
Sacramento, Calif.

There isn't, apparently, for we've fought this problem month after month. We can't put it on the back cover because the advertiser there pays for his space and wants every inch of it to show, despite one reader's suggestion that this might get a lot of postal employees to read the ad who wouldn't see it otherwise.

The best compromise would be placing the label horizontally in the lower left corner, thus covering up the UPC Code symbol (bar chart) which is needed only for newsstand sales. There is, however, no machinery available that will affix labels this way without greatly slowing down the process and thus adding to the cost. Sorry, but those are the economic facts of publishing.

Travels In Sonora

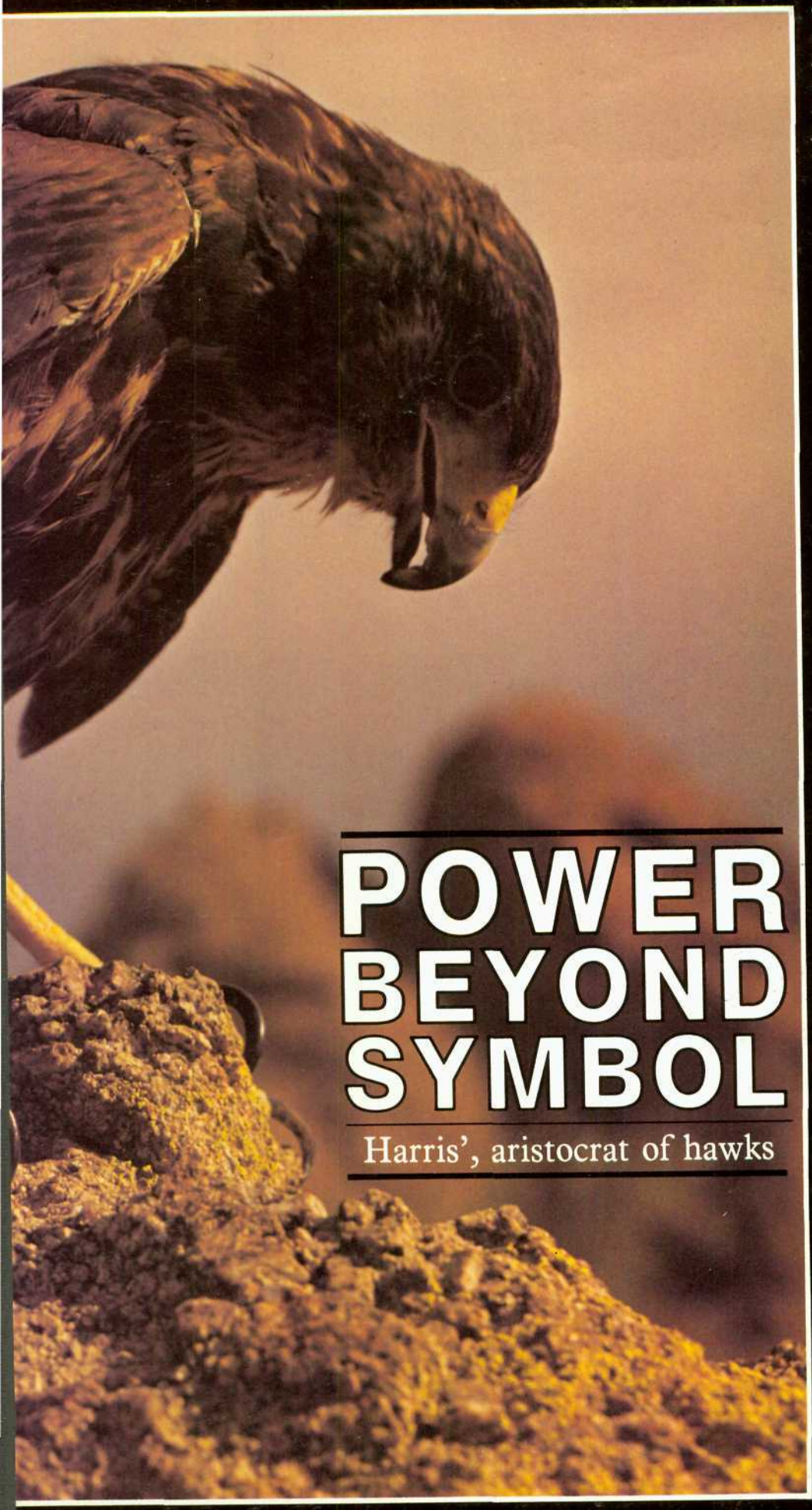
Recently I found a copy of *Desert* Magazine dated September, 1974, in which there was an article by Rodger Mitchell about a trip in Sonora from Cananea to Arispe. My wife and I made this trip in 1931.

We were warned by the oil companies, whcih made maps for travelers in those days, not to try it and we were similarly warned by a former patient of mine who lived in Cananea. We went anyway, following the Sonora River to Arispe, to Ures, and on to Hermosillo in our passenger car. There were no real roads and sometimes it was best to drive the water in the river.

In 1939 we packed into the Barranca de Cobre from the south, and were the first to botanically explore that big unknown area. We were doing research for my *Mammillaria Handbook* on cactus plants, published in 1945. I hope Mr. Mitchell sees this and contacts me, as I'd like to talk with him about the area.

Robert T. Craig, D.D.S.
Baldwin Park, Calif.

The editors of *Desert* Magazine welcome the experiences and opinions of readers and will publish as many letters as space permits. They should be addressed to us at P.O. Box 1318, Palm Desert, CA 92261. No unsigned letters will be considered, but names will be withheld upon request. Please be brief; otherwise, we cannot guarantee to print your letter in its entirety.



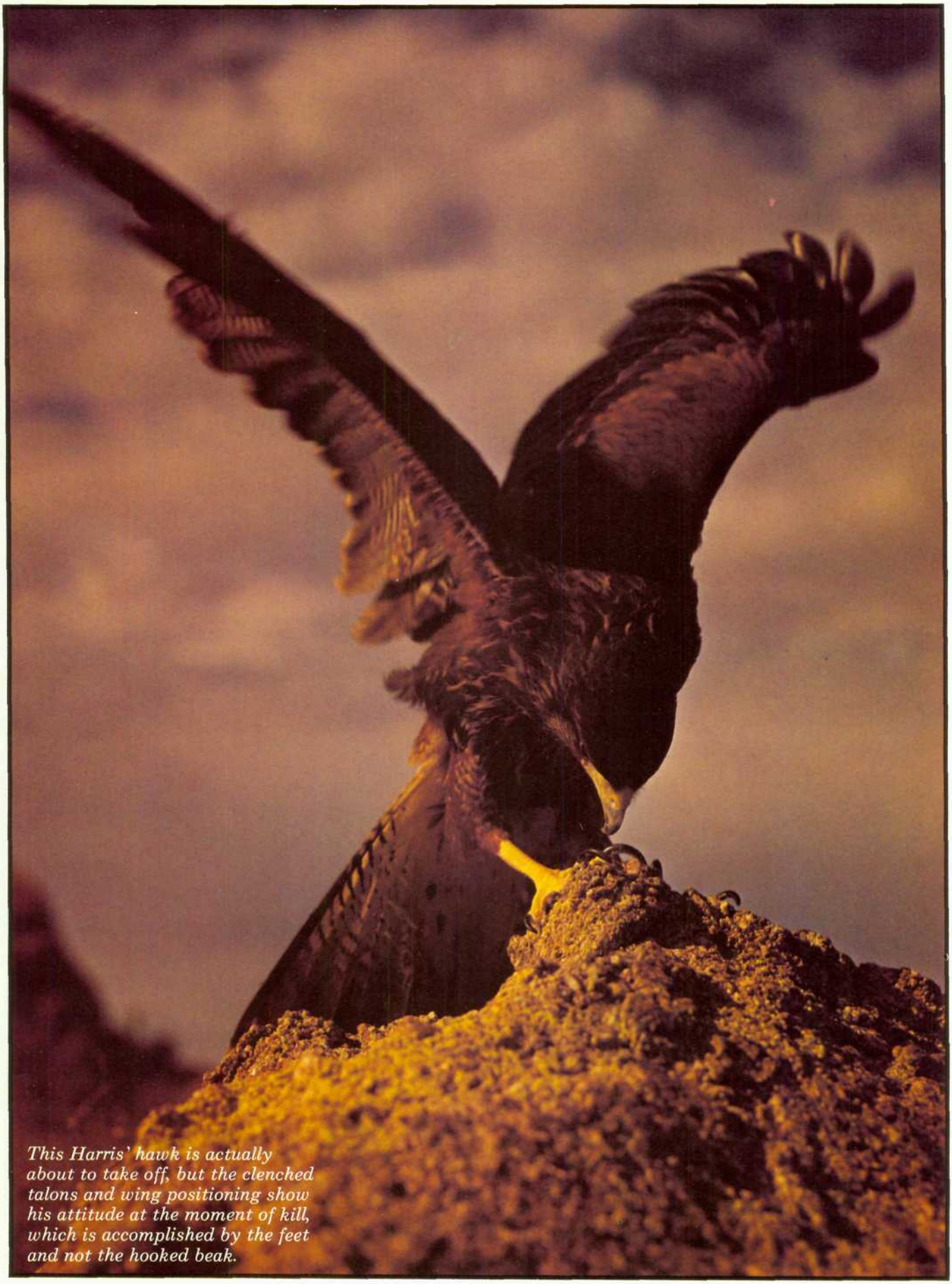
The Harris' hawk nests in what's technically known as the Upper Sonoran zone, a desert area embracing the northern part of the Mexican mainland, the southern portion of Arizona and Southeastern California.

POWER BEYOND SYMBOL

Harris', aristocrat of hawks

by Susan Durr Nix

Photographs by Willis Peterson



This Harris' hawk is actually about to take off, but the clenched talons and wing positioning show his attitude at the moment of kill, which is accomplished by the feet and not the hooked beak.

HAWKS AND doves were powerful symbols in the charged atmosphere of the late '60s and early '70s, when Americans were denouncing one another for pro or anti-war sentiments. Then, as in wars past, the birds were symbols of power and gentleness, of aggression and pacifism.

Like most of the 'Nam generation, I allied myself with the peacemakers and decorated my apartment with the issue posters of bird and olive branch. Had I realized at the time that doves are technically pigeons—birds with far less emotional appeal—I might not have been so cocky about my totem. Nor at the time had I ever seen a hawk, silhouetted against a cloudless sky, or looked one in the eye and recognized a fellow creature.

Few symbols, I suppose, can withstand close scrutiny. Although we need them to enrich our language and crystallize our thoughts, we also need to know the thing itself, the real hawk or dove, to give substance and depth to our understanding.

Demythologizing hawks isn't easy. The hawk is many birds, more than 100 species world-wide, and 21 of these are native to North America above the Mexican border. Hawk can mean streamlined falcon or stocky buzzard. The word evokes images of cruelly-taloned killers, of daring 180-mile-per-hour dives and of lonely, almost eagle-sized birds making lazy circles in the sky.

For more than 5,000 years, hawks have been worhsipped, feared, admired or stigmatized. In Egypt, the hawk was Horus, the Lofty One; to the Old Testament prophets, he was both evidence of the mysterious ways of God and one of the "unclean;" to the Incas, he was a supernatural protector, synonomous with the sun. For more than 4,000 years, man has used the hawk's strength and speed to help him hunt, first for necessary food and later for sport. For centuries, gamekeepers, farmers and ranchers have protected their interests by killing these birds.

No single hawk is all of these things, yet each individual exhibits characteristics that clearly say "hawk" rather than eagle, owl, vulture or falcon. Collectively, these five are known as birds of prey, or raptors, all sharing three anatomical features: hooked, tearing beaks, strong clawed feet and excellent vision. Among themselves, they are differentiated by size, wing and foot structure, preferred prey, hunting style and habitat. One of the most striking differences is that which sets the owls apart. They are almost all night-hunters, with the acute hearing and specialized vision necessary to nocturnal habits, whereas other raptors are active exclusively during the day.

For more than 4,000 years, man has used the hawk's strength and speed to help him hunt...

Up close, the eyes of a hawk are so startling, so certain, that the whole bird seems to be concentrated there. In conjunction with the violently hooked beak, the effect is distinctly aristocratic and highly intimidating. A handsome species like the Harris', or bay-winged, hawk *(Parabuteo unicinctus)* heightens the impression of absolute, unyielding control. Poised on top of a tall saguaro cactus or airborne and screaming to warn off intruders, this Swiss-chocolate colored, medium-sized hawk commands the respect not only of cowed humans, but of larger, equally efficient red-tailed and ferruginous hawks.

Harris' hawk ranges through Central and South America and briefly into the United States, where it is confined to the southwestern border states of California, Arizona, New Mexico and Texas. We know it as a Sonoran Desert bird that nests in saguaro, mesquite and yucca, or as a rarer resident of the Colorado River margins from Needles to Yuma. Against this open desert or semi-desert background, Harris' is especially dramatic, skimming above the ground or soaring overhead, sharp-eyed for mice, gophers, lizards, snakes,

cottontails and small birds.

Those eyes again—but the world of birds and especially birds of prey is predominantly visual. The great raptorials are equipped with eyes nearly as large as our own, some eight to 10 times more acute. When we see nothing but a fuzzy blur up close, they still see a clear image at great distances. Consider this: At more than 100 yards, a hawk can sight a small green grasshopper against a background of green weeds. Put that same grasshopper in plain view on a post and it fades from our 20-20 sight at about 30 yards.

Apart from the size of the eyes themselves and the large image cast on the retina, birds of prey have two points in each eye where sight is extremely sharp. Two of these are directed sideways, to the right and the left, for monocular vision, and two face forward for binocular vision. A slight movement of the head instantly focuses any image to the sides or straight ahead. To see behind, the head swivels on a very flexible neck, especially noticeable in owls, who seem to be able to turn it a full 360 degrees. Hawks have two added advantages: the highest known concentration of visual cells in the world and the most elaborate pecten, an organ at the back of the eye that throws shadows on the retina and seems to sharpen depth perception.

If we need further proof that sight is absolutely vital to these birds, it's there in the form of a protective bony ridge above the eye, which contributes to their haughty appearance, and a third eyelid, shared by all birds and inherited from their reptile ancestors, called the nictitating membrane, which can be drawn across at will to prevent damage while struggling with prey, crashing through vegetation or feeding eager, uncoordinated young.

The rest of a hawk's body is designed for where it lives, what it eats and how it hunts. The length, strength and arch of the beak is a fair, if not infallible, clue to its prey preferences. Broadly, those who eat large mammals like jackrabbits have proportionately larger beaks than bird or insect eaters. Those that make carrion part of their diet tend to have fewer feathers at the base of the beak. Wings and tail are longer, shorter, broader or narrower depending on whether the bird soars, glides or dives and where it lives. In densely wooded areas, for instance, a longer steering and maneuvering tail and shorter wings are an advantage. Likewise, the structure of the foot is modified to the bird's way of life. Bird-eaters generally have long, slender toes; mammal-eaters, short, powerful ones.

The feet and talons are dual-purpose killing and holding tools which lock automatically to secure prey. A hawk has three toes pointing forward and one pointing backward, a design useful for perching, too. Dagger-like, the talons grip and pierce with such unexpected strength that handling even a small sparrow hawk requires a stout leather glove. I have never held a large raptor, but I have seen the vice-like grip on other arms and have a healthy respect for both bird and handlers. The grasp of the larger and stronger eagle is numbing, so I hear, and impossible to loosen unless the bird relents.

...the hawk's body is designed for where it lives, what it eats and how it hunts.

Although the impact of the landing bird is often sufficient to kill, two powerful muscles contract the toes until they meet resistance. Large animals whose bodies fill or extend beyond the outstretched foot are impaled on the talons, while moderately sized prey allow the toes to close with crushing force, as well. With small prey that can be completely enclosed by the contracting foot, the talons may not come into play at all.

The foot, then, is as important as the beak in determining predator/prey relationships. Short, stubby toes are clearly better adapted to killing snakes than are long, slender ones.

Harris' hawks have huge, powerful feet which allow a wide range of prey, including jackrabbits five times heavier than they are. Bare, scale-covered legs (another vestige of reptile ancestry) mark Harris' and numerous other raptors as snake and sometimes carrion eaters. Easier to keep clean than feathers, scales also offer some protection against snake bite.

THE FLIGHT and hunting style of a Harris' hawk are characteristic of two quite distinct genera: the soaring Buteos or buzzard hawks (e.g. the red-tailed

hawk) and the secretive, gliding Accipiters or bird hawks, like the goshawk. (One authority dubs Harris' the Jeckyl and Hyde hawk.)

They might be common red-tailed hawks making graceful spirals high in the sky but for a conspicuous band of white at the end of the longer tail. At rest, they can be mistaken for red-shouldered hawks because of the rusty patches on their shoulders and thighs. To make a kill, however, this broad-winged buzzard look-alike takes on the appearance of a bird hawk, dashing through thorny bush or along desert water courses with remarkable speed.

In several other ways, Harris' hawks are highly atypical. Most raptors hunt alone and maintain a more or less exclusive hunting range by conspicuous perching or soaring. Once the kill is made, they assume a shielding posture to conceal it from other predators, or carry it off to a secure site to eat at leisure. Harris' hawks not only hunt cooperatively, they share the kill. Three have been observed pursuing a rabbit and finally cornering it in a bush. After repeated attempts to flush it out had failed, one of the birds finally slipped in and got it. Each bird in the hunting party received a share.

At more than 100 yards, a hawk can sight a small green grasshopper against a background of green weeds.

Even more unusual is their nesting and breeding behavior. William J. Mader discovered and documented the fact that anywhere from one to three other adult birds, who would be considered trespassers and quickly challenged or attacked for their pains by all but one other raptorial species, are welcomed as "helpers" by mated pairs of Harris' hawks and are allowed to assist in defense and feeding duties.

The broad stick next generally houses three chocolate and rust Harris' chicks. It sits eight to 30 feet off the ground in a variety of plants, including prickly pear, Spanish bayonet, mesquite, cottonwood and saguaro, and is decorated with leaves, grass, Spanish moss, elm shoots and other bits of greenery for no known utilitarian purpose. The "helpers" regularly supply the nest with prey, delivering it either to the brooding female or to another male who in turn feeds it to the chicks. They also gather to repel intruders, circling and crying together, or standing sentry on near-by perches until the danger is past.

Why this solidarity rather than the isolation and monagamy that is the general rule among raptors? No one knows. Contrast the behavior of the incubating red-tailed hawk, whose own safety takes precedence over the safety of its offspring. The adult will abandon the nest when danger approaches, presumably because nesting success can be assured later by laying another clutch.

Harris' hawks are also fastidious eaters, at least where bird prey is concerned. They are known to pluck a kill almost as completely as does a falcon. They also keep the nest scrupulously clean, discarding bones, fur, feathers and other indigestable material after the chicks have fed. Because of their cleanliness, bold looks, aggressive and agile hunting style, their rarity, cooperative behavior and ease of handling, they are highly prized by American falconers.

Most of the raptors I see as a naturalist at a refuge are damaged birds—victims of systematic poisons, gunshot wounds, accidents and malnutrition. That last is probably the most frustrating cruelty, the result of well-meaning but uninformed human interference with wildlife. Skilled falconers are not to blame, for they are well-schooled in the needs of predatory birds and have traditionally contributed new information to our understanding of raptor biology and behavior. Their less skilled imitators, excited by the prospect of taming a bird of prey, may be. Unfortunately, a young bird whose exacting dietary requirements have not been met, or who has been kept in too small an enclosure too long, is ultimately deprived of a normal life. It may live up to 50 years in captivity without once having flown or hunted on its own, a partially-realized thing.

Until I saw macaws in the wild, it was hard to think of them as anything but colorful, rather clumsy birds. In flight in their natural state, though, they are whole creatures with a grace and elegance that delights and surprises. I hope when I see a Harris' hawk, it is screaming its harsh territorial *krrr* over a desert landscape where it belongs, both a symbol and example of lofty power.

WATER CONSERVATION Imperative of the Desert

Can man succeed in his unending struggle to live at peace with the sun?

by Dr. Sherwood B. Idso Photographs by the Author

IT'S 2 O'CLOCK in an Arizona afternoon. The searing rays of the summer sun are beating mercilessly upon a patchwork quilt of greens and browns. A vehicle appears and pulls to the side of the dusty road that zigzags through the blocks of vegetation. Two men get out. One of them holds what looks like a small handgun. He points it, first toward one field and then another.

"Our sensors indicate the alfalfa has used about 60 percent of the available water in its root zone," he says without expression. "Irrigation will be needed within the next 36 hours."

"You're probably right," replies the other, "but let's check the data from the airborne scanner. It can assess the high spots farther out."

It sounds like a portion of a *Star Trek* episode, with Mr. Spock giving a report to Captain Kirk on the status of a farming venture on some far-flung planet in the distant future, but it is not. The time is now, and the place is the U.S. Water Conservation Laboratory in Phoenix, Arizona, where scientists are conducting experimental work on the remote detection of plant water stress—work that will one day be essential to the continued existence of agriculture in the demanding environment of the desert.

CONSERVATION IN HISTORY

Water conservation: It's almost as old as civilization itself. A man named Isaiah once said that the desert would someday "blossom as the rose." The Mormon pioneers took him at his word and made him a prophet, indeed, but their ways of irrigating were not the first, nor were they to be the last. As far back as the archaeological record can be deciphered, the great southwestern desert has been the site of innumerable efforts at intelligent water management. Many of the techniques developed were sound and lasted for centuries, but each finally gave way to new innovations: today we stand on the threshold of perhaps the greatest technological leap ever envisioned by man in his unending struggle to live at peace with the sun in this land of cactus and mesquite.

Will he finally succeed? Let's check his track record, and then let's look at some of the new reasons for his ebullient optimism.

Three hundred B.C. marks the start of significantly structured life in Arizona. About that time, the Hohokam civilization emigrated into the Salt and Gila river basins by way of the "Piman Corridor"—a broad thoroughfare up the west coast of Mexico. The early peoples that traveled this route brought with them traditions of large houses, figurines and ceramics, turquoise, stone and shell work, and, most significantly, the concept of canal irrigation.

For the next 1,600 years, the practice of irrigating terraces for food production was vigorously pursued; more than 500 miles of canals have been charted for this period, many of them with sequences of rebuilding. The canals were sophisticated too, with laterals, gates and overflow reservoirs. Contrary to what many have long believed, however, these great irrigation systems may not have been used to grow cultivated crops such as maize, but rather to augment the natural production of highly nutritious indigenous foods. Saguaro fruit, barrel cactus fruit, cholla buds of all kinds—these are the staples of the desert. Indeed, the early Hohokam found that they could easily produce more mesquite pods on a unit area of land than they could maize. It was not until A.D. 900 that corn achieved dominance. The only reason for the changeover was the probable destruction of mesquite, due to its heavy utilization as fuel for ceramic production, which the Hohokam civilization concentrated on for trade.

THE INFLUENCE OF CLIMATE

Why didn't this sytem of life, this marriage of man to the desert, continue much beyond A.D. 1300? One reason was the change at that time from a summer-dominant to a winter-dominant rainfall regime. With the less intense rainfall of winter prevailing, the rate of canal-filling by silt exceeded the ability of the Indians to keep the channels open. Thus, the Hohokam abandoned their aging system of canal irrigation and converted to a floodplain system much like that used in Mesopatamia, where they periodically let the rivers flood adjacent fields by breaking their banks.

