

ARIZONA HIGHWAYS

FEBRUARY 1983 • \$1.50

SM14253

EXCLUSIVE

Petrified Forest National Park

*An Ancient Land Yields Up Some of Its
Best Kept 200-Million-Year-Old Secrets*

2 Petrified Forest—

Arizona's Other National Park

New scientific findings are proving our park to be a veritable storehouse of treasures from the Dawn Ages.

20 Accentuating the Positive at Petrified Forest

Finding new ways to keep people from loving our forest to death is getting to be a full-time job.

35 Pilgrimage to the Petrified Forest

Photographer/writer James Tallon finds a special world of wonder when he takes family in hand to explore the back country of the Petrified Forest.

40 Forms from the Land—The Art of Allan Houser and Dan Namingha

Two artists, both Native Americans, one a sculptor, the other a painter, what nurtures them, feeds their strengths, sparks their inspiration? Free-lance writer Kay Mayer travels to their homes to find out.

48 Yours Sincerely

Hugh Harelson, *Publisher*
Gary Avey, *Editor*
Wesley Holden, *Managing Editor*
Richard G. Stahl, *Copy Editor*
Gary Bennett, *Art Editor*
Lorna Holmes, *Assistant Art Editor*
Robert J. Farrell, *Assistant Copy Editor*
Shirley Mummaw, *Circulation Manager*
Bruce Babbitt, *Governor of Arizona*

Arizona Department of Transportation

William A. Ordway, *Director*
Thomas R. Lammers, *State Engineer*
Board Members
R. R. "Bob" Evans, *Chairman*, Mesa
Lawrence M. Hecker, *Vice Chairman*, Tucson
John W. McLaughlin, *Member*, Morenci
Lynn Sheppard, *Member*, Globe
Hal Butler, *Member*, Show Low
Ted Valdez Sr., *Member*, Phoenix
Sondra Eisberg, *Member*, Prescott

Arizona Highways Publication No. (ISSN 0004-1521) is published monthly by the Arizona Department of Transportation. POSTMASTER: Send address changes to Arizona Highways, 2039 W. Lewis Ave., Phoenix, AZ 85009. \$15.00 per year in U.S. and possessions; \$18.00 elsewhere; single copies \$1.50 each. \$2.00 each outside U.S. Second Class Postage paid at Phoenix, Arizona, under Act of March 3, 1879. Copyright © 1983 by the Arizona Department of Transportation. Prices subject to change without notice. Allow six weeks for a change of address. Send in the old as well as the new address including ZIP code. Telephone (602) 258-6641. The editors will not be responsible for unsolicited manuscripts, photographs, artwork, or other materials sent for editorial consideration.

(Front cover) The Jasper Forest area of fabulous Petrified Forest National Park, in northeastern Arizona. Once considered worthless, the park today is helping to add a new chapter to the story of the Earth's Dawn Ages. David Muench



(Above, clockwise from top) Among many startling discoveries made recently at Petrified Forest is this fossil of a 45-foot-long Phytosaurus. Beside it, for comparison, is a modern-day alligator. Jeff Kida Mystery is mirrored in this section of a 200-million-year-old petrified log. Josef Muench A sunshaft strikes the exact center of an ancient petroglyph creating a unique solar calendar, another recent discovery at the park. Jack B. Dawson

Where Time Stands Still, But Secrets Still Emerge

Certainly the sight of massive stone tree trunks scattered about an undulating lunar-like landscape stills the tongue. The muted grays and tans encourage silent awe in this vast visual sweep. Cross sections of great shattered columns expose brilliant color bands of crimson, violet, yellows, and blues frozen in crystalline form. The very ground is carpeted with gems of different visual delight. Fragments and chunks of fossilized time betray the subterranean existence of other giants to match the surface leavings.

Here, in Petrified Forest National Park, these clues, now coupled with high technology, are today opening vast new areas for research. The petrified trees (*Araucarioxylon arizonicum*) have pointed the way to other companions such as the gigantic alligator-like *phytosaur*s. Paleontologists, paleobotanists, and other scientists are all sharing in the excitement of discovery. Dozens of hitherto unknown creatures, including one the size of a bus, fuel the search for our past conjunctively with new insights into prehistoric man's role in the area. Among the hundreds of petroglyphs within the park, no fewer than 14 sites have been identified as ancient solar calendars.

Also, from this land of gigantic dimensions come two giants in the world of art... Allan Houser, an Apache, and Dan Namingha, a Hopi-Tewa. International acclaim has come to these two very individual artists who have expressed their heritage in monumental works of art.

The blending of such seemingly diverse elements is not really a paradox in this land of paradoxes but a fulfillment of the Southwest's continually unfolding destiny. So with images and prose as our propelling force, we again invite you to join us in discovering Arizona.

(Inside front cover) Millions of years of erosion in the park's Blue Mesa area continues to reveal astounding artifacts from the late Triassic period of Earth geology. Kathleen Norris Cook

Gary



Getting a new look at Man, Time, and Fossils at
Arizona's other National Park...

by Don Dederer

Spin of Earth, a day. An orbit, a year. To these we relate. A thousand orbits. Our minds rebel. Labor. Falter. Now we try to conceive of a million loops around the Sun. Now *four and a half-thousand million orbits*. Impossible.

It helps not at all to convert the abstraction into 4.5 billion years. Yet this is the span the Creator required to assemble and solidify, deposit and compress, elevate and lower, fracture and erode, irrigate and drain, plant and stock the Earth of this *our* orbit.

Through a glass darkly, Science pursues Truth, although cautioned by the great Einstein: "The real nature of things, that we shall never know—*never*."

Still, there are windows in the world where clues to creation are seen more clearly. Grand Canyon is such a place—an open page of geology—and so is Petrified Forest,

Arizona's other national park. In the past year, *our* orbit, if you will, science has made astounding discoveries within the ancient expanses of the park. New insights into prehistory are on display there for veteran visitor and neophyte tourist alike. Non-experts need not be intimidated by these revelations of the ages. For the scientists, also, in the presence of timeworn creation, are filled with wonder.

text continued on page 11

The ages-old muds, silts, and clays of Blue Mesa, in the Petrified Forest, surrender to forces of wind, water, and temperature. David Muench (Inset) Kachina Point and the Painted Desert Inn. Built in 1924, the structure is now on the National Register of Historic Places. James Tallon









Petrified Forest

A Vast New Storehouse of Ancient Scientific Treasures

(Previous panels, pages 4-5) Russet, mahogany, and ochre vie for prominence in the park's Jasper Forest area, one of the world's largest exposures of the opaque usually reddish form of quartz. **David Muench** (Pages 6-7) The back country of Petrified Forest National Park, seen here from Kachina Point, offers an abundance of curious and beautiful geological structures to the wilderness hiker. **David Muench** (Pages 8-9) Amidst eroded shale beds, a petrified log becomes a dramatic centerpiece. **Kaz Hagiwara** (Left) In majestic park areas similar to this one, scientists are finding fossilized animal skeletons from the Dawn Ages, creating an explosion of knowledge. **David Muench**

text continued from page 3

Shakespeare himself could not have contrived a more bizarre theatrical setting for his banished Bordeaux duke, emoting:

"Sweet are the uses of adversity,
Which, like the toad, ugly and venomous,
Wears yet a precious jewel in his head..."

Today a burnished brass sun radiates from zenith. All around repose the odd-est of hills; blue-gray, bleached, barren as moonscape; textured and spongy underfoot as shag carpet. A lonesome zephyr whispers down a dune, rustling bunch grass and dry shrub. On scimitar wings a raven surveys a fractured ridge. Distant horizons darkly rumble with summer squalls.

"And this our life exempt from public haunt

Finds tongues in trees, books in running brooks,
Sermons in stones, and good in everything."

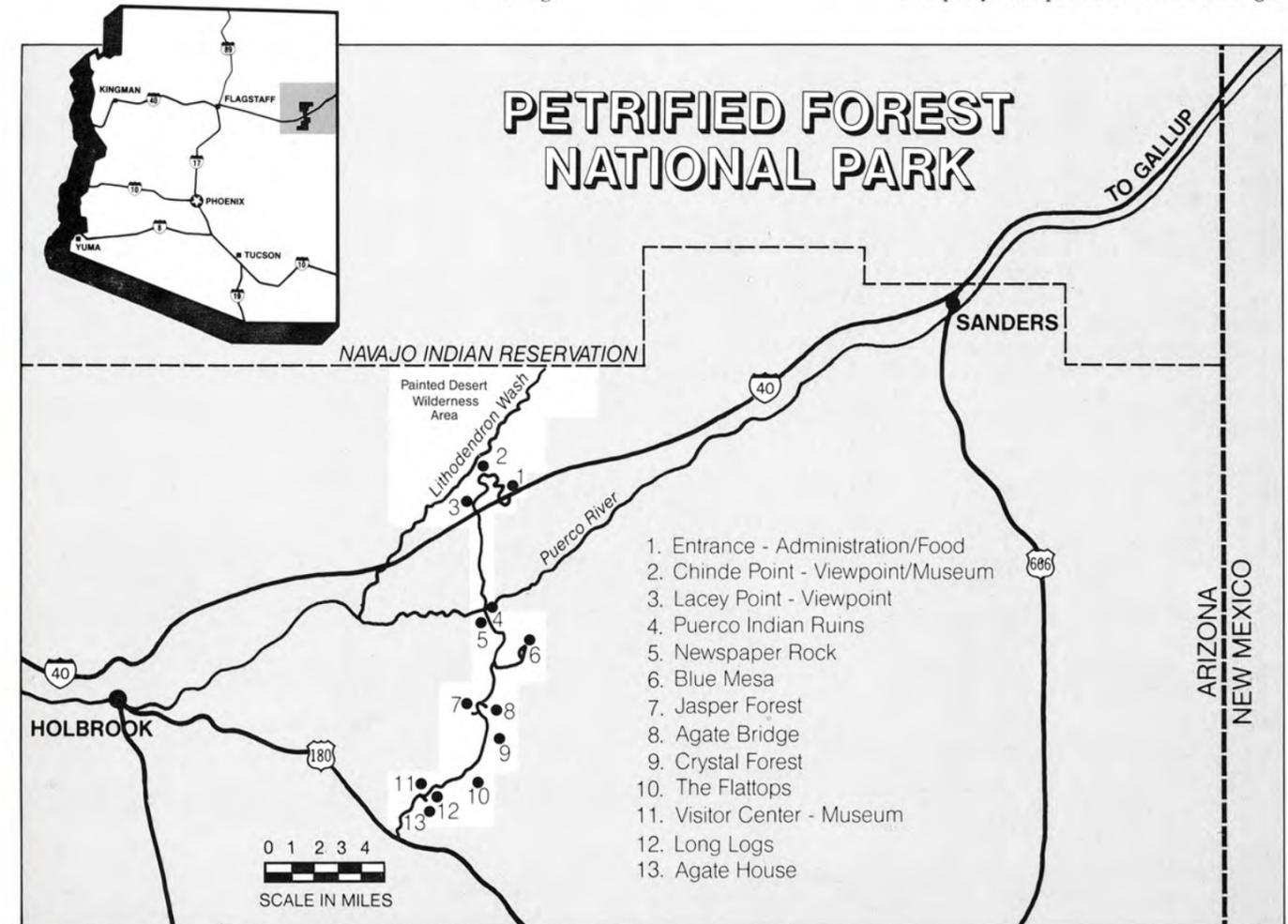
But our hero this day is no make-believe French nobleman, prancing upon the boards of the Old Globe. This man is a real-life modern, striding among the foundations of the Earth. He is a paleontologist. From the University of California, Berkeley. By name, Robert Long.

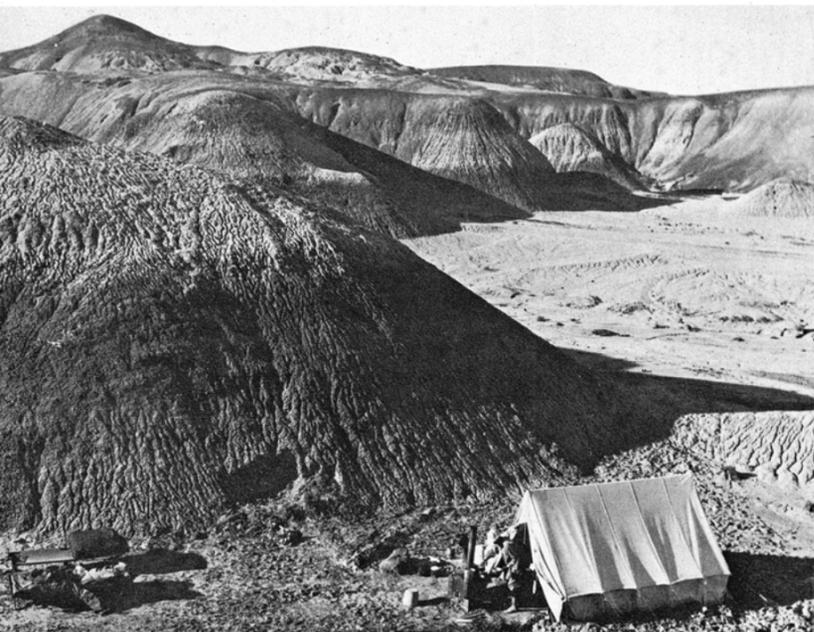
His golden tan—even to eyelids, palms, and armpits—testifies to months outdoors. So, too, his luxurious beard of spun honey, and his bright, shaded eyes. Aches and strains seem to drain from his lean frame as he rises to address a small band of visitors.

"Welcome to the most exciting spot in North America," he says.

