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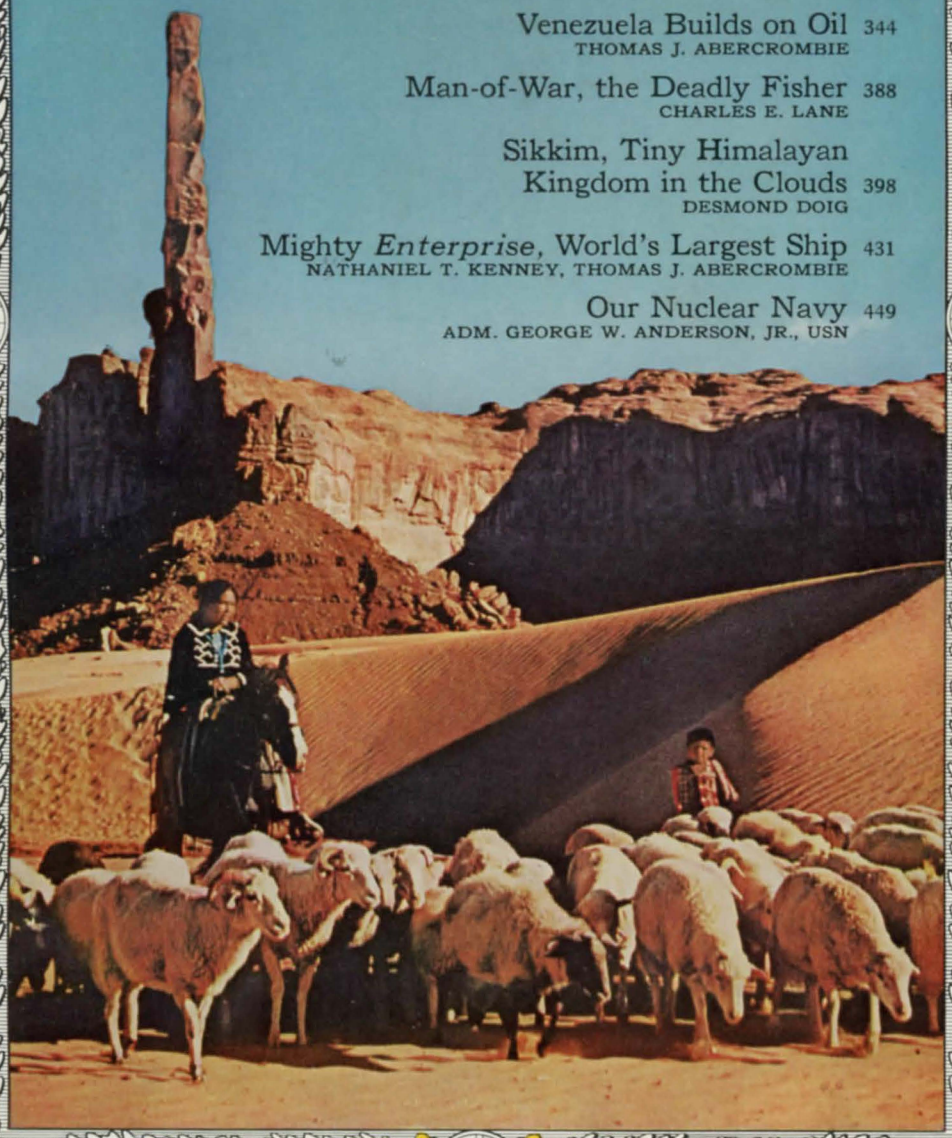

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Arizona: Booming Youngster of the West

By ROBERT DE ROOS

Illustrations by National Geographic photographer ROBERT F. SISSON

WHEN MY DAUGHTER Barbara was married, she moved to Phoenix, Arizona, and it seemed a long, long way to go from San Francisco. But she consoled me: "Look at it this way, Daddy. You're not losing a daughter—you're gaining spring training with the Giants."

Since I was then emotionally involved with the San Francisco Giants, who swing their bats every spring in Phoenix, the whole idea took on new brightness.

Now, two years later, I find I have not lost a daughter. I have gained the whole spectacular, overwhelming State of Arizona.

State of Mind and of Majesty

After a 3,500-mile look at it, I can report that Arizona is an unparalleled experience—a state at once complex, casual, and simple, endowed with a handsome display of wonders.

It brims with energy and friendliness. The people love Arizona, and they have an endearing urge to make you love it, too.

"When I was on a local newspaper," said John Fahr of Tucson, "people would call in just to say how much they liked Arizona."

Arizona is beyond compare scenically, in terrain and vegetation. "Why, she's loaded to the sideboards and running over with scenery," said Harry Goulding, the gentle, perceptive Indian trader of Monument Valley.

The state shimmers with color: the pinks and blues, golds and greens of the desert; rivers the color of chocolate milk; red rocks rising from black sand; hills splashed with mineral purples, greens, and blues.

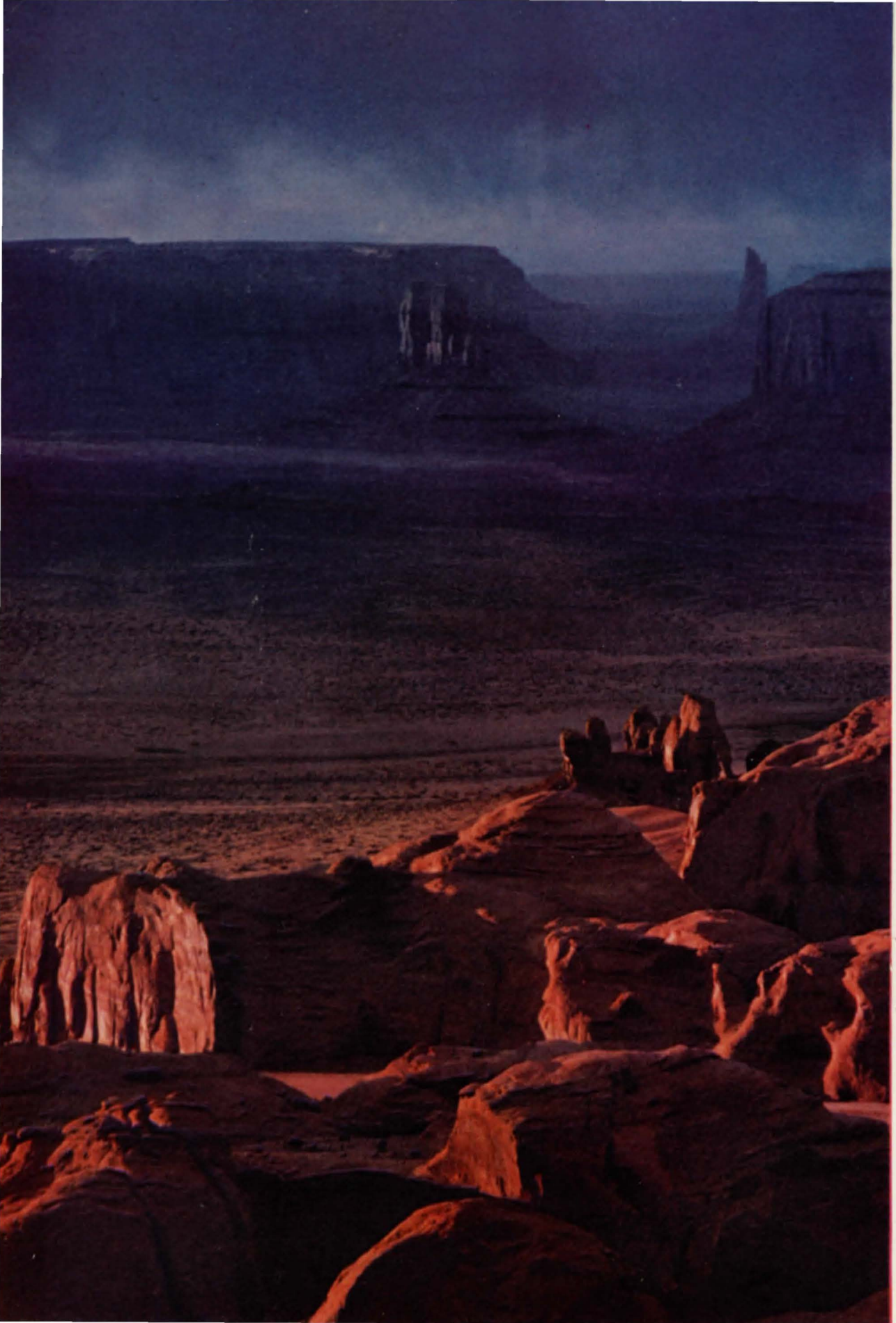
It has its own sounds: the banshee wail of wind in the buttes; the rumble as wheels roll over a cattle guard; the *"hoy yah, oh hah, hoy yah"* chant of Indian dancers; the hollow sound of men walking in boots.

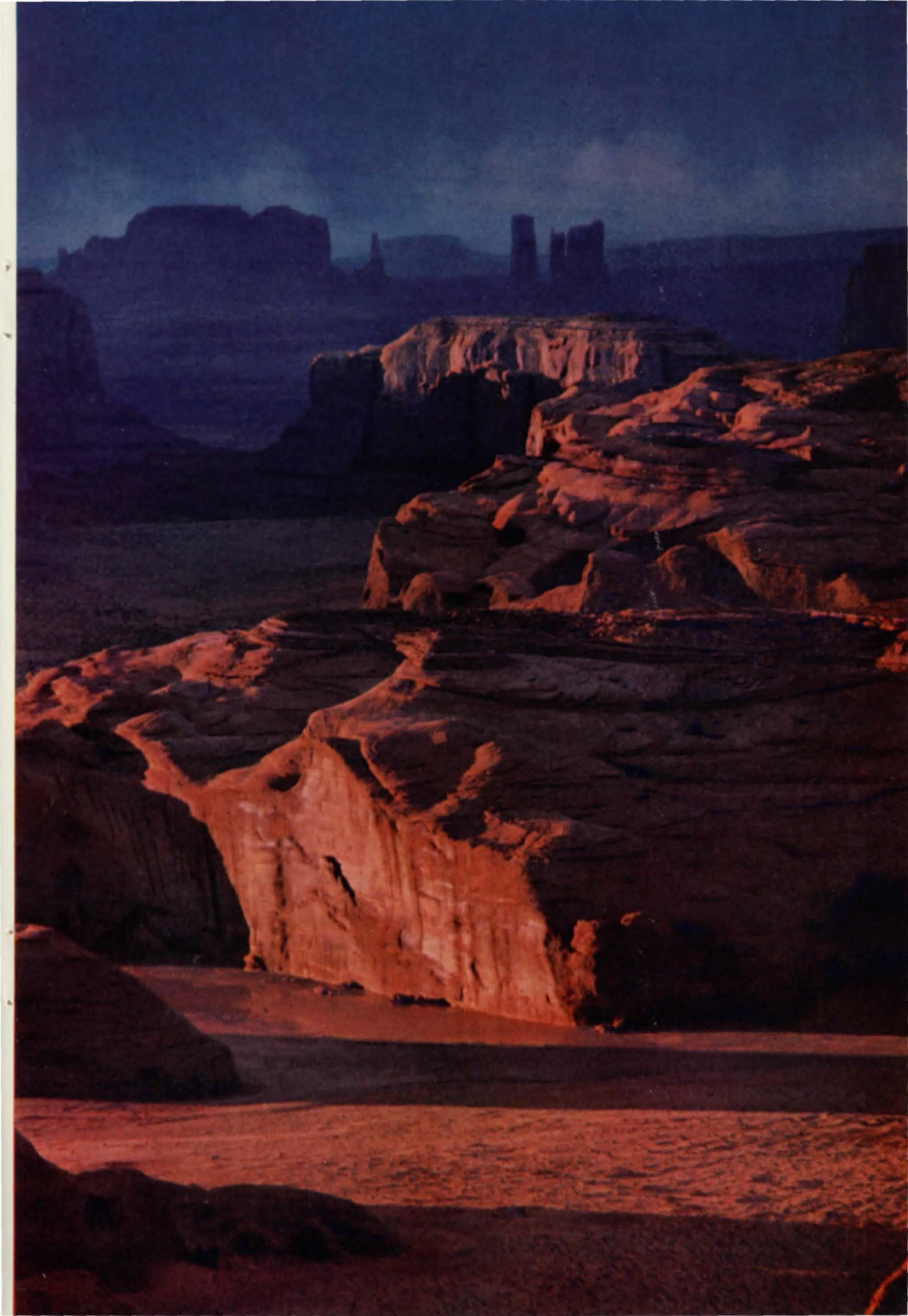
There is no one Arizona. Physically, it is divided into three very different regions: the hot southern deserts; a mid-portion of snow-capped peaks and fir and aspen, where the land starts its ascent to the Rocky Mountains; and the high northern plateau mantled by juniper and mesquite (map, page 305).