This system worked well in the valleys, but more complex approaches were needed in range and hill areas. On Fort Mountain near Cave Creek, for instance, a three-foot-high wall was built to divert runoff from rainstorms to terraces on the hillside and small garden plots at the foot of the slope. Check dams were constructed along the two streams that parted to flow around the hill, and water thereby diverted to irrigation borders. Downstream, a canal system directed the tailwater to another series of garden plots. Tempe Butte was similarly farmed on its entire northwest slope by a multitude of small, half-moon gardens that were fed water from rainstorm runoff by a series of check dams.

The Hopi Indians of Black Mesa had yet another diversified system of water conservation, whereby every drop of rain that fell on their watershed was used in one way or another. Rain fall-

Irrigation water is distributed and reclaimed by furrows in the parched desert cotton fields.

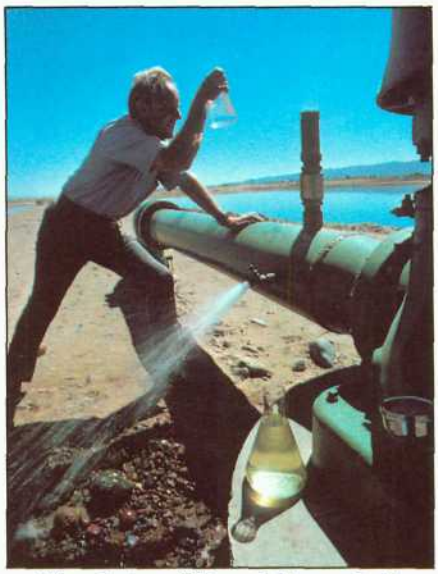
ing far back in the uplands infiltrated the ground and eventually reappeared at the base of the hills in the form of springs. That which ran off the land was used for floodplain farming at the edge of the mesa.

Even on the desert, they made use of minimal rainfall by "sand dune farming." Sand dunes there lay upon an impervious clay layer, so rain falling upon a sand dune would seep vertically through the sand and exit the dune horizontally at its base. Thus, the Hopi planted their crops in the sand around the base of the dune, where they were favored by practically all of the water that fell over the dune's entire surface. By each family owning a little of each kind of land—spring, floodplain and sand dune—they were almost always assured of success in at least one farming venture each year, in spite of variations in weather patterns.

MODERN MAN ARRIVES

As the years rolled on, new influences made their way into the area. Spanish padres led the way from the south, while pioneers and profiteers came from north and east. Some looked for easy riches, and when their dreams were either dashed or fulfilled, they moved on. Others came seeking a different kind of gold, and sank their roots into the fragile desert soil along with the Indians. Once again, new irrigation techniques were instituted.

With the shifting of the climate back to a summer-dominant rainfall regime in about 1850, canal irrigation became the way of life for the settlers. At the start of this "modern" age of irrigation, shovels were used to turn water from earthen distribution systems onto fields, where the slope of the land was relied upon to (hopefully) spread the water evenly. With the advent of siphon tubes in the 1940s and gated pipe more recently, this labor-intensive system was significantly improved, but efficiencies still remained low. Only about 50 percent of the water applied to a field was ever used by the plants; the rest either percolated through the soil to the groundwater, or ran to the end of the field and was lost. By installing reuse systems that picked up runoff water from the ends of their fields, however, farmers boosted their irrigation efficiencies to about 85 percent. Even better figures were in the offing.



After being filtered through the soil, reclaimed water is pumped back to the surface.

DEAD-LEVEL IRRIGATION

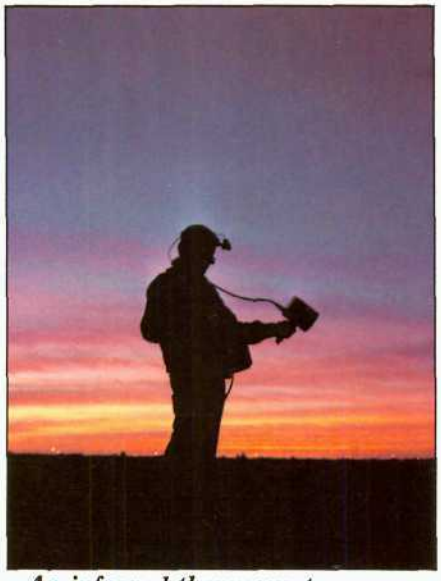
One technique that is expanding rapidly at the present time and gives water use efficiencies of better than 90 percent is dead-level irrigation. Here, level basins eliminate the problem of runoff loss, common to standard

A battery-powered laser transmitter and receiver mounted on a drag scraper achieve precise land-leveling in record time.

sloping-field irrigation, and also allow a more uniform application of water. To use it, fields must be accurately leveled, so that there is no more than one inch difference between the highest and lowest points. Until recently, such precise leveling was nearly impossible. In just the last few years, however, the introduction of laser technology to land-leveling has made it commonplace.

To achieve precise land-leveling, an operator sets up a battery-powered laser transmitter on a tripod, and a receiver is mounted onto a drag scraper. The transmitter projects a beam out over the field as it revolves around and around, sweeping out a level plane in the air. The operator of the scraper then surveys the field by driving about with the scraper blade held at a no-scrape height. He reads the blade elevations below the laser plane from a tractor-cab console, recording them on a field map. The average field elevation is thus computed and set into the control mechanism. Switching to automatic laser-leveling, the operator then starts driving in more or less random fashion, working the high spots toward the low areas, using the field map as a guide. In much less time than it could have been done in the past, the field is leveled with a degree of precision that was only a dream a few years ago.

To enhance the benefits of dead-level irrigation, the delivery of water to the level basins has been automated. There are now several systems on the market that, at an affordable price, will reliably open, close or change irrigation flow from field to field on a given time schedule, ensuring that just the right amount of water is applied.



An infrared thermometer senses when plants are in need of watering.

CONTROLLING THE WATER

One of the most promising of these methods is a jack-gate actuator, powered by compressed air transmitted to an air cylinder from a central control station. It delivers water to the basins by opening and closing, in proper sequence, slide-type gates or ports in the sides of modern concrete-lined canals.

Other recent innovations in irrigation technology deal with the means of water application. Foremost among these developments is the center-pivot sprinkler system, which has been touted as "perhaps the most significant mechanical innovation in agriculture since the replacement of draft animals by the tractor."

Why such strong praise? One reason: center-pivot sprinklers provide accurate

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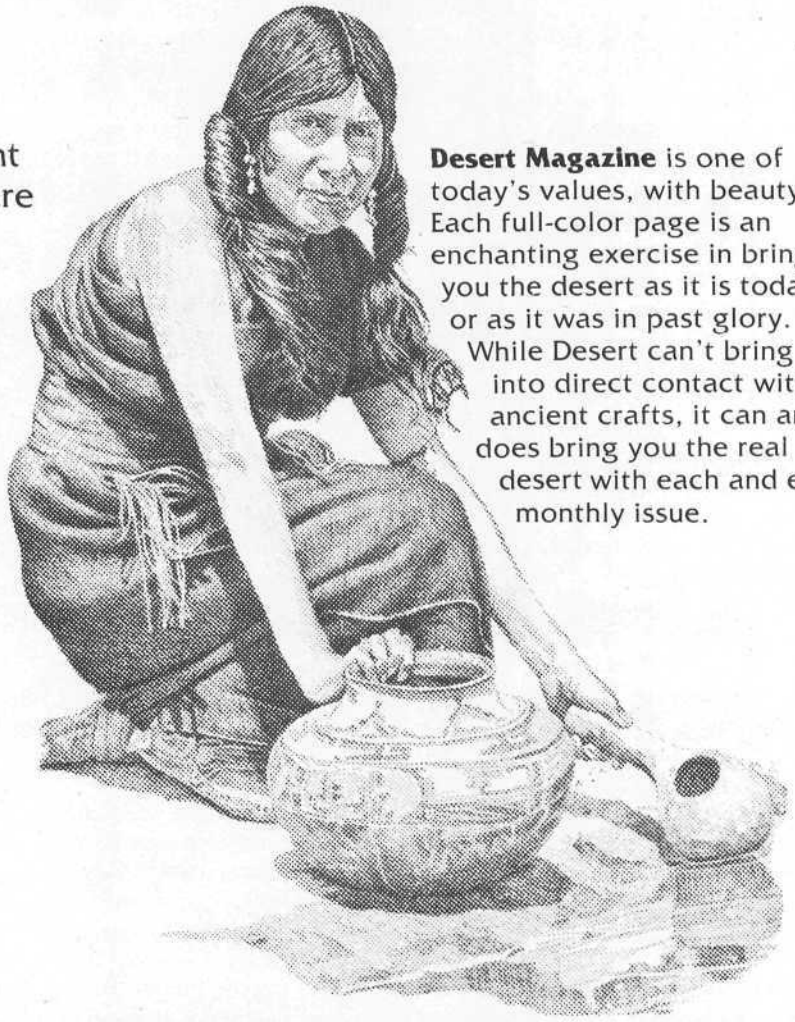

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control of both water application rate and frequency; for another, they operate automatically. They can also be used to apply liquid fertilizers and herbicides. Perhaps the most important reason of all, however, is that the center-pivot sprinkler is well adapted to rolling terrain and to coarse or sandy soils. Thus, its most rapid growth has been on land once considered non-irrigable, land that has now been converted to high crop production.

Although sprinkler systems can be used so as to produce no runoff water and practically no deep percolation to the groundwater, there can still be a superfluous loss of water by evaporation from unplanted portions of a field. The ultimate in irrigation control to eliminate this last nonessential use of water is trickle or drip irrigation, whereby water is delivered right to the base of individual plants, to drip out onto the soil from plastic pipes or tubes through small outlets called emitters. In this way, areas of the ground not covered by the crop are kept dry, with water only going to plant roots. Orchards are the most obvious application for irrigation by this method. In Arizona, about 7,000 acres of citrus, pecan and deciduous fruit trees are managed in this way.

But what good are the best of tools unless one knows how to use them? Over-irrigation, for instance, can cause leaching of fertilizer nutrients, flooding and downstream pollution in addition to wasting water. In hot climates, too much water can also scald sensitive plants. Where energy costs are high, as in pumping districts, over-irrigation exacts a monetary toll that can hurt inefficient operators. Of course, the drawbacks of insufficient irrigation are obvious.

All of these problems are now being minimized by the development of a new flow-measuring device or flume that represents a real breakthrough for ditch irrigators, who supply water to more than 1.1 million acres of land in Arizona. At a cost of one-third to one-tenth that of previous flumes, the new device can be installed in a ditch in a single day, and flow rates subsequently read with a precision of plus or minus two percent—with the irrigator not even required to get out of his pickup to take a reading. The new measurement technique allows operators to put precise quantities of water onto level basins, where highest efficiencies can only be obtained with careful attention to the application of just the right amount of water in each irrigation.

WHEN TO IRRIGATE

But when to irrigate? This is the primary question that has faced irrigators of all times. One approach to the problem that is widely employed is to place soil moisture sensing devices in various locations throughout a field. Another modern development is the use of computers to calculate evaporative water losses from basic weather data. It is likely, however, that the greatest innovation of the last two decades of this century will be the use of remote sensing techniques to directly evaluate plant water stress and thereby signal when irrigation is required.

The basis for the remote sensing approach is to be found in the concept of leaf temperature assessment. When plants are well watered, they transpire a significant amount of water through their leaves. The evaporation process cools the leaves, sometimes as much as 10 degrees below air temperature in the hottest part of the afternoon. Once the water in the crop's root zone has been reduced below a certain percentage, however, it becomes more and more difficult for the plants to extract further water. Their transpiration rate falls; the reduced evaporation at the leaves no longer cools them as much as before. Leaf temperatures rise, sometimes as much as 10 degrees above air temperature. Consequently, by monitoring crop temperature, water can be withheld until it is definitely known that it is needed.

The space age...is exerting its influence upon the most basic of human endeavors—the production of food for sustaining life.

How is it done? All objects in the environment radiate heat. An infrared thermometer senses this heat radiation and translates it into the temperature of the object viewed. Portable infrared thermometers have been developed that weigh no more than a 35mm camera. In the shape of a small handgun, they are ideal for use by an individual farmer. Larger operators or irrigation districts can also install thermal scanning equipment in light aircraft for obtaining actual temperature maps of entire fields. Flying between altitudes of 500 and 1,000 feet, such devices can map the temperature of each square foot of farmland below.

FARMING BY SATELLITE

Carried to its ultimate, the thermal scanning technique can also be applied from satellites. At the present time, ground resolution from satellite altitudes is rather coarse, but as technology is improved and new satellites capable of sustained orbits at lower altitudes are developed, we can expect that this application may someday become a reality.

We stand, then, at a unique point in history. The space age has truly arrived and is exerting its influence upon the most basic of human endeavors—the production of food for sustaining life. Nowhere is this interplay of technology and tradition more apparent than in the desert: irrigation is the lifeblood of agriculture in arid lands, and civilization cannot long exist in such an environment without acknowledging this fact.

Not all of today's new water conservation tools are products of the space age. Some of the more unique ones date back to the earliest inhabitants of the land.

Take water harvesting. A lot like sand dune farming, its basic objective is to collect rainfall from a large area and concentrate it on a smaller area where it is used for a variety of purposes. Many treatments have been developed for waterproofing catchments to provide water for both crops and livestock in this manner. One well-tested approach consists of installing an asphalt-fiberglass lining, while another simply creates a water-impervious layer by sprinkling wax chips over the soil surface that will melt in the afternoon sun and solidify at night.

Once captured, harvested rainfall is also conserved in storage. Earthen stock ponds, for example, can have their seepage rates significantly lowered by chemical treatments to restrict water flow through otherwise porous soil constituents. Metal storage tanks are another approach. In both cases, water evaporation can be curtailed with floating covers of different types of plastic films, wax blocks, or even lighter-than-water cement slabs.

USING HARVESTED WATER

One of the most interesting water harvesting projects presently under investigation involves the construction of

small micro-catchments near individual bushes of jojoba. This is the native plant of the Sonoran Desert that produces peanut-sized seeds containing a high quality wax. The wax has been proven to be an excellent substitute for the now rare sperm whale oil, which is renowned for its tolerance to high temperatures and oxidation. The oil has long been essential to many different industries, and sustained production of jojoba wax could relieve some of the pressure on the endangered sperm whale. By augmenting the water received by jojoba bushes with water harvesting, researchers have boosted their yield by several hundred percent.

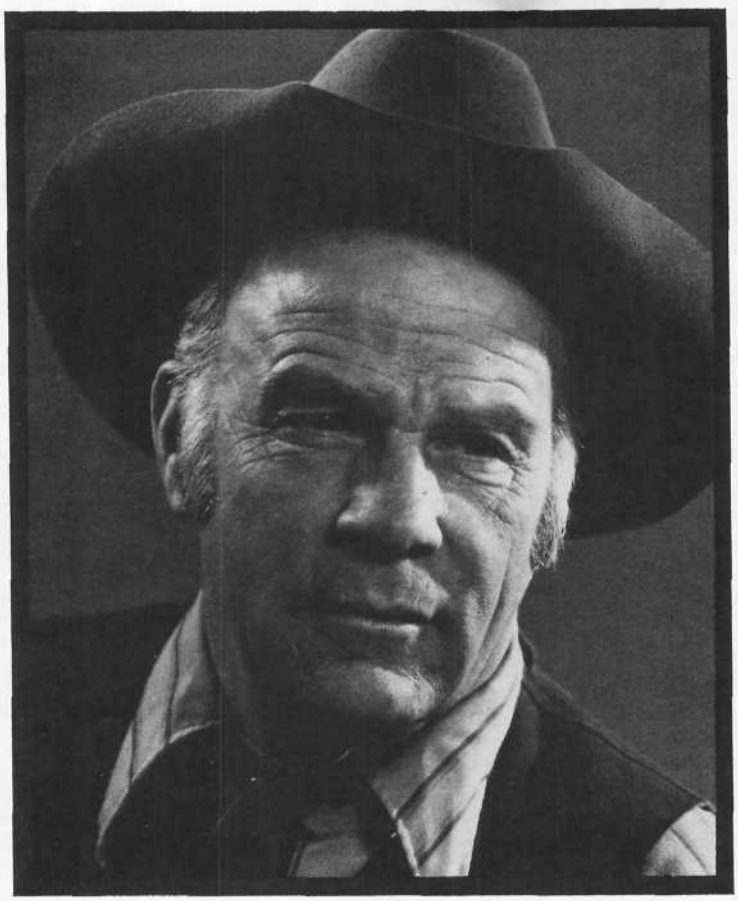
As man thus learns to exist in symbiotic harmony with the desert, the volume of waste products produced by his civilization continues to grow with his prosperity. Yet, even these floods of refuse can provide useful resources, not the least of which is water.

The Flushing Meadows Project is a prime example. Operating for more than a decade now, this joint research project of the U.S. Water Conservation Laboratory, the Salt River Project, the City of Phoenix and the Environmental Protection Agency has demonstrated that secondary sewage effluent from Phoenix can be profitably reclaimed by allowing it to filter through the sands and gravels of the Salt River basin, and then extracting it from strategically placed wells. Research has shown the reclaimed water to be both chemically and biologically cleansed: it can be used for both irrigation of crops and construction of recreational lakes capable of sustaining large populations of fish.

So we ask ourselves again, will man be able to cope with the demanding environment of the desert as we accelerate into the future? I suggest that he will. His temper may be brash and his self-confidence overinflated, but his tutelage has been long and significant. With the mind-boggling tools of the space age at his disposal and centuries of hard-earned experience behind him, he is forging a system of water conservation that hearkens diligently to the requirements of the land. It is a marriage of harsh realities and delicate aspirations, but with continued and conscientious nourishment, it can be successful.

A rose indeed, the beauty that is the desert may be enhanced even more by the intelligent husbandry of man. This was his God-given charge from the creation of the world. It remains his stewardship to the end of time.

PHOTOS COURTESY OF FRED OLDFIELD



His paintings prove he's worn boots and chaps

by Emily J. Horswill

FRED OLDFIELD
The Cowboy Artist

"I DON'T KNOW if I paint so good, but I got the reputation," Fred Oldfield chuckles. The collectors and admirers who mob his art shows and auctions don't agree with Fred's self-assessment, and everyone knows his reputation. He is the cowboy-artist whose work is now sold with Charlie Russell's at the annual Russell Auction in Great Falls, Montana. Fred is also a throwback to the 1860s.

Titles like *Quittin' Come Payday, For 30 a Month and Keep,* and *Leaving the Humboldt* march down museum walls. The paintings leave no doubt that the artist has worn boots and chaps, ridden hunched against sleet and dust storms, cooked bannock and bacon over a campfire. Hand in hand with the titles, each painting tells a complete story, with one exception. In the middle of the wall hangs the odd one. Here with bold, sure palette knife, Oldfield has depicted a horseless cowboy.

In full regalia, the cowboy stands in endless burnt sienna space, with a saddle in one hand and a bridle in the other. The title, *Bus Stop,* adds to the enigma, but his old friends know that cowboy is Fred, and he is following a familiar trail. It leads from cow country, 1860, to a posh party at some big hotel in 1980. Fred is the guest of honor. His cowpony failed to make the time machine journey, leaving his master waiting for the bus. That painting is Fred's autobiography.

Fred was born in 1918 on the Yakima Indian Reservation. His Scotch-Irish father followed the harvest, taking his family by covered wagon. Eventually, nine children were to take part in those migrations, of which only one showed Fred's mother's part Indian ancestry. "My pretty, sweet Mom. What a rough life," Fred says. "My Dad? He was an honorable man, a hard worker, a gifted talker. Everybody liked him. When I was a little guy, and he'd toss me into the wagon for a trip to town, I'd whoop with joy."

CHEYENNE WINTER CAMP
Collection of Mr. & Mrs. Joe Crouck

Fred was but three when he first saw cowboys in the cloud of dust hanging over a roundup. Then he heard the bawling of the frightened cattle, smelled smoke from the campfires and the acrid odor of branding, saw the men crouched over the fires, the riders on their sweating horses, their lariat loops swinging, the horses braced as the loop settled. In his excitement, he almost fell out of the wagon.

It may have been then that Fred first tried to capture western action with a pencil. But, more likely, that came later as the covered wagon jounced from crop to crop.

"I can't really remember when I began to draw," Fred says, "but I know I decorated the wagon with my doodles. I drew on every scarce inch of paper. I covered both sides of scraps of old building paper. I drew on barns and fence posts."

Fred's mother encouraged him. Later, the boy saved the brown paper bags in which he carried his school lunches.

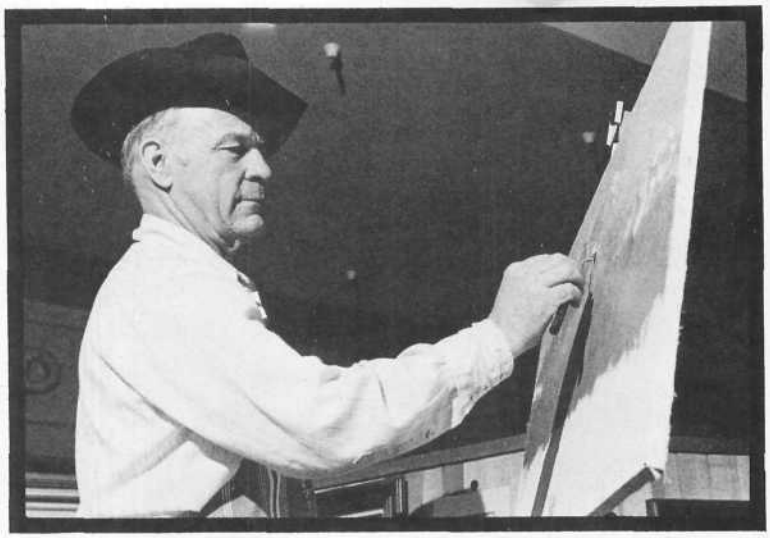
Formal schooling was scanty and it was from his mother's meager knowledge that Fred got his art training. "She'd had only an eighth grade education, but she had talent," Fred says softly. "It wasn't until years later that I realized how great she could have been."

Fred was 14, when, while lagging behind the family caravan, he stumbled onto a whisky still and his first bottle of white lightning. He tasted and tasted. A younger brother doubled back looking for him. "It had to be 'Decent Dick' who found me stretched out giggling," Fred grimaces. "Still, disgusted as Dick was, he shared his lunch with me and since I couldn't go back to the wagon, we rode all night to get me a camp outfit. We both knew he wouldn't lie, and I'd better stay out of Dad's sight for a while." The boy took an alternate route to the harvest fields.

That summer he learned how to hop freights and cook beans on the railroad tracks, but next to beans in importance was a sketching pad. In the fall when he drifted home, his mother admired his book full of sketches. His father clapped him on the shoulder and said, "Boys will be boys." The incident was forgotten.

That year, Fred's father gave up wandering to sink roots on the Yakima Indian Reservation, and the boy quit school to pick spuds and pitch hay. He spent the winter alone in a shack, feeding 1,000 pigs left-over bakery goods for the animals' owner, who was away tending his bakery. A friend rode up to Fred's shack to visit, bringing the latest news. It was about a "depression."