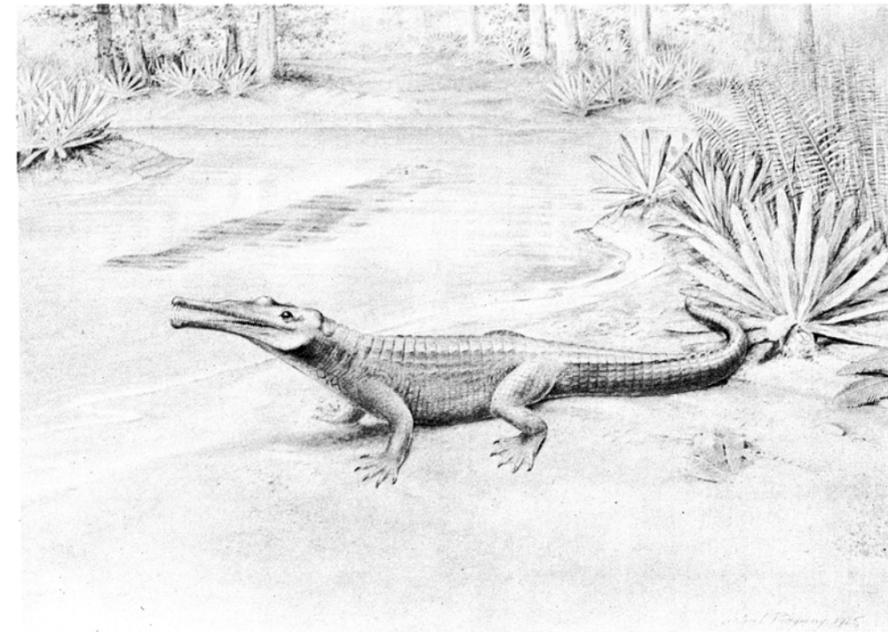
"Here, right beneath your feet, is the richest new source of large vertebrate fossils on the continent."

By training and temperament, Rob Long is not one given to exaggeration. But at the moment his enthusiasm overflows as if his puny rock pick has broken through





In the early decades of this century, scientists first explored the Chinle formation finding many plant fossils but relatively few ancient animal fossils within the Petrified Forest National Park. Dr. Charles L. Camp, a scientist of boundless curiosity and heroic energy, discovered five reptile fossils from the Triassic era in the Petrified Forest. He began his fieldwork in the early 1920s continuing with it nearly every year into the 1930s. (Far left) Dr. Camp's bivouac at his Blue Mesa excavation in 1921. **Dr. Charles L. Camp** (Left) Dr. Camp at Jasper Forest, 1923. **Annie Alexander** (Right) Artist's conception of the Phytosaurus. The fossilized skeleton of this one-ton, 40-foot-long reptile was one of the first discovered by Dr. Camp and motivated him to further explore the Petrified Forest area. **John L. Ridgway**



an eternal barrier into unknown, unpre-
sumed chambers. He points to the ground,
to shallow excavations the size of bathtubs.

"From those holes alone we extracted
three species of animals heretofore
unknown to science. We've been averaging
*one new type of animal for the park every
three days* for the better part of two
months, and I hesitate to guess what the
future will reveal."

Sufficient unto this day:

"So far, our largest discovery is the
fossil of an animal about 45-feet long.
That's as long as a Greyhound. I mean, a
Greyhound *bus*. Probably weighed 10 tons.
In its time, it could have been the largest
animal living on the Earth. It carried armor
like a tank—at least three types of enor-
mous protective bony plates on its tail

and back and belly. I think of this crea-
ture as a great big tin can packed with
2000 pounds of deliciously tempting
stew on the hoof."

Really? As a gigantic *tin can*?

"Yes," smiles Rob Long. "We have also
discovered *the can opener*."

Petrified Forest National Park encom-
passes 93,493 acres of high desert bad-
lands in northeastern Arizona. Nearly a
million motorists annually stop by park
headquarters near Interstate-40, some 25
miles east of Holbrook. Those who tarry
a few hours mostly tour by automobile.
From numerous viewpoints they scan pan-
oramas of the Painted Desert, puzzle among
the ponderous logs and myriad chips of
the world's greatest exposure of petrified

wood, and wonder about the region's mys-
terious prehistoric people.

These casual legions of tourists depart
with only a fleeting glimpse of an extraor-
dinary place. Only one in a thousand—a
backpacker, a naturalist, an intrepid pho-
tographer—will invest the time and energy
to learn the park well. They hike the laby-
rinthine trails, gulp the winey mile-high
air, scrutinize tiny wild flowers, meter the
pulses of the universe in age-old rocks,
communicate with vanished cultures, and
camp on fields of gems mirrored by bejew-
eled heavens.

But now, even these elite students of
Petrified Forest must return. An explo-
sion of knowledge—much revealed only
in the past year or so—is expanding appre-
ciation for a wilderness much more than

simply a forest of petrified trees.

What good is it?—once a prevailing
public attitude—is giving way to a prayer
of gratitude, *Thank God we managed to
save it!*

America almost lost its petrified forest.
Uninhabited, semiarid, remote, harsh,
profitless, the Painted Desert of the vast,
uplifted Colorado Plateau excited few early
champions among Spaniard, Mexican, and
American explorers and settlers. Not until
the mid-1800s did the Petrified Forest earn
mention in official reports to Washington.
Just a century ago were a pair of petrified
tree trunks freighted back to the Smith-
sonian. A trans-Arizona railroad in 1883
brought souvenir hunters, gem seekers,
and commercial jewelers. Logs were blasted
open for quartz, amethyst, and agate. By

the 1890s erection began of a mill, for
crushing the petrified wood into indus-
trial grinding powder.

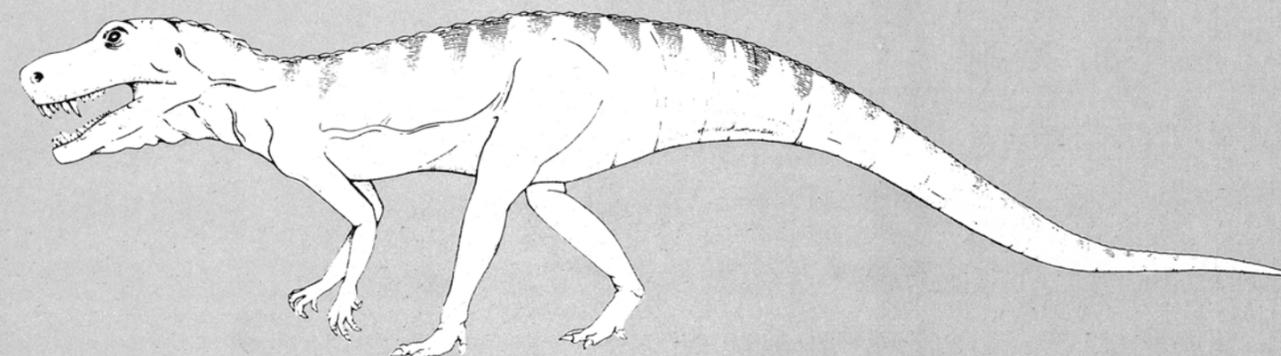
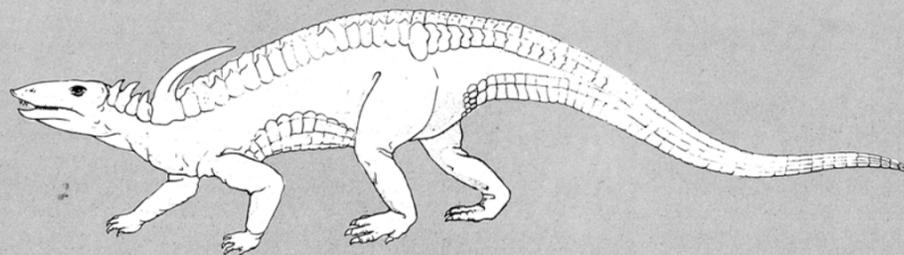
Alarmed citizens of Arizona (still only
a territory) begged Congress to preserve
the Petrified Forest, "that future genera-
tions may enjoy its beauties, and study
one of the most curious... effects of nature's
forces." Ruin and removal went unchecked
until 1906, when President Theodore Roo-
sevelt set aside the area as the country's
second national monument. Petrified For-
est was designated a national park in 1962.

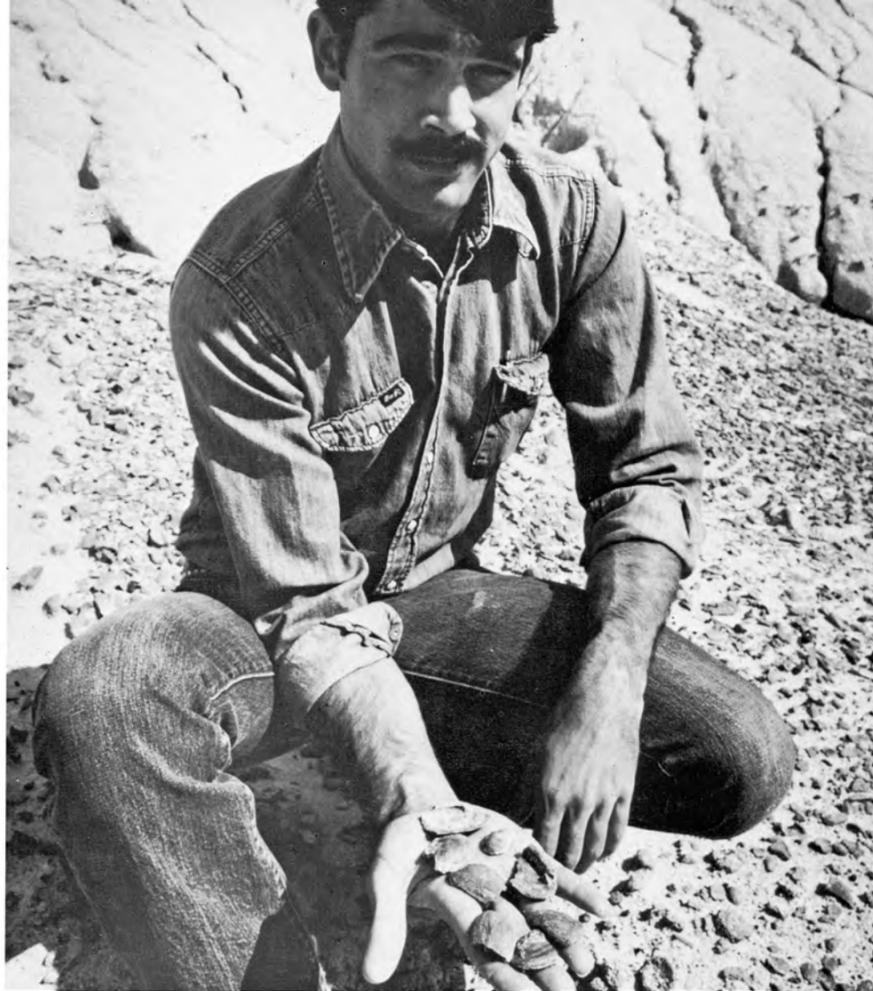
The record of science at the park is as
uneven as the political one. Jules Marcou,
French-Swiss geologist, was the first scien-
tist correctly to describe formations as
Triassic, roughly 200 million years old.
John Muir is said to have discovered one

of the seven major "groves" of petrified
trees in the park. Fifty years ago, a park
naturalist, Myrl V. Walker, recognized
the significance of fossilized plant leaves.
A California paleobotanist, Lyman H.
Daugherty, thereafter cataloged scores of
extinct species of vegetation. Later, another
naturalist, Phillip VanCleave, found the
remains of more previously undescribed
plants in the park. Misses Annie Alexan-
der and Louise Kellogg came across fos-
sils of *phytosaurus*, one-ton sharp-toothed
crocodile-shaped reptiles which must have
dominated Triassic swamps "like a series
of bad dreams."

As an infant science, paleontology was
wracked by internal rivalries and attacked
by external enemies. Pioneer professors
jealously guarded their bones and defended

Enormous reptiles roamed the
Petrified Forest/Painted
Desert 200-million-years
ago. The Lythodynastes,
(far right) a 20-foot-long
carnivore and the 14-foot-
long plant eating Desma-
tosuchus (center) would
dwarf the modern six-foot-
tall human. Artist's con-
ceptions are from fossils
found in the Petrified Forest
during the summers of 1981
and '82. **Pat Lufkin**





(Above) Carl Bowman, park aid, sits amidst a bed of fossilized fresh water clams, near the south end of the forest. Wes Holden

their theories from fortress museums. And when afield in the virgin West (as an associate wrote of E.D. Cope), "Every animal of which we had found traces during the day played with him at night..."

Yet dig by dig, fact by fact, the Earth's grand history fit together. Birth as a planet: 4.5 billion years. Emergence of life: 1.5 billion years. First simple animals: 600 million years. First land plants: 400 million years. First reptiles: 275 million years. First mammals: 160 million years. First human beings: 2 million years.

Probably our oldest stories are those which attempt to explain how the Earth was made. Few cultures of the known past and present lack a version of creation. According to a Babylonian myth, the bodies of dragons became land and sky. A Chinese belief holds that the world began with a cosmic egg, which broke apart; the white of the egg became heaven, the yoke, Earth. A Pima Indian legend tells of Earth Medicine Man kneading a ball of soil from his own skin, and setting the sphere in space. Genesis teaches that "In the beginning, God made Heaven and Earth." and all of their features and creatures.

In the realm of modern science, too, much curiosity focuses upon the origins and processes of the Universe—the mechanics and chemistry of the planets and moons—the structure and dynamics of the Earth. And for science, at least, more understanding of the fundamentals of the Earth's geology has emerged in the past decade than in all the years before.

Most revolutionary are the discoveries of the *Glomar Challenger*, of the international Deep Sea Drilling Project. In voyages to drill in all the ocean bottoms, the little ship has shown:

- Some 200 million years ago all the continents formed a single land mass. At that time, the place we now call Arizona lay near the mouth of the Amazon River.
- Continental plates moved only inches a year, forming new oceans, jamming some land masses into others, and erecting mountains five-miles high.
- India and Australia once were one.
- At least once, Europe and North America rammed into each other (uplifting the Appalachian range), then drifted separate ways. Africa and South America likewise were joined.
- Nor are the enormous forces at rest. Predictably, some day Africa will collide with Southern Europe. The Red

Sea will open into a great ocean. Within 65 million years, Los Angeles, California, will slide past San Francisco and dive into the Aleutian Trench.

In the calendar of eons now generally accepted by science, the Triassic period lasts from 235 million years to 185 million years before the present. Presumably, during the Late Triassic, primordial Arizona occupied a southern warm latitude. The Petrified Forest was an area of low relief near sea level on which many slow-moving rivers flowed. At this time the sea was where California is now.

Among numerous types of plants were large trees similar to pines. Floods may have felled these forests, buried the timber with silt, mud, and ash. Logs were probably also washed in from the mountains, which were where Tucson is today. There were even ferns which looked like small trees, and cycads with small thick beehive-like trunks!