All this is easily accessible. In winter, people in Tucson and Phoenix can swim in the morning, cavort on ski slopes in the afternoon, and be home for dinner. The Colorado River, Gulf of California, Lake Mead behind Hoover Dam, and a dozen other man-made lakes are there for boating and fishing. A tremendous new body of water, Lake Powell, will be created on the mighty Colorado River after the Glen Canyon Dam is finished in 1966.

Sunset and thunder squall paint fantastic sandstone buttes in Monument Valley, astride the Arizona-Utah border. This panoramic view captures massive Sentinel Mesa (left) and Brigham's Tomb (right, center). Totem Pole, shown on the magazine's cover, stands out of sight nearby. Prospectors and traders identified monuments by shapes.

JOSEF MUENCH © N.G.S.





KODACHROMES BY

Laguna hoop dancers and Mexican Aztecs in peacocklike headdresses delight parade-goers at

Arizona also abounds in color of the intangible, romantic kind, a legacy from the early Spaniards, Indians, and gunslingers. Although the state is officially only 51 years old (it was admitted to the Union on St. Valentine's Day, 1912), it revels in a bloody, riproaring history. The past seems very close.

"I am 52 years old, not what I'd call elderly," said David F. Brinegar, executive editor of Tucson's *Arizona Daily Star,* "yet I've known every Governor of Arizona except one. That was George W. P. Hunt, the first Governor—and I shook *him* by the hand."

And consider Senator Carl Hayden, the Nation's senior legislator. He has been in Congress ever since Arizona became a state.

Long before the Pilgrims dreamed of Plymouth Rock, before Capt. John Smith or Virginia Dare appeared in our history, Marcos de Niza, an Italian serving Spain, entered Arizona. That was in 1539, a scant 47 years after Columbus reached the New World. In 1540, García López de Cárdenas, one of Coronado's captains, stood at the Grand Canyon, speechless before the awesome sight.

Centuries earlier, Arizona had been the home of prehistoric Indians who created highly developed cultures. Oraibi, in the Hopi

The Author: Robert de Roos, a free-lance writer and former newspaperman, contributed "California's City of the Angels" in the October, 1962, NATIONAL GEOGRAPHIC.

NATIONAL GEOGRAPHIC PHOTOGRAPHER ROBERT F. SISSON © N.G.S.

Flagstaff's Southwest Indian Pow Wow

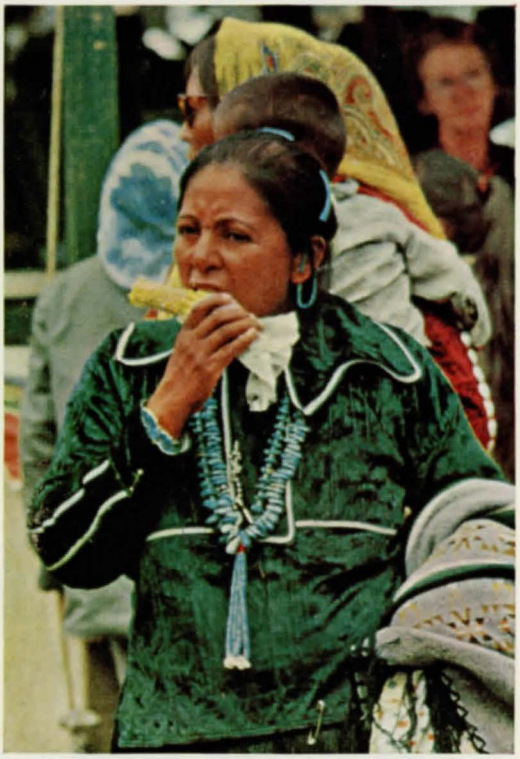
Bells on her ankles, beads on her forehead, and a jaunty plume in her hair helped two-year-old Camille Lacapa, a Chippewa-Hopi, win the baby beauty contest at Flagstaff's Pow Wow last July.

Smeared with clay and white ash for their performance as clowns in a fire dance, Navajos assemble for the Flagstaff parade.

country, is the oldest continuously occupied town in the United States.

Descendants of these long-gone Indians still inhabit Arizona, which has more Indians than any other state. The state embraces the lands of the Hopi, Navajo, Apache, Papago, and ten other tribes. They exist like principalities: at once a pride, a problem, and a sting to the national conscience.

The Spaniards were followed into Arizona by the mountain men in pursuit of beaver pelts; then by Mormon settlers, Confederate veterans, gold seekers, and the gunslinging outlaws who made Tucson, Tombstone, Bisbee, and other towns, in the words of a man on the scene, "a paradise of devils."



Munching freshly roasted corn, a Navajo woman enjoys the carnival at Flagstaff's Pow Wow. Her heavy turquoise necklace is worth $300.

Writhing bull snakes clutched in teeth, bogus Indians dance to the beat of a tom-tom in Prescott. Smoki People, a "tribe" of white men dedicated to perpetuating Indian rites, yearly perform at a pageant in the dark of the moon.

Arizona was ceded to the United States by Mexico after the Mexican War. It was later enlarged by the Gadsden Purchase of lands south of the Gila River. Its first years under the United States flag were as part of the Territory of New Mexico.

Arizona wanted separate territorial status, but Congress failed to act. Sympathetic to the South during the Civil War, Arizona became a territory with the Confederacy in 1862.

In one Civil War skirmish that bloodied Arizona soil, 12 Union soldiers from California attacked 16 Confederates in the Battle of Picacho Pass, 38 miles northwest of Tucson, in 1862. Three Union men died, three Confederates were captured. The next year Arizona became a United States territory.

The first capital was at Prescott. Then it moved to Tucson. In 1889, Phoenix became the permanent capital, a blow that Tucson feels to this day.

A Human Flood Keeps Coming

It was not until World War II that Arizona stuffed pants legs into cowboy boots and marched out to confront the 20th century. During the war, Arizona was discovered by tens of thousands of servicemen who trained on the desert slopes. After the war, thousands of them returned there to live.

It was not a flash flood. The settlers keep coming, to escape winter winds and snows, to find a place in Arizona's industry, to retire in a warm corner—and for health. A star-

Sun-drenched Arizona, sixth largest state in area, experienced a 74 percent growth in population between 1950-60. Phoenix, the capital, quadrupled its numbers to 439,170.

tling 25 percent of the families that settle in Arizona do so because some member is ill.

Between 1946 and 1960, according to the latest census, the state's population increased 111 percent—from 616,000 to 1,302,161.

But then, almost everything seems to grow fast in Arizona. Flower stalks of the century plant shoot up 12 inches in 24 hours; a steer in a feed lot puts on three pounds a day; fields of alfalfa yield eight cuttings a year.

Paul Fannin, Arizona's tall, handsome Governor, told me: "Our economic growth has been faster than our population growth. We lead the Nation in 10 of 12 important economic indexes, from income growth rate to increase in life insurance in force. We are second in the other two indexes."

Governor Fannin sat beneath a bronze replica of the great seal of the state. It depicts a reservoir bright in the sun, a steer, and a miner with pick and shovel. It bears the Latin motto: *Ditat Deus*—"God Enriches."

"This is still a frontier state," Governor Fannin said. "We've just begun to grow."

And a friend said, when I had been in Arizona only a short while, "You'd better publish fast—before everything changes."

Capital Rose From Indian Ashes

Phoenix takes its name from the mythical bird that is consumed by fire every 500 years, only to rise triumphant from its ashes. Founders predicted the city would "rise like a phoenix" from traces of prehistoric settlement by the Hohokam, "Those who have gone."

I had not been in Phoenix for 12 years, and I was amazed at its changes. I remembered a luncheon at the Arizona Club on the top floor of the Luhrs Building. Then all Phoenix spread below, a compact, properly delineated town, closely hemmed in by groves of date and citrus trees. Many of the downtown sidewalks were covered with wooden roofs. Phoenix had the look of a Western cow town.

Today the city seems to stream off in all directions (pages 342-43). It is not an illusion. In 1950 Phoenix occupied 17.1 square miles; now it covers 187.4 square miles.

Since 1948 more than 300 firms have settled around Phoenix, many of them from California. The giants are AiResearch (page 338), General Electric (page 339), Reynolds Metals (page 323), Sperry Phoenix, Motorola (page 338), and Goodyear Aircraft.

Lights wink on as dusk enfolds Tucson, grown from a mud-hut village to a city of 213,000.

To find out what attracts industry to Phoenix, I called on Dr. Daniel E. Noble, Executive Vice President of Motorola. He greeted me in his spacious office, decorated with pre-Columbian pottery.

"We're in competition for brain power, not labor, these days," he said. "We set up a plant here because we thought this was a place that would attract brain power.

"We were flooded with applications. Phoenix is a real asset in approaching scientists and engineers. We have a symphony, a good one. We have a dynamic and moving art museum, a good little theater, and a musical theater. And what is truly wonderful about Phoenix is the participation of the people."