"What's that?" Fred asked. He ex-



Fred Oldfield uses a palette knife to create a more active surface for his work.

plains, "I couldn't see any changes. Things were pretty much as they'd always been with me. If anything, a pinch better. Along with the hunting and fishing—and they were great—I had all the doughnuts I could eat."

About that time, beef ranching came to the Yakima Reservation, and Fred settled into a saddle. Life, like his drawings, followed the cycles of nature. Slow times, he covered walls of restaurants and taverns with murals which mostly were awkward but convincing stories of the life of a cowboy.

"I was still lying fluently about my age to get into the bars," Fred recalls. "Then, while I worked, customers would argue with me about how I should proceed. A drunk would stagger over, pick up a paintbrush and help." Fred shudders, then adds, "But, that experience has been invaluable. Now, demonstrations are easy."

The murals were popular, and proprietors began to pay well. Of those early efforts, Fred says, "Fortunately, in the spots still operating, owners have been able to redecorate." His work improved. Soon most of the nightspots in the northwest testified to his ambition. Then he ran out of art commissions.

He heard rumors of a good job possibility in Alaska. He hitched his way to Sitka, where he learned he had 20 more miles to go. He started walking. The road was deserted. So was the logging operation when he found it. It had closed for the winter. Somehow, he stumbled back to Sitka. He began casing the honky-tonks for the most food for the least price. He broke his last dollar bill for a double order of hotcakes. He now knew that every cheap bed and every inch of concrete under a roof had a prior claimant.

Still, on a full stomach, the alley scenes intrigued him. Shortly, he was engrossed in a drawing.

He looked up when a boozy voice asked, "You broke, kid?" A woman, who'd been sitting at the nearest bar drinking, pointed at the drawing and said, "That's worth a bed and breakfast."

By the time she had assigned him a tiny room, he realized she was a madam. "The next few days, she woke me at daybreak, fed me, and hustled me out to work. As fast as I could finish a picture, she sold my art to her clients," Fred remembers. "I'll never forget her kindness."

With cash in his pockets, he bought a ticket home.

There, he found that the younger brother he adored, handsome, hard-working Pat, had died in a factory explosion, leaving a wife, Alice, with a five-year-old child and another on the way.

World War II came. From his Army base, Fred began writing to Alice. "She was so very beautiful," he reminisces. "Yet, three-and-a-half years later she married me. Why me?" He hesitates, then says, soberly, "I made a point of polishing my image as a papa, and I always figured that gave me the edge over all those other guys."

WITH THE war over and murals going well, Fred enrolled in The Burnley School of Art in Seattle. Shortly, he decided the training was inconsistent with space, freedom, his oneness with nature's seasons—all those things which are his essence and the spirit of his paintings. He says, "Stay with the same teacher long, and you're in danger of becoming a carbon copy. Get stuck with rules, and you're in trouble."

He quit and moved to a mountain cabin. When he ran out of money, he painted murals once again in order to build Frontier Village near Mt. Rainier, complete with teepees, Indian crafts and his own art work. He also offered visitors an opportunity to drive a stagecoach. His venture, unfortunately, antedated the craze for the Old West that was soon to sweep through the country. In 1964, he went broke.

Desperate to feed his family, he took 12 paintings to a dealer, who offered $300 for the lot. Fred walked out, only to return the next day to accept an offer reduced to $200. Still, he refused to go through bankruptcy. He went back to painting murals, hopefully for the last time, and paid every debtor.

But fate runs in strange circles: enter the 1970s and western art. Sellouts followed—and collectors. Recently, one collector priced at $34,000 10 of the 12 paintings Fred had sold for $200. In 1976, Fred had a one-man show at the Frye Art Museum in Seattle. Today, he doles out paintings, often still wet, to the collector highest on his waiting list.

In January, 1981, Fred's biography, by J. Moynahan, came off the press, and admiring crowds at an author's party in Tacoma stood in line for the artist's autograph.

However, Oldfield hasn't forgotten the lean years. He encourages and promotes other artists, and he is constantly working on a benefit show. At his own annual auction in Tacoma, a percentage of every sale has gone to such charities as the Juvenile Court, Gonzaga University, organizations for retarded children, Opera on Wheels and his current favorite, the Northwest Kidney Foundation.

CAMP ON DRY CREEK
Collection of Mr. & Mrs. Keith Corner

Asked about his extensive donations, Fred shuffles his feet, puts a hand in a pocket, and answers, "It's embarrassing. Everything I give seems to come floating back faster than I can give it. I have more offers of vacation homes, yacht cruises and dinners than I got any use for."

In 1972, he gave a large painting to Spiro Agnew's family when the United States formally returned 22,000 acres to the Yakima Indian Tribe.

Fred still goes home to Yakima for fishing trips with friends and, of course, he rides in the annual fall roundup in Medicine Valley on the reservation. His eyes sparkle as he says, "We trail the herd 70 miles in two days. I get pretty stiff, but I can still manage it." He also manages to find time for Alice and their three children.

There's beautiful Patty Lorraine, one of the area's most talented vocalists. She has appeared on the Lawrence Welk Show, but she takes time out to entertain at her "daddy's" exhibitions. Then, there is Jerry, the DJ in Portland, and Joella, who, with her husband, manages Fred's art shows. Give Joella a chance and she asks, "Have you met Daddy? Isn't he marvelous?"

They will all tell you Fred was born in the wrong era, that he belongs in the 1860s.

Fred Oldfield and Charlie Russell have much in common. Both were always artists, both storytellers. In 1945, Fred sold an adventure story, *Bear for Breakfast,* to *Outdoor Life.* Both Oldfield and Russell counted Indians among their best friends, and each shared the Native American's philosophy.

Russell once wrote, "Where cattle waded hip-deep in bluejoint, a gopher couldn't graze now."

Fred has an update, "When I first rode in the Medicine Valley, bunch grass grew belly-deep to a horse. Now, like everything else that has any value, it is an endangered species. Man is a disease. He's eating up the world."

Asked what education he would advise for the present generation, he answers, "I'd advise them to get a degree in Survival."

CAMELS FOR UNCLE SAM

by Richard Varenchik

IT WAS 1860; the sun smiled down through clean air on the dusty little town of Los Angeles, California. Members of the Los Angeles German community laughed and sang as they enjoyed a picnic. The horses and horse-and-buggy rigs that had carried the celebrants to the picnic grounds were scattered about; the horses grazed peacefully.

Tables were piled high with fine German delicacies including liverwurst, dill pickles and sauerkraut. Baskets of pretzels were the target of attack by children, who snatched and ran to avoid the slaps of scolding women.

Finally, the speaker of the day rose and cleared his throat. The happy crowd prepared to listen to an enthusiastic speech which would extol the virtues of the Fatherland.

Suddenly—like a shimmering mirage from a faraway desert land—an incredible apparition wheeled into view. It was a strangely-dressed Arab in a yellow cart which was being drawn along by two massive camels. The idyllic picnic scene was quickly transformed to one of wild chaos. The picnickers' horses, spooked by the strange sight (and smell) of the camel team, bolted with terror. Parents scrambled to snatch their screaming children out of harm's way as stampeding horses, some of them dragging overturned carts and buggies, sent tables of food flying through the air.

The camels gazed upon the tumultuous uproar with a look of disdainful boredom, calmly trotting off down the road and vanishing from sight with their buggy and driver in tow.

It is said that Los Angeles newspapers devoted colorful paragraphs to the incident the next day, describing picnic grounds that looked like a battlefield and hungry Germans who had to walk miles to get home.

The whole bizarre incident would never have taken place were it not for one of the strangest experiments in the history of the United States Army. The logic behind the experiment was simple: If camels could successfully haul men and supplies in the Levant (Arab countries), why could the beasts not do the same in the deserts of the American southwest?

On March 3, 1855, at the urging of then Secretary of War Jefferson Davis, the United States Congress approved $30,000 (some say the amount was $50,000) for "...importation of camels and dromedaries to be employed for military purposes."

CALIF. DEPT. OF PARKS AND RECREATION

Edward Fitzgerald Beale

Henry C. Wayne, a U.S. Army major, wrote of the proposed experiment: "Its object being to introduce a new animal into the heart of our continent, where there are neither navigable rivers nor practicable roads, and by means of it to hold in check the wandering tribes of Indians that are constantly warring upon civilization, to carry on commerce, and to facilitate communications."

Wayne, along with Navy Lieutenant David Porter, sailed to the Levant on the Navy Ship *Supply*. After many adventures and misadventures, including the purchase of two sickly camels that were quickly sold off to a butcher "for purposes known only to himself," the two men managed to buy 33 healthy camels.

"I was much pleased with the dromedaries when I got them all on board and cleaned up," Porter wrote. There was one problem, though: a Bactrian (two-humped Arabian) camel was so huge (seven-feet, five-inches tall), he would not fit in his stall. The problem was solved by cutting a hole in the deck of the ship. On February 15, 1856, the *Supply* set sail from Smyrna, a seaport in west Turkey, for Texas.

By May 13, 1856, 34 camels had been unloaded near the Texas port of Indianola. The expedition ended with an extra camel, despite the death of one adult beast during the journey. Several baby camels had been born aboard ship; two had survived.

It was during the camels' stay in Indianola that Major Wayne became irritated by suggestions that the animals were too weak to ever be of much use in hauling supplies. The major marched out one of the beasts, had it kneel down, and loaded it with four bales of hay, weighing a total of 1,226 pounds. People in the crowd made bets that the camel would not even be able to stand up, much less walk off with the load.

"But," Wayne wrote with some humor, "When the camel arose without a strain and quietly walked off with his four bales...there was a sudden change of public sentiment, most flattering to the outlandish brute and encouraging to his military sponsors."

IN FEBRUARY of 1857 a second shipment, containing 41 camels, was landed in Texas. With the camels came several Arabian and Turkish camel drivers to assist the Army in caring for the animals and to teach soldiers how to use them.

Among the foreigners was Hadji Ali, whose name was changed by the American soldiers to Hi Jolly. Home for Hi Jolly, his companions and the camels was set up at Camp Verde, an Army post about 60 miles northwest of San Antonio, Texas.

The Army had imported the camels as work animals, not curiosities. The time for serious evaluation was at hand. Former Navy Lieutenant Edward Fitzgerald Beale was assigned the task of putting the camels to the test.

Beale was an energetic explorer who had made many trips across the country. He was very high on the idea of using camels. His enthusiasm for the beasts sprang, perhaps, from the book *Travels in Tartary, Thibet and China During the years 1844, 1845 and 1846,* by Abbe Huc. The book described the use of camels in those foreign lands; Beale read passages aloud to his companion, Kit Carson, during one of the

NATIONAL ARCHIVES

When Beale's party became lost, the camels were used to search for water.

explorations they made together.

Beale's assignment was to survey a wagon road along the 35th parallel from Fort Defiance, New Mexico, all the way to California. On June 25, 1857, Beale, with a contingent of troops, 25 camels and camel driver Hi Jolly, set out for California.

Accompanying Beale to assist with the survey was 19-year-old May Humphreys Stacey. The young man recorded events of the expedition in a journal. He was in camp near San Antonio when Beale brought in the camels for the first time:

"The first intimation we had of their approach was the jingling of the large bells suspended from their necks. Presently, one, then two, three, four, until the whole twenty-five had come within range in the dim light...Our mules and horses were very much frightened at the approach of the camels. They dashed around the corral, with heads erect and snorting wild alarm."

At first the camels were slow, and lagged behind the mules and horses. As they toughened up they set a good pace and were able to outdistance the other animals, in spite of the heavy loads they carried. By mid-July, Beale's journal, as recorded by Stacey, contained words of praise for his ships of the desert:

"It is a subject of constant surprise and remark to all of us how their feet can possibly stand the character of the road. It is certainly the hardest road on the feet of barefooted animals I have ever known. As for food, they live on anything and thrive. Yesterday they drank water for the first time in twenty-six hours..."

The explorer's admiration for the camels increased even more during an incident that brought the survey party near disaster. On September 5, Beale

ARIZONA HISTORICAL SOCIETY

Camels were generally more reluctant than horses or mules to cross rivers.

NATIONAL ARCHIVES

When water was found the men, horses and mules rushed forward to drink, but the camels looked on disinterestedly.

camped in the desert near some Indian ruins, a site near present-day Holbrook, Arizona. A few days later, one of the guides reported he could find no water and the party was lost.

Beale ordered scouts, mounted on camels, to search for water and try to pick up the trail west. Young May Stacey reported that it was remarkable how the camels "...stood it so well as they did, traveling under a hot sun all day and packing two hundred pounds apiece..." The camels did not seem to be suffering from thirst while "one of the most painful sights I ever witnessed was a group of [mules] standing over a small barrel of water and trying to get a drink from the bunghole, and seemingly frantic with distress and eagerness to get at it."

Water was finally found in a small canyon and the party was saved. But water—too much of it this time—was again a problem when Beale's party reached the Colorado River. California and the end of the journey were on the other side of the river, but the camels seemed balky about the swim.

Beale ordered the largest camel brought up to the river's edge. The beast waded up to its flanks and then started to swim. The other camels were soon coaxed into the water and made it to the other side.

Such was not the fate of the other animals: "We lost 10 mules and 2 horses by drowning. the Mohave Indians had a great feast that night on dead mules," Stacey wrote in his journal.

The crossing, made on October 19 about 15 miles north of present-day Needles, marked the official end of Beale's assigned journey. The great adventure from San Antonio had taken four months and covered more than 1,200 miles.

Beale felt the trip had been a resounding success. He was in such a good frame of mind that he talked Hi Jolly into joining him in playing a joke on the people of Los Angeles.

While the main contingent of men, horses, mules and camels went by way of Palmdale up to Fort Tejon (about 40 miles south of Bakersfield), Beale and Hi Jolly took two camels and headed for Los Angeles.

On November 8, 1857, they rode the desert beasts into the sleepy little town. Hi Jolly was decked out in a flashy native costume, while his camel was strung with tiny bells. Their arrival created a sensation.

Local children begged for rides, while horses bolted and ran off in all directions. Beale and Hi Jolly spent a few days in town and then headed off for Fort Tejon. (It was Hi Jolly who, three years later, brought chaos to the German picnic when he rode by with his camel team.)

In a letter sent to the Secretary of War, Beale was lavish in his praise of the camels. "At times I thought it impossible they could stand the test to which they have been put, but they seem to have risen equal to every

trial...

"With heavy packs, they have crossed mountains, ascended and decended precipitous places...I think it would be within bounds to say that, in these lateral explorations, they have traversed nearly double the distance passed over by our mules and wagons."

After arriving back at Fort Tejon, Beale even ordered the camels out to work in the snow. He reported that they did quite well and did not seem to mind the cold.

BUT, BEALE was sorely mistaken in thinking that camels had a bright future in America. The Army never imported another camel. The animals fell into disfavor for several reasons.

When the Civil War started in 1861, no one on the Union side was about to support an experiment proposed by former Secretary of War Jefferson Davis, the man who became president of the Confederate states. Even the Confederate soldiers who took over Camp Verde in Texas did little more than abuse the camels they found there.

In fact, abuse became the common lot of the poor beasts. Soldiers are reported to have knifed one camel and shoved another off a cliff. Many camels were allowed to escape. Settlers and miners shot at them.

On February 26, 1864, the Army auctioned off the 37 camels it owned in California. In 1866, a similar auction was held at Camp Verde.

From then on the animals were sold to circuses or zoos, or put to work hauling freight and supplies. Unhappy owners set more of the camels loose to fend for themselves in the desert.

And for years, prospectors would belly up to the bar in dusty southwestern towns and tell of the strange beasts they had seen in the desert. Some of these stories had more than a little fiction in them—as, most likely, did the story of how Hi Jolly met his death.

It is known that the old camel driver died on December 16, 1903, in Quartzsite, Arizona. He was 75. Supposedly, Hi Jolly was in a Quartzsite saloon when a prospector walked in and told of seeing a huge red camel in the nearby desert.

Hi Jolly walked out of the saloon and was not seen alive again. His body was found several days later in the desert, his arms wrapped around the neck of the red camel, which had also died.

THE CACTUS CITY

Clarion

THE NOSIEST NEWSPAPER IN THE WEST

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Rangers Harass Sick, Lost Man

CRY FOR HELP COSTS $80,000

by Wayne Winters

Tombstone, Ariz.—The United States Forest Service is notorious for throwing its weight around, harassing the helpless, picking on women and children, then backing off on prosecution of real lawbreakers who have no excuse for their actions.

The latest American to feel the sting of the green whip is John R. Miles, a 56-year-old diabetic who, after four days stranded in an Idaho mountain snowstorm, set fire to a couple of old cabins in a national forest in an attempt to attract rescuers. Now the bureaucratic hirelings seek $80,000 from the ill man as restitution for his effort to save his own life.

On the other hand, four Fort Huachuca soldiers—grown men—were cited by the Forest Service for leaving a campfire unattended, one that allegedly touched off a 9,000-acre fire in the Huachuca Mountains. Their citation was a misdemeanor and called only for a $15 fine under federal law.

The list of such inequities is long. It was not many years ago that the service acquired, via purchase, the old Reef Mine and its associated camp—a place that has been described as the "best ghost town in Arizona." It's in the Huachuca Mountains of Cochise County. The feds lost no time in putting the torch to a number of buildings that were in excellent condition. So many structures were burned that smoke from the blazes hung over the city of Sierra Vista for three days and nights before being wafted away by the wind.

The list of cabins torched by the Forest Service in southern Arizona alone over a period of 20 years is almost endless. A few that come to mind include the historic cabin in the Santa Ritas where President Grant stayed in the course of his mining camp visit to Arizona Territory, a couple of house trailers on the Pittsburgh patented mine in Warsaw Canyon of Santa Cruz County, the Oro Fino cabin, the Apache Mine cabin, the Wolff buildings in Ash Canyon and the Oro Blanco camp in California Gulch.

Then there are structures that fell to the bulldozer, places like the Old Soldier cabin, Black Diamond camp, the old store on Ruby Road, more buildings in California Gulch, the whole town of Harshaw, the ancient Spanish cabin ruin on the Laura patented claim. Add to these mine tunnels whose portals were covered, roads wiped out and shafts on active claims filled in—the list of autocratic actions extends throughout the west.

These are not just incidents out of the past. The harassment of so many active, legitimate miners, particularly in northern California, that continues at this time emphasizes the need for reform in the federal bureaucracies, particularly the Forest Service and the Bureau of Land Management.

These civil servants must be held liable for the actions they take on their own. Heretofore they have been let off via in-department investigations, with such ridiculous excuses as "the contractor's crew got ahead of the ranger's supervision" in the case of the old Spanish ruin.

Many observors hoped these bureaucratic highjinks would cease with the installation of a new set of federal officials under the Reagan administration. It appears, however, the old-line Forest Service administrators haven't received the message as yet that there are times when rules and law should be tempered with mercy. The Miles incident appears to be one such case: some compassion should be shown for the plight of an ill, lost man who feared for his very life.

—Western Prospector & Miner

YUMA DESALTING PLANT TEST PROGRAM DELAYED

Yuma, Ariz.—Unexpected declines in productivity have interrupted proof-testing of membrane desalting equipment for the planned desalting plant here, the Interior Department reported recently.

The Yuma desalting plant is the central feature of the Colorado River Basin Salinity Control Project. Scheduled for completion and startup in 1986, the plant is a federally sponsored project to meet treaty obligations placing limits on the salt content of Colorado River water flowing into Mexico.

The manufacturers and federal engineers are investigating the productivity decrease, and are hopeful desired performance levels can soon be restored.

The testing halt is not expected to delay completion and startup; in fact, uncertainty of future funding for the project is more likely to delay plant completion than the equipment test interruption.

—*Desert* News Service

TWO CAPTURED BURROS PATROL HUACHUCA CITY

Bisbee, Ariz.—Huachuca City's two lawnmowers are a pair of wild burros, captured in the Grand Canyon and officially adopted by the local government to keep down weeds and vegetation around the town's sewer lagoons.

The Arizona Department of Health Services requires municipalities to control plant growth

Continued on page 36

GRASSHOPPERS THRIVE DESPITE BLM

Reno, Nev.—Officials of the United States Bureau of Land Management last year conducted an experimental program under which they attempted to eradicate threatening swarms of grasshoppers in northern Nevada by studying them to death. The plan failed despite weather conditions that were rough on grasshopper populations, so this year the BLM has a new plan, announced here recently.

In 1981 the federal agency will attempt to talk the grasshoppers to death, and they have invited public participation in the campaign. In addition to plain old talk, BLM is soliciting written comments to augment a written multi-agency draft environmental assessment, no doubt part of a back-up plan whereby grasshoppers would be smothered with paper.

If BLM officials really want to cut down the grasshopper population, they should quit stalling around and take some drastic action. One possibility would be to negotiate a management program for grasshoppers under the jurisdiction of the Nevada Department of Wildlife, the agency which managed the mule deer herds of northern Nevada to near-oblivion.

—The NEVADIAN

M-X BUDGET DOUBLES

Washington, D.C.—The M-X mobile missile system, which the Air Force has estimated will cost $34.2 billion, actually will carry a price tag of more than twice that much by the end of the century, according to the General Accounting Office.

A report issued by that office states that the required number of intercontinental missiles and shelters is not firm, and that the lack of a new arms limitation treaty with the Soviet Union could mean that many more would be necessary, adding billions of dollars to the cost.

The report cast doubt on the accuracy of the $34.2 billion estimate, which the service based on the value of the dollar in 1978, with no regard for inflation. Even taking the Defense Department's traditionally over-optimistic inflation projections into account and assuming no major program changes, the M-X program will cost the Air Force some $70 billion to build and operate, the report said.

Interestingly enough, this $70 billion figure does not include the undisclosed cost of developing, acquiring and maintaining the warheads for the M-X, or the cost of impact aid to the areas where the missile system could be deployed. Also not included are the salaries of the military personnel needed to accomplish this task.

***—Desert* News Service**

SIX STATES PASS PRO-SAGEBRUSH LAWS

Bridgeport, Calif.—Twelve western states have officially joined a fight, called the Sagebrush Rebellion, to gain control of federal lands in their jurisdictions. The rebellion began in 1976, when the Federal Land Policy and Management Act was passed, placing public land in perpetual trust by the federal government.

The federal government owns 52 percent of all the land in the west, 700 million acres in all. The states feel that they cannot control their own destiny and that the federal government is continuing to restrict use on more and more public land.

Seventy-five percent of Mono County's 3,139 square miles is owned and managed by the federal government, 62 percent is managed by the United States Forest Service and 13 percent by the Bureau of Land Management. Only 21 percent is privately owned.

The problems in Mono County are small compared to those in other western states. In Idaho, a group is fighting against a proposal to expand a wildlife refuge from 26,000 acres to 839,000. Some of the acreage involved is valuable crop land, according to opponents of the plan.

In Alaska, where 95 percent of the land is owned by the federal government, citizens are battling a plan to ban oil exploration in the Arctic Wildlife Range.

Colorado timber firms claim that they are denied access to federal forests, where timber is literally rotting on the ground.

Nevada and Utah residents are disturbed over federal plans to base the M-X Missile System in their states: 24,000 square miles are needed for the project.

Legislators in California have objected to the Bureau of Land Management's proposal to inventory mineral and energy resources in the California desert. The BLM study will document these resources and could place them off-limits to the public.