As time wore on, many other geological changes intervened until the land mass rose, and erosion exposed the thousands of petrified trees on view today. In and around Petrified Forest, fossils of plants and animals occur mainly in the Chinle formation of sandstones and mudstones—the colorful and inconsistent horizontal layers which wind and water have sculpted into canyons and mesas and rearranged as dunes and rockpiles. About 60 years ago, to the Chinle was attracted a scientist of heroic energy and boundless curiosity— Charles L. Camp.

SERMONS IN STONES

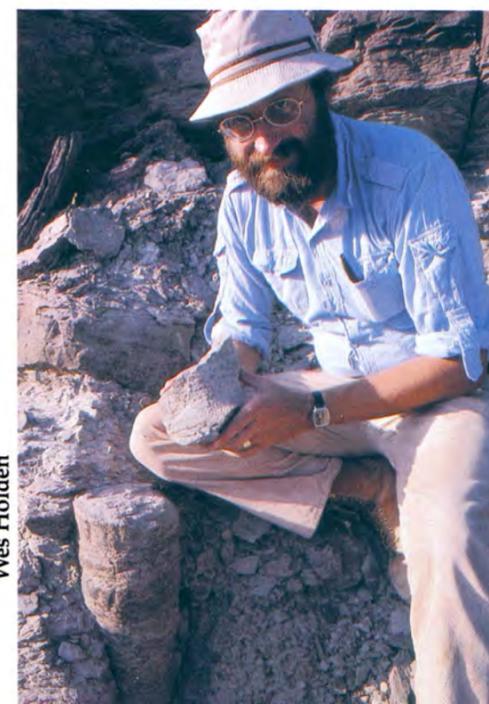
"I knew Dr. Camp personally at Berkeley, at a time when he could have been my grandfather," says Paleontologist Rob Long today.

"Dr. Camp started poking about the Chinle in the early 1920s, and his field work continued nearly every year into the 1930s. And although Camp and his contemporaries found plenty of fossils in the Chinle elsewhere, only five ancient animals were identified within the park. Surprisingly few.

"Still, when our renewed interest centered on the Chinle, we not only had access to Dr. Camp's fossil collections, but also to his original field notes and portfolio of splendid photographs. We were able to draw upon a great deal of work of many other scientists who've explored the Chinle over a four-state region. I say this with humble appreciation for the published findings of fellow scientists. With all of that guiding us, together with Dr. Camp's notebooks, during the summer of 1982, we completed the most extensive paleontological reconnaissance, ever, of Petrified Forest.



Peter Kresan



Wes Holden



Jeff Kida

From numerous formations throughout Petrified Forest, scientists have recovered the fossil remains of some 60 species of Triassic plants. (Far left) Paleontologist Robert Long with a giant fossilized horsetail recently uncovered, still embedded in the soil in which it once grew. It may have reached a height of 45 feet, yet, curiously, it is botanically similar to the living horsetail of today, left.

In the Triassic period, when the high desert of the Petrified Forest/Painted Desert (right) was little more than a huge swamp, the giant metoposaur (below)—one of the largest amphibians of all time—roamed the land. The huge size of its fossilized skull dwarfs the tiny present-day salamander perched on its nose.

Peter Kresan/ Jeff Kida





(Above) In the crowded quarters of the paleontological specimen room of the University of California at Berkeley, Karen Ballew, department assistant, logs in fossilized specimens from digs undertaken during the summers of 1981-82 at Petrified Forest. In the foreground are spines which once projected from the armor plating of a *Desmatosuchus*, a 14-foot-long reptile covered with heavy bony plates, which made it look like an armored crocodile. (Left) Lower jaws, foreground, and skulls of phytosaur *Rutiodon*, the biggest land-dwelling animals of their time. Also found at Petrified Forest, indications are they may have reached a length of 45 feet. An alligator-like creature, its jaws were set with sharp teeth, and the body and tail were protected with heavy bony plates. Capable of movement on land and able to live in water, the phytosaur *Rutiodon* was an efficient predator. Jeff Kida photos



Scientists at the U. of C. at Berkeley and new/old fossils from the Petrified Forest contemplate each other across 200 million years. (Above) Paleontologist Robert Long and assistant Karen Ballew piece together parts of the lower skull of a *Placerias*. The skull parts are contained in a sandbox to protect the delicate fossil pieces. The *Placerias* was a mammal-like creature about the size of today's rhinoceros. It had huge tusks, traveled in herds, and was the largest plant-eating reptile found in the Petrified Forest. Jeff Kida

Among findings of a team of some 11 scientists and assistants:—

- The bus-size reptile. To support its ponderous body, probably it spent most of its life submerged *a la hippopotamus*. It munched on fish, amphibians, and reptiles with six-inch-long teeth. The skull is six-foot long.
- The heavily armored planteater nicknamed "the can."
- The "can opener". A reptile, a primitive dinosaur, resembling the ferocious meat-eating *tyrannosaur*. The newly discovered Petrified Forest predator measured some 20 feet in length, scampered about on short, powerful hind legs. It carried some bony armor, too. Maybe to protect itself from other can openers.
- About two dozen other heretofore unknown park creatures— some new to science. Not yet thoroughly studied, the fossils suggest amphibians and reptiles resembling oversize salamanders

and lizards. Most are not even named. Lab analysis no doubt will yield dozens of scientific papers.

All this, from the Chinle, of which an emeritus fossil expert had written, "The paleontologist who spends his time in Chinle exposures will find fossil fragments by the thousands; his discoveries of complete skeletons will, by contrast, be comparatively rare."

Then what of luck? "Of course we've had good luck," admits Rob Long. "And I don't entirely discount insight. Intuition, if you will. In a single summer, we've filled 1200 sample sacks. We arrived at a degree of understanding in which we *knew*, that if we found *this* and *this* in association, we felt confident we could make significant fossil discoveries. It's a thrilling situation for a field scientist, on falling asleep at night, to be *certain* of finding something new tomorrow."

Echoing such enthusiasm is Dr. John R. Bolt, chairman, department of paleontology, Field Museum of Natural History, Chicago. A world-ranking expert on the reptilian groups which ruled every habitat of Earth for 145 million years, Dr. Bolt is impressed with Petrified Forest's potential for filling in chapters of evolution.

"Relatively speaking, so little has been done," he explains. "And of that, so little published. We found the first dinosaurs in the park this summer. We are always on the alert for insights into the ways that amphibians adapted for living on land, how reptiles branched into beginning forms of birds, why successful creatures like dinosaurs disappeared entirely, and where the earliest forms of mammals may have derived.

"So today we have the park. Much of it

untouched. A mere century ago, our country couldn't imagine a worthwhile use of Petrified Forest. Now it may serve as our clearest window to the distant past. What better argument for reasonable preservation? To keep our options open for the day when we learn more about our world?"

A PRECIOUS JEWEL

John's Hill. The place-name is freshly minted for the point on a map of Petrified Forest where John Bolt's crews excavate. But the otherwise nondescript area was recognized as valuable by a woman: Ann Preston, an artist.

In the same summer of 1982 that the paleontologists were stalking vanished beasts, Mrs. Preston was searching for objects quite different: prehistoric human carving on rocks. And while hiking, she literally stumbled upon the boneyard bonanza at John's Hill.

Ann and her husband, Dr. Robert A. Preston, could afford to share the bone treasures with the fossil hunters. The Prestons believe their own recent discoveries in Petrified Forest partly solve riddles which have confounded several generations of archeologists.

What are New World petroglyphs—those geometric and suggestive symbols pecked into certain convenient rocks? What do the figures mean? Of what purpose? Not everywhere commonplace, petroglyphs seem most apparent in the American Southwest and into Mexico and Central America.

Here's a sampling of opinions (not necessarily ranked in order of logic or importance):

- From a ranking Arizona anthropologist: "Undoubtedly some of them had significance, but certainly the majority may be labeled 'idle scribblings....' Many have no meaning—we would call them 'dawdlings.'"
- From a revered Arizona historian: "Crude representations of men, animals, birds, fishes, and reptiles and of numerous objects real or imaginary... camels, insects, snakes, turtles, and what not. One stone bears on it what might be taken to be a mastodon, a horse, a dog, and a man. Their heads are turned to the east, and this may commemorate the passage of the aborigines."
- The wife of a pioneer Indian trader: "They are very simple, even childish things. Just art in the rough.... Are they a tribal saga? Or were many of them made aimlessly just as we moderns make pictures on a scratch pad while we wait?"

text continued on page 22

Accentuating the Positive at Petrified Forest

How to Keep People from Loving it to Death

by Don Dedera

Adamanasuchus rectori will be the scientific Latin label for one of the newly discovered Triassic creatures.

Adamana is a tiny community near the excavation. Rector is the name of the superintendent of Petrified Forest National Park. Roger Rector cares for a public preserve surrounded by 92 miles of fence. The park is open every day of the year, but has no overnight facilities. While managing a hospitable community complete with firefighting, medical, restaurant, public relations, educational, police, and cavalry (some patrols travel by horseback), Rector wrestles with a dilemma unique to his park:

"How to keep people from loving it to death."

On the one hand, Rangers are the good folks—the cheerful, informative, official hosts and hostesses. On the other, they are the rules keepers—who must dissuade certain guests from packing off with part of the park. For if every visitor departed with a souvenir, the park soon would be picked clean.

One tourist hid a bit of petrified wood in a bikini. Another thief covered the crime with a baby's diaper. Other hiding places: hairdo, garter belt, bean pot, dashboard. All failed. Federal law prohibits removal of even a tiny chip, at pain of a possible fine.

"We'd rather accentuate the positive," says Rector, genial Park Service career officer. "Most citizens want to do what is right."

In opening and interpreting Petrified Forest to the public, Rector is assisted by an innovative and energetic organization, the Petrified Forest Museum Association. Non-profit, directed by a board of local businessmen, the association staffs visitor centers, publishes books and pamphlets, and contributes funds to special projects. Of note in recent times, the association has provided grants for scientific research in the park, has contributed to the auditorium at the main visitor center, and has furthered the restoration of a historic home and hostel, the Painted Desert Inn.

Underway, as this issue of *Arizona Highways* goes to press, are plans to provide visitors with interpretation of the astronomical petroglyphs at Puerco Ruin.

Also, there are plans to return, as soon as analysis and preservation allows, some of the elements of large fossils discovered in the park during 1982. Probably these materials will join exhibits already in place at park headquarters and at the museum at the southern entrance.

As for accommodations, although no overnight facilities are maintained for the public within the park, the wilderness awaits hardy hikers. Several dozen excellent hotels and scores of restaurants are in

Holbrook, on Interstate-40. Holbrook is 25 miles west of the park's northern entrance, and 19 miles west of the park's southern entrance.

The yen to own a petrified keepsake need not be stifled entirely. Petrified wood gathered from private land is offered for sale in concession shops inside the park, and at roadside trading posts along main highways. Cut and polished specimens suitable for bookends sell for \$40 to \$100, but tumbled stones are commercially offered for as little as 25 cents. Some gasoline stations give away tokens of petrified wood as incentives to customers.

The largest producer and seller world-



(Above) Petrified Forest National Park Superintendent Roger Rector and wife Betty. Figuring how to keep people from loving the park to death has become a full time job. (Bottom, left) Don Patton, Patton and Sons, Inc., checks the condition of part of a giant 250-foot petrified tree trunk his firm is removing from land outside the national park. It is the largest petrified tree found to date, anywhere in the world. (Bottom, right) Patton and Sons has mineral rights to huge tracts of land adjoining the Petrified Forest. J. Peter Mortimer photos.

wide and no doubt the oldest area purveyor of petrified wood is just outside the southern entrance of the park. Patton and Sons deals in both rough and polished stone, extracting from a 33,000-acre area. To cover the sometimes vast distances between sites, the company uses aircraft which does double duty acting as an "eye in the sky" for people who wander off the trails in the national park. It was on Patton land, it should be mentioned, that the largest petrified tree found to date was uncovered. The forest giant is estimated at over 250-feet in height.

Ill-gotten park wood does seem to bear a curse of conscience.

A California woman once returned, at great expense, a 47-pound chunk of petrified wood she had stolen from the park. One small piece was returned parcel post from Great Britain. Last year the park received 22 "conscience letters" accompanying 50 pounds of pilfered petrified wood, and \$5 penance to be donated to the Petrified Forest Museum Association. Typical of the letters is one displayed at a park visitor center, "I am a Christian and cannot keep the wood, and remain a Christian." □



text continued from page 19

Did some romantic Don Juan carve his love-lorn thoughts on a rocky page while he waited for his dusky sweetheart?"

—A Phoenix Chamber of Commerce press release: "Many of them are similar to old Egyptian and other symbols with serpent and geometric designs predominating. . . Scientists estimate there are between 50,000 and 100,000 petroglyphs in Arizona."

—A famous amateur (perhaps imaginative) archeologist: "The symbols were not the work of Indians. Ten thousand years ago, highly developed humans explored and charted the entire North American continent. Identical symbols can be found on the coasts of Mexico, on the Aleutian Islands, and on the banks of the Salt River, south of Phoenix."

In unusual concentrations, rock pictures occur in Petrified Forest, occupied by human cultures by A.D. 300 or even earlier. Within the park, the pictures typically are chiseled into the patina, or desert

varnish, of sandstone cliffs and boulders.