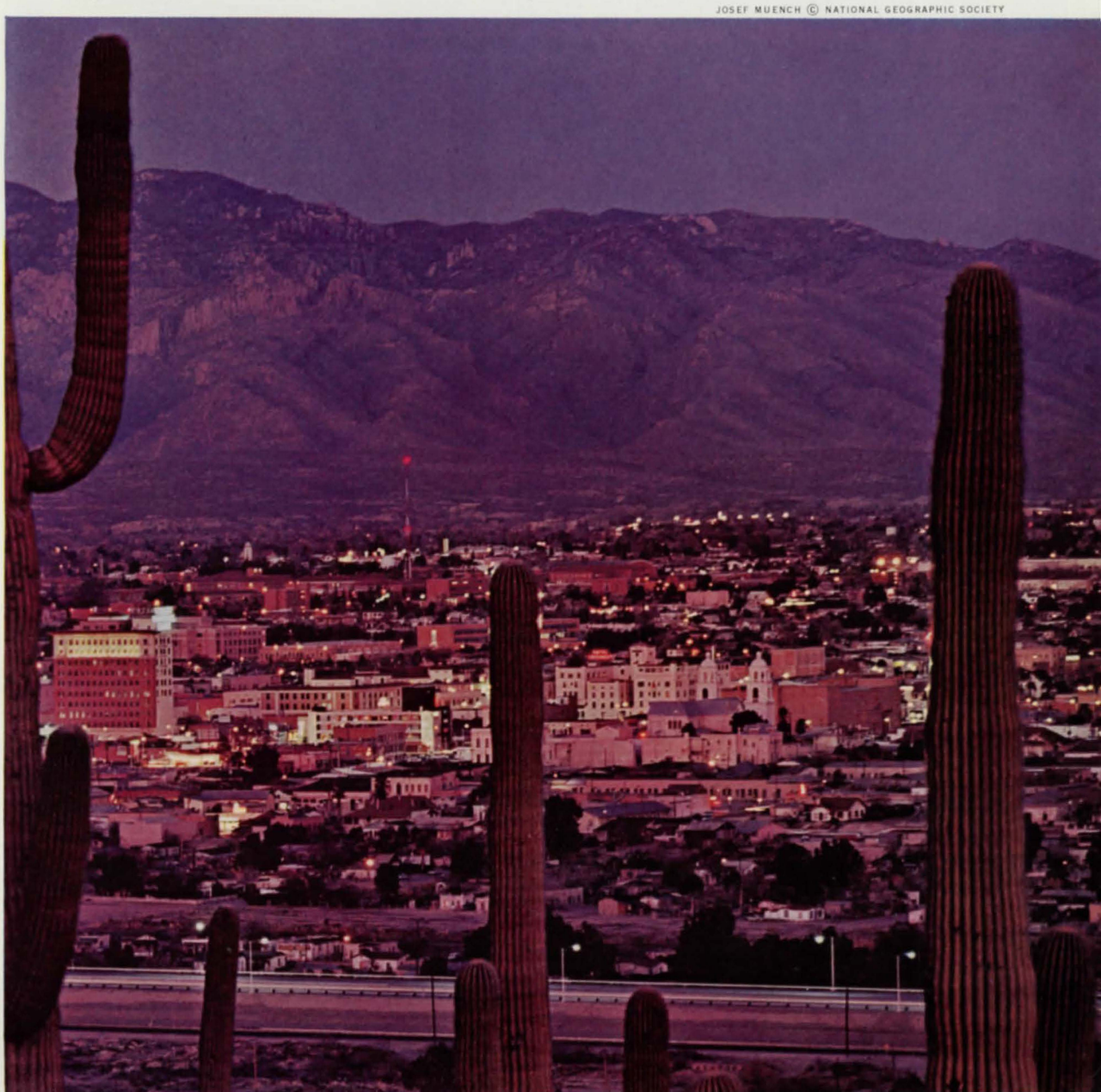
Right in the forefront of this participation is Walter R. Bimson, Chairman of the Board of the Valley National Bank, Arizona's largest. One of his chief interests is the excellent Phoenix Art Museum.

"We suffered and died to get the museum going," he told me. He added that before the museum opened in 1959, its exhibits were valued at $3,000. Today its art works are valued at more than $3,000,000.

Banks are very visible and highly competitive in Arizona. Mr. Bimson's bank has led the expansion throughout the state. Arizona now has a bank for every 7,400 residents, a high proportion.

Before its economy began to burgeon, Ari-

Saguaro cacti on a hillside look across the valley to the Santa Catalina Mountains




PARKING

zona called itself the Five-C State—for copper, cotton, citrus, cattle, and climate. The cynical added two more: cactus and cowboys. No less important were the three A's: arthritis, allergies, and asthma. Arizona was thought of primarily as a vast health resort.

But a simple AC—for air conditioning—now is an important factor in the state's life.

"The war and cheap air conditioning brought the boom to Arizona," I was told. "The 'swamp cooler'—a simple evaporative cooler that runs water over excelsior in front of a fan—cools 85 percent of Arizona."

Air conditioning has made Arizona a 12-month state. No longer do women and children flee the southern deserts in the summer.

Almost everything is air-conditioned: jails, buses, homes, offices, automobiles, supermarkets, and hot-dog stands. In Phoenix an entire shopping center is air-conditioned, including the malls. The grandstand at Greyhound Park is completely under glass, lest unconditioned air intrude.

Not everyone rejoices. A man in Tucson cracked: "I came here for sinus trouble, and after a year under air conditioning, I got it." I heard a visitor say, at an open window in Bisbee, "Boy, it's good to smell real air."

Scottsdale Nurtures Indian Art

Scottsdale, a red-and-white, board-and-batten town just east of Phoenix, prospers on tourists. But its mock-Western façade also attracts a good share of the shopping dollar from Phoenix and other nearby towns.

Many subdivisions are springing up. In some, two-bedroom houses, with a 15-by-30-foot swimming pool, sell for under $10,000. But luxury homes in the $100,000 to $250,000 range are common, too, in the Scottsdale-Paradise Valley area. Many new apartments rent for $400 a month during the winter.

Scottsdale has become a center of modern Indian arts. John and Virginia Bonnell pioneered production of modern silver in the old, simple designs. Their White Hogan ranks with the world's great silver shops, thanks to the artistry of its Navajo silversmiths, Kenneth Begay and Allen and George Kee.

Lloyd New (whose professional name is Kiva) and Charles Loloma are world famous: New, a quiet, talented man, for his leather design and use of "clash colors" in textiles, and Loloma for his gold and silver work.

ARIZONA: facts and figures

AREA: 113,909 sq. miles; 1/3 of area Indian reservations. **POPULATION:** 1,302,161 (1960); grew 553,000 since 1950. Leads states in number of Indians, 83,400. **NAME:** From Papago Indian, meaning "place of a little spring." **NICKNAMES:** Grand Canyon, Copper, Valentine State. **ADMITTED:** Feb. 14, 1912, as 48th state. **REPRESENTATIVES:** 3. **CAPITAL:** Phoenix, 439,170. **OTHER CITIES:** Tucson, Mesa, Tempe, Yuma. **LANDMARKS:** Grand Canyon of the Colorado, 217 miles long, cuts 3,500 to 6,000 feet deep; Hoover Dam, 726 feet high, forms one of the world's biggest man-made lakes; 15 national monuments. **TOPOGRAPHY:** Southern desert plains, diagonal mountainous belt, high northern plateau; highest point Humphreys Peak, 12,670 feet. **CLIMATE:** Dry, clear; sunshine 80% of the time. **ECONOMY:** Cotton, livestock, citrus, copper (leading U. S. producer), manufacturing, tourists. **STATE FLOWER:** Saguaro (giant cactus). **BIRD:** Cactus wren. **TREE:** Paloverde. **MOTTO:** *Ditat Deus,* "God Enriches."

I stood with Charles Loloma in his small shop on Scottsdale's Fifth Avenue. He held a meticulously painted Kachina doll in his right hand. In his left he held a black-and-silver bracelet accented by turquoise and coral. The bracelet was a strikingly modern design, the Kachina as ancient as the Hopi.*

"Different? Yes," he said. "But both are pure Indian, seen through Indian eyes."

Paul Huldermann, whose House of the Six Directions is one of the finest shops in Scottsdale, nodded as Loloma spoke.

"Most Indian art moves along traditional lines," he said. "The artists produce what buyers want. Here in urban Scottsdale, close to sophisticated customers, the Indian is branching out—using new materials and designs, but maintaining his Indian base."

Yes, Arizona changes. But there is an Arizona that does not change except under the slow mortification of the elements: alternating heat and cold, rasp of wind and water, lichens noiselessly fragmenting rock.

A brassy moon still rises over the gaunt mystery of the Superstition Mountains. Nothing can erase the improbable desert sunsets (pages 314-15). There will always be saguaros

*For this aspect of Indian life, see "Kachinas: Masked Dancers of the Southwest," by Paul Coze, NATIONAL GEOGRAPHIC, August, 1957.

Pima County Courthouse's dome of Spanish tile and its stucco walls contrast with the aluminum-and-glass façade of Tucson's tallest building, on Governor's Corner. Four flags have flown at Tucson: Spanish, Mexican, Confederate, and United States.

Mock gun fight erupts in the streets of Old Tucson, a motion-picture set now preserved

crowned with cream-colored waxen flowers, and towering buttes that send their sunset shadows for 35 miles across the plain. The emptiness of the land remains.

Almost everyone I met in Phoenix (they call themselves Phoenicians) advised me to leave town, and all had a favorite direction.

"Baby Rattlers" Guard Hunter's Door

I headed for Wickenburg, but was sidetracked to Gila Bend first. There I spent the day on the desert, exploring a prehistoric Indian village and visiting the Painted Rocks petroglyphs beside the Gila River.

Indian symbols and stories covered maroon rocks. There were emblems like swastikas, a rayed circle for the sun, and a spiral. The ancient artists had chipped lizards, bighorn sheep, and lions into the stone surfaces.

At Gila Bend I called on Lynn Cool, a lion trapper. In the concrete of his front walk he had impressed tracks of bobcat, buffalo, and javelina. I reached for the doorbell—then pulled back at twice the speed.

Under the bell was a box inscribed: "Look out for the baby rattlers." Inside the box I found a pair of celluloid rattles—those with which babies play. Old joke, but new to me.

Lynn Cool's living room was a clutter of his trophies. He is one of ten men who have shot the big ten of Arizona: javelina, lion, bear, bighorn sheep, elk, white-tailed deer, mule deer, turkey, buffalo, and antelope.

Mrs. Cool was cooking yucca fruit, as yellow as squash and shaped like a skinny carrot. It tasted somewhat like heart of artichoke,

KODACHROMES © NATIONAL GEOGRAPHIC SOCIETY

as a copy of the adobe pueblo of the 1860's

but the fruit left a lingering, bitter aftertaste.

"The Indians use yucca for just about everything," Lynn Cool said. "They eat it, use it for thread, and even make sandals and baskets out of it."