Not everyone favors state control of federal land. Environmentalists and many congressmen feel that if the land were turned over to developers, much of the west's most beautiful land would be ruined. Others feel that wildlife habitats would be affected, water supplies would dwindle and sensitive ecosystems would disappear.

In spite of the environmentalists, six western states have passed legislation laying claim to federal land within their borders. Alaskans have gone so far as to threaten to secede from the union if the issue isn't resolved.

—The Mammoth Lakes REVIEW

RAGTOWN REMEMBERED, FOUNDER FORGOT

Carson City, Nev.—Among those Nevada pioneers ignored and forgotten by modern historians is Asa L. Kenyon, early-day station keeper on the Carson River.

Born near Rome, N.Y. on April 20, 1830, Kenyon learned the blacksmith trade as a young boy, but his ambitions took him far from the tranquil life he might have lived had he remained in upstate New York.

In 1854, overland immigrant travel on the Carson River route was picking up. Kenyon and his wife established a station on the river that became the first stop for wagon trains coming off the dreaded Forty Mile Desert. Needing fresh stock, hay, supplies and whiskey for the final push over the Sierra Nevada, the immigrants gave Kenyon a liberal patronage; he did well in his new enterprise.

The station soon became known as "Ragtown" because of the washed clothing, tarps and linens draped over the sagebrush after families came off the trail.

Kenyon also did some trading with the Indians of the area—a trade which included providing them with whiskey—and there are stories of other kinds of dealings between the enterprising station keeper and the natives.

There is evidence that Kenyon hired Indian bands to run off stock accompanying immigrant trains out on the trail. He would then act as an agent to negotiate the return of the cattle, taking a percentage of whatever monetary consideration was involved in the transaction.

On accasion, the immigrants would try to put one over on Kenyon, but they were seldom successful. The story is told that a group of travelers once came into Ragtown and inquired about purchasing medicine. Kenyon asked what ailment they were seeking to treat, and they told him smallpox. Fearing that he would contract the dreaded disease, he bolted out the door and crossed the river on a dead run.

The visitors then proceeded to sack the store, intent on carrying off anything that struck their fancy, but Kenyon had become suspicious and was standing in the doorway with a shotgun a few minutes after his hasty exit. Informing them that his own cure for smallpox was a quick walk up the Carson River, they took the hint and lit out west. As compensation for his own time and trouble, Kenyon kept their teams and wagons.

Asa Kenyon died at Ragtown on March 25, 1884. The remains of Ragtown Station are no more, but the site, 10 miles west of Fallon, is marked by a historical plaque, a saloon and a pizzeria.

—Nevada Historical Society

QUALIFICATIONS OUTLINED FOR JOB HERDING TURTLES

by Ernest G. Kirby

Kanab, Utah—I have applied to the federal government for the position of Chief Turtle Herder. You see, the feds want to set aside a 35-mile square of land (that's 22,400 acres) down here in southern Utah as a turtle refuge. They call them the desert tortoise, but they are turtles to me, and even the dictionary agrees. I'm sure a retired person could fill the bill. Turtles move rather slowly—certainly I could keep up with them.

I'd expect that the government would fence the entire project so that cattle persons, cowboys and tourists would have to apply for permission to enter. I'd expect the government to build Rita (my wife) and me an air-conditioned home and offices. I'd need a private car and Jeeps to take me around my turtle domain.

No doubt the government would want me to record for posterity many important aspects of the lives of these underprivileged creatures — their life cycles, eating and drinking habits, sex lives, longevity and most especially, their environmental impact on the land.

However, I'm a little worried about the reactions of the ranchers and cowboys of this area, who don't seem to realize that turtles are more important to the economy than cattle. They might attempt to invade my domain and put cows to graze there illegally. To thwart this, I'm going to propose that the government put up watchtowers with armed guards at strategic locations to properly monitor the project.

This turtle territory will become an important tourist attraction. How else could you spend a few hours more profitably and interestingly than watching a tortoise move about?

If I get the position, I hope you will welcome me and support me.

—Southern Utah NEWS

LADY'S BEST FRIEND RELATIVE NEWCOMER

New York, N.Y.—For some 2,000 years, the only known source of diamonds was the streambeds of ancient India, where diamond "pebbles" were found occasionally in the alluvial wash. Though the gems were prized for their rarity and collected by royalty, no one knew how to cut them, so they were far less spectacular in appearance than rubies or emeralds.

The discovery in about the 15th Century that diamonds could be used to cut other diamonds led to a new interest in the gem. In the closing decades of the 17th Century, a Venetian lapidary, Vincenzo Peruzzi, developed what is known as the brilliant cut. This manner of cutting the stone, which is an arrangement of 58 facets, mathematically proportioned to obtain maximum fire — or refraction of light rays—gave the diamond a new and dazzling brilliance.

A diamond gemstone is evaluated by color, clarity, carat weight and style of cut. In fact, colorless, or white, diamonds are extremely rare and prohibitively expensive.

Most diamonds have a tinge of color, and those of a strong cast are called fancies. A famous fancy is the dark blue 44.50-karat Hope Diamond, now in the Smithsonian Institution.

Clarity refers to the absence of imperfections, such as carbon spots or cracks, which might interfere with the free passage of light through the stone. A diamond is considered flawless only if no imperfections can be found in it with a 10-power magnifier.

The cut, which refers to the arrangement and number of facets, must be executed so exactly that each angle falls within a half-degree of each other angle; to miss is to lose a gem's full potential of fire.

—*Desert* News Service

FUND SHORTAGE TO STALL HIGHWAY CONSTRUCTION

Sacramento, Calif.—California must cut all of its state and local transportation services unless new revenues are provided, according to the California Transportation Commission's draft biennial report to the legislature.

According to the report, more than $1 billion is needed in the next five years to buy buses and coaches needed to keep up transit services. Some counties have begun to change paved rural roads to gravel, to save on maintenance costs.

Contracters and construction workers should know that after next year there will not be enough money to match federal road aid, so about $400 million a year in construction funds will be lost.

The report documents huge deficits for a wide range of services, including local transit and streets and roads, the state's highways, the Highway Patrol, even the registration of vehicles and licensing of drivers.

The report points to inflation and fixed user fees, especially a gasoline tax set at 7¢ a gallon since 1963, as the main causes of the financial crisis. For example, San Bernardino County's labor costs have jumped 82 percent since 1974, its gasoline costs 300 percent, and road oils 600 percent, but revenues for transportation have increased only 21 percent.

A recommendation of the report is that the Department of Transportation adopt more efficient management policies for its highway maintenance program.

—*Desert* News Service

LYNX LAKE MISNAME

Bisbee, Ariz.—By exploring unknown country, Arizona's early day inhabitants earned the right to name rivers, creeks, mountains and passes. They named them after their home towns, their girl friends or wives, historic figures, or some physical feature that reminded them of a particular thing, or some event that occurred there.

Sam Miller was one of a group of adventurers recruited by Captain Joseph Walker. The party set out from the east to make their fortunes prospecting for gold in Arizona.

In May of 1863, the group camped for a few days on the banks of the Hassayampa River, while small scouting parties went out to explore the surrounding countryside and do a little hunting.

Miller and his group headed for the Bradshaw Mountains, while the rest of the half-dozen scouts followed a small stream up into the forest in search of game. Sam stopped and panned for gold. He found the shiny stuff in his first pan, and his discovery led to a booming mining industry and the establishment of the city of Prescott.

However, Sam Miller is most famous for what happened a few minutes after he found the gold. Walking along the sandy stream bed, he saw a bobcat lying alongside the water. Thinking it was dead, Sam reached down to pick it up and the cat sprang at him, clawing his arm. One account says Miller kicked the bobcat to death, the other has him strangling the cat with his bare hands.

Sam and the other members of the party thought the cat was a lynx. But that dweller of high country was never found in Arizona, the state being far south of its normal range. It looked like a lynx, at any rate, and history passes along the story with the lynx name intact.

The creek where the gold was found was called Ookilsipava by the local Indians, and that's the name that it went by for a time after the gold strike. Many Anglo tongues tripped over the odd Indian name, and Sam Miller's cat tale was repeated so many times that the small stream eventually became known as Lynx Creek.

So, back in the 1960s when the Arizona Game and Fish Department decided to build a lake on the stream, it was named Lynx Lake. Today the small lake is a very popular spring, summer and fall camping, fishing and picnicking spot for local residents, and for visitors from the Phoenix area.

—Bisbee DAILY REVIEW

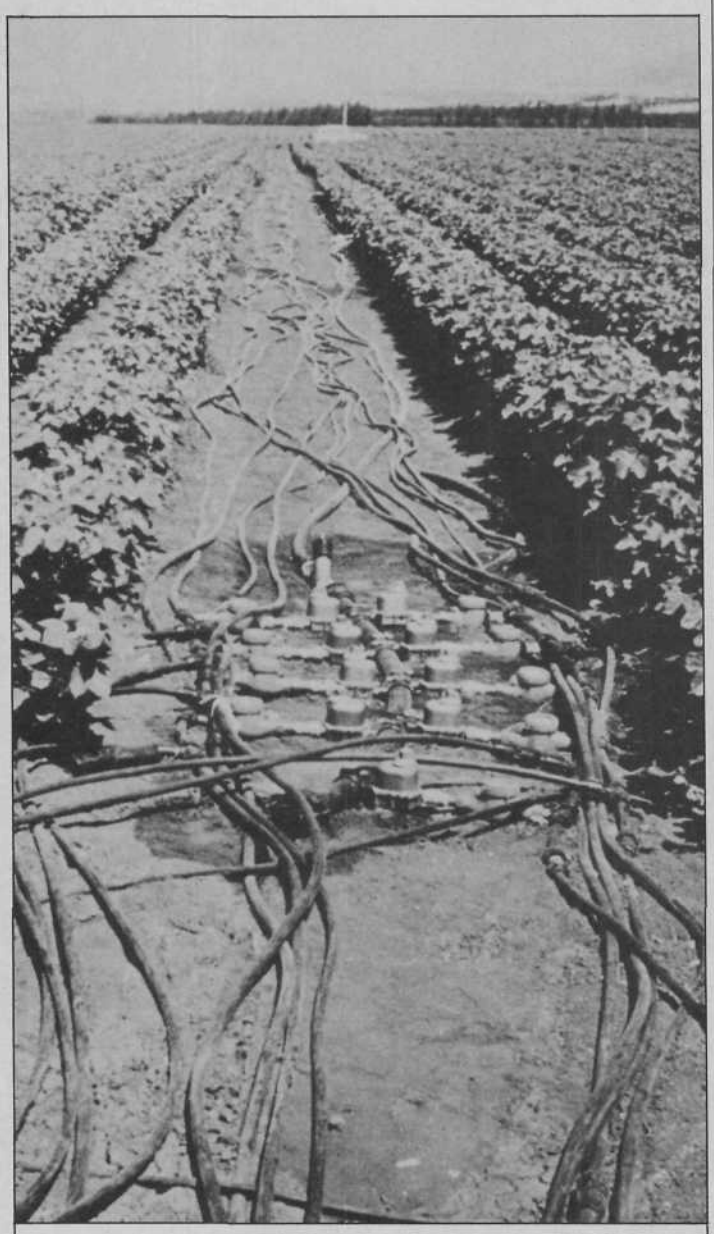
WATER HARVESTING IN ISRAEL

3,033 YEARS OF NECESSITY BREED INVENTION

Israeli technology has turned desert like this in arid Aravah to growing vegetables.

Sde Boker, Israel—On a barren hilltop in the Negev Desert, the windswept ruins of a once-affluent, ancient civilization stand guard over rows of flourishing fig and pistachio trees.

The lush orchards, growing in an arid valley where no more than one inch of rain falls every year, receive no additional irrigation. The fields, however, have been brought back to life after more than 2,000 years by inquisitive Israeli scientists, who have unravelled the technological secrets of water collection and storage used by earlier civilizations. The scientists intend to apply the techniques of the ancients to modern agriculture in the desert.



Kibbutzim (collective farm) controls drip irrigation water with computers.

Avdat, which in the first century B.C. was one of a chain of wealthy Nabatean cities in the desert, is the setting for this unusual research project. It is only one of hundreds of ambitious water research projects which are helping Israel keep pace with growing water demands. In this half-desert country, where 95 percent of all practical water resources are already being used, the quest for more water and a more efficient use of it is a matter of necessity, not merely scientific curiousity.

Professor Michael Evanari, who for the last 20 years has explored the agricultural techniques of early Israelites and Nabateans, works in collaboration with Dr. Yiftah Ben-Asher, one of a new breed of young Israeli scientists. Ben-Asher, a soil physicist and agronomist, is tall, prematurely gray — a former kibbutznik who knows that the future of food production in the world depends on wise use of water today.

"What we are learning here," says Ben-Asher, "are basic principles of collecting and saving local water. Rain is collected from the hills surrounding our farm in what is called the 'catchment' area. There, some 30 percent of the rainfall can be captured and directed to the lower farming area. Man-built channels help direct the water to the fields and orchards below. In order to collect enough water, the catchment area must be 20 to 30 times the size of the actual farm area.

"In the desert," he explains, "we hope to close watersheds or catchment areas to capture rain water, probably with dams." The project has also uncovered the possibility of creating wells from flood waters by catching rainfall and forcefully using it to recharge natural aquifiers.

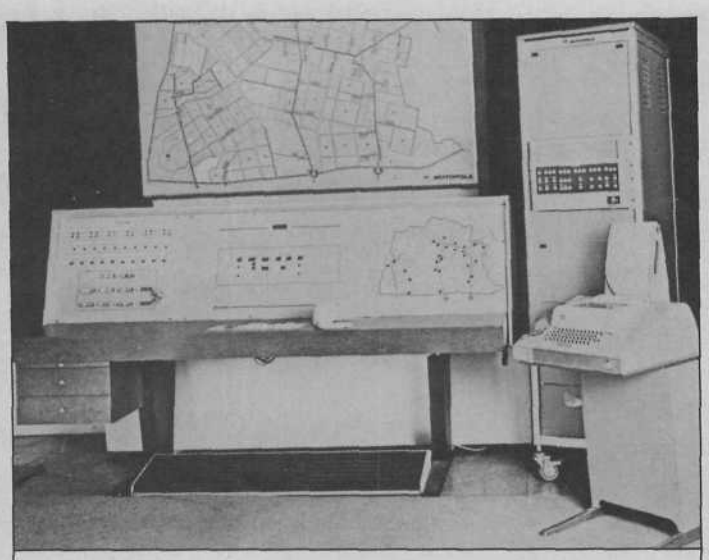
The project has revealed surprising facts about the water needs of certain plants. With the aid of geiger counters, it has been proven that many crops can thrive with much less water than is being given to the same plants in a nearby kibbutz.

"Policies governing water use in both developing and developed countries are not aggressive enough," declares Ben-Asher. "Water research must be given top priority, not just in Israel, but in the world."

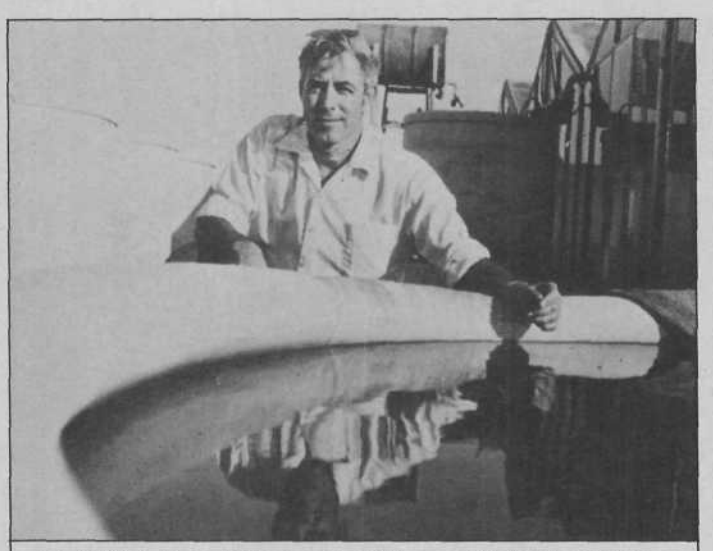
Water for Agriculture

In Israel, where there is a pressing need for more water now, the government plans to increase Israel's available water supply an impressive 50 percent by 1990. One of the solutions will come through desalination of sea water. Three flash-evaporation plants are already in operation, supplying desalinated water from the Red Sea to the people in the port town of Eilat.

This is only the beginning: Israel is in the midst of a 15-year program to develop plants with



Israeli subsidiary of Motorola leads in the development of computerized irrigation control.



Dr. Yiftah Ben-Asher, one of the new breed of young Israeli scientists, poses at Audat Experimental station. Photo: M.S. Krosney

Professor Michael Evanari applies irrigation methods of earlier civilizations to modern agriculture — here, a flourishing fig tree.

lion gallons per day (MGD). Israel signed a $20 million agreement with the United States to build a plant at Ashdod, on the Mediterranean coast, but the real news is that a 100 MGD desalination facility will be built coupled to a nuclear power plant, producing about 120 million cubic meters of fresh water each year at around 30¢ per cubic meter — the cheapest cost yet anticipated for producing fresh water from the ocean.

Water supplies will also be supplemented by recycled sewage and industrial liquid wastes — not to be used for drinking, but for irrigating restricted agriculture. Israel currently uses 80 percent of her water supply in the fields. Treatment of sewage is a costly process; scientists at the Technion, Israel's Institute of Technology, Hebrew University and Ben Gurion University are involved in many promising research projects to develop feasible treatment methods to augment Israel's water supply at a reasonable cost and at the same time clean up the environment.

Underground Water

Newly discovered water reserves located by hydrologists in huge reservoirs under the Negev and Sinai deserts may be another partial answer. Although plentiful, the water (actually an accumulation of rain water which fell on the Judean Hills to the north and the Sinai to the south during the time of Jesus) has drawbacks; it is slightly saline and costly to bring to the farmer.

Researchers at Israeli institutions are now developing special strains of crops which can tolerate and actually thrive on that water. Cotton, tomatoes and other crops are already growing successfully and economically on this ancient water in no-rain areas, not far from where Dr. Ben-Asher is conducting experiments at Avdat.

Counting Each Drop

It was 15 years ago that Israel, in keeping with her efforts to use water wisely, gave to the world her innovative system of drip irrigation. Today, however, controlled amounts of water, with very little loss through evaporation, are mixed with soluable fertilizers and other chemicals and fed to field row crops for the first time. Before, drip irrigation was limited to basic vegetable and fruit growing in restricted areas. Now, with special disposable hoses, vast fields of cotton, sugar and potatoes, producing basic commodities, can be reached by this water-saving system of irrigation.

Further in the field of irrigation, it is becoming more and more common to see a kibbutz with a special control room equipped with electronic remote sensing, control devices and a computer. All these gadgets are used to optimize water-saving irrigation systems for several thousands of acres producing a wide variety of crops.

Mobilizing Resources

The shortage of water has always been a problem in the Holy Land, even in Biblical times when the Jordan River was the main practical source. It is only in the last 33 years, during Jiftah Ben-Asher's lifetime, that the problem has been tackled. The land of Israel has always suffered the incongruity of a wet north and a dry south. When statehood occurred in 1948, the Israelis immediately started to employ modern technology to transport large quantities of water from the Galilee to the Negev by means of the National Water Carrier, a 108-inch diameter pipeline, which along the way integrates thousands of boreholes and wells.

Paralleling such engineering feats as the giant carrier are the constant stream of scientific innovations which continue to emerge in the areas of desalination, ground water research, irrigation technology and sewage treatment. The experiment at Avdat is only one of thousands of research activities which have taken place during Israel's 33 years of existence, investigating various aspects of water.

Equally important is the high priority the Israeli government has given to national water planning and the scientifically-oriented nature of the entire water program: "Israeli research into water use must continue on a high, dynamic level," says Ben-Asher. "What we are learning now is of course relevant to Israel and other desert countries today, but our present-day discoveries hold important consequences for the future of the whole world." (Please see related article on page 17.)

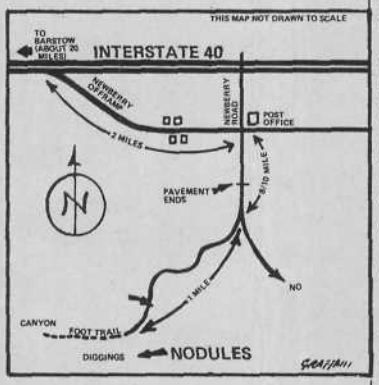
—*Desert* News Service

THE DESERT ROCKHOUND

by RICK MITCHELL

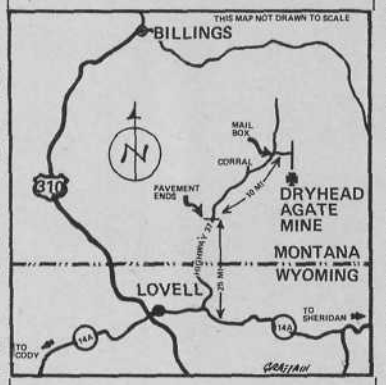
Collecting Sites: Santiam Lapidary will allow collecting on their famous Dryhead Agate claim again this summer. Currently, they plan fee collecting from June 1 to September 30, but in the future, the time may be substantially reduced because the company is having trouble filling all of its own orders. The rates will be $25 per person per day, with a ladies' fee of $20. I suggest you bring a shovel, bar and pick. A hammer and chisel are often handy, as well. To get there, take Highway 37 north from Lovell, Wyoming, 35 miles. This is a good paved road for the first 25 miles, and then it turns to gravel. There is a dry camp at the mine itself for those staying more than one day. The Dryhead agates are among the most beautiful to be found in the United States, and the work involved, as well as the fee, are well worth it. For more information, write Dryhead Agate Mine, Lovell, WY 82431.

Very nice agate-filled nodules can be obtained near the tiny town of Newberry California, which is about 20 miles east of Barstow. Take Interstate 40 to the Newberry exit and drive through town to Newberry Road. Turn south, going approximately eight-tenths of a mile to the fork. Head to the right, and continue until the road ends at the base of the



mountains, about one mile from the fork. Here you will see where others have camped, and you can spot a trail going into the canyon. Take it to the diggings. They are easily spotted on the southern side of the cliff because the color in the soil is lighter. Simply climb to a promising spot and start to work.

The spherical nodules are easy to find, even when only sifting through the loose soil. I have had my best luck, though, using a pick and shovel. A good collecting technique is to have one person doing the pick-and-shovel work, while another inspects the freshly excavated soil for the nodules. Their sizes range from very tiny to many inches in



diameter. Most have nice agate interiors, but there are some duds. This has long been a prime source for nice agate nodules, and it is still a most productive location.

Misrepresentation: A few weeks ago I saw an advertisement for a large, well known supplier of lapidary materials. They were having a sale on cut synthetic stones. Among the offerings was synthetic emerald. I have collection of such stones and therefore sent for some. I knew that synthetic emeralds could not be mass-produced as economically as other widely known synthetics, so I was not surprised at their higher price.

When the package arrived, I eagerly opened it and inspected the emeralds. They looked different from those I have previously purchased, so I decided to test them for authenticity. They were green synthetic spinels, so I queried the dealer as to why he had misrepresented his merchandise. His reply was that "everybody knows it is standard practice to call synthetic green spinel, synthetic emerald." He also told me that other synthetics touted to be tourmaline, peridot, etc., are actually spinel or corundum, and not what they are advertised to be.