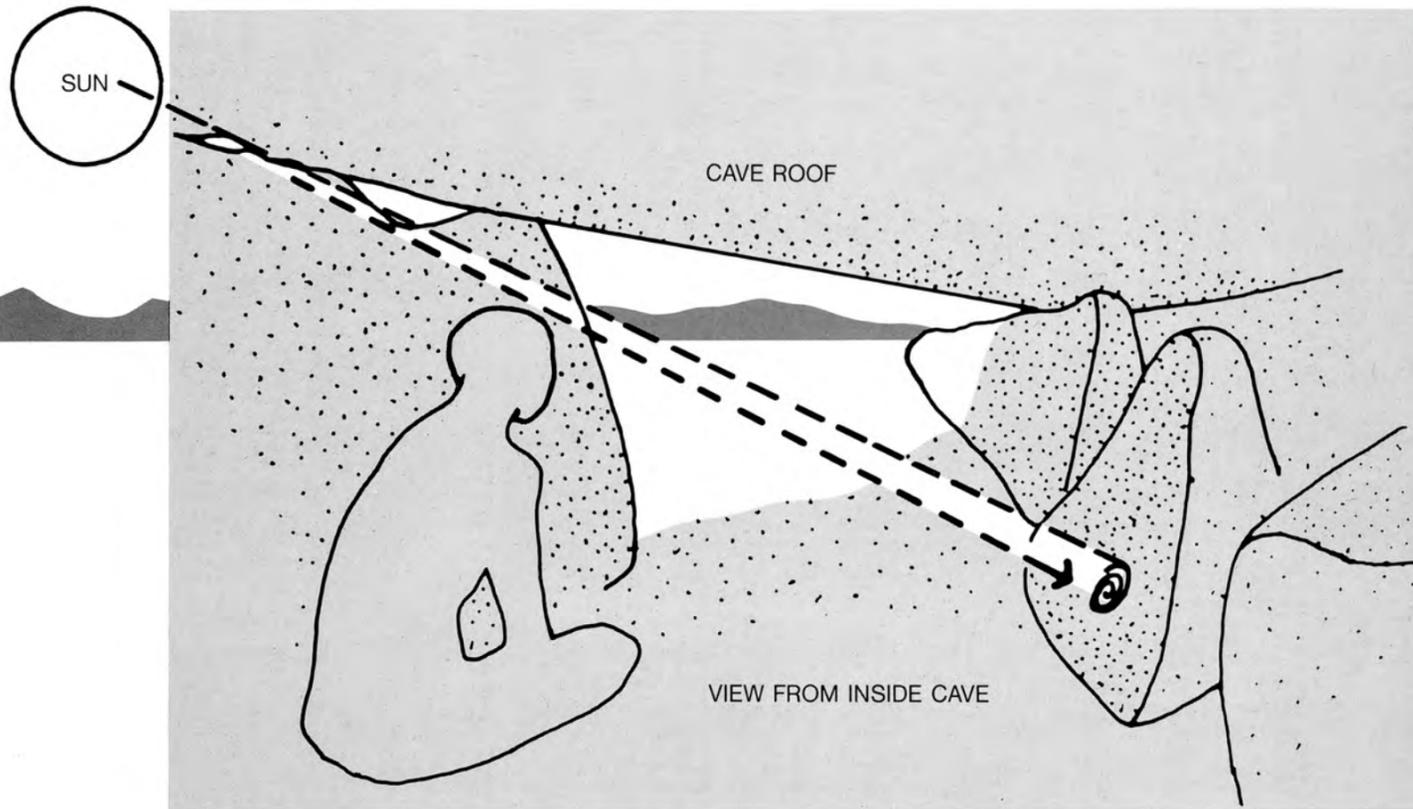
Here, as elsewhere, speculation is free—and rife. To some observers, some symbols suggest suns and moons, river systems and farm maps, lizards and humanoid stick figures, slices of pie and games of tic-tac-toe. Self-appointed translators have ascribed to the petroglyphs religious significance, sexual meanings, and property titles.

Not so, the Prestons. Ann brought to the project a refined sense of three-dimensional art; Dr. Preston is an astronomer and supervisor of an astronomical measurements group at the Jet Propulsion Laboratory (CalTech and NASA) at Pasadena, California. As a disciplined scientific inquiry for the better part of a year, the Prestons packed instruments and cameras to a score of petroglyph sites. MIT-trained, Dr. Preston is more accustomed to computer language, and space probes to the planets, and to the complex control panels of gigantic radio telescopes which study the mysteries of quasars billions of light-years distant from Earth.



Not far from the Puerco River, Dr. Robert Preston, a research scientist, sights from a petroglyph along the sheer cliff face and through a tall thin crevice in the rock, perhaps 25 feet away. As the sun rises during vernal and autumnal equinoxes (and only then) it will shine through the bottom of that crack as shown in the following photo. Ann L. Preston/Robert A. Preston

On a large flat rock face, in the central area of the park, this similar equinox sighting mechanism has performed its twice-a-year feat for perhaps 800 years or more. Ann L. Preston



THE "CAVE OF LIFE" SOLAR CALENDAR AT WORK

Rays from the afternoon sun, 45 days, or one-eighth of a year, before winter solstice, shine through a crack in the boulders to illuminate a spiral petroglyph. The dagger-like light then moves further into the cave, as the sun lowers, passing through several other symbols. It finally comes to rest in a large cross-shaped glyph. (Photos pgs. 24-25.) It is believed to have been the Anasazi who migrated through this area and

left these petroglyphs. Interestingly, one-eighth of a year before winter solstice is the approximate beginning for the Wuwuchim Ceremony of the Hopi which denotes the beginning of creation and the germination of all life on earth—plant, animal, and man.

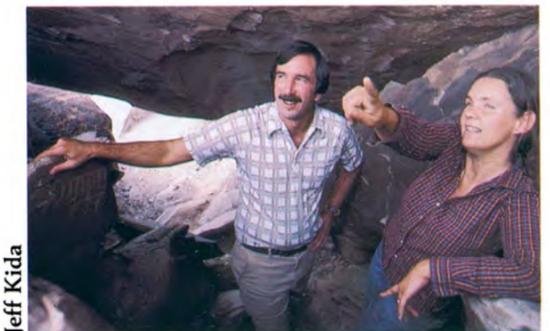
Illustration by Ann L. Preston



Kathleen Norris Cook



Wes Holden



Jeff Kida

(Left) An inside-looking-out view from the "Cave of Life" shows how the sun slips between cracks in the boulders. The photo (top) is from the outside-looking-in. The setting sun focuses directly upon the cross-shaped petroglyph at center of photo. During their months of study, Robert and Ann Preston (above) have identified a total of 14 such "solar calendar" alignment sites within the Petrified Forest.

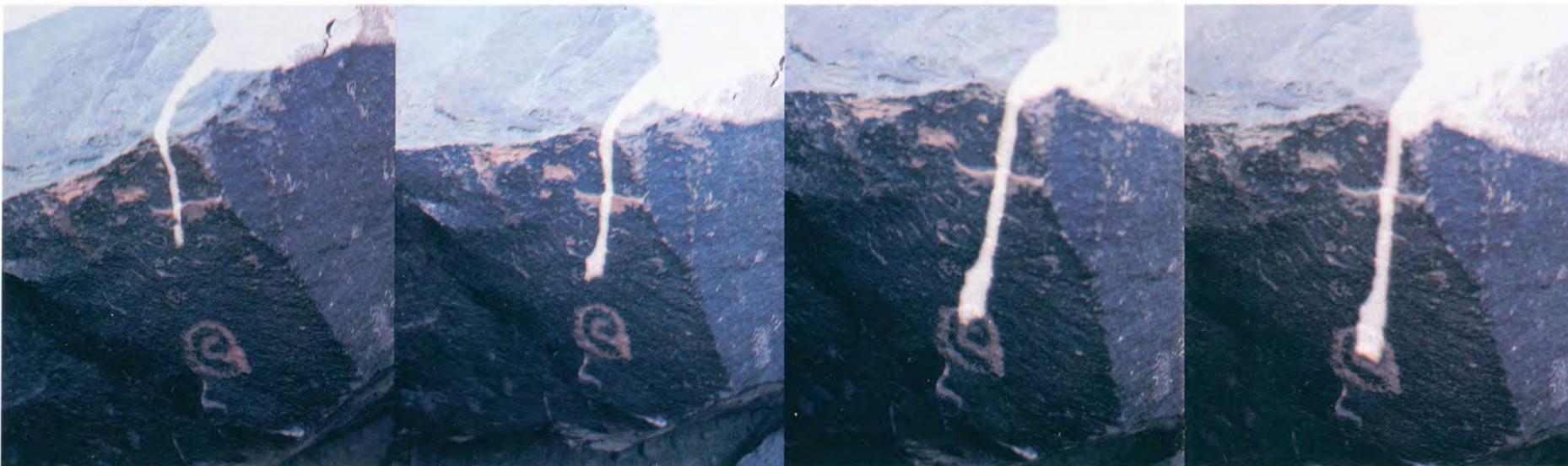


One-eighth of a year from winter solstice, sunlight filters through cracks in the "Cave of Life" wall and falls on a spiral petroglyph inside the cave. As the sun sinks toward the horizon, the "light-dagger" becomes bright orange, progresses

from left to right through several abstract symbols, and disappears at the center of this large cross at the moment of sunset. In this same cave, at spring and fall equinoxes, sunlight passes through the entrance and falls on a petroglyph covered

rock, far right. At the moment of sunset, the shadow from the entrance roof is perfectly tangent to a circle/spiral glyph. Winter and summer solstices are similarly marked in the cave.

Jack B. Dawson/Robert A. Preston



During the period of summer solstice, a sunlit image "flows" down the rock face of an ancient solar almanac like a viscous white liquid and intersects the center of a small four-inch diameter spiral

petroglyph. The sequence shown spans about 15 minutes. On the Hopi mesas, 75 miles northwest, summer solstice signals the beginning of the Niman Katsina Ceremony, commonly called the

Home Dance. Perhaps for the ancient Anasazi, like today's Hopi, the summer solstice signaled a time for religious observation. This ancient calendar will be on public display this summer at Puerco Ruins.

Ann L. Preston



At dawn on the day of the summer solstice, a pointed shadow retracts, from left to right, on a remote rock face in the southern end of Petrified Forest, allowing a vertical shadow to pierce the center of a

giant 20-inch spiral "calendar" petroglyph. The sequence shown here requires about 10 minutes.

Jack B. Dawson

"Ann and I experienced a sense of communication with the prehistoric peoples of Petrified Forest," Dr. Preston says. "We were obliged to walk, even climb, to the sites. We camped out, timing our schedule with astronomical events—and when you do that, of course, you can't travel at your own convenience, and you don't dare to be late."

The Prestons concentrated their observations, measurements, and recordings on the behavior of sunlight and shadow interacting with spiral, circular, and other petroglyphs.

"What we see simply could not happen by chance," Dr. Preston insists. "We know that the sun's position relative to Earth has not greatly changed, that what we see is what these people were seeing a thousand years ago. By now, at 14 sites in the Petrified Forest and at four more sites spread throughout Arizona, involving 60 petroglyphs, we have observed 100 functions for four major solar positions. These people—in the least—were noting with great precision the winter solstice and summer solstice, and the spring equinox and fall equinox. They could thereby neatly divide their year into four. And there is evidence they also marked one-eighth of a year from winter solstice."

The action of sun shafts and shadow lines is quickened and dramatized in time-lapse still photography. Light images are caught on film, darting and disappearing into exact centers of spiral petroglyphs. In other instances, streaks of sunlight intersect the outer rings of rock symbols. Shadows also appear to interplay with the petroglyphs. Other rock art seems related to the positions of the sun in geological features of the horizon. In an extreme case, the Prestons ascribe no less than seven solar functions to one petroglyph inside a "cave" of Petrified Forest National Park.

Says Ann Preston, "Perhaps it seems surprising that a culture which had to struggle for survival would sacrifice time for this elegant form of art. But of course measuring time of year was not an entirely unpractical pursuit for a subsistence-level farming community."

Adds her husband, "When you watch a spectacular solar interaction with a petroglyph, you can't help but feel awestruck. These places were very special to people a long time ago, yet they've stood abandoned and forgotten for a thousand years. It's a moving feeling to be the first persons again to see these devices work."

"We've restricted our inquiries to the observable astronomy. How these calendar stones were used is open to speculation. For us, for now, it's enough to know that a solar almanac existed. The intriguing questions remain, whether the profusion



As the planet Venus rises, photographer Jack Dawson prepares his movie camera equipment in the pre-dawn glow to film the sequence shown at the bottom of the page. Roger Barclay

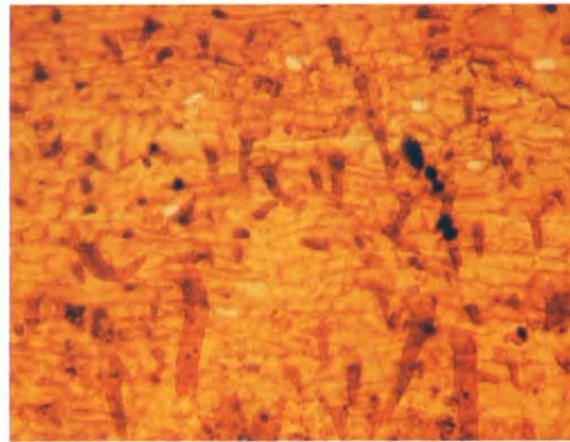
of rock symbols also might be related to movements of the moon, planets, and stars."

Sad to say, the petroglyphs of the American Southwest may not survive long enough for scientists of this and future generations to unravel the meanings. Vandals and collectors have obliterated and removed scandalous numbers of petroglyphs for the silliest of reasons. Off-road cyclists have ruined forever intaglios (gigantic figures on the desert surface) along the Colorado River. With crowbars, winches, and dynamite, thieves have hauled away entire grottos of rock art. Alas, "fools' names" have been added to the prehistoric petroglyphs of Petrified Forest National Park.

"There are at least two reasons the petroglyphs should be preserved," says Dr. Preston.

"First, it is possible that the true meanings of the figures are just now coming to light, and what a fascinating story they may tell about the people who created them.

"And they represent valuable recreational resources. If they can be interpreted and exhibited to the public, the petroglyph sites could become major attractions. Municipalities, states, and the federal government should see that the sites are saved."



(Above) A photomicrographic view of the wood of the tree *Araucarioxylon arizonicum*, the popular petrified tree. (Top, right) A spore and four pollen grains, and (right) the cuticle of a leaf of a fossil spiny plant *Dinophyton spinosus*. The microscopic study of these fossilized plants is giving science clues to what the climate and geological processes of the Petrified Forest were 200 million years ago. **S.R. Ash photos** (Below) Black Forest Petrified Bridge. Most of the trees of the Petrified Forest are cone-bearing conifers related to the genus *Araucaria*, which today still thrives in parts of South America, Australia, New Zealand, and several small islands in the southern hemisphere. **Peter Bloomer**



TONGUES IN TREES

But for the big logs, no park would be today. And rightly so. One enormous forest of petrified trees along the 28-mile scenic drive is converted almost entirely to jasper. Many trunks of the Long Logs Forest exceed 100 feet in length. Crystal Forest is named for semiprecious gems; in Black Forest, the wood is displaced by dusky minerals. Logs bridge gulleys, teeter as balanced rocks on hilltops, and retain their petrified roots. Agate Bridge, a 100-foot-long log spanning a 40-foot-deep wash, is where Tom Paine, a Hashknife cowboy, won a \$10 bet by riding his horse across in 1886.