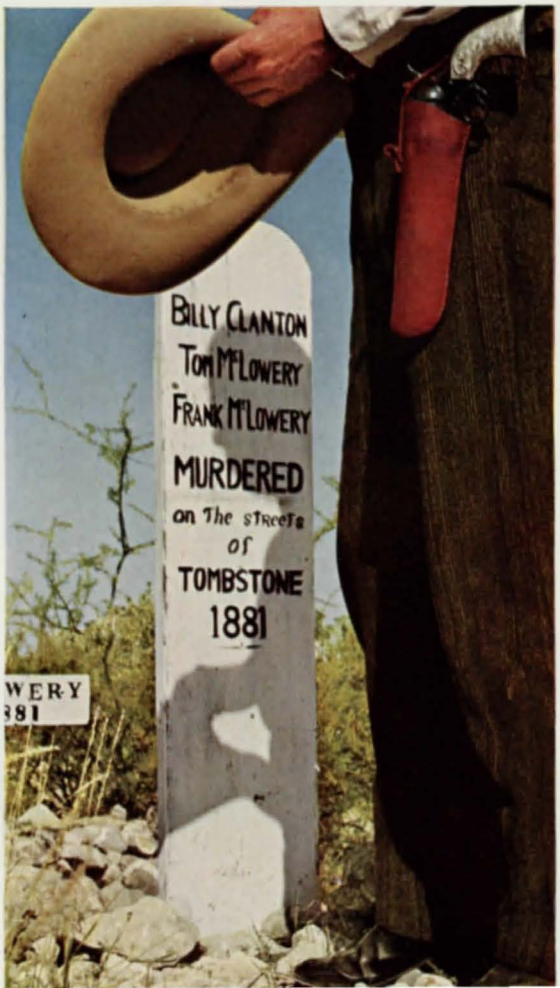
After tasting yucca, I can recommend it for thread and sandals and baskets.

The desert was in fine color. Green-barked paloverde trees blazed with yellow blossoms, the mesquite put out pale-yellow catkins, and the salt cedar was a spray of delicate ash pink.

Lynn Cool spun his four-wheel-drive truck off a rutted road into the bed of the Gila River, and we rode in a great sneezing of feathery dust until we nosed into a grove of mesquite. Cool stopped the jeep near a grave mound formed of black stones, and we got out to stand silently in the hot sun.

Fast draw. Fanning his .22-caliber pistol, an Arizona gunslinger blazes away in six-hundredths of a second. He uses blank shells.

Boothill cemetery in Tombstone marks the end of the trail for three men shot by Marshal Wyatt Earp, his two brothers, and Doc Holliday in the famous and controversial battle at the OK Corral.



A bronze marker told the story. Here six members of the Oatman family were massacred by Indians in March of 1851, when the Apaches were doing their best—which was very good indeed—to repel the white man.

A red-winged blackbird darted into the thicket. It seemed to be the only living thing within miles. Here, at this deserted graveside, Arizona history seemed very close.

Building Walls Assay at $25 a Ton

The first thing I saw in Wickenburg was a sign, "No fishing from the bridge." This was notable because there was not a drop of water here in the Hassayampa River. The second thing was a marker retelling the Indian legend that once a man drinks Hassayampa water, he will never tell the truth again.

Wickenburg clings hard to its old Western ways. Its life is casual, based on desert rides, rodeos (the horse population is 500, the people population, 2,445), deer and bird shooting, golf and tourists.

This community claims to have invented the dude ranch. It still calls itself "the dude ranch capital of the world," even though there are many more ranches in the Tucson area and near Patagonia in the southeastern corner of the state.

"My husband and my father rode the Southwest looking for the right place," said Sophie Burden, who runs the Remuda Ranch with her sons, John and Dana. "They stopped here because it's best for riding."

Dana Burden drove a kind of high-pocket station wagon toward the Vulture Mine, one of the richest of Arizona's gold finds.

"You have to drive fast on these washboard roads," Burden said, as I clung desperately to the jouncing seat. "It levels out the bumps."

I was grateful when we stopped at the mine, where in 1863 Henry Wickenburg found a hill of gold 80 feet high and 300 feet long. The Vulture Mine produced half a million ounces of gold (worth $17,500,000 today) before the lode was lost.

Dr. George Mangun now owns the mine.

"It used to cost $15 a ton to haul ore to Wickenburg," he said. "So, if the ore didn't assay $40 a ton or better, it was thrown aside. These buildings are built of rock that runs about $25 a ton."

We walked toward the A-frame of the mine, used to haul ore to the surface, and passed an old ironwood tree. A sign said: "Hangman Tree. Eighteen men were hanged here during the heyday at the Vulture."

"Most of them were hanged for killings or high-grading," Dr. Mangun said. "Some of the ore ran $100,000 a ton, and it was quite a temptation to the miners to lift a little. One old mining fellow used to complain about his rheumatism. It was so bad he could scarcely walk. One day he fell down, and when they helped him up, they found out why his rheumatism was so bad. His boots and trousers were loaded with ore."

Nothing much grows around Wickenburg, but intensive farming to the west, at Aguila and Salome, is turning the desert green. Lettuce, cotton, and safflower seed are the crops. The water comes from wells.

Yuma, to the south, on the Colorado River, "on the sunny side of the west," is the center of an agricultural boom (page 317). As urbanization takes over citrus acreage in other areas, Yuma's groves are expanding rapidly. More than 17,570 acres are now in citrus—most of them planted since 1952.

State Slopes Upward to Grand Canyon

North of Wickenburg, Arizona humps its back, and Yarnell Hill rises abruptly from the desert floor. The odd thing about Yarnell Hill is that you do not descend very far on its northern side. Instead, the countryside tilts gently, gradually rising toward the Grand Canyon, 140 miles away (map, page 305).

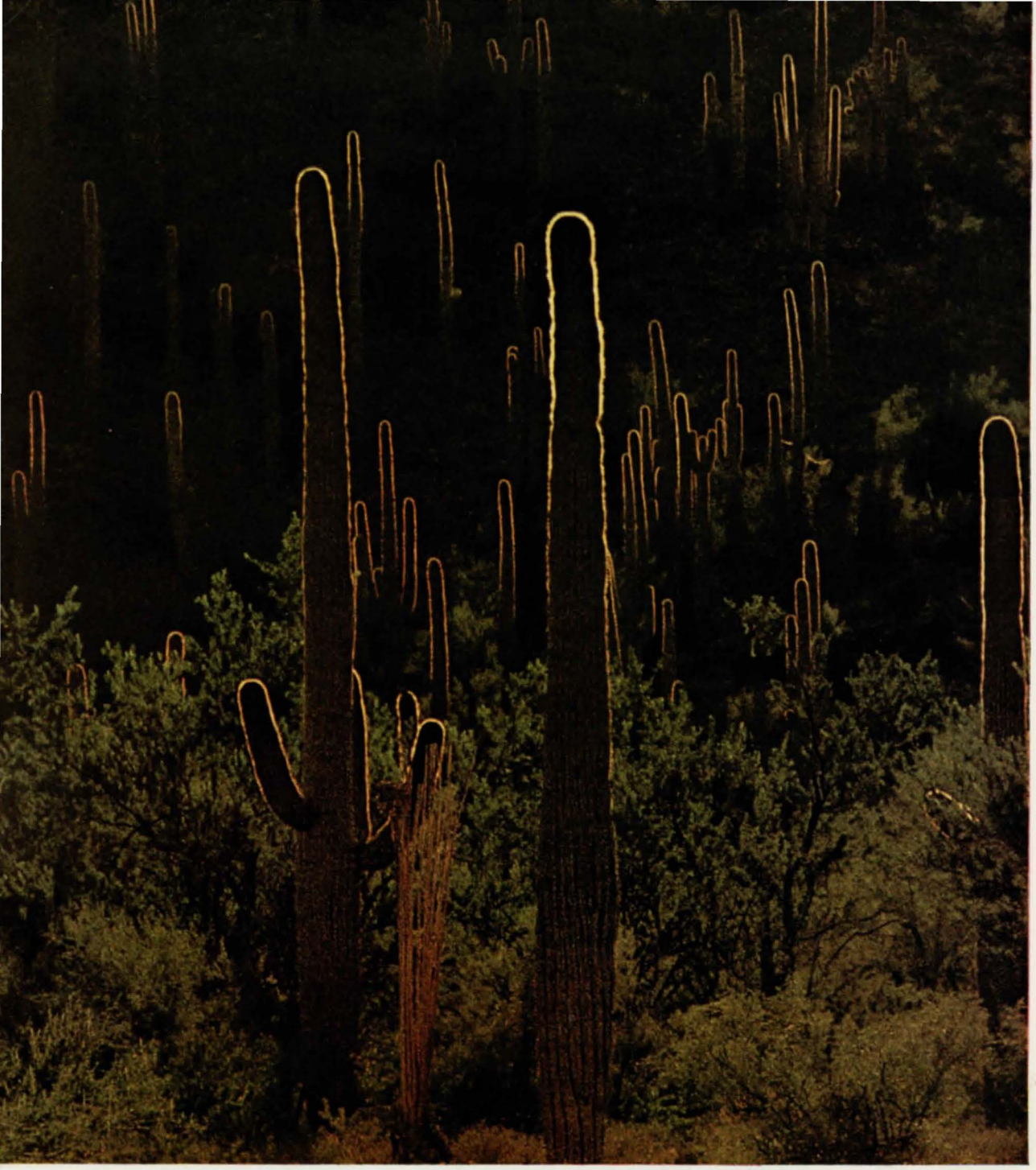
The road to Prescott runs through a dwarf forest of piñon and juniper, dark green against the yellow of the range grasses. Ponderosa pines appear as the altitude increases.

Prescott is a blue-jeans-and-boots town. Many men wear flowered frontier shirts and order their hats by the gallon. The quiet town is dominated by the granite courthouse in the plaza and the Arizona Pioneers' Home high on a hill.

When Arizona's first territorial Governor, John N. Goodwin, reached Prescott in 1864, he moved into an 8-room, log-sided mansion.

Mission San Xavier del Bac Calls to Mind Tucson's Hispanic Past

Father Eusebio Francisco Kino, Jesuit missionary and explorer, founded the mission in 1700 as one of a chain from northern Mexico to southern Arizona. Today it still serves Papago Indians on their reservation. Mission pupils and padre chat in the court.



Setting sun backlights giant saguaro cacti, symbolic of Arizona. Towering above feathery paloverde

Because the capitol was not finished, legislators held their first sessions in his home. The mansion, still sturdy, now houses a museum of local memorabilia.

The bones of Pauline Weaver, first white man to see the site of Prescott, lie under a granite boulder in front of the Governor's house. "Pioneer, Prospector, Scout, Guide, Free Trapper, Fur Trader, Empire Builder, Patriot," read the bronze words on his grave.

Pauline was named Paulino when he was born among the Cherokees in Tennessee in 1800, but he quickly and permanently became Pauline. He ranged all of northern Arizona. In 1862, he discovered gold near Ehrenberg on the Colorado—where Michael Goldwater,

KODACHROME © NATIONAL GEOGRAPHIC SOCIETY

trees, they spike a hillside in Saguaro National Monument, a 78,650-acre preserve near Tucson

grandfather of Senator Barry Goldwater, established a general store three years later.

I did not range all of northern Arizona, nor did I find gold. But what I did find is even more priceless. I rode through a pygmy forest, on what seemed to be the absolute top of the world, toward the town of Grand Canyon on the great chasm's rim. The land rose steadily as I approached the national park. I could appreciate the surprise early viewers of the canyon must have had.

Although I have seen hundreds of pictures and read much about it, my first view of the Grand Canyon was shocking.