I disagree! A synthetic stone is a man-made chemical replica of the gemstone it duplicates. If a merchant is selling synthetic green spinel, he should advertise it as such, maybe with a note saying that it looks like emerald. He should not try to pass it off as something it is not. Genuine synthetic emeralds are available on the market, and are beautiful. Most people do not have the equipment to analyze what is actually sent, and are at the mercy of the seller's integrity.

Equipment: The Lev-Co Development Company, P.O. Box 183, Pottstown, PA 19464, is producing a revolutionary new type of soldering block. It is unique, because it only gets hot in the area immediately near the work, while the rest remains cool enough to handle. It is made from a very durable, honeycombed ceramic, and should prove to be a most useful piece of equipment for anyone who employs soldering in their lapidary work.

Publications: The Ultra Tec Company has an informative pamphlet available: *The Economics of Semi-Pro Faceting*. It contains valuable information for those who go beyond the hobby stages of faceting, using it as a source of income. If you already have an Ultra Tec machine, this information will be distributed to you in their regular newsletter. If not, you can get a copy by writing Ultra Tec at 1025 E. Chestnut Avenue, Santa Ana, CA 92701. Please tell them you saw it in *Desert* Magazine.

The Automobile Club of Southern California offers an interesting, though basic, pamphlet on rockhounding. It gives information about rock types, mineral identification and collecting locations. I recommend this guide. It is available free to any member of the club.

Gem Slides: Gem Media is marketing beautiful 35mm transparencies of cut diamonds and virtually all of the more commonly encountered colored stones. These can be invaluable to supplement lectures and talks by rockhounds and jewelers. I have personally viewed them and they are all first class. The price is $7.50 per set of five, or the complete collection of 110 slides is available for $165. For more information, contact Gem Media, Dept. D, 1660 Stewart Street, Santa Monica, CA 90404.

Helpful Hints: A good way to accomplish two tasks at the same time is offered by the Rockhound Ramblers. They suggest using shells to neutralize acid that you want to dispose of. The acid will do an outstanding job of getting the shells ready for use in jewelry, and they, in turn, will neutralize the acid. This technique is especially handy for bringing out the iridescence in abalone shells.

If you ever find yourself ready to start tumbling a barrel full of stones and discover that you have no coarse grit on hand, I suggest using an old silicon carbide grinding wheel. Just break it up into small pieces and place them in the barrel with the stones. The chunks will granulate quickly and then serve as grit. I have used this technique and it does a good job, allowing old wheels to serve a purpose. Don't, of course, do this for the finer grits.

Warning: There have been a number of articles published which suggest that antifreeze can be used as a good coolant in saws. It does, in fact, serve that purpose very well, but poses severe health hazards. Antifreeze is quite toxic, whether ingested, inhaled, or simply absorbed through the skin. In addition, it can kill animals if they drink even a small amount. Therefore, I suggest avoiding it as a coolant, and sticking with the more standard solutions.

DESERT CALENDAR

Listing for Calendar must be received at least three months prior to the event. There is no charge for this service.

May 16-Aug.2: A photographic exhibit capturing the delicacy of the tiniest desert wildflowers opens May 16th at the Natural History Museum in Balboa Park, San Diego, CA. The exhibit will feature photographs by Robert I. Gilbreath which were taken in the deserts of the western United States and Mexico. For further information, call (714) 232-3821.

May 22-24: Northern California Square Dancer's Association will hold their 28th Annual Square Dance Festival at the San Francisco Civic Auditorium. More than 1,000 dancers will be on the floor at any given time. Exhibitions will be held each evening and on Saturday and Sunday afternoons. Spectators are welcome in the balcony for all events from 8 to 11 p.m. Friday, 10 a.m. to 11 p.m. Saturday and noon to 11 p.m. on Sunday. For further information, contact Parker and Jill Brown, Publicity Chairmen, 1587 Mizzen Lane, Half Moon Bay, CA 94019 or call (415) 726-6272.

May 22-24: Annual Green Fair and Balloon Festival. Spring exhibits. 8 a.m. to 5 p.m. at Red Rock State Park, Gallup, NM.

May 29-31: Lancaster, CA will hold its Annual Heritage Days Celebration on Lancaster Blvd. between Sierra Highway and West 10th St. On Friday evening, there will be a street dance. On Saturday, a 10 kilometer run, parade, antique car and fashion show, volleyball and softball tournaments, barbecue and more. Saturday and Sunday at the Fairgrounds there will be an art show, gem and mineral show and much more. Hours are 7 a.m. to midnight Saturday and 8 a.m. to 5 p.m. Sunday. For further information, call (805) 948-4518.

June 4-6: Clovis, NM will hold its 11th Annual Pioneer Days Celebration. Festivities include a balloon fiesta lift-off at 5:45 a.m. and a rodeo during the evening. On the 6th, a parade will be held at 10 a.m. downtown. For details contact Curry County Fairgrounds, Clovis, NM.

June 6-7: The 15th Annual Rockatomics Gem and Mineral Show will be held at 8500 Fallbrook Ave., Canoga Park, CA. There will be exhibits, dealers, demonstrations, free hourly prizes and junior member participation. Hours are: Saturday, 10 a.m. to 9 p.m.; Sunday, 10 a.m. to 6 p.m. For further information, contact Betty Martin at (805) 527-3718.

June 6-7: Convair Rockhounds Gem and Mineral Show at the Convair Recreation Hall, 9115 Clairemont Mesa Blvd., San Diego, CA. Show includes dealers, Tailgaters Pancake Breakfasts (8 a.m.). Hours are: Saturday, 9 a.m. to 8 p.m.; Sunday, 9 a.m. to 5 p.m. For information contact Show Chairman: G. M. Halterman, 406 Tyrone St., El Cajon, CA 92020.

June 7-21: Albuquerque, NM. Arts & Crafts Show at the Textiles Co-op in Old Town. Work represented: Andrea Miller, mixed media; Betty Meador, weaving; Harriet Reymore, stoneware pottery. Hours are: 10 a.m. to 6 p.m., with a reception on the 7th from 2-4 p.m.

June 13-14: The National Petroculture Society will be sponsoring an Energy Fair at the Sheraton-Anaheim in Anaheim, CA. The fair will feature some 70 exhibits and a continuous film festival encompassing diversified aspects of renewable resource and alternative energy industries. Hours are: Saturday, 8 a.m. to 9 p.m.; Sunday, 8 a.m. to 5 p.m. General admission is $3, senior citizens and students, $2. For more information, contact the National Petroculture Society, 3990 Westerly Place, Ste. 100, Newport Beach, CA 92663 or call (714) 833-2333.

June 13-14: Gates Cactus and Succulent Society Show and Sale at the San Bernardino County Museum, 2024 Orange Tree Lane, Redlands, CA. Hours are: Saturday, 10 a.m. to 5 p.m.; Sunday, 1 p.m. to 5 p.m. For more information, contact Doris S. Lutz at (714) 885-7692.

June 17-20: Gallup, NM. Rodeo sponsored by the Lions Club. Festivities, which begin at noon, will include a barbeque and dancer's and fiddler's contests. The rodeo is being held at the Red Rock State Park.

June 27: Great Hi-Rise Baking Competition at the Bazaar Del Mundo, 2754 Calhoun St., San Diego, CA. Judging will begin at 11 a.m. Competitors and onlookers alike are welcome. After the competition, spectators get to taste. For more information, call (714) 296-3161.

June 27-28: In Ventura, CA, there will be a spectacular Flower and Plant Sale, with many varieties of plants being exhibited and sold. It will be held in the Agriculture Building at the Ventura County Fairgrounds. The show will be judged; admission is $1, with children under 12 free. Hours are: Saturday and Sunday, 10 a.m. to 5 p.m.

June 27-28: The San Bernardino County Historical Bottle and Collectibles Club is having its 13th annual show and sale at the San Bernardino County Fairgrounds in Victorville, CA. The show will feature a variety of antique bottles, fruit jars, glass and related collectibles. Hours are: Saturday, 9 a.m. to 5 p.m.; Sunday, 9 a.m. to 4 p.m. Admission is $1. For more information, contact Gene Kemble, 14733 Poplar, Hesperia, CA 92345 or call (714) 244-5863.

Continued from page 29
around their sewer lagoons. Huachuca City's burros save the cost of sending men to the lagoon area to mow or spray the vegetation, a cost estimated at $2,000 or $3,000 a year.

The lagoon area is fenced and gated, and the third pond has water pure enough for animals. The town had five goats foraging the 23-acre sewer lagoon area. They were doing a good job of keeping down the weeds and grass, but local coyotes developed a taste for goat meat.

Huachuca City decided to adopt the burros because they can graze just about anything and still ward off coyotes. If the project works, other cities may adopt burros for the same purpose.

—Bisbee DAILY REVIEW

WATT'S ANSWER

Tombstone, Ariz.—"The federal regulatory regime affecting the mining industry is the result of years of activity at all levels and branches of the federal establishment to achieve goals . . . have not only failed to achieve those goals, but have also created additional severe disruptions," wrote American Mining Congress President J. Allen Overton, Jr. to Interior Secretary James Watt in response to the secretary's request for examples of "excessive, burdensome and counterproductive" regulations under his jurisdiction.

The secretary has asked for similar material from a variety of sources, including government agencies and environmental groups. He told Overton that his request is part of an effort "to end unnecessary and burdensome regulations now frustrating the balanced management" of the nation's resources. Watt is also seeking data on recommendations for changes in existing legislation.

In his response, Overton urged numerous changes in the department's coal management program, which he says "will not in a timely fashion place sufficient coal in industry hands to meet our national energy needs." In addition, he deplored the "attitude of the Interior Department [during the last 10 years] to emphasize other land uses, or even total nonuse of land, at the expense of mineral production."

—Western PROSPECTOR & MINER

BLM THREATENS SEIZURE

Trona, Calif.—The Bureau of Land Management's California Desert Plan is threatening private property in the Trona area. Peter Canning owns 520 acres near Indian Joe's old home. It was also the home of John Searles, for whom Searles Lake was named after he discovered borax here. Canning has been notified that his property has been included in the proposed Wilderness Area. This would mean denial of access, and it is not known whether the BLM would try to take the private property from Canning.

The Wilderness proposal is not clear on how much of Crow Canyon and Homewood Canyon would also be included in protective custody, with no entrance allowed.

Anyone having property that may be threatened by the California Desert Plan, including mine prospects, is asked to send a letter to Assemblyman Philip Wyman, attention John Lovett, at 14800 Seventh Street, Victorville, CA 92392. The Victorville office of Assemblyman Wyman may also be reached by calling (714) 245-1661.

It is important that the letters be dispatched at once to assist in a pending court suit to stop the local implementation of the California Desert Plan.

—Trona ARGONAUT

RULES PROPOSED TO CURB DRUGSTORE COWBOYS

Reno, Nev.—A survey by the United States Department of Agriculture revealed that there are approximately 100 million head of cattle in this country at any given time. Another recent survey, by the United States Habadashers Association, revealed that there are more than 200 million cowboy hats sold in America each year.

As everyone knows, the principal responsibility and duty of a cowboy is to boss cattle around. That was all well and good back in the days when the cattle outnumbered the cowboys. Now that nine out of 10 people in America are cowboys, the impact on cattle herds is devastating.

With two or three cowboys bossing around each individual cow, the poor animals become confused and disoriented. They get depressed, lose weight and, in general, become stringy and tough.

The newly formed Cow Protection League is introducing laws in several state legislatures which would require that anyone posing in advertisements for any product whatsoever (from cologne to automobiles to designer jeans) while wearing a cowboy hat must personally own at least three head of cattle.

Additionally, all male models appearing in western wear must have dipped snuff or chewed tobacco for a full 60 days before the advertisement or commercial is photographed or filmed. Finally, the Cow Protection League is seeking a constitutional amendment which would make it a federal offense for anyone to harrass or nag a cow which he did not personally own or had not been paid to pester.

Should these measures prove effective, the nation might look forward to healthier, less neurotic cows and see a decline in the number of people wearing cowboy hats, thus finding it easier to watch movies in crowded theaters.

—The NEVADIAN

ATTORNEY SEES BRIGHT FUTURE IN M-X

Carson City, Nev.—A Nevada attorney forsees a bonanza in law activity should the proposed M-X system be built in the state, with much of the litigation having to do with claims against the government by Nevada ranchers.

Dave Gamble, Carson City attorney, says, "One of the impacts of the M-X will be the construction of a great many buildings and courthouses in Nevada to house lawyers and law cases."

—Humboldt SUN

BATH BAFFLES DOG

by Don Pelon

Tombstone, Ariz.—Over Arivaca way they tell about a tramp miner who used to work in some of the mines around the district. He mucked in the Montana Mine at Ruby, drilled in the Dos Amigos at old Oro Blanco, and rocked a cradle in Holden Canyon during the Great Depression days.

He got the name of "Bathless" Cooper for obvious reasons. Some say it was 11 years, six months since he changed socks. He was so gamey, only his dog would get closer 'n a rock throw of him.

One day Bathless disappeared 'n they sent out a search party lookin' for him. He was found the next day sittin' on a rock in the creek that flows through Smugglers' Gulch. Up on the bank, here was his faithful dog, snarlin' and yappin' every time Bathless so much as blinked.

What happened, we said? He says it was so hot he decided to go wadin' and he stepped off into a deep hole. 'N when he come up out of the creek all clean 'n white, the dog wouldn't let him near his clothes nor his burro.

"I guess I didn't smell right," he said.

—Western PROSPECTOR & MINER

$1000 REWARD FOR FEDERAL VANDALISM

Tombstone, Ariz.—The Committee of 1,000 is a loosely organized group dedicated to the suppression of vandalism and destruction on unpatented mining claims by Bureau of Land Management and Forest Service personnel. It offers a reward of $1,000 for information leading to the arrest and conviction of such federal government employees who commit these crimes. Address of the Committee is Box 146, Tombstone, AZ 85638.

—Western PROSPECTOR & MINER

OREGON HISTORICAL SOCIETY

John Day Country and The Chinese Medicine Man

BY BILLIE DURFEE

THE LAND Oregonians refer to as "the John Day Country," an area of 4,000 to 5,000 square miles, extends south nearly 200 miles from the mouth of the John Day River on the Columbia. U.S. Highway 26 transects it east to west, and U.S. 395 comes north from California through the empty desert to arrive at the crossroads of the eastern Oregon town of John Day.

John Day is a name once given to several small towns and stagecoach stops, two rivers, one dam and three impressive fossil beds. The United States Postal Service, however, was forced to rename all but one of the towns to eliminate confusion.

The use of the name John Day in so many places is strange, since the man himself contributed little to Oregon history. He is known mainly for one uncomfortably cold experience with hostile Indians on the banks of the Columbia River.

All this started back in 1811, when the Astor-Hunt Overland Expedition left the midwest to go by foot, horseback and canoe to the outpost of Astoria, where the Columbia flows into the Pacific. Almost all of the 60 men who set out from Nodowa, Missouri, were fur trappers, as was John Day. The Astor-Hunt group followed seven years after Lewis and Clark had completed the first overland exploration to the west.

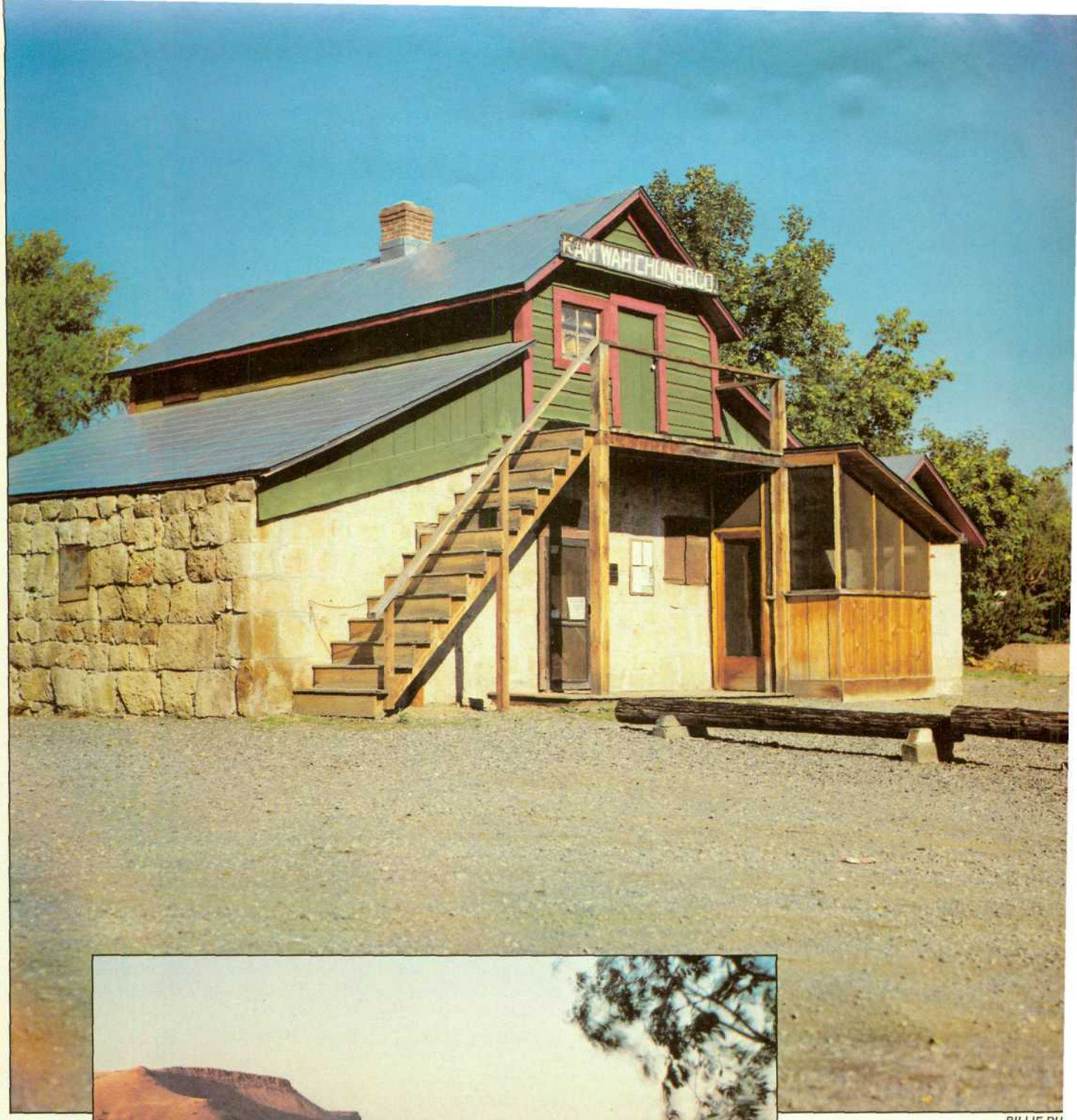
Twenty-five years after the expedition, John Jacob Astor paid $5,000 to Washington Irving to write a book about the Astor Pacific Fur Company. This book, *Astoria,* includes the only description of John Day:

"He was about forty years of age, six feet two inches high, straight as an Indian; with an elastic step as if he had trod on springs, and a handsome, open, manly countenance. It was his boast that, in his younger days, nothing could hurt or daunt him; but he had lived 'too fast,' and had injured his constitution by excesses."

The Astor party experienced great difficulties from the beginning, but especially in crossing the Snake River near the Grand Tetons in Wyoming. Eventually, because of bad weather and lack of food, the men were divided into four groups, to increase their opportunities for shooting game. Either at this point or soon after, Day, Ramsay Crooks (his superior in the party) and three Canadians became ill and dropped back, unable to travel further.

The Canadians joined with some friendly Shoshone Indians, but it was some time before Day and Crooks were strong enough to continue west. Six months later they were found by Robert Stuart, the leader of a few men who were canoeing down the Columbia towards Astoria. Day and Crooks had been attacked by Indians, and were left naked on the river bank north of The Dalles military post. It seems incredibly like a grade B western movie that a canoe would simply paddle by so far out in the wilderness. However, this is what happened.

The river near where they were attacked was called Day's River and John Day's River before it settled in as the John Day River. It is curious that the name Lepage's River, given by Lewis and Clark, didn't stick. It is even more



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BILLIE DURFEE

Picture of Ing Hay (opposite page) was taken when he was in his early twenties, with hair still in a queue. Kam Wah Chung Co. building (above) is now a museum. The John Day River runs through the town of the same name (left) to create an oasis in barren eastern Oregon.

curious that John Day's name has surfaced so frequently when not one hamlet or stream has been named after Crooks. Perhaps Crooks had lived less riotously, or maybe he was just shorter.

Even though the river bearing his name runs by the town, John Day himself couldn't have been within 150 miles of the crossroads. Nonetheless, today's townspeople call him theirs, and they are very proud of him. Their folk hero, they believe, was every bit as good a frontiersman as Daniel Boone. In fact, the Oregon Historical Society has several letters in its files which claim that the two men came from the same part of Virginia, and must have known each other.

IN THE early years, the biggest settlement in the John Day Country was Canyon City, a stage stop for north to south and east to west transportation. It was here, in 1862, on Hog Point near Whiskey Gulch, that gold was discovered, and a full-scale rush followed.

During the peak of the gold rush, Canyon City had a population of 10,000, and it is thought that by 1870 more than 1,000 of these were Chinese who had come to work in the mines. After a devastating fire, the Chinese population was forced to move a few miles north to what was originally referred to as "the other town," despite the fact that the Post Office had already decided it was to be called John Day. A Chinese community developed, and a Cantonese herbal practitioner moved in.

Ing Hay, later to be known as "Doc" Hay, was born in southern China near Canton. From 1860 to 1870 there was a period of unrest in China and many men left to find work in the United States, among whom were five of Ing Hay's "uncles," who settled in Walla Walla, Washington. [Ed. note: The term "uncle" could have included actual uncles or more distant male relatives in the Chinese familial tradition.]

The Chinese Exclusion Act was passed in 1882 when gold strikes had become less frequent and railroad construction was slowing down, the purpose being to stop the influx of unskilled workers who could be tricked into working for so much less than Americans. However, after this date it was still possible to enter Canada and migrate south, and that is probably the route taken by Ing Hay, who emigrated with his father.

After some years with the uncles in Walla Walla, Ing, a handsome young man, arrived in John Day in 1887. He was dressed in traditional Chinese clothes, complete with queue, and soon after arriving he met Lung On, who was to become his lifelong partner. Without Lung, Ing could not have practiced his herbal skills.

The two men were very different. Lung On, a young scholar, adapted quickly to this country. He learned to read and write English with fluency and he became a canny businessman with successful investments in real estate, cattle and gold. In later years, he owned the first automobile repair shop in the eastern part of Oregon. Ing Hay, however, always had trouble with English, but with Lung On as his constant companion and interpreter, he became the doctor for the immense John Day Country.

Their partnership started in 1887, when the two men bought the Kam Wah Chung Company Building, which soon became the center of business and social life for the Chinese in eastern Oregon. Translated, Kam Wah Chung becomes the Golden Flower of Prosperity, and it turned out to be a highly suitable name.

Ing became well known for his diagnoses through taking pulses from four different places on the body.