Scientists agree that most of the big trees were of a cone-bearing species akin to the *Araucarias*, conifers which today thrive naturally in South America, Australia, and elsewhere in the southern hemisphere. (Note the biological connection to Brazil.) Specimens of logs of petrified *Araucarioxylon arizonicum* in the park tape seven feet in diameter. Nearly all large logs are broken into sections, as if "cut to fireplace length." Geologists attribute the rather uniform sectioning to cracks imparted by earthquakes, when the brittle petrified trees were deeply buried for millions of years.

All that said, the big trees may prove less important scientifically than Petrified Forest miniatures.

"Thinking small," says Dr. Sidney R. Ash, chairman of the department of geology and geography at Weber State College, Ogden, Utah. "The things we study today with powerful microscopes can tell us more about the plants and the climate processes than the petrified logs ever can."

Clearly, "thinking small" is catching on in a variety of disciplines. Micro-analysis of minute fossils today helps geologists find oil. At Koster, an extraordinary archeological site on the Illinois River, graduate students use water and chemicals to float and sort tiny seeds, teeth, and bones as clues to prehistoric human diets. In California, kitchen middens are sifted for pollen and other microscopic evidence of past millenniums' climate. At the La Brea Tar Pits in Los Angeles, the emphasis today is not on the dramatic saber-toothed tigers and outsized sloths but on skeletons of fruit flies and backbones of mice. In Alaska, tissue frozen for centuries proves that prehistoric Eskimos suffered from "black lung disease," likely a result of breathing fumes of whale oil lamps.

In Petrified Forest National Park some 60 species of plants have been identified. However, every time Sid Ash collects in the park he finds at least one new species. Undoubtedly there are many other spe-



cies there that have not yet been discovered.

Some of the fossils present natural works of exquisite art—entire fern fronds, just a few inches long, complete in every detail of structure including cells, tiny reproductive structures, spines, and hairs. In some instances, remnants are compressed like coal; others are imprinted into rocks. Still more are petrified. And some plant components—such as pollen and spores, and even the epidermis of certain leaves—persist in original unchanged form. A waxy substance called *cutin*, found on some of the leaves, endures unaltered within these 200-million-year-old rocks. Some of the fossils even show evidence of attack by ancient insects. For example, the fern fronds in the park have been nibbled on by insects and some of the large logs contain burrows made by wood-boring insects of some type.

Dr. Ash has been marching up and down the Chinle strata most of his adult life; he ranks as a world authority on plants of the Triassic period, and he has also worked on plants of this age in Australia and Mexico. Of Petrified Forest, he says:

"How fortunate we are to have it! Not just for ourselves but for future Earth scientists as well! Relatives of nearly all kinds of plants living today are represented in the ancient record here. That record also includes the remains of some plants which cannot be related to any modern plant groups—for example *Dinophyton*, and who knows—maybe that abominable mystery—where did the flowering plants come from?—maybe solved in Petrified Forest."

Sixty species of fossilized plants have been identified in the Petrified Forest. Above, entire fern fronds, millions of years old, are imprinted into rocks. **Jeff Kida**

BOOKS IN RUNNING BROOKS

Fact One: Today no spring of water flows anywhere in Petrified Forest.

Fact Two: More than 300 sites of prehistoric human occupation are documented within the park.

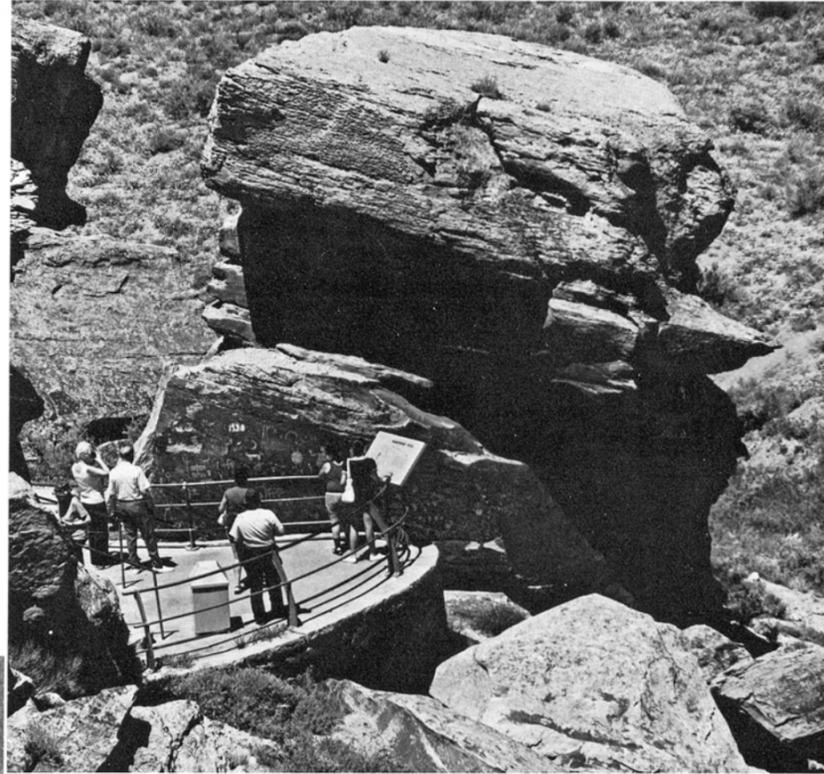
Conclusion One: People of long ago had no need of water. (Unthinkable, although they certainly got along with less than we.)

Conclusion Two: During the past thousand years, for reasons not yet clear, life-supporting springs and dependable streams ceased flowing. (A better bet.)

That geological formations favorable for water existed in the past (and seem suitable today) is generally accepted. Debatable is: What went wrong? The smallest of the Petrified Forest dwellings might shelter a single family. The largest, Puerco, contained 76 rectangular rooms organized on a mesa, enclosing a plaza. Some edifices of masonry apparently were of ceremonial use. And then there are the profusive petroglyphs of enigmatic geometry, but also of realistic cougars and toads and antelopes. In nearby Grand Canyon, scientists are still puzzling over a petroglyph

The story of ancient man in the Petrified Forest covers a span of 1500 years. He made his home here and farmed the valley soils. Evidence of his culture can be seen today at petroglyph sites like Newspaper Rock (right and below).

Herb and Dorothy McLaughlin



unmistakably of a mammoth, a North American elephant known to be extinct for 10,000 years!

Yet, when Spaniards explored the region of Petrified Forest in the mid-1500s, this neighborhood was uninhabited. A myth of Hopi Indians mentioned the badlands as a place of racial origin. Far-off Utes offered another legend—the petrified logs were the broken arrow shafts of their thunder god, *Shinuav*. Nomadic Navajos believed the stone trees to be the bones of *Yietso*, a gigantic monster slain by ancestral Navajos.

Through the prism of archeology, more scholarly chronicles take shape. Some Petrified Forest ruins were populated as early as A.D. 300. During later centuries subsistence changed from hunting and gathering, to methodical agriculture. During periods of abundant rainfall, early people may have prospered as scattered suburbanites, living in small dwelling units off the fat of the land: plentiful game, wild grains, cactus fruits, greens.

But during periods of prolonged drought — documented in surrounding archeological ruins and prehistoric sites throughout the Southwest—people of Petrified Forest farmed river terraces, alluvial fans, and sand dunes. They stored large amounts of food to ward off famine; they pooled resources in larger villages near the most dependable streams. Marine shells, coral,

and exotic pottery unearthed in Petrified Forest sites suggest extensive travel and a trading network reaching to the Pacific Ocean or Gulf of California. Capable potters in their own right, these plateau peoples may have exploited an obvious resource for barter. Scarcely any material in nature produces more handsome, keen, and durable stone tools and weapons than petrified wood.

At partially excavated sites such as the Flattops, Twin Butte, and Puerco, and at museums maintained by the Park Service, current passengers of Spaceship Earth may ponder upon the crafts and debris of a civilization which, for all of its ability to hew to the natural world, could not cope with gross environmental decline. One scientific supposition holds that intensive cultivation of crops such as corn, beans, and squash ultimately contributed to the loss of topsoil, which in turn, lessened the ability of the land to store water for permanent springs.

Be that as it may, by A.D. 1400, long before the arrival of the first Europeans, the people were gone. No human called Petrified Forest home.

In recognition of the importance of Petrified Forest's prehistoric record, the Park Service recently completed *An Archaeological Overview of Petrified Forest National Park* (Yvonne G. Stewart). A

revised management plan notes that:

"Prehistoric resources in the park are extensive, comprising over 300 recorded sites, including pit-houses, campsites, and multiroom pueblos, some of which were constructed from colorful petrified wood blocks. Evidence indicates that numerous unrecorded cultural sites exist throughout the park...."

"A few of the over 300 locations have been excavated, and the remaining archeological sites form a regionally significant *data bank* of future scientific information. The park was initially inhabited by sedentary farmers who entered its present area from southern origins during the early Christian centuries. These people are significant because they were among the first farmers in the northern Arizona region. Later, more developed agriculturalists from northern and western origins settled in the park area. After A.D. 1100, they built a number of villages, including Puerco and Agate House.

"The central plains of the park contain evidence of a wide variety of human travel through this region in the American Southwest, which culminated in today's Interstate highway 40 and the Santa Fe Railroad. The route of the east-west Beale Camel Trail—also known as the Whipple Route and the Prescott and Santa Fe Mail Route—can still be seen crossing the park."

Over 300 ruins are scattered throughout the park. Puerco Ruin (right), near the intersection of the park road and the Puerco River, is the remains of a large masonry pueblo consisting of about 75 rooms arranged around a plaza.

Herb and Dorothy McLaughlin

The pueblo, thought to have been two stories high, included a kiva (below), used for religious ceremonies.

Wes Holden





GOOD IN EVERYTHING

My backpack is small and light...not much more than a square of plastic, a bedroll, dried foods. No weapon or heavy tool is worthwhile. Better a canteen and spare vessel of water. A knife. A camera. A map. A kit for light housekeeping. Comfortable clothing. A hat. Top quality hiking shoes.

At no additional cost, I've obtained a permit from a Park Ranger. Parked my car at a designated trailhead. And set off into one of two Petrified Forest wilderness areas. For most seasons the weather is bearable, even benign, windy but seldom wet, warm to hot by day, but cool to cold at night. The country is open, devoid of confusing vegetation, blazed by heavenly markers. The few poisonous creatures are nonaggressive. Delightful campsites beckon everywhere—a cozy cove sheltered from wind, an overhanging rock to roof off a summer shower, a warm sandy arroyo shaded by thrifty shrubs.

And, odds are—I'm alone.

Of the near-million people annually who pass through Petrified Forest, fewer than a thousand get away from the pavement. That averages but several hikers per day for the 43,000 acres of the Painted Desert wilderness and the 7000 acres of Rain-

bow Forest wilderness. Not that backcountry adventure is discouraged. To the contrary, Park Rangers recommend it. Favorite visitors of a few seasons ago were a newly married couple who spent their honeymoon for five days in a setting where "sweet are the uses of adversity."

To each hiker, a plateau wildness mingles surprise and serendipity. A herd of pronghorns spilling down a rippled dune. A covey of quail exploding from a sagebrush plain. In spring the perennial grasses revive; if given rain, the summer flowers fill eyes and nose with salmon mallow, indigo lupine, and golden daisy; autumn deluge intensifies earthen hues; it may happen in winter that a dusting of snow flocks the cap rocks and frames the fields of stoney wood.

On any clear night, black as velvet, in the high, dry air, stars ignite as nowhere else: brilliant ice blue, dull amber, glinting green. Jupiter serves as evening star, Mars darts toward Antares, and a hunk of space junk tumbles 20,000 miles per hour off to Albuquerque. Meteors flash. A sliver of moon peeks over a monolith. A moment, abed, on the ground, for wondering.

- Some of the light falling on Earth tonight began its journey across the universe 200 million years ago, when "thunder lizards" lumbered through my campground.

(Left) In the Petrified Forest, modern man can walk leisurely back in time, particularly when he visits such places as Agate House (right). This partly restored ruin, circa A.D. 1100, is made of blocks of petrified wood held together with adobe mortar.

J. Peter Mortimer/Kathleen Norris Cook

- This ageless sand beneath my head—does it guard the secret of the *angiosperms*, which with a blossom conquered the Earth? And, why did so many groups of plants, which were once so successful, die out, only to be replaced by others?

- Which came first—the reptile or the egg? (The hen arrived much later.) And if dinosaurs were so altogether unsuccessful, why did the crocodiles prevail? They, and the turtles? They, and the snakes?

- How long does it take the elements to darken pink stone black with desert varnish?

- What words were spoken around a campfire here on an evening 10 centuries ago, downwind of bison dung, in a hemisphere with no horse?

- If layers of Earth a half-mile thick were eroded (as science says) from this land—where did it go? Washed down the Puerco River? Blown away to Utah? It seems too monumental a chore for a drop of water, a wedge of ice, a puff of wind.

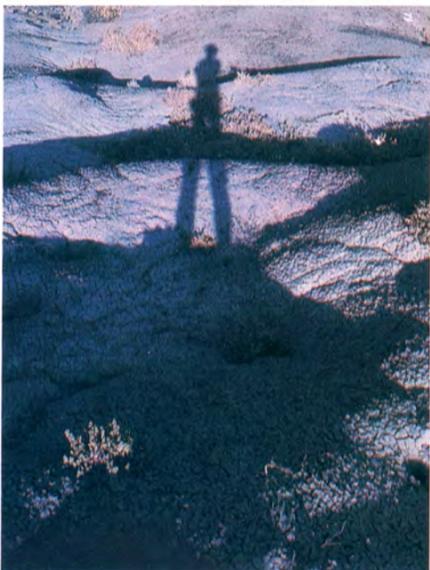
- Were dinosaurs warm-blooded? Did some have feathers? What color were they? Lime green? Sorrel? Shocking pink?