There was nothing else in the world. As far as I could see to the left, to the right,

straight ahead, there was only the canyon.*

Once, long before, I had flown over it at great height. I knew the chasm goes on and on for 217 miles, that it is from 5 to 15 miles wide and a mile deep. Seeing it before me, I knew it to be immeasurable. It is not a place for statistics. It is an emotion (pages 334-35).

No one ever adequately describes the Grand Canyon. But the names given to the natural wonders are a clue to its mystic power: Holy Grail Temple, Zoroaster Temple, Krishna Shrine, Solomon Temple, the Temples of Isis and Osiris, Wotans Throne.

No one had ever told me about the trees, gnarled junipers, clinging to filigreed stone terraces. The trees are magnificent—twisted by the winds, hammered by storm, pressed under snows, until, in their age, they achieve a kind of miniature majesty.

In early morning darkness I walked toward the Shrine of the Ages on the South Rim of the canyon for Easter sunrise services.

The blanket-wrapped crowd sat on rock outcroppings. There were many babies, some in strollers, others plastered against their mothers in the damp-rag attitude of sleep.

The sky glowed yellow against the dark rim of the canyon. The eerie forms of eroded buttes and spires appeared gradually, like a photograph in a developing solution. Then the sun rose over the rim. It turned the tips of stunted pines a sparkling gold.

A chorus of 52 voices suddenly lifted in a great "Hosanna." Then there was silence. The cliffs revealed their contours, and the Rev. Frank L. Dickey, Jr., of the Grand Canyon Community Church, read the triumphant story of the Resurrection.

Monument Valley Glows With Fire

Some days later I visited Goulding's Trading Post, just north of the Utah-Arizona state line, in Monument Valley.

"No matter how much is written about it or how many pictures are taken, the valley never lets you down," said Harry Goulding.

We were looking eight miles across the

*See Louis Schellbach's "Grand Canyon: Nature's Story of Creation," in the NATIONAL GEOGRAPHIC, May, 1955.

KODACHROMES © N.G.S.

Combing a cotton field in Yuma County, a mechanical picker does the work of 110 men in a day. Cotton is king of Arizona crops.

Parched desert blooms into fertile farmland. Irrigation canal snaking through Yuma Valley produces the magical transformation.

plain to timeless buttes glowing red and orange in lowering sunlight. The soil was so red it made the tough grasses look almost blue.

Harry Goulding is a long-legged Indian trader of 65. The Navajos call him "T-pay-eh-nez"—Long-man-with-the-sheep—in memory of the days when he ran sheep in the valley. He has been there 38 years.

"You must like it here," I said.

"Well, it gets to be a part of you," he replied. "When things happen here, they always happen big. When it rains, it'll drop an inch in 15 minutes.

"And you should see the electrical storms —there must be deposits in the valley that attract lightning. It'll come down, peck at the ground, then explode in blue flame."

There was a thunderstorm in the far distance; the rain glistened on the buttes. So definite was the line between sun and storm that I was reminded of an old Arizona saying: "A man can wash his hands in a summer shower and never get his cuffs wet."

Harry Goulding has poked into more canyons than any other man in Arizona. He took me through some of the 19,592 square miles of the Navajo Indian Reservation, which spills across into Utah and New Mexico.

The next day we drove out from his lodge past the towering forms of Mitchell Butte and Gray Whiskers—somber in the backlight of the morning—to the check-in station at Monument Valley, then down 400 feet on a winding red road.

A strong aura of mystery abides in this valley—in its silences, in the odd shapes carved by wind, water, and sand, in the improbable presence of the monuments themselves.*

You can see anything you like in these rocks: rabbits, boars, camels, Indians, roosters, witches, nuns, elephants, mules, penguins —each to his own taste.

Architectural forms suggest weathered columns of forgotten temples. Precipices hun-

*See NATIONAL GEOGRAPHIC, October, 1945, "Flaming Cliffs of Monument Valley," by Jack Breed.

Spawning ground of bold new architectural ideas, the former desert home of designer Frank Lloyd Wright serves as winter quarters of students enrolled by the Wright Foundation. Chief architect William Wesley Peters discusses a drawing of a Hawaiian hotel with some of the 50 trainees in their workshops at Taliesin West, near Phoenix.

KODACHROME BY NATIONAL GEOGRAPHIC PHOTOGRAPHER JAMES P. BLAIR © NATIONAL GEOGRAPHIC SOCIETY

Like broken jackstraws, stone logs strew Petrified Forest National Park. Living trees in the Triassic Period, they were buried on flood plains 170 million years ago. Crystallized quartz filled wood cells and duplicated their structure like plaster in a cast. Stone became harder than steel.

KODACHROMES © NATIONAL GEOGRAPHIC SOCIETY

Polished cross section reveals glowing colors locked forever in a log's stony heart.

dreds of feet high are chiseled by wind into lost friezes: ruined bas-reliefs of departed gods and men who were giants—figures just beyond the reach of recognition, a whole heroic history just out of grasp (pages 300-301 and 330-31).

In the sighing silence of the valley, you might even hear far-away trumpets and the barest echo of a cymbal.

"The valley is a Navajo Tribal Park," Goulding said. "The Navvies run it, and their rangers guard it jealously. They are always on patrol against vandals, and they can get mighty rough."

Later we drove for hours through the reservation. To me it looked empty. The domed hogans were plastered with the soil they stand on and were difficult to see. Occasionally we saw a two-horse farm wagon carrying an Indian family wrapped up in their blankets —and the always-present barrel of water.

"There are supposed to be 74,000 Navajos here," I said. "Where are they?"

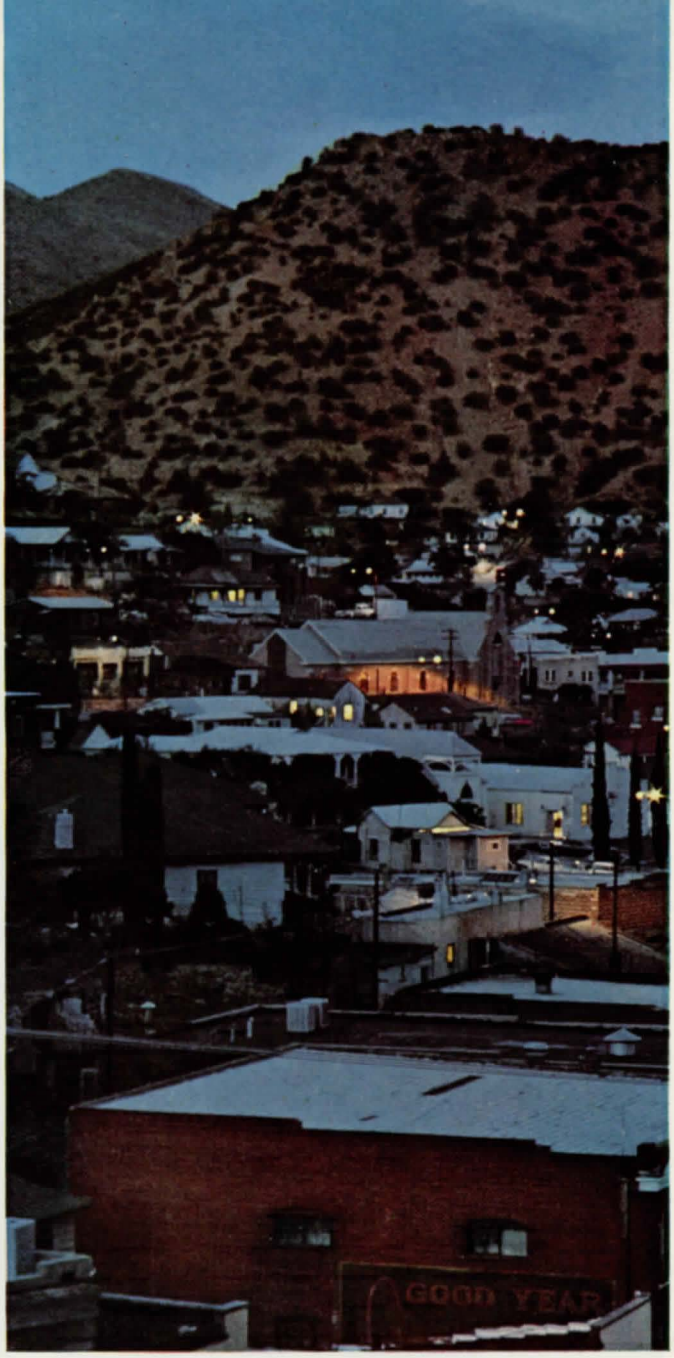
Goulding waved his hand toward the horizon. "Well," he said, "this is a mighty big place. But I'll bet we won't be anywhere today that Navajo eyes won't be watching."

I was surprised, too, by the scarcity of wild things. We saw few rabbits, prairie dogs, or ground squirrels.

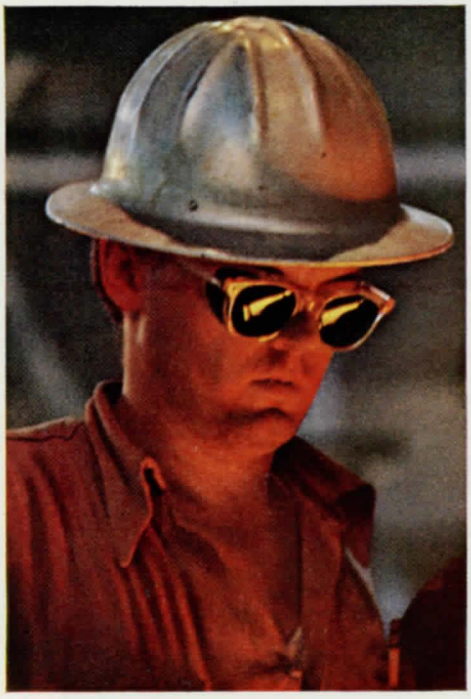
"About six years ago something happened

Mountaintop "B" Identifies Bisbee, Mile-high City in Cochise County

Air-conditioned by its altitude, copper-mining Bisbee stretches some two miles long but only a few blocks wide as it rises along both sides of a deep gulch. Many houses cling to terraces and are pitched atop one another like swallows' nests on a cliff. To save the postman weary steps, Bisbeeites daily trudge to the post office for their mail. The community of 10,000 is one of the largest in the United States without house-to-house delivery.



Molten glow reflects in the protective glasses of a Kennecott copper worker in Hayden. Hard hat is standard equipment in metal plants.