The men enlarged the sandstone building to include not only the general store but also a pharmacy, medical office, gambling hall, bank, assay office, opium den and religious shrine. Barlow and Richardson, who wrote *China Doctor of John Day,* say that the structure is architecturally like many in southern China.

It is thought that Ing studied herbal medicine in Walla Walla with Doc Lee, a pioneering Chinese herbal doctor in this country. Lee's books were found in the Kam Wah Chung Building. It is evident that Ing learned well. Initially his patients were the Chinese miners, many of whom stayed to work on the roads, but in time he became a trusted healer for everyone—Occidental and Oriental—in the John Day Country. Doc Hay made house calls with Lung On interpreting and driving over the vast area, first in a buggy and later, a car.

Ing became well known for his diagnoses through taking pulses from four different places on the body. His cures for blood poisoning, influenza and meningitis were respected by all.

Both men prospered but unlike most other immigrants, they did not keep in contact with their families back in China. Americanized, but still retaining much of their Cantonese heritage, they became a respected part of the John Day-Canyon City community. Ing must even have become a Mason, for he was given a Masonic funeral.

LUNG ON died suddenly in 1940. He left an estate of more than $90,000 to his friend Ing, an amazing amount of money for a Chinese immigrant to have made in such a small and remote town. After Hay's death, the estate was to have gone to Lung On's daughter in China. Because of the political situation between the two countries, this never happened, and the money eventually reverted to the State of Oregon.

After Lung On's death, Ing Hay, who was slowly becoming blind, asked his nephew to come help him with his practice. In 1948, he fell and broke his hip, an affliction he could not cure with herbs. He consulted the town's MD, a man he had known as a child, and the doctor persuaded him that he must have the hip pinned in a Portland hospital. The hip did not heal properly, and Ing spent four years in a Portland nursing home before he died at the age of 89.

The Kam Wah Chung Building was given to the town of John Day. In 1967, Gordon Glass, a councilman, decided to look it over with the idea of restoring it as a reminder of the contributions of the Chinese to the John Day Country. The Chinese population had dwindled to 21 by 1940, the last available figure. The Occidental population had also declined; nowadays, only 2,090 people live in John Day, with an additional 690 in neighboring Canyon City.

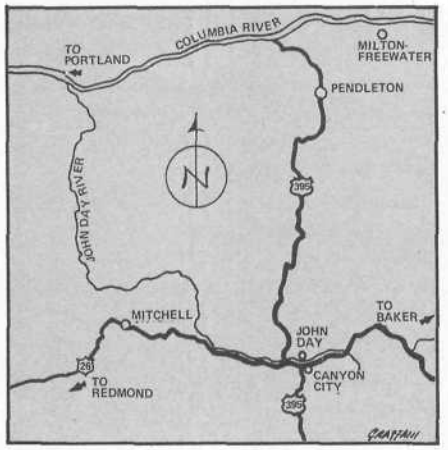
The contents of the building, which are on display today, tell the story of life among the pioneer Chinese workers in the American west. Most interesting among the items found from the attic to beneath the floorboards were 500 different herbs and medications, most imported from China. Ing had ground these up and

combined a variety of them to boil as a medicinal tea. Many letters in the Oregon Historical Society attest that, no matter what the ingredients, the brew tasted awful. Some of the more exotic items found were jars of rattlesnakes steeped in alcohol, opium cans dating from 1898 to 1913, opium pipes, Doc Lee's herbal medicine book, Chinese lamps and the shrine, a receipt for a Chinese poll tax (an early-day Oregon law), a large chest with one dead bat, a burlap bag with two bear claws and a jar with playing cards surrounded by herbs.

There were cartons and cartons of records in Chinese calligraphy, some being letters from parents asking for help in finding sons who had come to work in the western mines. Seventy-two fifths of bourbon bearing labels no longer on the market also surfaced: "Joel Frazier" and "Old Palmer" were especially well liked. And, of course, the shelves contained the dusty staples that any grocery store of the era would stock, such as ancient cans of coffee, tea, baking powder and the like.

The money to rebuild the building and to clean and inventory the contents came from the National Trust for Historic Preservation, the Oregon State Parks and the Oregon Historical Society. The manpower came from community volunteers as well as students and faculty from Lewis and Clark College and the University of Oregon.

The museum is now open. A leisurely visit takes the curious a long step back into a vastly different culture in pioneer America. It speaks well for a town the size of John Day that it worked so hard to reconstruct and maintain the Kam Wah Chung Building, both as a reminder of the contributions of the 19th Century Chinese immigrants to the west, and as a memorial to the John Day Country herbal doctor, Ing Hay, and his partner Lung On.



A DREAM WITH A PURPOSE

The story of Don Johnson, a man of two nations

by Mary Eileen Twyman
Photographs by Loren Smith

Don Johnson, host of the Hotel Serenidad and U.S. Consular agent, has successfully blended two cultures.

BAJA CALIFORNIA is as much a mystique as it is a land. Everyone who ventures beyond Tijuana or Mexicali senses this; few, however, find true perception, few come face to face with the "other Mexico."

For each of those who do, it is a different experience. Or so it seems; in reality, it is the same. Whatever they may have been, the misconceptions, the misunderstandings and the preconceived notions are stripped away. He who has been just a visitor, a *gringo*, a *turista,* becomes one with Baja and its people.

In 1961, Don Johnson came to Mulege for the sole purpose of checking out an investment he had made sight unseen, a part ownership in what today is called the Hotel Mulege. Though then and now he could be mistaken for the prototype "white hunter," he was actually a successful, 34-year-old custom tailer in San Jose, California.

His business was prospering, but he felt empty. Even today, he cannot explain just why. There was a void that success could not fill. It is this kind of restlessness, the vague trouble of the spirit, that is the prelude to understanding Baja. Once infected, there are some who stay.

Johnson had no skill with the language, and he soon realized his image of the people was erroneously founded on second, third and even more-hand hearsay. To his astonishment, he found that he could not only trust these people, but that he sincerely liked them and their town.

What is more, he met and fell in love with Nancy Uguilde Gorasave, a lady of prominent family, business acumen and exciting good looks. She accepted his proposal of marriage and they decided to make their home in Mulege.

He soon exchanged his interest in the hotel, then called the Loma Linda, for that which he holds today in the Hotel Serenidad, a partnership he shares with his wife and another North American, Chester Mason, who lives in Murietta, California. It was an astute exchange. The Loma Linda, while more pretentious then, was without land around it, whereas the few cottages called the Serenidad sat on property with space for an airstrip.

This was vital to success, for the transpeninsular highway would not be paved for another 12 years. Places like the Serenidad are called sky ranches, isolated resorts to which affluent Americans fly their own airplanes for an afternoon, a weekend or a week. A cult has grown around this concept, each ranch being separately favored for its special kind of fishing or hunting, or just the personality of its owner.

Serenidad has its own fleet of fishing boats, hunting trips can be arranged and so, too, can mules and guides for visits to the remote mission ruins and cave murals in the mountains behind Mulege, but its proprietor, Don Johnson, is why patrons, including the famous, keep coming back.

First names, informality with digni-

ty, are the rule at Serenidad. You ask Don why he stayed. He offers none of the usual inanities about fleeing from freeways, pressures and smog. He says it is the respect which he first offered, and then had returned a thousand-fold. It is, he says, the basis of the charm of the Mexican people.

Shared respect brought him acceptance in Mulege. In the process, he became an even better citizen of the United States. He has dedicated himself to erasing the barriers that stand between the Mexican and North American peoples. He has found the viewpoints of each distorted about the other. He would like to see all of this give way to complete understanding and respect between the two countries.

Don Johnson uses the term respect a lot, believing it is the foundation upon which this understanding can be built. No doubt he is very right.

When the Johnsons and Chester Mason finalized their acquisition of the Hotel Serenidad in 1962, it was little more than a few cabanas and a name. Today there is a main building housing guest rooms, a kitchen, a dining room and a bar which is ringed by 32 comfortable cottages. The focal point, however, is outside at the massive facility where Serenidad's traditional Saturday night barbeque is prepared. Whole goat and pig are the usual fare; sometimes steaks are offered.

Don appreciates his successful resort and the employees who helped it to succeed, but he has a more compelling mission. His stature in the community and with the Mexican authorities has led to his appointment as Consular Agent of the United States of America, the first ever to be stationed in Baja. In fact, there are only 24 U.S. consular agents in the world; nine of these are in mainland Mexico.

He is able to help North Americans visiting Baja when this is needed, but more important, is his role in expediting visas for Mexicans who wish to visit the United States. Few people realize we do not reciprocate our southern neighbor's open border policy. A visit to this country for a Mexican family can require weeks of waiting for the necessary papers.

Being a U.S. official now, Don Johnson will not criticize our policies. He just takes scissors figuratively in hand and snips unmercifully at the red tape. The families and individuals in Baja who come to him from as far away as La Paz appreciate this, especially the simple farmer who had saved nearly a lifetime to bring his wife and children to Disneyland.

The farmer, you see, was apprehensive. He had heard he would be hassled about the papers, that it would take a long time. With Don Johnson, it didn't. The trip was all the family had dreamed it would be, and one more step was taken toward understanding between the peoples of two nations.

Mulege is a hard two days drive from the border, even with the new highway, but the airstrip at the Serenidad makes it possible to be there in less than four hours. The famous and not so famous come in their own or chartered planes. Lately, there has been scheduled service by Air Cortez out of San Diego.

The famous may be the easiest to please, for they find the casual atmosphere of the Serenidad wonderful relief from the demands of the spotlight. Johnson is friends with many and awed by none, except maybe back when the late Charles Lindbergh used to fly in with the great Baja authority, Kenneth Bechtel.

Don recalls a frequent visitor, a young man named Astaire, who kept saying he was going to get his Dad to come down. A telegram for reservations finally came from Fred Astaire, but Don didn't really connect the two until they got off the plane together.

Another memory frequently revived is Jim Arness borrowing Don's little Honda 90 to tour Mulege, a couple of miles down a tropical riverbank trail from the hotel. Arness looked ludicrously big maneuvering the small bike.

The most cherished entries in the Serenidad's guest book, however, chronicle a 16-year record of friendship with John Wayne. The Duke loved Mulege: Like many others, he considered Bahia de la Concepcion, 12 miles south, to be the most beautiful bay in the world.

The Duke was a frequent visitor to the hotel and at Don's home in town, which sits over the gift store operated by Nancy. The visits were reciprocated: Don talks of a lunch he almost missed at Wayne's home in Newport Beach about a year before the actor died. He's glad now that for once he set business aside and chose to spend what turned out to be his last few hours with a great man.

Don Johnson now is a man content. He has been able to span two cultures over the years, blending the best of each. He has status, yes, perhaps to a degree that he could never have achieved in the United States, but it is meaningful rather than ego-serving, because he translates it into good and positive action.

Don Johnson has never met Joseph Pintauro, but he would agree with what the latter says: "Peace will never happen until we can laugh at the stitches in our maps where we think we really split the planet into parts."

Mulege is four hours, by air, from San Diego.

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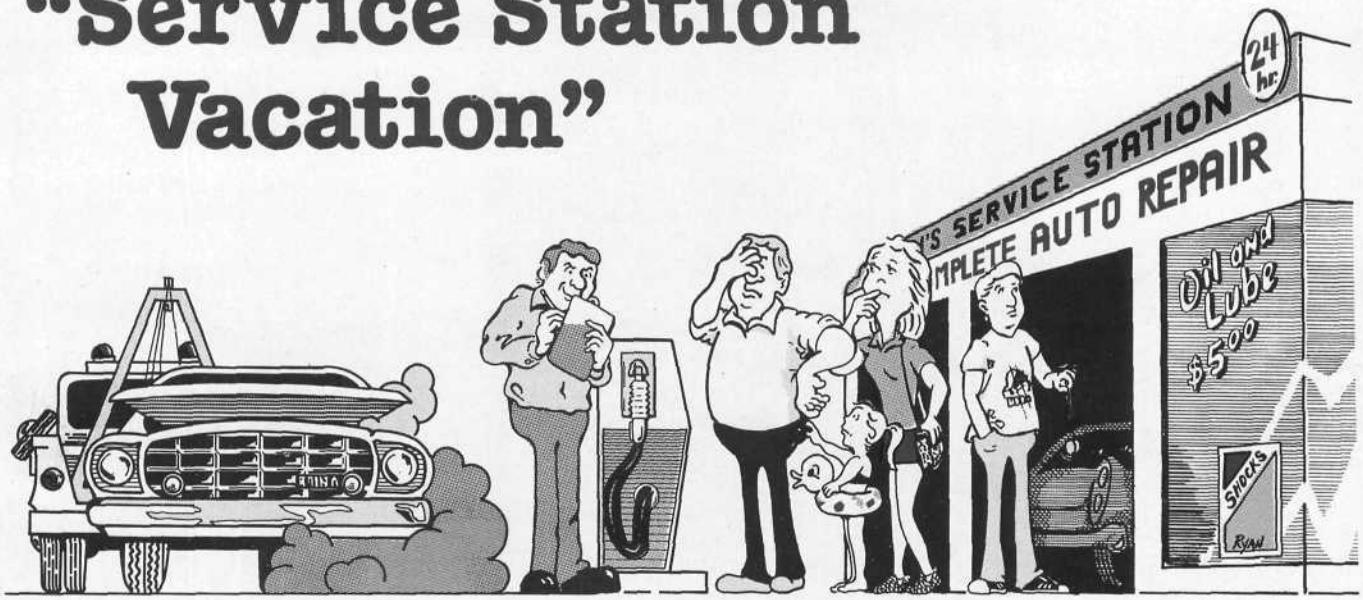

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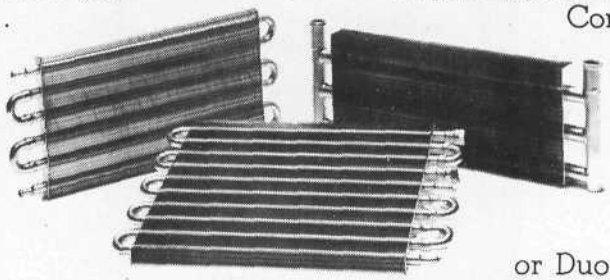

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The Prolific Jackrabbit

by Susan Durr Nix

EVERY COLLEGE algebra student has had to work out the figures: Mr. Brown's pet shop has a population of 100 rabbits. The 100 become 495 in four months; in eight months, 2,450; in a year, 12,100; and in two years, 1,500,000, assuming none die or go home with customers. (I've wondered what happened to Mr. Brown. Was he lauded by the S.P.C.A., or fined by the Health Department? Perhaps he simply suffocated under a mountain of bunny bodies.) The truth is more startling. A single pair of rabbits is theoretically capable of producing 13,000,000 descendents in three years.

Nature gave rabbits an insatiable sex drive to compensate for the dubious distinction of being her number one prey and game animal. They are prolific breeders out of necessity; wherever they live, there is a host of predators ready to eat them. Here in the desert they must evade hawks, eagles, owls, coyotes, foxes, mountain lions, bobcats, gopher snakes, rattlesnakes and people, not to mention the latter's automobiles. With so few defenses to protect them, it's no wonder they ensure their species' survival by an indiscriminate, some say indecent, eagerness to mate.

The *Leporidae* family includes hares and rabbits, a distinction muddled by their close resemblance to one another and the misapplication of the terms in popular usage. Belgian hares are properly rabbits. They make burrows or nests and give birth to blind, naked, helpless young. Our desert black-tailed jackrabbits *(Lepus californicus)* are really jack hares, non-burrowing leporids whose young, called leverets, are open-eyed, fully furred and nearly independent at birth.

This independence stays with the jackrabbit as he becomes the free spirit we see springing across the desert landscape like a rubber ball. To say he is cursorial, or adapted to running, is an understatement. He easily outdistances a lone coyote and is reportedly able to explode from a crouching position to 45 miles per hour in a fraction of a second.

A hare's gait is halfway between a weasel's lope and a horse's gallop. The jackrabbit bounds on paired hind feet, like the weasel, but puts his forefeet down one after another at the end of a leap, like a horse. Extra long and strong hind feet, proportionately the longest and strongest on the desert, permit bounds 15 to 20 feet long and up to five feet high. It's not necessary for the jackrabbit to land fully and gather between springs; he rebounds by the force of the impact of his toes as they hit the ground. This is an animal built for speed and maneuverability, a perfect running machine.

KAREN SAUSMAN

The jack's richly veined ears help control heat intake, loss, and act as megaphones.

Leaping not only puts distance between jackrabbit and predator, it reveals the lay of the land to eyes with a visual range within an ace of a full circle. Because dense vegetation would impede both flight and sight, black-tailed jackrabbits are found only in wide-open settings where they are unprotected from predation. They range through the western United States and into northern Mexico.

It's remarkable how few we see in an average desert day, considering the jackrabbit's large size and non-burrowing habits. Part of the reason is that we are looking at the wrong times —dusk to dawn is their most active period—but the main reason is that they spend most of the day motionless in shallow scratchings called forms, screened and shaded by plants. There they rest and escape as best they can the desert heat.

A form is scant protection in 120 degree temperatures, but here at least the soil and air stay relatively cool. Jackrabbits have inefficient cooling systems, so they rely on a combination of behavioral and psysiological adaptations to cope with high temperatures, including the ability to store excess body heat without becoming agitated or restless. An animal with a higher body temperature absorbs additional heat from the environment less readily and doesn't need to work so hard to feel comfortable. As temperatures dip, he cools off more quickly. A jackrabbit's richly veined and lightly furred ears are thought to help control heat intake and loss by a unique system that regulates the blood supply reaching them. The more blood in the ears to pick up heat and carry it through the body, the hotter the animal gets, so when temperatures soar, circulation to the ears is cut off.

Those ludicrously large jackass ears which, incidentally, account for the jackrabbit's name, also act like megaphones to amplify the slightest sound. This is necessary in hot, dry desert air, where sound travels poorly. Maximum coverage is achieved by continuously swiveling the ears in wide arcs. This is especially necessary at night, when visibility is poor and most predators are out hunting a meal.

Jackrabbits have prodigious appetites for a variety of green stuff, which they nip off with pliable lips and sharp upper and lower incisors. Behind the upper front teeth is a second pair, purpose unknown, which helps distinguish rabbits and their relatives from rodents. Depending on the time of year, jackrabbits eat grasses, herbs,

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yucca, mesquite, wildflowers, cacti (including cholla), dried vegetation and numerous other plants, including chile peppers minus the seeds.

A jackrabbit near starvation will even try to eat bitter creosote leaves and stems, a litter of trimmings under the bush being evidence of his lack of success. Jackrabbits get most of their water from plant material, although they will drink free water if it is available. At the Living Desert Reserve, they have been seen drinking from ponds and artificial water holes. Leverets are brought into the reserve for rehabilitation less frequently than young cottontails, proving the greater self-sufficiency of young hares.

Jackrabbits void soft greenish pellets as well as hard brownish ones, an average of 531 a day, according to one study, irrespective of age, sex, species or type of forage. The greenish pellets are usually re-eaten. This practice, shared by other mammals, is called coprophagy. It is an efficient way to extract as much nourishment and moisture as possible from food.

Despite their potential for infinite reproduction, jackrabbit populations fluctuate from year to year. Reproduction, directly affected by rainfall, declines during long periods of drought and poor nourishment, but returns to normal as soon as conditions improve. Any upset can affect jackrabbit numbers, including overgrown vegetation and too few coyotes. Coyotes, whose normal diet is 75 percent jackrabbit, are an important check on these animals. The coyote's meal is not without consequences, however. Jackrabbits carry the larvae of tapeworm, which are activated in the coyote's digestive tract. The cycle is perpetuated when the tapeworm matures, lays eggs, and the coyote defecates, depositing in the process numerous eggs on weeds and grass, later eaten by jackrabbits.

Under normal circumstances, a jackrabbit has a 50 to 80 percent chance of being eaten or dying of accident or disease before he is one year old. When populations get out of hand, epidemics of rabbit fever, a sort of emergency substitute for normal control of predators, may wipe out 90 percent.

The odds are against a jackrabbit from the moment he is born. Speed and vigilance are all he has going for him in a world full of hungry clawed and taloned creatures. He truly needs both of his "good luck" hare's feet to keep him alive to see another day.

Tomatoes

by Stella Hughes

IT'S BEEN said that the west was won, not by guts and guns, but by beef and beans. If that's so, then the dessert had to be canned tomatoes.

I once asked an old-time cowman, who was due to become a millionaire from oil found on his ranch, what he planned to do with all his money. His prompt reply was, "I'll buy all the canned tomatoes and peaches I can eat!"

One of our Arizona ranches, back in the early twenties, was so stingy with grub, it was known from Canada to the Mexican border as The Macaroni Cattle Co. The cowboys working for this outfit swore they seldom even had the "termaters" to go with the macaroni.

The old-time prospector may not have eaten very high on the hog, carrying months of supplies on his burro, but you can bet he always managed to have a few precious cans of tomatoes, along with his salt pork and beans. These old desert rats knew a can of tomatoes was more refreshing—and far better for their well being—than gallons of gyppy water.

When I was a child on the farm, my mother often made a simple dish, when in a hurry, by opening a jar of stewed tomatoes, sauteing a little onion in butter, combining the two , and when brought to a boil, crumpling in just enough stale bread to barely take up the liquid. Seasoned with salt and pepper, we kids thought this great fare. Sometimes leftover bits of bacon were added to the dish, but leftover biscuits were never considered as good as "light" bread.

On hot summer days, many of our Apache cowboys would make a quick and easy lunch by opening a can of tomatoes, drinking the juice, crumbling crackers or bread on the remaining tomatoes in the can, pouring in a generous amount of canned milk and topping it off with as much sugar as this mess could absorb. Others preferred salt and pepper on their bread and tomatoes. If the weather was cold, the tomatoes were heated in a skillet, seasoned with salt, pepper, and perhaps several spoonfuls of bacon drippings, and eaten with bread or crackers.

Before the days of refrigerators, ranchers and farmers were wont to lower cans of tomatoes in a gunny sack into their shallow wells or cisterns. Cold tangy tomatoes were a wonderful treat on a sizzling hot day.

In our part of the southwest, tomatoes are a prolific crop. A few plants are often consumed by grasshoppers or cut-worms, or are nipped by early frost, so I usually plant a few extra rows, hoping I'll end up with enough fresh tomatoes to eat all summer, and a few left over to can. Last year, something happened and the few turned out to be a slew. Tomatoes do not freeze worth a darn, so I resorted to canning. As whole tomatoes take up lots of room in a jar, I peeled them, chopped them in small pieces and canned them as stewed tomatoes. I added onions, garlic and chiles. According to the hotness of the chiles, I labeled the jars Hot, Sorta Hot and Damned Hot. You better believe the last one, for I used some little fiery blow-torches called chiletepins, or bird peppers.

ILLUSTRATION: GITTA PFAHL

Canned stewed tomatoes are good added to other vegetables or vegetable casseroles. The hot tomato and chili combination goes into my chili con carne and gives it lots of pizazz.