- Darwin theorized that relentless competition within species for limited resources inexorably favored individuals possessing slightly advantageous qualities. Thus: slow evolution to new species. But fossils are missing where fossils might be expected. How did shrews leap from leg to wing, as bats? Or if whales derived from a hoofed land mammal, where are the fossils of creatures in between?

- Why do dunes occur in three models? Crescent. Transverse. Longitudinal. Solve that riddle here, and gain an international reputation. For dunes assume these distinctive shapes the world around.

- Of turtles. It is known that today's sea turtles are sexually determined during incubation of the egg. Temperature seems to be the key. As eggs develop buried in sand, the cool ones become boy turtles. Five degrees warmer, eggs become girls. But female turtles *under stress* can reproduce hermaphroditically, that is, all by themselves. Does this explain the riddle of the departed dinosaurs? A cool spell





(Right) Ancient history lurks amidst the tortured sandstone landscape of the Petrified Forest. (Far left) The bottom of an Anasazi pot remains where it was placed hundreds of years ago. (Left) A modern-day visitor casts his shadow over a landscape unchanged since the time of the pueblo dwellers. (Below) Out of the murky swamps of the Triassic period came creatures like the Placerius. The modeled head shows the animal had three eyes, one of which was mainly a light sensing organ. Today, paleontologists are recovering its bones in the Petrified Forest.



(Left) Cryptic messages yet to be decoded are vivid reminders to passers-by that ancient man dwelt here.

that permitted the hatching only of males?

- Does the pronuba moth think? It has struck up a partnership with the fineleaf yucca. The yucca will not make seeds unless the moth fertilizes the flower. The moth cannot incubate eggs unless the yucca produces seeds. So the moth carries pollen to the plant's stigma. Does the yucca think?
- If I travel tomorrow to the Hopi mesas, or to Zuñi, might I meet and talk with a direct descendant of that woman who shaped and shattered the corrugated brown bowl strewn upon my mesa?
- And where does a 300-pound *stegoccephalian* sleep? Anywhere it wants, goes the old vaudeville routine. But seriously, how did enough of these nine-foot-long

muck crawlers, with brains the size of walnuts, this thick-skulled salamander with three eyes, how did they elude the huge, predatory *phytosaur*?

- Of science. This is what they said: *W.H. Auden*, "When I find myself in the company of scientists, I feel like a shabby curate who has strayed into a drawing room full of dukes." *A.N. Whitehead*, "Aristotle discovered all the half-truths which were necessary to the creation of science." *Bertrand Russell*, "Science is what you know, philosophy is what you don't know." *Paul Valery*, "Science is a collection of successful recipes." And *Einstein* again, "Science without religion is lame, religion without science is blind."
- The Bible says that God breathed life into a handful of clay. Today, in a school

called New Biology, scientists set a scene 3.5 billion years ago—an Earth bombarded with cosmic rays, pickled with vigorous chemistry, rent by bolts of lightning, churned by riotous volcanoes. And life beginning as proteins and nucleic acids in the sunbaked clays of the beaches of warm, rich oceans.

Now, as sleep slips into Petrified Forest and steals its living residents one by one, no answers flash upon the eternal scene... only that ages-old catechism expressed in the Book of Job: "Where was thou when I laid the foundations of the Earth? declare, if thou hast understanding. Who hath laid the measures thereof, if thou knowest? or who had sketched the line upon it? Whereupon are the foundations thereof fastened? or who laid the cornerstone thereof..." □





Pilgrimage to the Petrified Forest

BY
JAMES
TALLON

Of course we wouldn't be going back 200 million years, and of course we wouldn't be visiting the Holy Land. It would just seem that way. Imagination is a marvelous instrument. But for our forthcoming explorations, not too much imagination would be required.

It all started when my wife, Vicki, and I were watching a television rerun of the motion picture *Jesus Christ, Superstar*.

"I know that place," I blurted out, pointing to a particularly beautiful desert scene on the screen. "I've been there."

"To Israel?" came the reply.

"They filmed it in Israel?" I asked.

"Yes."

Well, I hadn't been there after all, but someplace remarkably similar.

"How would you like to go?" I asked.

"Fine," she replied patronizingly, thinking I was really talking about going to Israel.

Two weeks later, with our eight year old, Rachel, we were perched on my Holy Land look-alike, actually a high, wind-swept bluff in the northern reaches of the Petrified Forest National Park. Stretching away from us like a fully-open Japanese fan, to the horizon and beyond, lay a cut and carved, sandpapered and stained,

painted and polished spectacle. A prime example of the Chinle formation. A product of the late Triassic age. The Mesozoic era.

It was deep afternoon, and the lowering sun added a golden bonus while the lady paid her respects to the land with silent awe. Vicki would later tell me that though the Forest was a "mirror image" of the scenes in the "Superstar" film, the background music was quite different.

In the days ahead, we would make a half-dozen pilgrimages into the Petrified Forest (and expect to do more). We would trek into the Painted Desert and Rainbow wildernesses. And we would gallivant the more public-frequented premises of the Crystal Forest, along the Blue Mesa Trail, among the Long Logs.

No mode of travel is more intimate than your own two feet. Direct contact with the earth completes a certain spiritual circuit. One that we relish. With small day-packs holding a few essentials, we were ready to adventure.

One of our first probes took us into the Rainbow Wilderness, an expanse of 7240 acres. If you wear glasses, as my wife and I do, day-hiking anywhere, and perhaps more so in the Petrified Forest, will be

infinitely more revealing if you take along someone with telescopic eyesight, who is attuned to nature, and who stands 25 inches closer to the ground. That aptly describes our eight year old. On an ice cream scoop hilltop, among 10,000 peanut-brittle chunks of petrified wood, she pinpointed a one-inch square of worked clay with a primitive black design. A potsherd. Hands and knees scrutinizing produced dozens more. But even more interesting, possibly, were hundreds of petrified wood fragments with unnaturally keen edges. Even a beginning archeologist would know this had been the site of an "arrowhead factory."

Here, where 300 prehistoric ruins dot the landscape, our imaginations ran rampant on that intoxicatingly warm, cotton-cloud day. Here at our feet was a minor miracle. In this spot, a pre-Columbian man with leather palm pad and a deer-horn tool had flaked a 200-million-year-old piece of wood-turned-to-stone into an implement that, when attached to a feathered shaft, would help provide subsistence. The small heap of flakes he'd left would become a curiosity to three wayfarers in a place called Petrified Forest, 800 years in the future.

It's been called a land of quiet grandeur, this back country of the Petrified Forest and Painted Desert, and all of it is waiting for the day-hiker and backpacker to explore. Kathleen Norris Cook

PILGRIMAGE



On a day-long outing with photographer/writer James Tallon, wife Vicki, and daughter Rachel experience first-hand some of the mysteries and beauties of the Petrified Forest: ancient petroglyphs, narrow eroded canyons, and "ice-cream-scoop hills." James Tallon photos

We are always troubled by the marks we make on pristine grounds. We resent our own footprints. But we justify them because we know the first rainstorm that follows us—surely the second, will eliminate them. Some fields of petrified wood fragments are unavoidable, usually intermingled with the short grass. In others, foot-size spaces allow passage. Many are scintillating, tightly-woven mosaics on bare ground, and we cannot bring ourselves to trespass. Move one piece and you have scarred the overall work of art; the balance is aggravated. But some fragments are too exquisite *not* to be handled. After-

wards, though, each piece is returned to its precise niche in the design. Frequently Vicki carries a tiny spray bottle filled with water which we use to bring up hidden colors in the wood.

Zigzagging across the Petrified Forest provides far more fodder for the inquisitive mind than does hiking by the maxim "...the shortest distance between two points." Take the Western cottontail we saw among the Long Logs. What made this wildlife encounter different was the animal nested in a section of three-foot-thick, four-foot-long petrified tree trunk. Weather, or perhaps rot before petrifica-

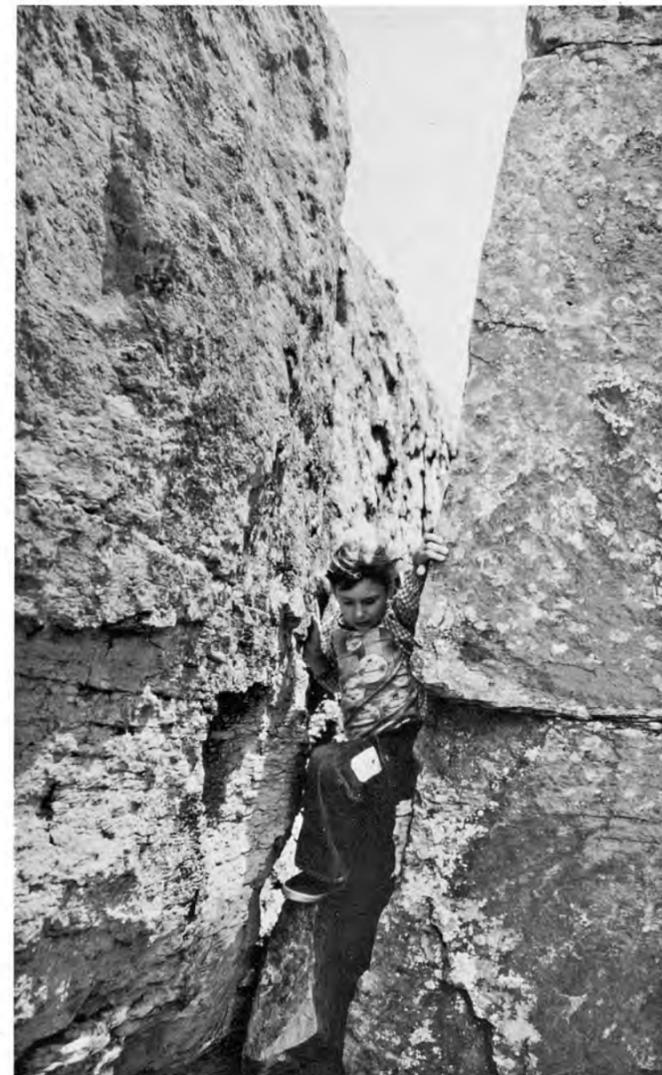
tion, had engineered a two-story agate apartment, and the rabbit sat in the lower one, easily in reach of a human hand and without apparent fear. It studied us as we studied it, and I had the strange feeling that any second it was going to say something curiously eloquent.

Numerous animal forms, some migrants, some residents, inhabit the Petrified Forest. Our tally included more cottontails, a few jackrabbits, dozens of lizards and birds, lots of small rodents, and my favorite animal. We had climbed a low ridge and rested on a park-bench petrified log. Out in the short grass among the mariposa

lillies and the fineleaf yuccas, it snipped at browse and with its 360-degree, eight-power vision, we knew it had seen us. A pronghorn antelope. A doe. Spooky by normal behavior and capable of running 60 miles per hour (Harper & Row's *Complete Field Guide to North American Wildlife* claims one was clocked by an airplane at 84 miles per hour), you feel the warning hairs on the rump patch should be erect and the animal putting greater distance between itself and you, the most deadly of predators. But protection afforded by National Park living—its daily association with unthreatening man—had

semi-tamed it and, sadly, taken away some of its nobleness. Still, such park animals perform a service, by providing oh's and ah's for the rush-through visitors who otherwise would never see them.

One of the most luminous hikes in the Petrified Forest is also one of the easiest—the Blue Mesa Trail. Here we found a graveled path leading three-quarters of a mile into a canyon, among the buffs, blues, and purples of eroded hills and Nature's astutely arranged groupings of agate logs. The Crystal Forest, though of lesser interest on our evaluation scale, was more heavily visited and that's because it can be



PILGRIMAGE

driven into. Here, too, we experienced the quiet. It enveloped us only a quarter-mile out in the desert.

The hike we remember most graphically, though, was in the 43,020 acres of the Painted Desert Wilderness, where foot-travel-only rules keep the solitude monastic and the land virginal. Where only the elements have accounted for any changes in tens of thousands of years. Where it looks most like the Holy Land.

Along with two kinds of cheese, cold cuts, assorted fruit, and a canteen of water, we packed a topographical map. Now it showed us that the Kachina Point trailhead, from which we departed, was 5826 feet above sea level, and down on the desert floor, where we would do most of our hiking, an average elevation of 5500 feet. A drop of 326 feet; a piece of cake.

A third of a mile down the trail, agate logs lay askew as if prior to some giant stacking them. Here the child asked, "What causes trees to be petrified?" We had read

up and paraphrased that no one knows for sure. But science tells us the whole of the Petrified Forest phenomenon was sort of an "apocalypse-then." Two hundred million years ago, in their living, vertical form, some of the trees towered more than 200 feet. They were primarily conifers and particularly *Araucarioxylon*. (Unlike the giant reptiles of prehistoric times, descendants of *Araucarioxylon* are alive and comfortable in the southern hemisphere.) As age or weather or whatever felled them, many floated here via the numerous streams of that era. Then, buried in mud, sand, and volcanic ash, decay and rot were halted. The job was completed by chemical action interwoven with a geologic fickleness that caused the land to sink beneath the sea and rise again.

For every hike we pick a destination. Often we don't make it. We meter distance and expended energy and divide it by remaining time. The important factor is the hike itself, the discoveries along the

way. On Kachina Point, we chose the Black Forest. Our "topo" map showed it to be about three miles out; or, roughly a six-mile jaunt.

In 1981, only 755 people ventured into the Petrified Forest's wilderness areas. Considering such light public pressure, you may not see another wanderer. We didn't. Yet, a distinct trail crosses the desert flats, and, periodically, it is marked with a rock cairn. Park Service personnel suggest leaving this beaten path and doing your own thing. We turned off two miles out, past Lithodendron Wash, angling right to inspect some pink 20-foot-high clay hills.