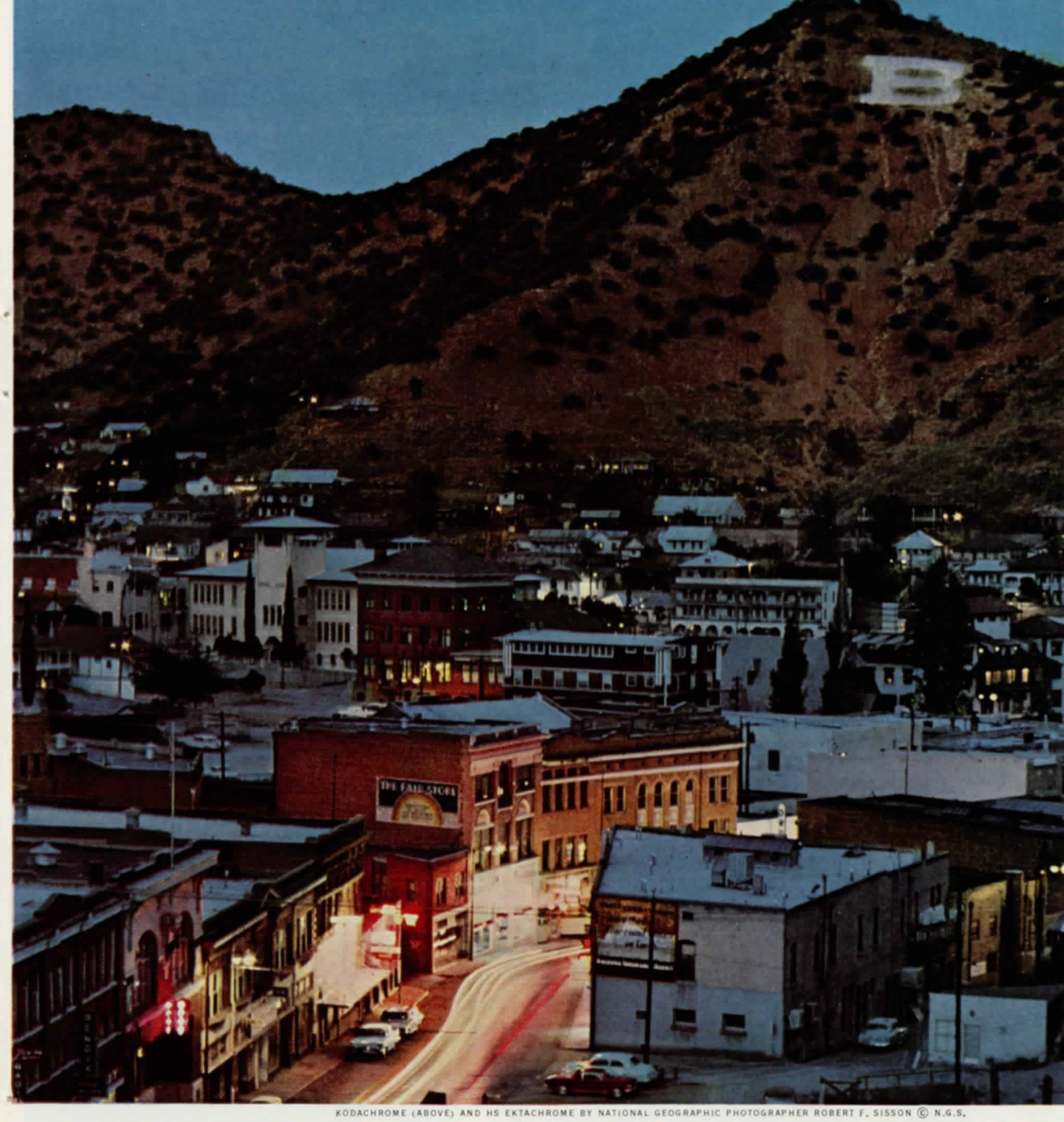
to the rabbits and small rodents," Goulding said. "They just didn't come out of their holes after their hibernation. There used to be a lot of coyotes, too, but they left when they didn't have anything to eat. If you do happen to see a rabbit, there'll be an Indian crowding him mighty close."

This is a harsh and brutal land, where the Indians live in scalding poverty, despite "general knowledge" that the Navajos are rich. Later I asked John McPhee, assistant to Paul Jones, Chairman of the Tribal Council, to explain the paradox.

"Fifteen years ago, the Navajo was one of the poorest tribes in the United States," he said. "Today it is perhaps the wealthiest, because divine providence gave it great oil and gas fields."

Uranium also yields big money. But instead of distributing income from these sources—more than $16,500,000 in 1961—the tribe spends it on long-range improvements in water supply, educational opportunities, and industrial projects to create jobs.*

*See "Better Days for the Navajos," by Jack Breed, NATIONAL GEOGRAPHIC, December, 1958.



KODACHROME (ABOVE) AND H5 EKTACHROME BY NATIONAL GEOGRAPHIC PHOTOGRAPHER ROBERT F. SISSON © N.G.S.

"The tribe set aside $10,000,000 for scholarships," McPhee said. "Now 30,500 Navajos are in school, including 300 in colleges."

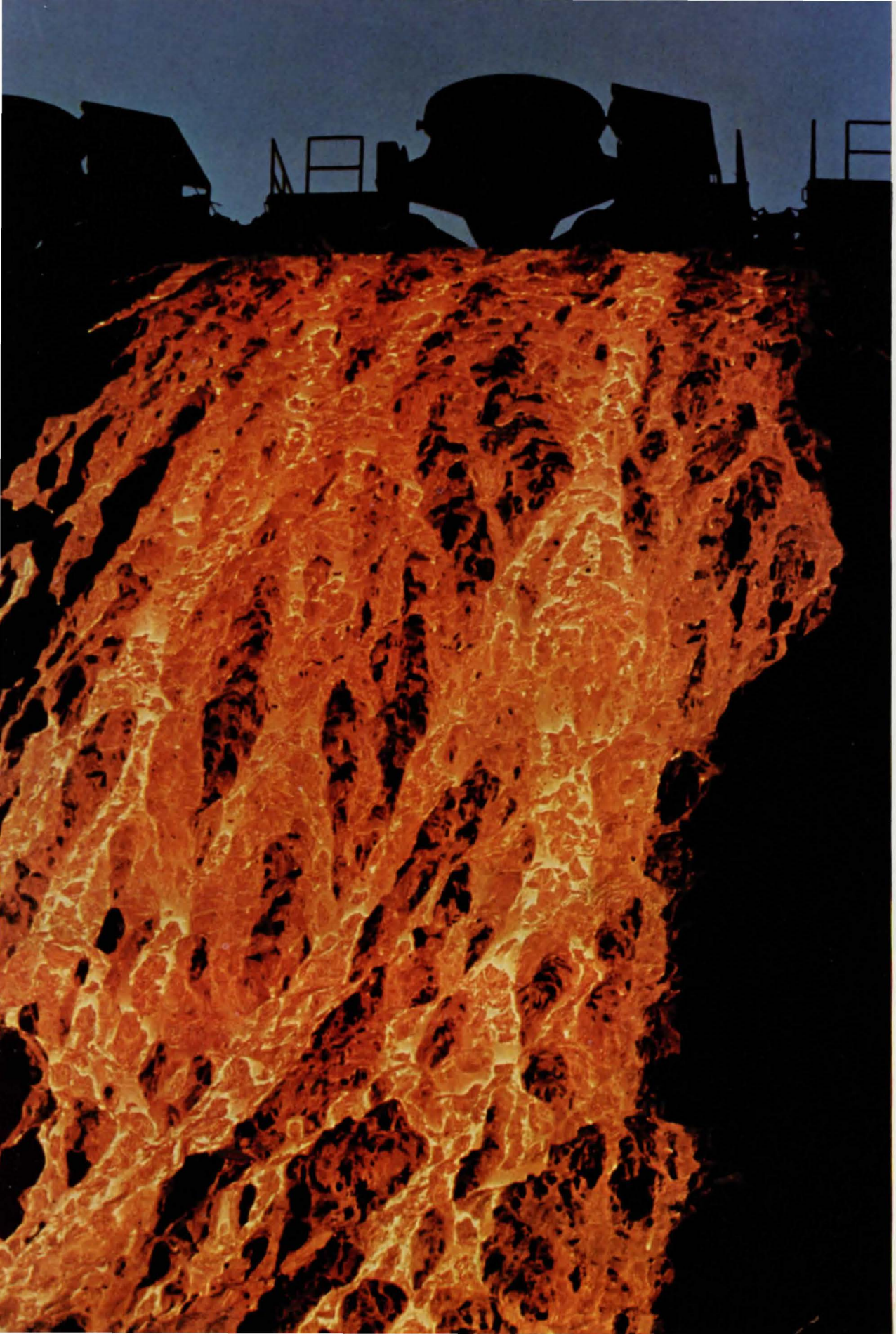
The Apaches, both the San Carlos and the White Mountain Apaches, are making a living these days, each with about 15,000 head of cattle (pages 326-27). The White Mountain Apaches pioneered burning underbrush to improve the range, and they have an intensive program to improve recreational facilities—for tourists—in the White Mountains.

But Indian prosperity is relative and limited. Most tribes eke out only a meager living by raising precarious crops of corn, beans, melons, and squash. Almost all Indians supplement their farm food by hunting.

Indians Scour Desert for Food

Prickly pear, mesquite beans, yucca, piñon nuts, and other seeds help stretch the menu. So important is the saguaro cactus to the Papagos of the southern desert that the day the fruits ripen is designated the first day of the New Year.

Many Indians winter in domed mud-and-timber hogans, or adobe cabins (page 333).



HS EKTACHROMES © N.G.S.

Copper Slag Cascades Like Fiery Lava

Arizona, the Nation's leading copper producer, turns out more than a billion pounds a year. Electric shovels, working in huge pits, gulp 11-ton bites of ore. Here a train of 15-ton slag pots dumps the waste into a ravine at Kennecott's plant in Hayden.

Bouquet of irrigation tubes took shape under the 4,000-pound pressure of an extrusion press at the Reynolds plant located in Phoenix. These unfinished aluminum tubes popped individually out of dies like bubble gum from a boy's lips.

In the summer, many of the tribesmen live in brush arbors or mound-shaped wickiups made of twigs.

Without an exception, everyone I talked to who *knew* the Indians thought highly of them. But there is still a prevalent attitude which holds the Indian in low regard.

"The problem is a lack of understanding and communication between the Indians and the white folks," Royal Marks, an attorney for three tribes, told me.

"It was always the white men's side of the story that was told in movies and novels," he continued. "How they were preyed on by the Indians, how the Indians shot the whites full of arrows, and burned their ranches. But people are now realizing that the invader was really the white man, grabbing property belonging to the Indian.

"The average Indian today, I think, still has suspicion toward the white man. The Indians live on their land and they love it. They feel that if they give even a long-term lease, they are going to lose the land."

Indians who serve in the Armed Forces return to their reservations with a broader outlook and modern ideas. Their influence is being felt in the tribal councils.

"All the tribes are making advances in adapting themselves to two cultures," Royal Marks said. "It isn't easy, and they are to be complimented for it."

But the Indians still must fight for a living in a land never designed to support an affluent society. I got a small taste of its harshness on my drive with Harry Goulding. The wind had been kicking up all day. In the afternoon it really went to work.