Green Bean and Tomato Casserole

2 cups stewed tomatoes
1 cup chopped onion
1 cup chopped celery
½ green pepper, chopped or thinly sliced
2 tablespoons bacon drippings
2 tablespoons sugar
1 bay leaf
salt and pepper to taste
4 cups cooked green beans, drained
1 cup shredded cheese
½ cup buttered breadcrumbs

Saute onion and green pepper lightly in bacon drippings in a large skillet. Add celery, tomatoes, bay leaf, sugar, salt and pepper and allow to simmer a few minutes. Place 2 cups green beans in a lightly greased casserole, layer half of tomato mixture and half of cheese on top of beans. Repeat layers. Sprinkle top with breadcrumbs. Bake at 325 degrees for 25 or 30 minutes. Serves 8.

Summer Squash Casserole

8 cups sliced squash (yellow gooseneck, scalloped green squash or zucchini)
½ cup chopped onion
⅓ cup melted butter or margarine
2 cups fresh tomatoes, diced
1 cup green pepper, diced (or green chile can be used)
1 cup cubed Cheddar cheese
salt and pepper to taste

You can use just one kind of summer squash, or combine two or more different kinds. Allow 2 cups sliced raw squash per serving.

Cook squash in as small amount of water as possible. Do not overcook; drain while squash is still quite firm. Saute onion in butter lightly; add onion, green pepper and tomatoes to squash, stirring to mix. Season with salt and pepper and place in lightly greased casserole. Top with cubed cheese. Bake about 25 minutes in 350 degree oven.

Tomatoes and Corn

1 can stewed tomatoes (16-oz.)
3 or 4 ears corn, cooked and cut from cob, or canned whole-kernel corn
1 green pepper, chopped
1 medium onion, chopped
1 tablespoon butter or margarine
2 tablespoons sugar
1 cup bread crumbs
½ cup shredded cheese
salt and pepper to taste

Heat tomatoes in large skillet until boiling. Add corn, green pepper, onions, butter, sugar, salt and pepper; mix well. Simmer about 15 minutes. Place one-third of vegetable mixture in a lightly greased 1-½ quart casserole; top with one-third of bread crumbs. Repeat layers twice. Sprinkle cheese over top. Bake at 375 or 400 degrees for about 20 minutes. Serves 6.

Cowboy Salad

6 ripe tomatoes, diced
2 med. onions, chopped
2 or 3 green chiles, chopped
2 or 3 yellow banana chiles, chopped
2 or 3 cloves garlic, diced
1 tablespoon sugar
1 teaspoon salt
2 cups vinegar

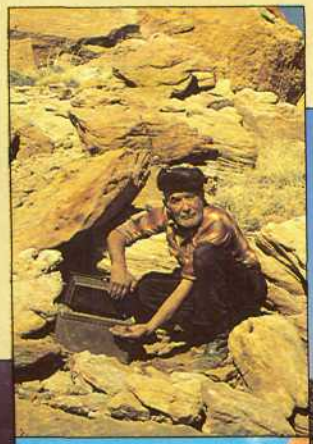
Place all ingredients in covered jar and chill for one or two days before serving. Serve with beans, barbecued beef, chile con carne or as a side dish with grilled steaks.

Old-Fashioned Tomato Pudding

5 or 6 pounds ripe tomatoes, peeled and chopped
1 cup butter or margarine, melted
1 cup dark brown sugar
1 6-ounce can tomato paste
1 teaspoon salt
6 to 8 slices white bread, cut into 1-inch cubes

In 3-quart saucepan over medium heat, bring tomatoes to a boil, then reduce heat to low; cover and simmer until tomatoes are soft. Uncover saucepan and cook about 15 minutes longer, until tomatoes are slightly thickened, stirring often. Stir in brown sugar, tomato paste and salt. Arrange bread cubes in 3-quart casserole. Pour melted butter over bread cubes; top with tomato mixture. Bake at 375 degrees for about 40 minutes. Makes about 10 servings.

FUN IN THE DESERT...



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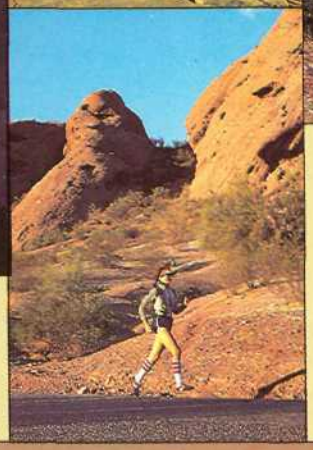

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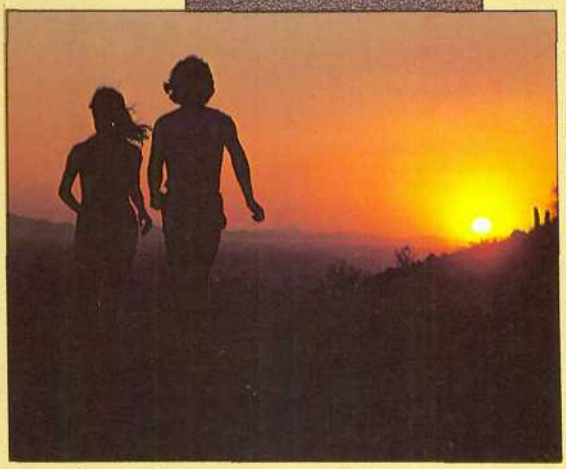

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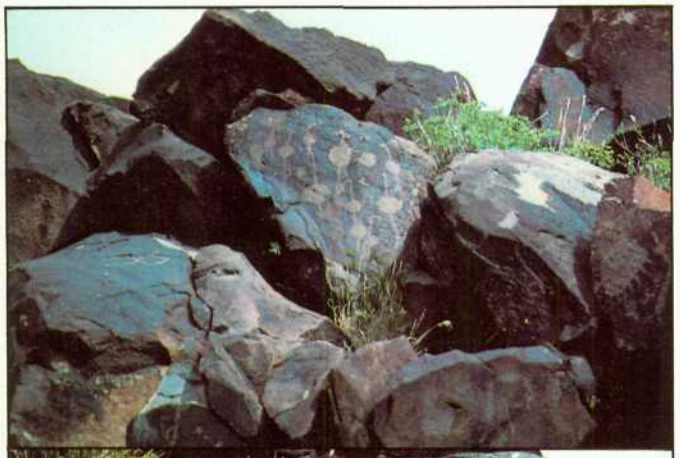
Sampling of Coso petroglyphs, top to bottom, shows atlatls isolated on a single rock; costumed figures with bizarre headdress; sheep depicted by both pecked and abraded techniques; fragile desert varnish worn away by human footsteps, destroying petroglyphs.



Petroglyphs of the Coso Range

by ANNE DUFFIELD
Photographs by JAMES SEITZ

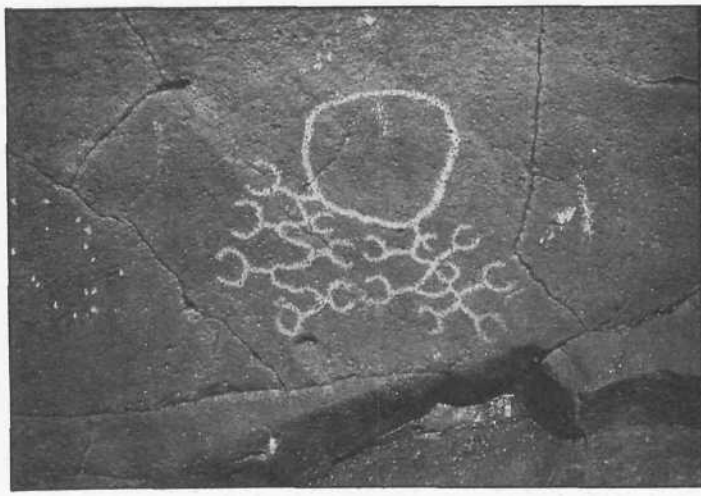
ONE OF THE MOST spectacular collections of petroglyphs in North America is found in and around the Coso Range, which lies just south of Owens Valley in California, tucked between the Argus Range and the Sierra Nevada. Thousands of carvings are scattered over only about 250 square miles. Random examples appear throughout the area, but the greatest concentrations are found in the canyons that slash their way through the flat, boulder-strewn high desert plains that slope away toward the southwest from the volcanic peaks of the Cosos.

Rediscovered in the 1920s, the petroglyphs were locked away inside the fences surrounding the China Lake Naval Weapons Center in 1943, which hid them from the public, but also protected these fragile treasures from the vandalism and thievery suffered by so many other rock art sites. To its credit, the Navy makes special efforts to be sure that the weapons testing program will not damage the petroglyphs.

Featured in *Desert* Magazine in 1944, word of the Coso petroglyphs gradually spread in spite of the fences. In 1964, the two canyons boasting the largest number and best examples of Coso rock art were dedicated as a National Landmark. One of these, Little Petroglyph Canyon (called Renegade Canyon on the U.S. Geological Survey contour maps) can now be visited, under certain conditions (see box).

A path leads visitors into the canyon from the parking area. The canyon walls are a jumble of basalt blocks, here vertical cliffs from 10 to about 60 feet high, there broken over the years into a tumbled pile. The basalt has weathered to a fine desert varnish, and this shiny brown-black patina provided the canvas for the ancient artists. They chipped or scraped the patina away, revealing the lighter, unweathered rock beneath, so that the petroglyphs appear as light figures on the dark background. Fragments of colored pigment cling in a few places, hinting that perhaps some were once painted as well.

The sheer number of carvings is overwhelming. A short few miles of Little Petroglyph Canyon alone displays more than 6,000 by one actual count, while nearly 15,000 have been recorded in the entire Coso area. Far and away the most popular subject was sheep. Sheep are everywhere. Big sheep, some nearly life-sized, and little sheep. Stick-figure sheep, round-bodied sheep, and others with flat backs and



There occasionally are whimsical, purely abstract shapes at Coso that defy identification.

Two men face each other with bows and arrows in one of the few "warfare" scenes at Coso.

round bellies, all balancing on skinny stick-like legs and carrying long, curling horns. Sheep march in lines, graze quietly or, more often, run frantically, chased by hunters and impaled by spears and arrows. Sheep appear inside other sheep (pregnancy?) or occasionally with a head on each end. Still more sheep are symbolized by scattered sets of bodiless horns. A rare antlered deer, squiggling lizard or bird joins the herds, but mostly, there are sheep. There are reported to be more sheep pictured here at Coso than in all other North American sites combined. Clearly the sheep, thought to be the desert bighorn, were of obsessive importance to the artists.

Human figures do appear. Simple stick figures brandish weapons or attack the sheep. Knee-length robes covered with elaborate designs costume the boxy bodies of others. Like the sheep, these costumed figures have kept their skinny arms and legs, and the head is a featureless ball perched on a thin neck, often displaying fanciful headdresses or hairstyles. Matching designs on each side of some heads suggest earrings, and often dwarf the head itself. Many figures have fingers and toes painstakingly drawn, but sometimes the artist seems to have lost count, and produced three-toed feet or sunburst six-fingered hands.

Fox-like animals thought to be dogs are pictured too, chasing and biting the fleeing sheep. Indian groups in the 1800s were observed using dogs to drive game animals. Here we see their ancestors doing the same.

More mysterious are groups of abstract patterns enclosed in circles of ovals. Like snowflakes, no two seem the same. Family crests, perhaps? Records of long-ago events, little histories we cannot read?

More familiar are sack-like shapes, often elaborately fringed, resembling the medicine bags used by many historic Indian groups to carry sacred or magical objects. Then, here and there are a few abstract designs that defy explanation. Unlike other nearby sites, though, abstracts are rare at Coso. Most drawings, with the help of just a little imagination, can be identified.

WHO WERE THESE rock artists? They left little other than their pictures behind, and we don't know for sure. They were probably members of the large Shoshonean-speaking population that occupied much of Southern California for centuries, and finally began drifting away about 1,000 years ago as the drying climate, population pressures and thinning game herds forced them to move. The uniqueness of their art suggests they lived in some isolation, in which their distinctive style evolved. Comparative ages among the carvings, determined by relative weathering and changes in style and sophistication, further suggests a society that was stable over a long period, while the great numbers of carvings also indicates a large population or a long time period, or both.

Whoever they were, they were gone by the time the first white explorers appeared in the 1830s. The few Indians living at Coso then could only say that the pictures had been left by the "ancient ones." They knew nothing of their origin, or their purpose.

Their age is just as uncertain. Obviously finished long before the white explorers arrived and asked about them, they are possibly thousands of years old. Human groups are believed to have inhabited the area for at least 8,000 years, but it is unlikely that the art we see today is that old. The desert varnish in which the petroglyphs were carved has been shown to be very fragile, requiring specific weather and climatic conditions both for its formation and survival. This means that the present patina probably formed since the last "wet" period, about 3,000 to 4,000 years ago. The petroglyphs carved in it, then, must be younger still.

The weapons pictured provide dating clues, too. The *atlatl*, a primitive spear or dart-throwing device, appears in great numbers, and to the exclusion of any other weapons in many scenes. Since the more efficient bow and arrow is believed to have been adopted in Southern California around 1 A.D., the picturing of the atlatl alone suggests that the artists were at work well before then. The bow and arrow in other scenes would indicate that work continued after 1 A.D. as well. This is not a precise dating tool, though, for Spanish priests recorded the atlatl in use by isolated groups in Baja as late as the mid-1700s.

Why did they draw these pictures? We can only speculate. It must have been of great importance, both to the artist and to the society he lived in, to have justified the hours, perhaps days, of slow patient work that would have been necessary to create these pictures with simple stone tools. The work is careful and precise, although not always completed, and often very sophisticated. These were not aimless doodles.

The great numbers of sheep and hunting scenes immediately suggest a hunting ritual—perhaps in advance of

The Moab Mastodon

Text and Photos by Art Foran

THE MOAB area of Utah is filled with stories in stone. LaVan Martineau, a Paiute from the San Carlos Reservation, is one of the few people who can read the inscriptions and, what is more, prove his interpretations. He showed me a collection of panels and interpreted each. He explains his method in his book, *The Rocks Begin to Speak.** I found it simple to read some panels after studying this book.

When you begin to read rock writing, you will find that you are discovering things no one has bothered to look for before. You will locate waterholes, hidden panels, abandoned trails and caves. Occasionally, you will be able to relive adventures forgotten for a millenium. Few will agree with your findings, because such things are not taught in schools.

The rocks near Moab tell a story of mastodons or elephants, whichever you will. We know such animals lived in the area 10,000 years ago, but this story indicates they may still have been alive 2,000 years ago, long after the retreat of the ice from the tops of the Rocky Mountains.

You won't find many panels as fascinating as the elephant set. These writings are as alive as the discoverer who takes the time to read them. They cannot be read from pictures in books: The story is as much in the place where it was written as it is in the images themselves.

Each of the four panels involving the mastodon has much more to tell than can be understood, but the mastodon aspect is clear and engrossing, because it challenges dates long accepted by archaeologists. The bow and arrow was not supposed to have been used in the west farther back than 2,000 years ago, while the mastodon was supposed to have died out in this area 10,000 years ago. Yet, these story pictures involve both the bow and arrow *and* the mastodon. The people who carved these stories obviously were quite familiar with both.

The first panel we studied has the most complete account, including information about a time of famine. This could bring the story even closer to our time. The elephant is shown with water at his feet. A horizontal line with vertical lines below it is the sign for rainwater. Water is also indicated at the elephant's feet in the third panel by deep, drop-like pecking.

The second panel in this series is a locator panel. Included in a longer story is one image that tells the reader to look elsewhere for the rest of the story. It says to climb out of the canyon by the river and turn north. A trail lies near the panel.

An oval is used to signify a canyon; a line below the river and two marks at the top of the rising line indicate a north turn after climbing from the canyon by the river. We found another mastodon panel by following these directions.

The mastodon pictured was using his trunk to toss water on his head. The panel faces a great rock that is shaped much like an elephant. We walked over to the foot of the rock and found water pockets, full from recent rains. Martineau mentioned that this rain water was prized by Indians and used for ceremonial purposes, in preference to creek water.

The front of the rock is impossible to climb; walking around it, we found the only way up, at the north side, or its back. On top of the head, we found a large, filled waterpocket. Rain runs into the depression off the elephant's back; it holds hundreds of gallons.

Martineau studied the area through field glasses and discovered one more panel, directly across the nearby Colorado River on the west wall of the canyon, in front of the elephant's trunk. We drove around for a closer look.

The fourth panel is of a bear. Figures attacking the bear with bow and arrow are included. Bears were used to show battle, as bears are fighting creatures, while goats, for example, were used to show action, as more can be shown with four feet and antlers than with human stick figures.

Now a story at least 1,000 years old began to come alive. The mastodon rock had been used during sieges: Water on top made lengthy perching on top feasible, and the defenders had the advantage of throwing rocks and other weapons down at the attacking enemy. The account of this action was inscribed in much the same intent that we put up instructional signs in air raid shelters.

Martineau thinks the desert varnish is no older than dated panels he had located in Africa, which are 2,000 years old. Considering that Hannibal crossed the Sahara on elephants, the implication is interesting.

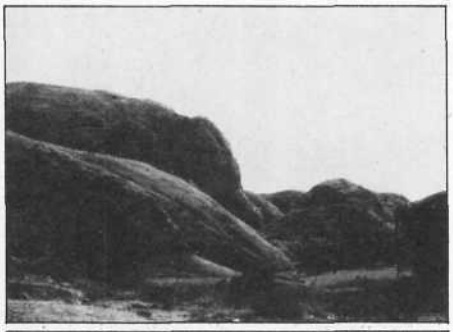
The Southwest is filled with rock writing telling similar stories. Once you understand a few of the symbols and know something of the locations, the game of panel reading is as fascinating as a treasure hunt.

You may unravel the unknown. Our awareness of the first Americans holds more mystery than knowledge. Reading what they considered worth writing in stone can make anyone a discoverer.

Some archaeologists think rock writings have little real meaning, while others are still struggling with interpretations. Both camps tend to discount LaVan Martineau's interpretations, because he is not a scientist.

Well, okay. He's not a scientist—he's an Indian. he learned the language of rock writing from previous generations of Indians. They pass on their knowledge to their own, but not necessarily to scientists.

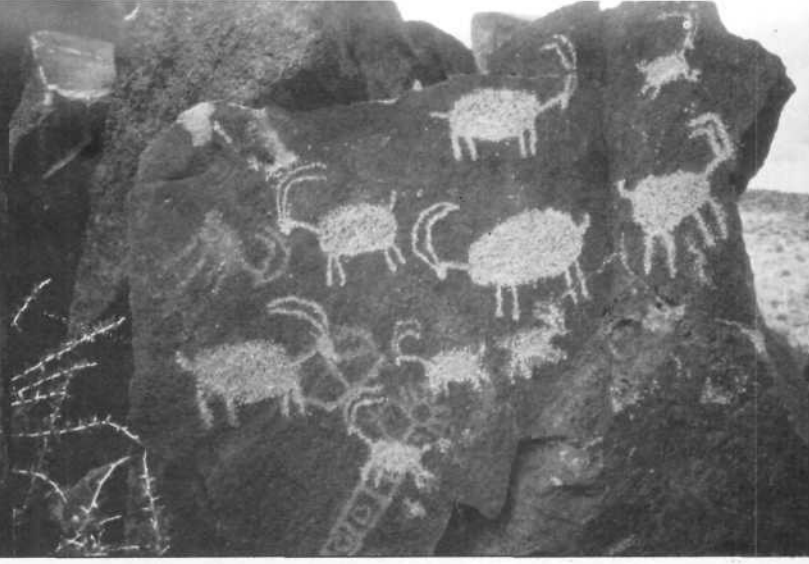
*K.C. Publications, Las Vegas, 1973



Clockwise from top left, mastodon with water marks at feet and figure on back; locator panel directing viewer to climb above this point to something of interest; mastodon spraying water on head, this panel facing the mastodon rock; and across the Colorado from the mastodon, the account of a battle.

WENDELL A. DUFFIELD

A sheep within a sheep could be an attempt to depict pregnancy.



Artistic license even in petroglyphs shows in these unusual rounded sheep.

the hunt in hopeful prayer, or after, in joyful thanksgiving for, or boasting of, success. Or perhaps a young man drew a picture on the occasion of his first hunt, or upon coming of age—or any combination of these events.

The elaborately costumed human figures, abstract shapes and unidentified objects also hint at ritual. We see no domestic scenes, little that could be interpreted as warfare, and very few female figures. This was a world of men, and the sheep hunt.

The picturing of so many sheep, and few of the other game animals that must have been hunted as well, suggests a cult. Sheep, and the successful sheep hunt, may have been the key to success or failure for the people at Coso. This idea is supported by observations of other hunting socieities around the world, where the wary, difficult to catch or highly prized game is pictured and becomes the object of cult worship, while the easy to catch beasts require no magic, and go unrecorded. This would certainly seem appropriate for a people dependent on the wily bighorn.

Another feature of the canyons invites speculation. Some rocks are more favored than others. Two blocks, side by side, appear identical to our eyes, but one is nearly blank, while its neighbor is covered with pictures. Every square inch has been used, and re-used as newer pictures were superimposed over earlier work. Did one rock possess more magic than the other? Did the owner of Rock A have such greater success to record than that of Rock B? Or did the unsuccessful hunter frantically draw picture after picture? Or perhaps everyone flocked to make his mark on a "proven" rock? Or—we can only guess.

It is interesting, though, that the greatest number of petroglyphs at Coso are found in these canyons, which would have been ideal for driving past waiting hunters. It is easy to imagine, as you walk the canyon floor, the poised hunter waiting just around the next bend, weapon in hand. Speared sheep are pictured with the projectile sticking vertically in their backs, hinting that they were attacked from above.

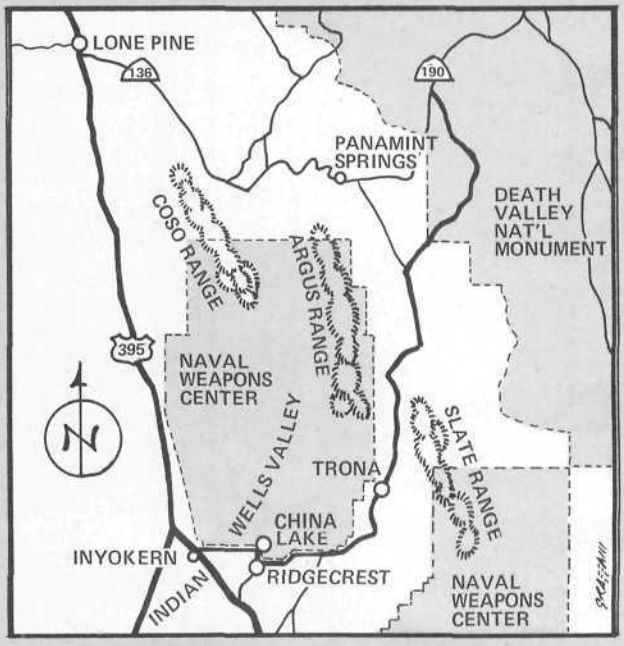
Whatever the meaning of the Coso petroglyphs to the long-ago people who created them, they are a delight to see today, and a wonderful springboard for a lively imagination. In addition to admiring their artistry, there is the fascinating mystery surrounding the people themselves, how they lived, what they thought, and why they carved their pictures on the rocks.

How To Visit Coso Range

The weapons testing program at China Lake means that visits to the petroglyph site must be strictly controlled, and you'll have to plan ahead. If you happen to know an employee of the Naval Weapons Center who will sponsor and escort you, special visits can be arranged. Contact your friend for details.