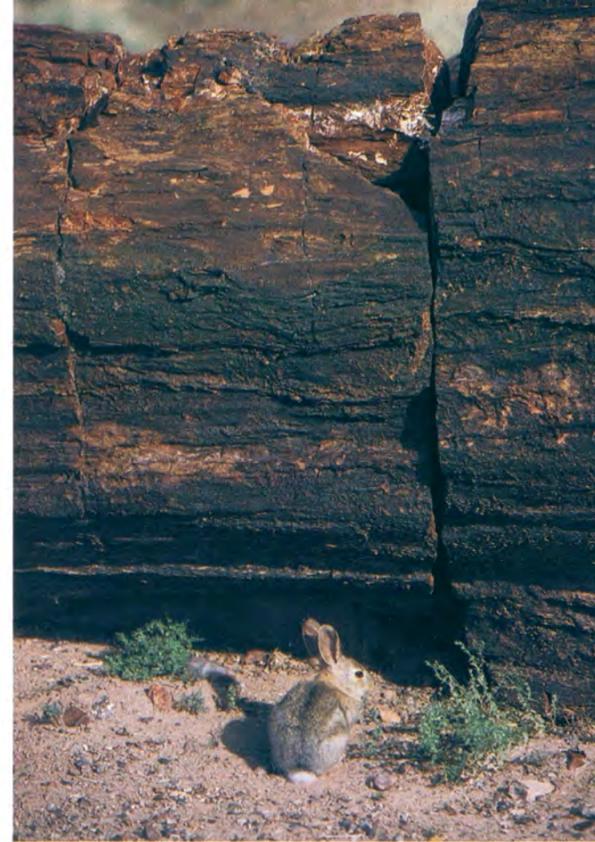
By the time we spread lunch, the wide arch of the sky was covered with grey gauze. No matter. It would make for cooler hiking back. Unfolding our map, we saw we had drifted well east of the Black Forest. Judging by dozens of black logs we had come across, though, very likely we had reached the fringes of it.

The sun had lost the battle to break through the overcast, and, with the western horizon hidden from us by a row of hills, I climbed one for a look around. To my chagrin, I saw a charcoal squall-line moving our way. Then I remembered I had not remembered to pack our rain gear. We quickened our pace in retreat, but the storm caught up with us one-half mile from the trailhead. Lightning was limited to one feeble display followed by a single muted roll of thunder. But the rushing screen of water grabbed us like a big silvery thing with claws. Before we could gain the shelter of an overhang, a few yards away, we looked like citizens who had scoffed at Noah.

Fifteen minutes later, no let-up seemed to be in the immediate future, and, since we could not get wetter, we moved on. As we topped out at Kachina Point, the downpour changed to a steady and gentle rainfall. Leg-weary and winded, we paused before making the final footage to our van camper. I turned and looked out across the Painted Desert Wilderness. Two-thousand-foot long tapestries hung from the sky. The pastels of earlier had become rich maroons, chocolates, purples. Threads of light reflected from the rivulets that coursed down and among the clay hills. Salvador Dali would have been thoughtful, Pablo Picasso delighted, Joan Miro influenced. Fighting overtones of anthropomorphism and recalling total annual rainfall here averaged just nine inches. I speculated that the wilderness' animal populations jumped with joy. Reveled in the wetness. And the plants—I knew the reaction of those that bore flowers, too.

"Even though the sun's light is withheld, Lo, a heavenly lamp shines here . . ." □

Few people get off the main road in the Petrified Forest, so hikers like the Tallons are almost assured a private picnic, surrounded by miles and miles of unpopulated scenic wilderness.
James Tallon



(Above) The protected environs of the national park are an unthreatening home for the Western cottontail, the pronghorn antelope, and a variety of other wildlife.
James Tallon photos



FORMS FROM THE LAND—THE ARTISTIC VIEWS OF Allan Houser and Dan Namingha

Two artists, both with feet well planted in today's world. Both well traveled, both hard working, both successful. Both Native Americans, with beginnings that today would be called disadvantaged. One at the end of his middle years, one in his early 30s. One an Apache, one a Hopi-Tewa. They are friends although their ancient tribes are as different as the French and the Germans. One known for his sculpting, one known for his painting. Yet two artists alike in their love of beauty, their respect for their fellow man.

What nurtured them? What feeds their strengths, sparks their inspiration? We visited them and asked our questions.



Allan Houser

Dan Namingha

by Kay Mayer

Allan Houser

Allan Houser is a polite host. Contained. He answers my simple questions briefly, to the point. He's shown me the inside of his design studio, his new sculpture studio, his painting studio, inside the downstairs and the upstairs of his country house. But not much inside the man. Not yet.

Allan Houser stands silent now on the roof deck of his new home, 20 miles south of Santa Fe, New Mexico, considering my question: What influence does the land have on your work?

In watch cap, soft jacket, and blue jeans, he studies the swelling land as it rolls into the huge waves of distant mountains and seems not the Apache of distinguished lineage, not the soft-spoken master of stone and bronze who has become internationally known and admired, but a tough, aging seaman who is at peace with his harbor and his future.

He moves to look west, bends over, rests his arms on the parapet. We hear no lap of water, only the steady sound of the chip, chip, chip of an assistant's chisel against marble. The impression is that Allan Houser comes up here frequently. I wonder what he is seeing.

He's as complex and simple as his work.

His credentials include a Guggenheim fellowship, museum and major private collections, yards of awards, exhibitions last year at the Smithsonian, the year before in the Grand Palais in Paris, this year in Germany. His work is public, he is private.

He speaks easily about the public part. Our conversation began in his design studio, an intimate space, removed from house and sculpture studio, "because," he said with a smile, "if ideas don't pan out the way I hope they will, nobody knows it but myself."

He said his process of creation often starts during his daily walks around the huge pieces of stone in his sculpture yard. Most of it is shimmering white marble from Carrara, Italy, from the 2000-year-old quarries made famous by Leonardo da Vinci and Michelangelo. This was the material provided for his first commission, at age 30, by the Haskell Institute in Lawrence, Kansas, for an eight-foot memorial to the Indian casualties of World War II. This is the material he once scrounged for, material he can finally afford in abundance.

After taking his daily walk, he may go to

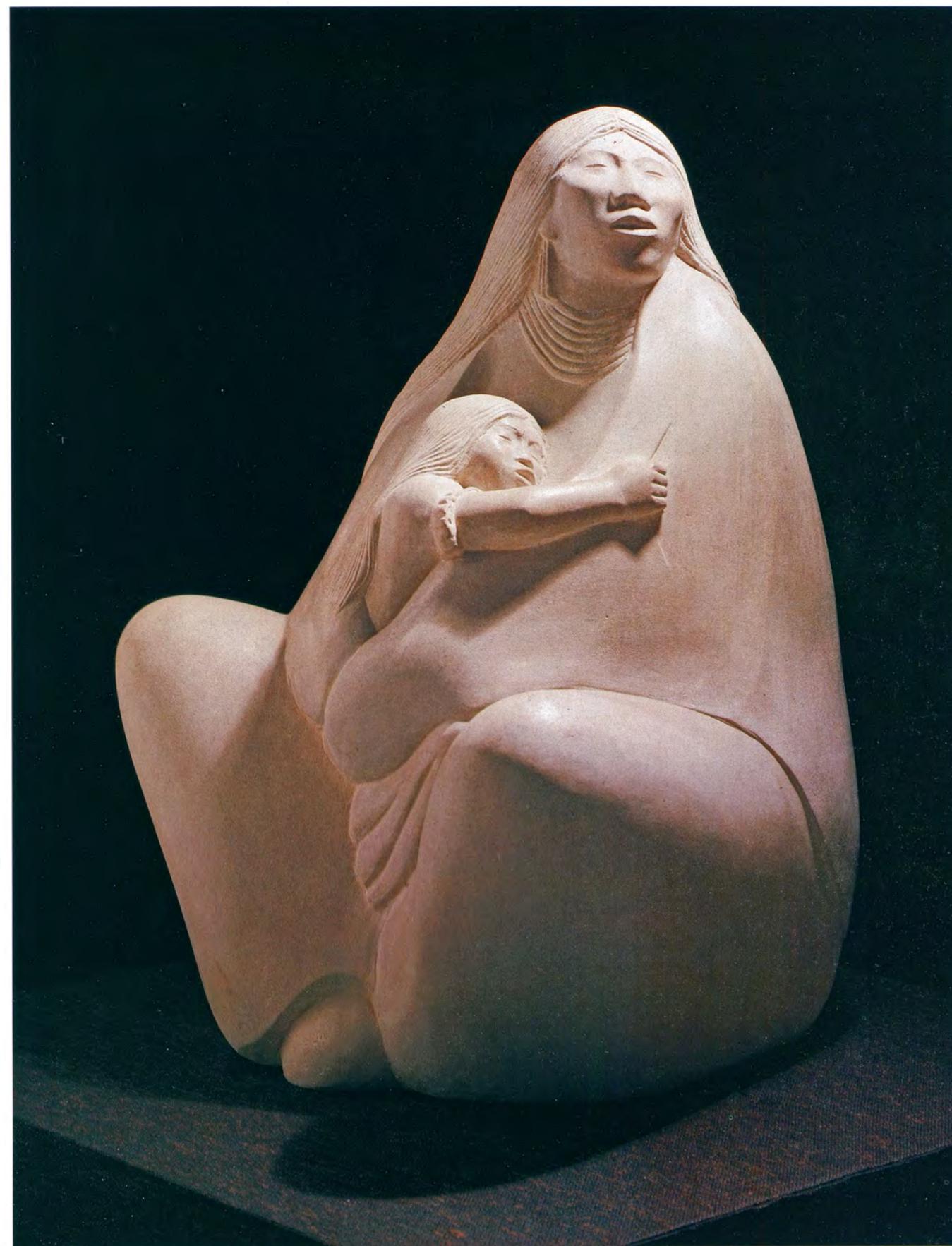
his sketchbook and begin drawing.

"But sometimes the subject matter is so obvious that I can almost see the piece in the stone," he said, "and I can start right in cutting."

When things begin to happen in his sketching, he picks up clay. The sketch goes into three dimensions. In this stage he carries his design further and solves most of his problems. But this is not the final form. "When the piece gets into large scale, it changes again," and continues to change until he finally says, "It's finished." Even then he thinks about it.

"One of the beauties of stone is to have something partially finished emerging from a rough area." He once said he knew a piece was finished when his back began to tingle. All of his finished pieces, stone, bronze, and steel, remain for days in his studio. "I observe them when I come to work each day, looking for little weaknesses in the composition that might later begin to bother."

As he talked, he handled each piece in his design studio as tenderly as he would a living being. "When I'm working on these little models," he said, "I'm living the part. I'm trying to get something across



Earth Mother, 1980, by Allan Houser, Indiana limestone, 40 by 28 by 34 inches.



(Clockwise from above) Apache Warrior 1982. Bronze, 30½ by 50½ by 17½ inches. Edition of eight. Allan Houser at work outside of his studio. Rendezvous, 1980. Indiana limestone, 61 by 23 by 22 inches. The Potter. Bronze, 21 by 24 by 14½ inches. Edition of 12.



Dineh, 1981, by Allan Houser. Bronze, 39 by 35 by 60 inches. Edition of six.

in the composition, the feeling I have in here." He tapped his heart. "People don't know it, but they've got a lot of Allan Houser in the piece they choose." This was the closest he came thus far to explaining the touching, touchable humanity of his pieces.

Suddenly the soft voice says, "I think one of the very important things that I rely on is going out on the Navajo."

That's the western direction he's been looking since my question, toward the Navajo Reservation, which adjoins the Painted Desert in Arizona.

His head doesn't move, but his eyes narrow, and now it's almost as if he is able to see across the state into the Arizona lands of his forefathers. I puzzle over the words, "rely on," then remember the unusual beauty of that landscape.

He says he visits the Navajo often. "I like just to wander around out there and observe. I like to see what the weather has done to those massive formations that nature has made."

His westward gaze continues. So do the silent intervals. But I know now something of what he is seeing.

"I like to get back to nature, among the Indians as well as the open country. I like to camp out. When you see things as masses—even trees, the big cottonwoods—the forms are almost like sculpture. Those old cliff dwellings," he hesitates, "I especially like to see what the Indians of years ago did by digging into some of those big formations, and then what the weather has done to the ruins. They're very sculptural."

Allan leaves the roof's parapet and almost seems to be addressing this last remark to himself, "The main thing is

not to stay here too long but to keep in touch with the Indians of the Navajo as well as the Apache and the people I'm familiar with."

We return to his design studio. Now what he shows me excites me anew. For in his fluid forms I am seeing wind-swept columns, flowing hill lines, textured sand dunes. *Two Lovers*, a seated couple wrapped in a blanket, could have begun as boulder formations, a majestic singing warrior as a single shaft rising from a desert floor, and, another of his father's stories about the people of the land, his magnificent *Apache Warrior*, runs a horse made even fleetier by two of nature's own windows in his frame. I'm seeing real people in stone and bronze, shaped by the land and these hands forever.

As if reading my thoughts, Allan shows me a face he is working, not a head, a face, stark and bold. "This is not a portrait," he says, "but in a way it is." The man was a boyhood friend whom Allan hadn't seen in a long time.

"I saw him again two years ago, and his face just stuck in my mind. He was from a

family I'd always admired. I couldn't forget the structure that I saw in that face. It just came out the other day, and now I'm playing with it. I'm not sure what will happen." He turns the clay masklike form and reveals the curved neck of the stand. "It's very exciting on a difficult piece to see what the outcome will be."

He says when he was younger, he enjoyed the hard labor with air hammers, drills, and chisels. Now he leaves much of that to his two assistants, preferring instead to take on more and more difficult composition problems "just to see if I can solve them."

He built his sculpture studio 20-feet high at one end so he can work with big pieces of steel. "When you're working with steel you have other problems. You're working with flat areas, and you have to gain the other areas in different ways." Solving such problems is what he calls "true creativity."

The deep-set eyes begin to glow. "A lot of my designs have to do with negative areas. With eliminating."

He approaches a design by taking hold

of the important parts of the subject matter. He then tries to eliminate, if possible, all other parts. He explains—he taught for 25 years—as he might for a young student. "Picture a person standing at night near a fire. Catch only those parts the light is hitting. Grasp those parts and make them work as a composition."

His attention returns to the clay models, and he lifts for my inspection an exquisite figure of an Apache Indian girl. He breaks the silence that follows my expression of pleasure. "I try to get something across in the composition about the beauty of the people, the sympathy I have for them. I'm sensitive to who they are, where they come from. You never get them perfect, but you try to get across the feeling that's coming out of you from very deep."

As we walk out together, I make a remark about the pleasure his work has given people. He glances at me, looks off again to the west, and says, "You know, you hear these things, put them together, and then, well, I think that's really what this whole thing is all about: making yourself happy as well as others."



View from Walpi, 1979, by Dan Namingha, is a 27-foot-long canvas on display at the Phoenix Sky Harbor International Airport.