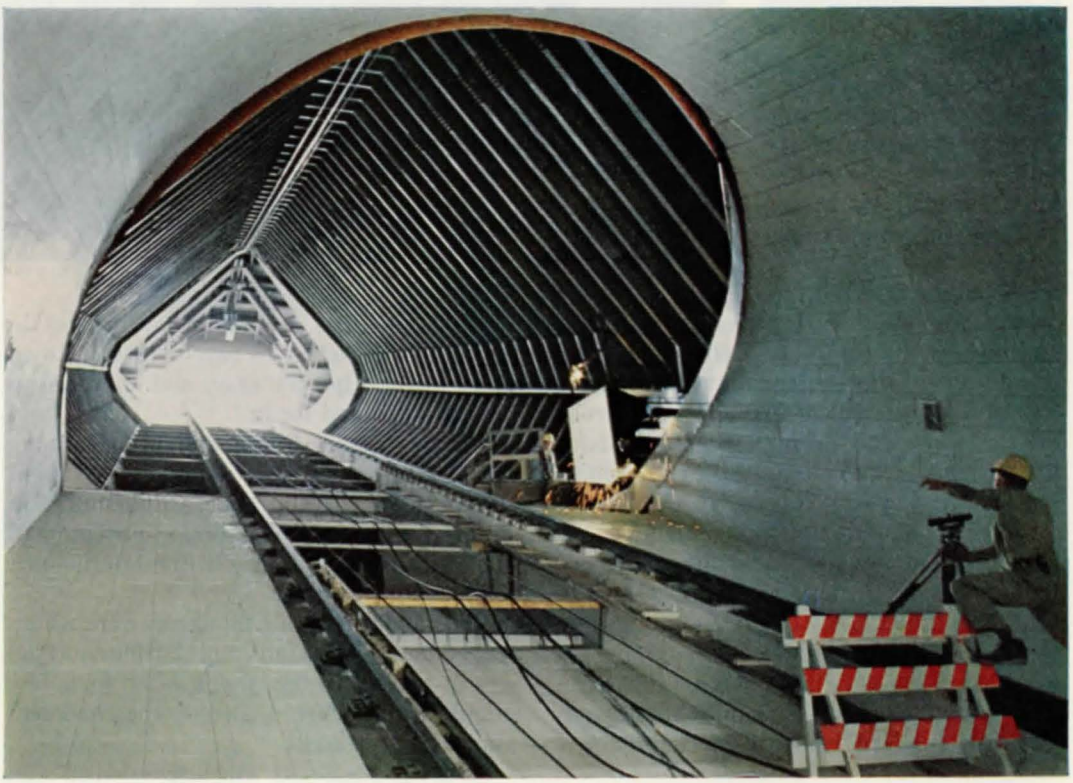
Red sand, driven as though it were water, flowed across the road in pink riffles and began to pile up in the ruts. I dozed for a few minutes, and when I awoke, the road had almost disappeared.

Now the wind was whirling the sand high

KODACHROME (ABOVE) AND HS EKTACHROME © NATIONAL GEOGRAPHIC SOCIETY

Lighthouse of the sky. Housing for the world's most powerful solar telescope nears completion atop 6,875-foot Kitt Peak. Eighty-inch mirror on the concrete tower will reflect sunlight down the 500-foot slanting shaft—300 feet of it below ground—revealing secrets about solar radiation, flares, and sunspots unresolved by smaller telescopes.

Halfway down the shaft, a workman checks rail alignment preparatory to installing a mirror mounting. Papago Indians, who own the peak and lease it to the Federal Government, call the stargazers "the men with the long eyes." Moon-bound astronauts will rely heavily on observations of dangerous solar radiation made at Kitt Peak.



in the air. Through it, the sun looked like a tiny, glowing coal of fire. Then it was snuffed out entirely, and we were in a whirling, whistling dusk.

"The old desert's got a stinger in her today," said Goulding.

The car porpoised up and down hills of sand, swerving and yawing like a boat at sea. The air was full of hurtling tumbleweed, like yellow cannon balls. In the queer half-light, we occasionally saw Navajo women and girls, their backs to the wind, watching their sheep. Their peach-colored, green, or blue satin skirts streamed out before them.

Suddenly we were in the sun again, and the wind dropped to a breeze. The evidence of the storm was all around us: Every plant had grown a lizardlike tail of sand.

"I'd hate to be a Navajo on a day like this," I said.

"No matter how tough things get, a Navajo sees the humor in it," Goulding said. "I think that's what kept them alive. They don't let anything get them down.

"The Indians are really a great race of people," he concluded softly. "They have qualities we need as a Nation."

Lava Scorched a Fire-hued Land

I continued by car from Monument Valley through the Painted Desert, where the country looks as though it were built of coursed brick one moment and like a Technicolor mirage the next. Then the road straightened for the long pull to Flagstaff, clustered at the base of the snow-covered San Francisco Peaks.

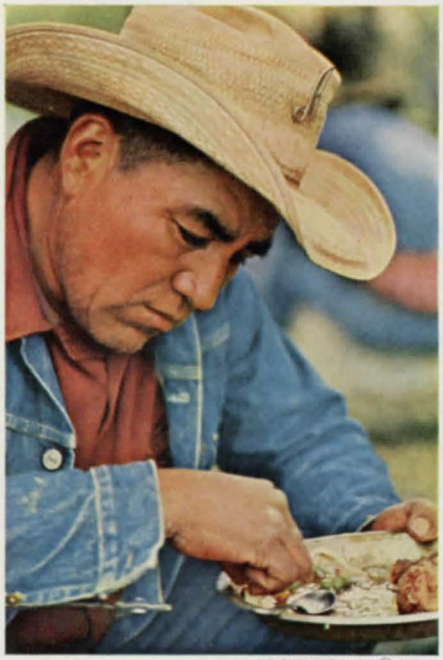
A 35-mile loop road took me through the two national monuments of Wupatki and Sunset Crater. More than 800 ruins

HS EKTACHROME (ABOVE) AND KODACHROME © N.G.S.

Close-up look at the moon. Air Force cartographers at Lowell Observatory in Flagstaff peer through eyepieces on a 12-inch and a 24-inch telescope and compare their observations to lunar photographs.

Mammoth moon crater, 70-mile-wide Gassendi, takes on light and shadow as Patricia Bridges airbrushes its relief features. To aid astronauts who may land on the moon, chartmakers are mapping the entire surface at a scale of 15.78 miles to the inch.

Apache cowboy sops up stew during the fall cattle drive. He tends Herefords in the White Mountains of eastern Arizona, where the Fort Apache Indian Reservation spreads over 1,664,872 acres of forested highland and rolling grassland.



HS EKTACHROMES © N.G.S.

Stout lariats induce a reluctant steer to cross a rain-slick road as Apaches move their cattle from high summer pastures to auction pens in Whiteriver. Cochise, Geronimo, Mangas Coloradas, and other Apache warriors roamed these hills a century ago.

KODACHROME BY NATIONAL GEOGRAPHIC PHOTOGRAPHER ROBERT F. SISSON © N.G.S.

In a tableau reminiscent of the old West, Herefords stand in the cool water of the White River. Steers will bring top prices from buyers in Whiteriver, headquarters of the Fort Apache Indian Reservation. October frosts gild the cottonwoods.

of the ancient Sinagua have been found here. The largest is Wupatki itself, once containing a hundred rooms built of Moenkopi sandstone. Great cubical boulders of this rock lie about the site, looking as rich as chocolate cake.

The dirt road rolls through red-and-green land for a few miles, and then the country changes. The fields are covered with black cinders. Whole hillsides of cinders rise from the plain. Clumps of yellow grass on these slopes look like stars in a night sky.

Sunset Crater—named for the red-yellow band on the crater lip—is a black hill which erupted in 1064, the date determined by tree rings in beams of houses covered by lava. Amid 800 square miles of cinders, an angry black lava flow fills a narrow valley—a frozen river that once seared the countryside.

I was met in Flagstaff by Ted Babbitt, whose grandfather arrived in the town in 1886. Just 10 years earlier, local lore relates, a party of scouts peeled a pine tree and lashed Old Glory to its tip to celebrate the country's 100th birthday. The flagstaff became a landmark and gave the town its name.

"This is the most misinterpreted area in the United States," Ted said. "People come through here with water bags on their cars, prepared for desert driving. They're amazed to find pine trees and cool air."

Flagstaff is a hummer. Daily 35 trains rum-

Peering through fence slats, Navajo woman and child watch Indian cowboys compete in the Flagstaff rodeo. Riders vie for $10,000 in prizes.

ble through town, and a truck a minute passes during daylight hours. Many trucks are cement "tankers" en route from Clarkdale to Glen Canyon Dam, near the Utah border.

Ten thousand Indians converge on Flagstaff for the All-Indian Pow Wow on the Fourth of July. "It's a show for and by the Indian," Ted Babbitt told me. "Not even the Governor himself could parade unless he were Indian" (pages 302-03).

Flagstaff is a busy intellectual center—the home of Arizona State College, the distinguished Museum of Northern Arizona, an important Naval observatory, and Lowell Observatory. The astronomers flourish under the same conditions—an altitude of 7,246 feet, dust- and pollen-free air—that attract sufferers from pulmonary disease to Flagstaff.

Lowell Observatory is famous for its "firsts," notably for determining the temperatures of Venus, Mars, Jupiter, and Saturn, and for discoveries that led to the theory of the expanding universe (page 325).

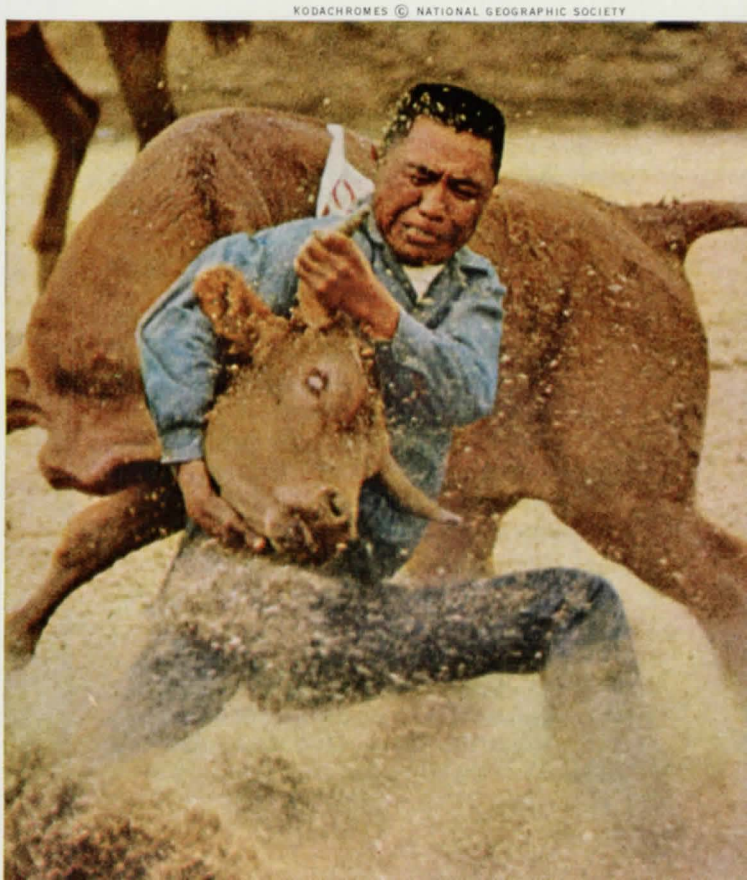
But the most dramatic of the observatory's efforts was the prediction of the existence of Pluto and its subsequent discovery. In 1902, Percival Lowell, founder of the observatory, reasoned there should be another planet beyond Neptune. Astronomers worked for years to complete the mathematical proof, and in 1930 Pluto was caught on the photographic plates by astronomer Clyde Tombaugh.