All other visitors must join a prescheduled, guided tour such as those sponsored by the Maturango Museum. For details, dates, and application forms, contact the Maturango Museum, P.O. Box 1776, Ridgecrest, CA 93555. Tours are scheduled on weekends only, spring and fall. The area is closed completely during July-August and January-February. Tour group size is limited, and groups often fill up well in advance. The museum, incidentally, is open daily, and displays the natural history of the Upper Mojave Desert.

For more expanded reading on the Coso petroglyphs, see *Rock Drawings of the Coso Range* by Campbell Grant, James W. Baird and J. Kenneth Pringle, published by the Maturango Museum.



MARY AUSTIN'S LAND OF LITTLE RAIN

The Country of Lost Borders

An Appreciation by Jon Wesley Sering

If one is inclined to wonder at first how so many dwellers came to be in the loneliest land that ever came out of God's hands, what they do there and why stay, one does not wonder so much after having lived there. None other than this long brown land lays such a hold on the affections. The rainbow hills, the tender bluish mists, the luminous radiance of the spring, have the lotus charm.

Desert is the name it wears upon the maps, but the Indian's is the better word. Desert is a loose term to indicate land that supports no man; whether the land can be bitted and broken to that purpose is not proven. Void of life it never is, however dry the air and villainous the soil.

THUS BEGINS Mary Hunter Austin's now classic work, *The Land of Little Rain.** Written in 1903, it is a book "east away from the Sierras, south from Panamint and Amargosa, east and south many an uncounted mile" of a vast land known to the Indian as the Country of Lost Borders.

Mary Austin, author of approximately 30 books and more than 250 articles, wrote on Indian folklore and anthropology as well as women's rights and the arts. Unquestionably, the most successful and deeply penetrating exposition of her passion for the earth is *The Land of Little Rain.*

Born in Carlinville, Illinois, in 1868, Mary Austin lived a very stormy, intense childhood and youth. Her father, George Hunter, was a learned man whose health had been severely impaired during service in the Civil War. Susanna, Mary's mother, was deeply bothered by the incipient lameness of James, their two-year-old son, and troubled by financial difficulties. The birth of Mary was greeted with bitter resentment.

Mary the child, hurt by the lack of her mother's love, surrogated nature, a substitution which formed the foundation of her perceptions and writings. By the time she was seven years of age, she knew she would be a writer.

Three years later, however, her world turned bleak and barren. Within two months of each other, her younger sister Jennie and her father, both of whom she adored, died. Her only escape was in her enjoyment of books and writing.

The Land of Little Rain is an eloquent series of essays which capture time and lifestyle within the Country of Lost Borders. Austin's essays describe her passion for the natural world and those who chose to inhabit this land on nature's terms. She writes of Seyavi, a Paiute Indian mother and basketmaker who, though blind, still "saw" through the experiences of her memory. She met and wrote of the Pocket Hunter, a prospector who searched for a small body, or pocket, of rich mineral ore. But, it is the way of life, the open free spaces, not the occasional pockets of riches, which tend to shape that man's destiny.

Mary Austin spent hours hiking and riding the desert trails and made copious notes on the plants and animals. Although she was criticized and called "peculiar" by her white neighbors in Independence, California, she had a deep, spiritual tie with the Indian:

This is the sense of the desert hills, that there is room enough and time enough. Trees grow to consummate domes; every plant has its perfect work. Live long enough with an Indian, and he or the wild things will show you a use for everything that grows in these borders.

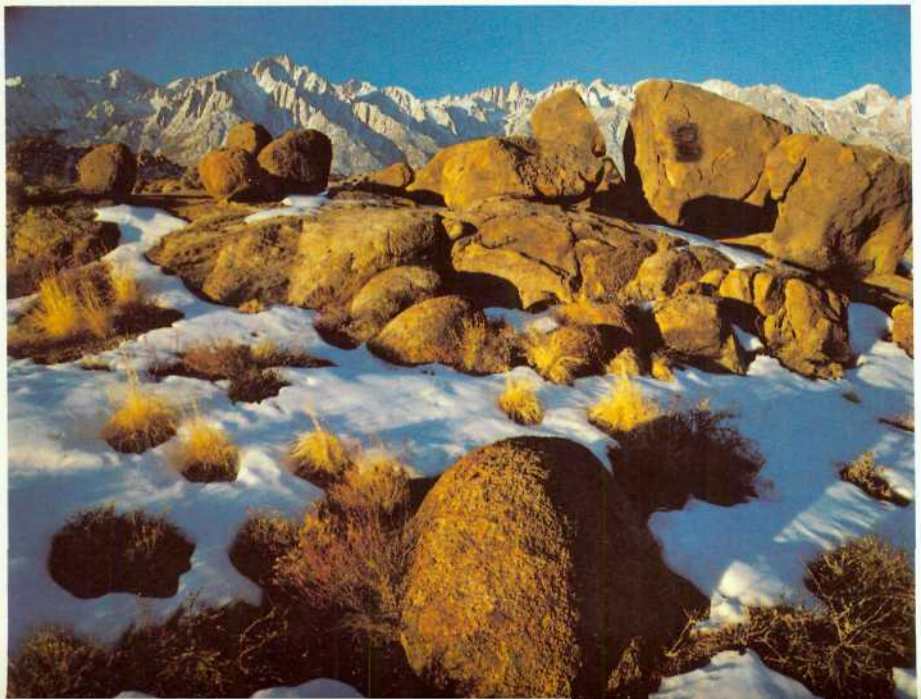
After graduating from Blackburn College with a degree in science at the age of 20, Mary moved west with her mother and 12-year-old brother George. They lived together on land her older brother James owned near Bakersfield, California. Upon arrival, Mary entered a dramatically new environment. Soon, her intense zeal for the exploration and study of it became insatiable. Of her new awareness she wrote:

Out west, the west of the mesas and the unpatented hills, there is more sky than

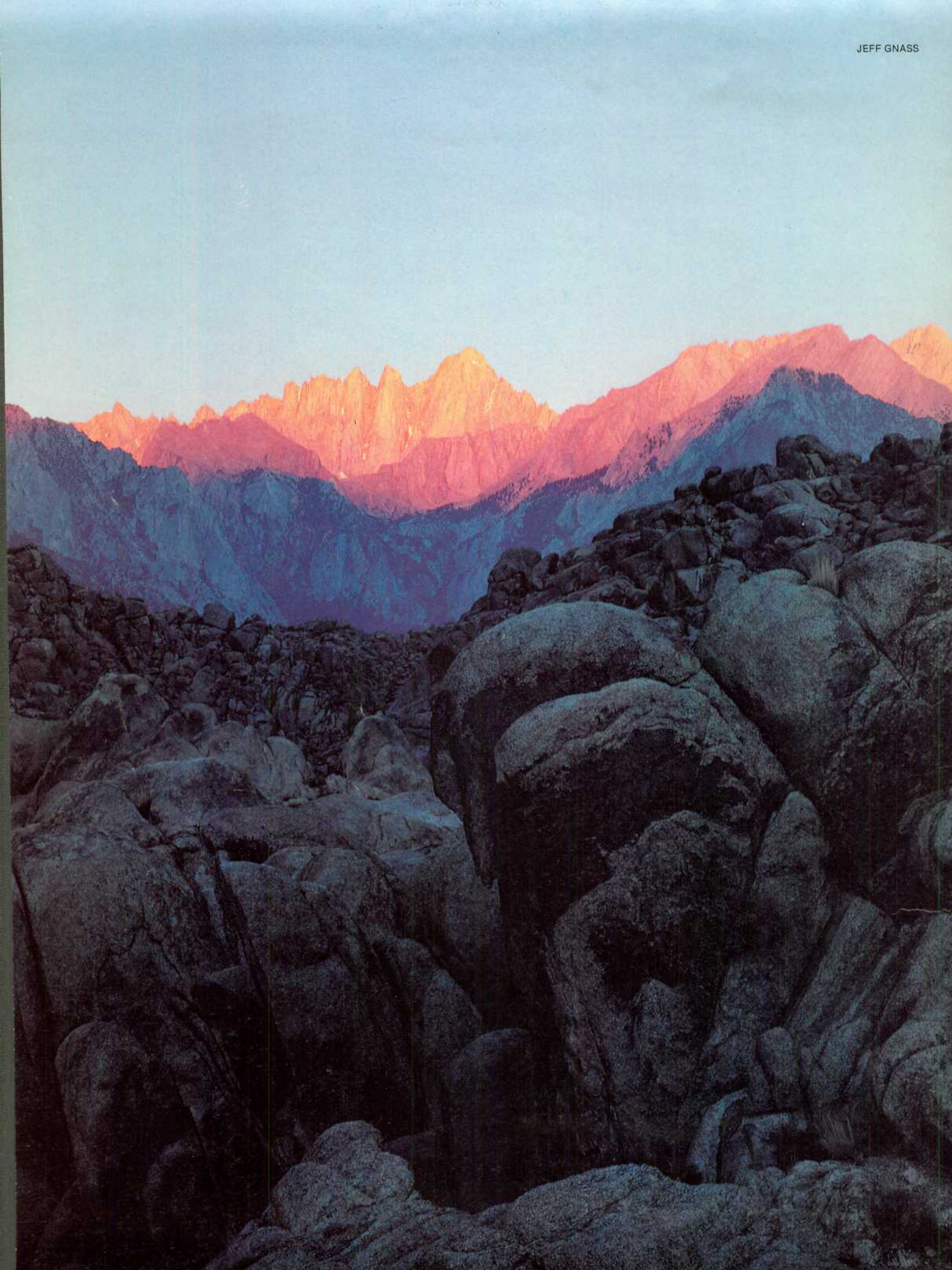
*Houghton Mifflin Co., Boston, 1903; Univ. of New Mexico Press, Albuquerque, 1974.

DAVID MUENCH

DAVID MUENCH



Owens Valley, California (above); Sierra Nevada eastside, California.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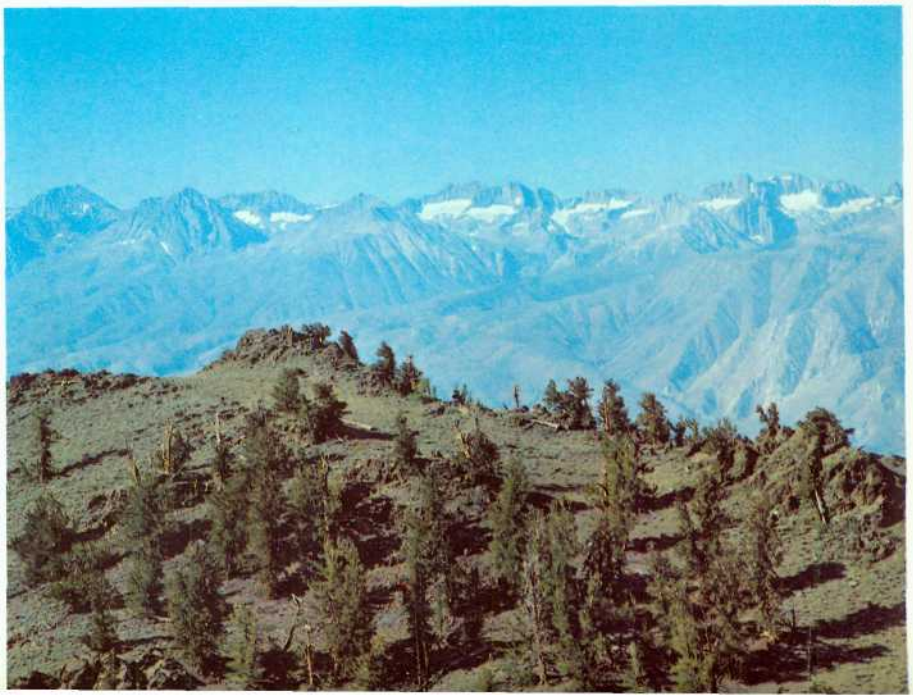

(Previous page) Sunrise, Alabama Hills; (above) Lone Pine Peak from Owens Valley, California; (right) Sierra Nevada crest across Owens Valley from White Mountains, California.

any place in the world. It does not sit flatly on the rim of earth, but begins somewhere out in the space in which the earth is poised, hollows more, and is full of clean winey winds. There are some odors, too, that get into the blood. . . . There is the palpable smell of the bitter dust that comes up from the alkali flats at the end of the dry seasons, and the smell of rain from the wide-mouthed canyons. And last the smell of the salt grass country, which is the beginning of other things that are the end of the mesa trail.

In 1889, Mary Austin began teaching in a Kern County school 10 miles from Bakersfield. Shortly thereafter, she met and married Stafford Wallace Austin. Before their marriage failed, Mary gave birth to a daughter, Ruth, who was mentally retarded. It was during her marriage that Mary Austin moved to the Owens Valley east of the Sierra Nevada. Soon, Mary began recording her mystical and sensitive impressions of the arid landscape, the source for *The Land of Little Rain.*

Of her love of the desert and the night skies she wrote:

For all the toll the desert takes of a man it gives compensations, deep breaths, deep sleep, and the communion of the stars. It is hard to escape the sense of mastery as the stars move in the wide clear heavens to risings and settings unobscured. They look large and near and palpitant, as if they moved on some stately service not needful to declare. Wheeling to their stations in the sky, they make the poor world-fret of no account. Of no account you who lie out there watching, nor the lean coyote that stands off in the scrub from you and howls and howls.

Mary Austin also explored the eastern slope of the Sierra Nevada, the source of the streams which flow into the sandy Owens Valley basin. These stream courses are the "threads" of the "streets of the mountains."

The Owens Valley was Mary Austin's home for 14 years. After publishing *The Land of Little Rain,* three books followed in as many years: *The Basket Woman,* a children's book of Indian stories, *Isidro,* a novel set in early Monterey, California; and *The Flock,* a book about sheep and sheepherders. With the money from the sale of her books, Mary placed her daughter in a private institution and moved to Carmel on the coast of California.

In Carmel she became closely associated with writers such as James Hopper and Jack London, and promising poets like George Sterling. While in Europe for her health, she met H. G. Wells and the young Herbert Hoover. Cured of her illness, she returned to the United States with new confidence and a public following.

For almost 15 years she lived in New York City until, by chance, she met Daniel Trembly MacDougal, a distinguished scientist with the Carnegie Institution of Washington's Department of Botanical Research. MacDougal was in charge of both its Coastal Laboratory in Carmel and its Desert Laboratory in Tucson. In 1919, with MacDougal's encouragement, Mary Austin visited and experienced the Arizona desert. With a surge of excitement from the return to the arid landscape of her love, she wrote a sequel to *The Land of Little Rain* entitled *The Land of Journey's Ending.*

In a pilgrimage to Inscription Rock at El Morro National Monument in New Mexico, Mary Austin strongly identified with the spirit of this massive sandstone monolith. In *The Land of Journey's Ending** she prophesied:

. . . you, of a hundred years from now, if when you visit the Rock, you see the cupped silken wings of the argemone burst and float apart when there is no wind; or if, when all around is still, a sudden stir in the short-leaved pines, or fresh eagle feathers blown upon the shrine, that will be I, making known in such fashion as I may the land's undying quality.

Mary Austin died in her sleep at her home in Santa Fe in 1934. At the summit of Mount Picacho, on the edge of the Sangre de Cristo Mountains, her ashes mingle with the rugged boulders overlooking her Country of Lost Borders. And every spring the strong westerly winds continue to blow toward the El Morro country, to the land of little rain.

. . . you may reach my country and find or not find, as it lieth in you, much that is set down here . . . The earth is no wanton to give up all her best to every comer, but keeps a sweet separate intimacy for each. But if you do not find it all as I write, think me not less dependable nor yourself less clever.

Of all its inhabitants it has the least concern for man.

I like that name the Indians give to the mountain of Lone Pine, and find it pertinent to my subject—Oppapago, The Weeper. It sits eastward and solitary from the lordliest ranks of the Sierras, and above a range of little, old, blunt hills, and has a bowed, grave aspect as of some woman you might have known, looking out across the grassy barrows of her dead.

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*Century Co., London and New York, 1924; AMS Press, 1969.

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THE WALLE-HAWK LIFE TOOL

MODERN CITY man dons backpack, sheath knife and boots after having memorized his survival manual and ventures forth for a weekend in the desert. A collection of gadgets in his pack equip him to snare small game, skin it, cook it with solar heat, wash it down with a sophisticated form of Kool-Aid and ultimately dispose of it in a sanitary one-man landfill.

In reality, the gadgets are seldom, if ever, tested. The survival cycle is snaring canned tuna at the campground store, washing it down with beer and disposing of it behind closed doors. The crisis, if any, centers around the inadequacy of survival gear, or advice, when a sealed metal container separates our hungry, thirsty hero from his sustenance.

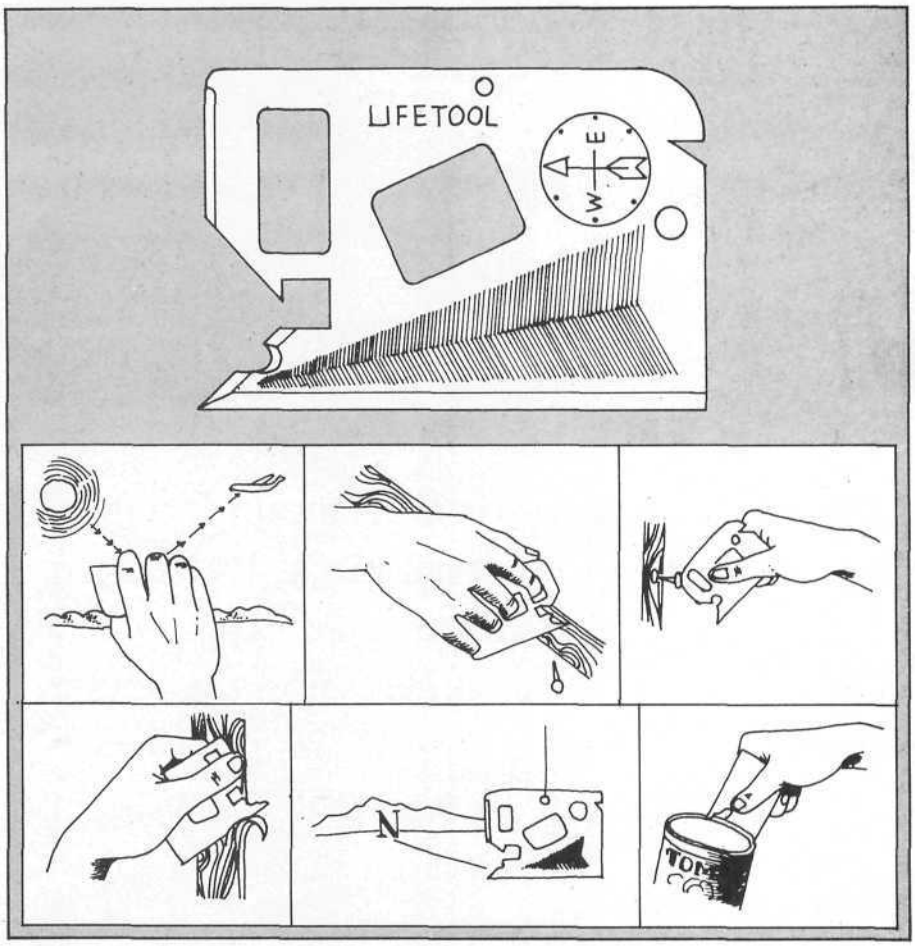
Back at home or at work, money in the form of cash or credit cards is substituted for gadgets, despite the fact that no amount will buy you a new zipper after the five-and-dime store has closed.

What obviously is needed is an all-purpose, pocket-sized tool that will tighten errant screws, open capped bottles, re-contour split fingernails, splice wires, comb hair; in short, cope with any emergency wherever you are.

An approach to filling this need is a 3 1/2- × 2 1/4-inch piece of 440-C stainless steel called by its inventor, one Jessie Morrison, the Walle-Hawk Life Tool.

One side of the tool is highly polished and can serve as a mirror for signalling, lighting fires or personal grooming. There is a cutting edge at the bottom for opening packages, skinning an animal, peeling apples or slicing the tread from old tires to make emergency sandals.

The tool is no thicker than a quarter, so the angled edge of the upper left corner may be used as a screwdriver. Suitable indents and edges are also provided so that the Walle-Hawk can function as a bottle or can opener. Three rectangular holes serve as both finger grips and as wrenches in 3/8, 1/2 and 3/4-inch sizes. Another use for the largest hole is to insert a handle, thus converting the tool into a miniature machete or ax.



The metal is magnetized, so if you hang it from a thin thread, it will align itself with magnetic north and with the aid of the compass dial etched on it, you can tell where you're going or have been.

There is a second cutting surface on the left upper edge, about the width of a small chisel. The lined grooves can be used as a file or for striking matches. Two small holes serve a variety of purposes, among them either straightening or creating fish hooks. The triangular cutout at the upper right edge is for prying nails or staples.

The Walle-Hawk Tool comes in a plastic case with a booklet that pictorially describes many other uses not mentioned here. You ask, why the name Walle-Hawk? According to inventor Morrison, it fits in your wallet and is modern man's counterpart to the tomahawk. Write him at Survival Services, Box 42152, Los Angeles, CA 90042 for futher information.

—Cliff Nyerges

Attention Manufacturers and Marketers: *Desert* Magazine will be glad to evaluate your product for inclusion in this column. We require that it be new, commercially available and of specific interest to our readers. For details, write New Products Editor, *Desert* Magazine, P.O. Box 1318, Palm Desert, CA 92261.

On Advertising:

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Ed Seyfolt

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AEI Timeshare Locations To Suit Your Every Need

Palm Springs is one of the world's most popular resorts. It's where visitors from all over the world come to enjoy a place in the sun. It's an outdoor sports paradise, with a healthy climate and year 'round sunshine.

With the clean desert air and nearby mountains offering a snowcapped view of winter, Palm Springs is certainly Southern California at its best — a beautiful place to visit. And — Surprise! — It's also a wonderful place to visit — year 'round.

Join the growing number of people who've chosen to make the good life in Palm Springs a part of their life. And before getting involved in locating Hotel/Motel accommodations or finding mobile home space in some desert parking lot, look into AEI TIMESHARE VACATIONS in Palm Springs.

...The Palm Springs
AEI
Timeshare Vacation

AEI TIMESHARE VACATION units in Palm Springs is a development that brings you right into the heart of Palm Springs. It's a luxury living complex less than a half mile from downtown.

The units are as luxurious as you might expect luxury accommodations in Palm Springs to be. It's resort living with the comforts of home. Large well constructed totally furnished two-bedroom units in a beautifully landscaped complex complete with three heated swimming pools, three therapeutic pools, two saunas, clubhouse, laundry facilities and covered parking. Golf, tennis and other sports activities are available nearby.

Compare the AEI TIMESHARE VACATION price, the facilities and the location. The ability to "trade" your AEI TIMESHARE VACATION week or weeks through a major international exchange network can allow 'round the world lifetime vacations. The AEI TIMESHARE VACATION program offers more. For now — and for the future.

Reserve Your Vacation Package Now. Reservations Now Being Accepted.

For further information, call AEI TIMESHARE VACATIONS 714-294-9000
or write 591 Camino De La Reina, Ste. 478, San Diego, CA 92108