Dan Namingha

Follow New Mexico Highway 68 out of Santa Fe toward Taos, and, with a suddenness that is eye-startling, the land drops away and opens to a 30-mile-wide valley of the Rio Grande.

In the San Juan Pueblo, a handsome young Hopi-Tewa of medium height is growing into gianthood by painting his Arizona heritage.

Dan Namingha greets me gently, almost shyly, in English touched by a Tewa accent. Later I can kid him about looking and sounding Italian after just one visit to Italy, then hear him laugh and say, "When I was in Italy, local people came up to me speaking Italian, expecting replies." One of the reasons for his Italian visit was to see an old teacher's—Michelangelo's—Sistine Chapel.

He invites me into his studio. Built by his own hands during summer afternoons several years ago, it is a functional structure, 20 by 30 feet, high ceiling, well-lighted, and able to accommodate drawing tables, chairs, an overstuffed couch, cabinets, boxes of paint tubes, plasticine—he enjoys sculpting, too—and a clutch of cotton canvasses ranging in size from big to biggest.

Fastened to a wall at one end of the studio is a painting in progress, shoulders and head of a Namingha katchina with a

butterfly headdress. Who can look at a Namingha painting and not respond to his colors? They are the joyous colors, the colors of sunsets and summer rain, of dances and drums, of youth and rainbows. Colors boldly combined, delicately equipoised.

Dan says simply, "The land is my palette, land and sky together, the area around the Hopi. I played there as a child. I hunted and roamed there, and every day I opened my eyes to all of these things. So it doesn't really matter where I am in the world. I will still see it, and I still paint it because it's part of me."

Like many another artist, Dan had to travel thousands of miles and several years to discover his emotional and spiritual homeland. He grew up during a time of social protest, a time of cultural contrasts.

Still, despite what might have seemed limited opportunities on the Hopi Reservation, in northern Arizona, the pattern of Dan's young life could almost be a model for how-to-train-your-child-to-be-an-artist. His mother, Dextra Nampeyo Quotskuyva, is a fourth-generation potter of renown, his uncles are noted for their katchinas, so Dan's efforts received early encouragement both at home on First Mesa and at school in Polacca.

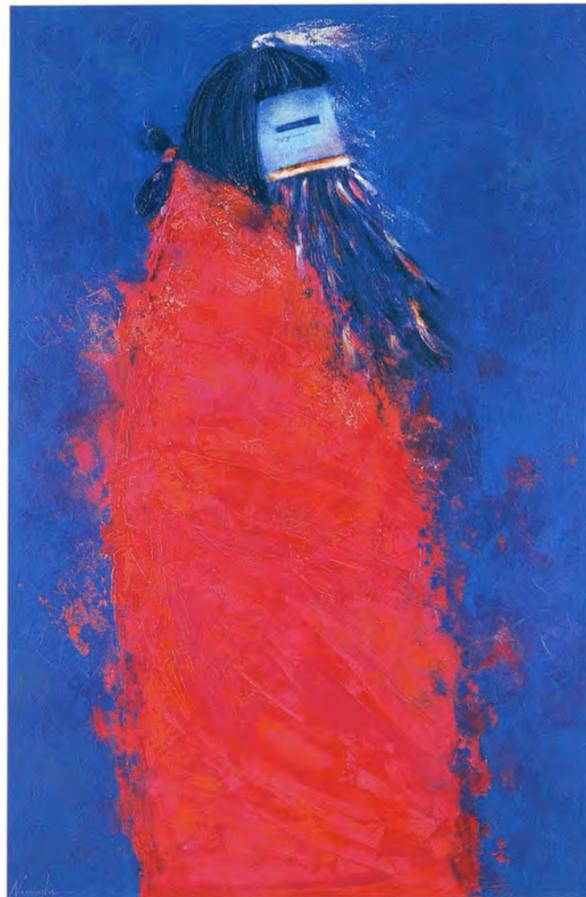
When he was in second grade, a teacher

asked him to meet with her and other students for an hour before regular classes. "Mrs. Russell provided all the materials," he says. "We would just paint whatever we felt like painting. That was my introduction to painting with oils and watercolors." Those morning sessions continued until he left for junior high school.

His introduction to Picasso and Van Gogh came when he was nine, and he claimed the "A" book (for Arts) from a set of encyclopedia his mother purchased. His introduction to Michelangelo came when he was 12, and a teacher handed



(Left) Namingha at work. (Above) His Sun Spirits, 1982. Acrylic on canvas, 80 by 72 inches.



(Left) Namingha's *Night Vision*, 1982. Acrylic on canvas, 72 by 48 inches, and (above) *New Mexico Skyline*, 1982. Oil pastel, 22 by 28 inches. (Below) Broad strokes and bright imaginings flow from Namingha's brush.

him a book of classic art reproductions. He was captivated. "After that I tried to draw like Michelangelo," he says. "The way he drew faces and the anatomy I saw in the sculpture."

When Namingha was 16, he won a summer art scholarship to study at the University of Kansas in Lawrence. That was a major turning point. It was there he began to get "really serious in terms of discipline." And it was there that he first perceived realistic forms as geometric shapes.

He returned to his home on the mesa with new awareness for the land and the ceremonial forms around him. But he was still not sure where his destiny lay. His next schooling was a two-year term at the Institute of American Indian Arts in Santa Fe, New Mexico.

Upon graduation, Dan traveled to Chicago and enrolled at the American Academy of Art. He didn't stay long. "At 19, I was restless. The school was okay, but I felt confined. I had to get out."

He solved his problem in a once-traditional way. He joined the Marines. And he lucked out. Enroute to Vietnam, his unit's orders were put on hold. They landed in Okinawa. He was able to combine peacetime duty in Okinawa with

visits to the island of Japan.

The Orient was a revelation. He says this was partly because of exposure to still another culture but partly because he discovered he related to the Japanese people, "to their language and to the way they do things."

He visited the countryside first. "Then I went into Tokyo, and I couldn't believe it! Here was a big city—high-rise buildings, everything—and so many people, yet they still had this sense of respect for other people." He made friends. And things began to come together for him.

He started sketching again. "I was seeing things in my mind from home, not just the land, but ceremonies, the little things that I remembered. That's when I started to go in my own direction. I told myself that I would make paintings of these sketches when I got out."

He began with collages, working with feathers and leather, twigs and paint, and canvass and paper. Sales were slow. He lived in dollar-a-day rooms in Santa Fe, worked odd jobs, painted at night. He won a competition, then another and another, and his career took off.

"A lot of my work still reflects the area around the Hopi Reservation," he says. "You look off to a distance and you start

seeing formations happen." They're never the same to him. Sometimes it has to do with cloud formations, sometimes with time of day, most often with color.

He picks up his sketch book and turns page after page of small pencil landscapes, geometric shapes he's sectioned off by color. "Earth and sky, they come together to make certain things possible." It takes a moment to realize he is speaking "holistically."

He says when he returns to the Hopi, which he does throughout the year, for



Dan Namingha



Flute Spirit, 1982, by Dan Namingha. Bronze, 26 by 7½ by 5½ inches. Edition of 18.



Pottery Mound Mana, 1982, by Dan Namingha. Acrylic on canvas, 48 by 60 inches.

religious and social occasions, "you feel this release. You feel..." he searches for the word, "...comfortable. It's the openness of the land. It's all the things that have gone on in that area, on those lands, for hundreds of years. The things that were important and still are important, to both the Hopi and the Tewa. They have a high regard for that land. And the rain, when it does rain, is used respectfully.

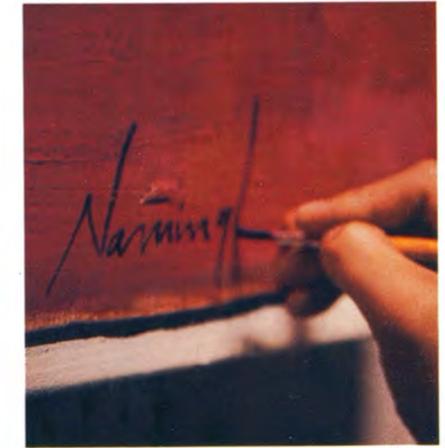
"There's so much to work with from that area," Dan Namingha continues, "the Southwest light and the brightness of the

sun." The reflections are brilliant and ever changing. "I paint what I see and feel. I'll break up something, construct what I've seen in my own way. Then whoever views it, views it in their own way. But I hope I'm extending that view." He laughs lest I think him immodest.

As I turn to go, I look back once more at his katsina figure at the end of the room. Even in his portraits, there is a sense of pulsation, of movement, of spirituality. I ask if I'm reading more than is meant.

The laughing face is suddenly serious. "I don't do exact replicas. I put it the way I visualize it, maybe beyond reality. So many of us take things for granted. It is all here for us to see and appreciate it, though not always with the naked eye. I try to say my thanks by painting it." □

All works copyrighted by the artists and appear courtesy of Glenn and Sandy Green, the Gallery Wall, Scottsdale, Phoenix, and Santa Fe.



Yours Sincerely

Comments and questions from around the state, the nation, and the world.

Dear Editor,

I am 85 years old, and after looking at your beautiful pictures and reading the articles in your December magazine I find I have a new outlook on the world around me. I admit I was depressed about a great many things in our society, but this issue has given me back a feeling of hope for our country.

Sincerely,
Doris Reinoehl
Bath, MA

Dear Editor,

It's been eight years since we moved from Wickenburg, Arizona, to a lovely, remote mountain valley in the corner of northeastern Oregon... (But) through the pages of your magazine I have brought part of Arizona with me. I just finished the Christmas issue and there is a blurring of the photographs and words throughout. Don't worry the printer about it though, the blurring is in my eyes. So strong are my feelings for this truly marvelous land called Arizona.

Sincerely,
Carole Jarvis
Joseph, OR

Dear Editor,

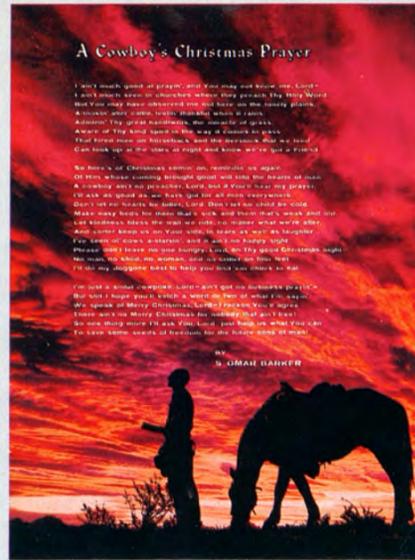
A little note to say I am sure, "Flowers are the most beautiful things God forgot to put a soul into." (*AHM December, 1982, p. 38*), is by Henry Ward Beecher. It is certainly appropriate for that issue.

Sincerely,
Mary Osgood
Middleboro, MA

Dear Editor,

Congratulations on another excellent Christmas issue. I am always pleased to receive your informative and colorful magazine. However, being a natural science student at Northern Arizona University, I must point out a slight error in species identification. On page 16 of the December, 1982, magazine the photo by David Muench is not of a hardy fir, but none other than a hardy ponderosa pine. I could tell at just a glance that the needles are too long for a fir.

Sincerely,
J. Rohan
Flagstaff, AZ



Dear Editor,

I thank you! My "Cowboy's Christmas Prayer" poem was first published in *Ranch Romances Magazine* in 1952, but its beautiful presentation in *Arizona Highways*, December, 1960, with a mounted cowboy and a red sunset, was what gave the poem broad circulation and gained it widespread approval. Through the years the poem has been reprinted well over a hundred times in a variety of publications, broadcast several times over national TV, put on tape and braille by the Marian Society for the Blind, quoted in a Lions Club bulletin in Rhodesia, and used by The Leanin' Tree Greeting Card Company for 18 years with changes of pictures. And now *Arizona Highways* shows it again with a beautiful, realistic ranch country winter scene. I find this especially gratifying now that I am over 88 years old and in uncertain health. So again, I thank you!

Sincerely,
S. Omar Barker
Las Vegas, NM

Dear Editor,

This is to thank *AHM* and Mr. Joseph Stocker for the fine article on the Arizona Rangers in the August, 1982, issue. It was of particular interest to me, as my father, then Lt. John Foster, was second in command of the Rangers (see picture on pages 34-35 of that issue). He was the short man next to Capt. Tom Rynning on the left of the photo.

Yours truly,
Ray R. Foster
Morro Bay, CA

Dear Editor,

For years now I have had the big fortune to be gifted with a subscription of your magazine by a good Swiss friend who has since adopted the United States as his homeland. I have so much enjoyment with

this magazine when I go through it. I marvel at all the beautiful illustrations, the variety of colours is exceptional, so are the reports and explanations. If one has not visited the States, you can not realize the variety of beauty one can find in this vast land.

Sincerely,
Grety Guhl
Clarens, Switzerland

Dear Editor,

Arizona Highways may be marketed as a travel magazine, but your publication transcends the scope of most travel magazines. More than a guide to encourage tourism, it is a valuable source of information on the American Southwest. The November, 1982, issue is a typical example. Focusing on southeastern Arizona, the reader is exposed to significant events in the human history of the region, as well as the flora, fauna, and natural history of the area. An obvious result is increased tourist travel... However, my greatest appreciation is that you provide a fine learning resource.

Sincerely,
Earl Befeld
San Antonio, TX

Dear Editor,

I just wanted to tell you that this new 1983 *Arizona Highways Calendar* is by far the most spectacular of all the many I've purchased from you over the years. I do miss my lovely West, and the calendar and subscription to the magazine give me much pleasure and happiness.

Sincerely,
Mona Ray
Winston-Salem, NC

Dear Editor,

We have had a love affair with *Arizona Highways* for several years. Besides the excellent photography, your writers capture beauty with words. Taken together, pictures and text, they make for an hour or two with the gods every month.

Sincerely,
Alexander M. Gibb
Winnipeg, Canada

(Inside back cover) Fetish Doll, 1982 by Dan Namingha. Acrylic on canvas, 60 by 48 inches. Judy Collins collection. (Back cover) Fragments of 200-million-year-old trees of the Triassic period form a veritable jeweled pavement in parts of Petrified Forest National Park. Theodore Roosevelt first established the 93,493-acre area as a national monument in 1906, "...for the wonder and enjoyment of all the people." Josef Muench



Namingha