Lowell did not live to see it. He died in 1916 and

Blast-off! Airborne Cowpoke and Bronc Part Company

Scarcely had this rider left the chute —one hand free, the other clutching rope—when his mount bucked. A second later, boots left stirrups and man met earth. Action took place at Prescott's Frontier Days rodeo, the Nation's oldest.

Arizonans and their visitors flock to some 125 rodeos held annually in the state. "Rodeo" derives from the Mexicans' word for roundup. They, in turn, took it from the Spanish verb *rodear,* meaning "to encircle."



Wrestling a steer, an Indian bulldogger grabs the horns, plants his heels in dirt, twists the head, and forces the animal to the ground.

lies buried near the telescopes on Mars Hill, 341 feet above Flagstaff.

After I had been in Arizona about three weeks, it occurred to me that—bemused by the exorbitant scenery and the exuberance of the people—I had not seen any copper.

Arizona has led the Nation in copper production for the past 50 years. From 1858 to 1960 the state's underground mines and open pits yielded 17,780,776 tons of copper, worth $7,072,681,000.

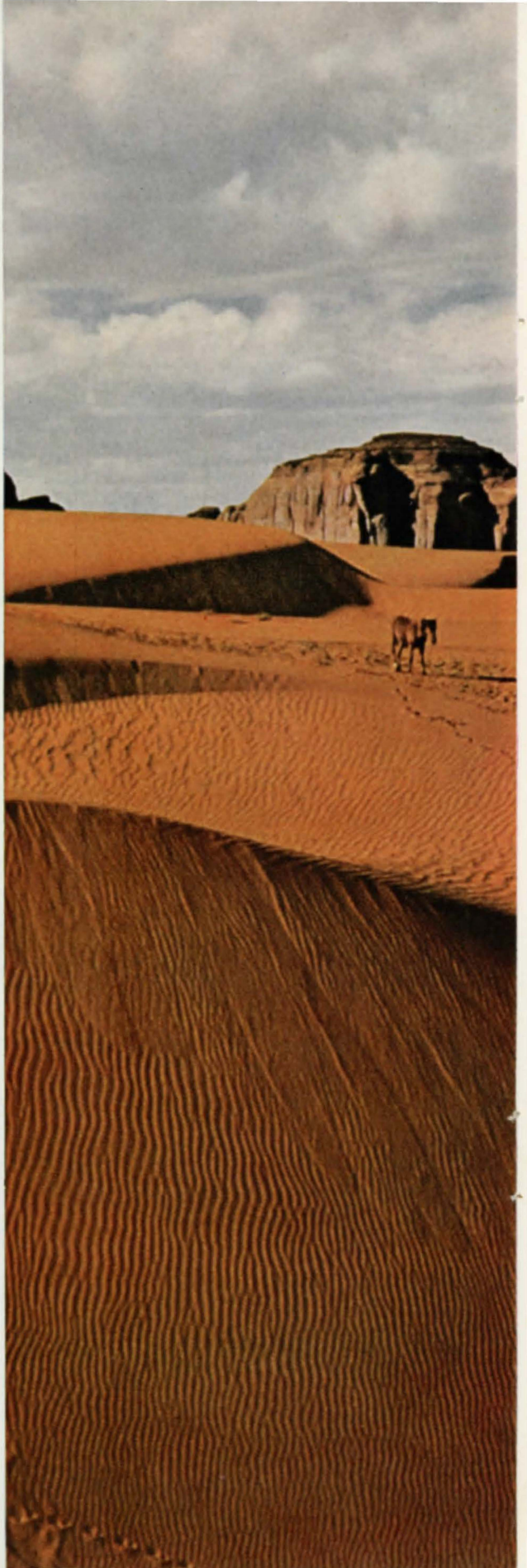
Some Arizona copper companies make a profit from ores averaging only twelve pounds of copper to the ton. For this they receive $3.72 at the current price of 31 cents a pound. A profit is possible because sulphide coppers are associated with gold and silver, and the return from the precious metals helps pay for the mining of the copper ore. (Annually, Arizona produces approximately $5,000,000 worth of gold and almost as much silver.)

Copper is responsible for some of the more improbable cities of the state, cockeyed cities built on roller-coaster hills. Jerome, once Arizona's fifth city, is now a ghost town, but Bisbee and Globe prosper.

They say in Arizona that men tear down nature's mountains, run them through mills and smelters, and rebuild new mountains of the waste. This is particularly noticeable in Globe, where a black mound of slag juts into a residential section.

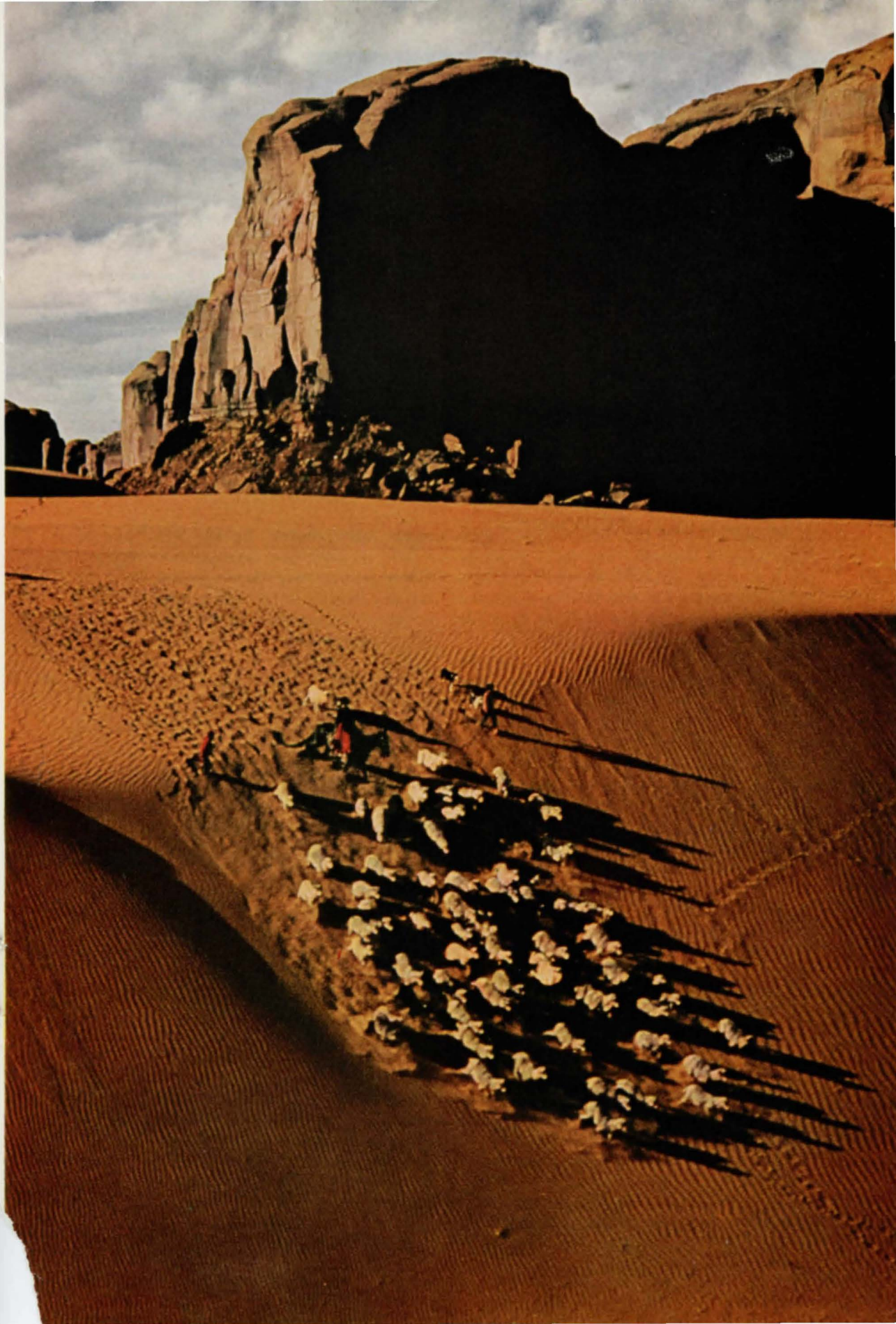
I met Norman Harrington of the Kennecott Copper Corporation on a dusty hill in Ray, the site of an underground mine established in 1900, now an open pit. He handed me a yellow badge and a hard hat, and we went to look for Stan Johnsen, the production foreman. We found him on one of the benches of the pit, just above a tremendous electric shovel which was methodically chewing up the hill in 11-ton bites.

The pit fell away in gigantic steps. Its sides were red, silver gray, and mauve. In the faraway bottom was a pool of sullen yellow water. Minerals had stained another pool deep, deep green. Tall boxlike trucks moved steadily about in the pit. Some crept toward the ore crusher; others plodded up a steep hill to dump waste rock.



Like a flash flood sweeping down flaming red sands, sheep head for water in Monument Valley after a day's grazing on desert shrubs. Navajos herd their flock on foot and horseback across dunes shaped by the same winds that carved magnificent Spearhead Mesa (right) and distant Rain God Mesa.

KODACHROME BY M. DURRANCE © N.G.S.



KODACHROME BY NATIONAL GEOGRAPHIC PHOTOGRAPHER JAMES P. BLAIR © N.G.S.

Navajo Surveyor Lays Out Streets in Window Rock, His Tribe's Capital

College graduate Harrison Yazhe offers evidence of the educational revolution that has swept Navajoland in the last decade. Trailer schools for youngsters and million-dollar boarding schools for teen-agers have sprung up on the 16,000,000-acre reservation, home of the largest tribe in the United States.

Arizona's Navajo population today numbers 74,000, a gain of 54,000 since 1900. Window Rock, in northeastern Arizona, derives its name from a wind-eroded sandstone arch.

"We mine 23,000 tons of ore a day," wiry Stan Johnsen told me, "and move twice as much in waste. All told, about 69,000 tons a day. We have a rule that nothing is allowed to interfere with the trucks. They have the right of way at all times."

When we drove in Johnsen's pickup to the crusher where the giants congregated, I began to appreciate the size of the ten-wheel trucks. They towered over our car. I felt a little like an ant among moving sugar cubes.

These trucks carry 56 tons in one load. Powered by two 335-horsepower diesels mounted side by side, they have automatic transmissions and power steering. Otherwise the drivers, who looked to me like midgets perched in the high cabs, could not handle such a mass of machine and ore.

"The tires cost $1,400 each," Stan Johnsen said. "That's $14,000 a truck right there."

"How long do the tires last?"

"Around 2,500 hours."

Later, I drove with Norman Harrington to the Kennecott mill and smelter at Hayden.

The ore from Ray—less than one percent copper, or about 18 pounds to the ton—arrives at Hayden by rail. As a first step it is crushed, in a turmoil of noise, to a diameter of three-eighths of an inch. I noticed that the dust from the crushers was carefully collected. "It's not just good housekeeping," Norm Harrington said. "There's copper in that dust."

The ore then goes to rod-and-ball mills for grinding into powder. After treatment by acids, it emerges as a dark-gray concentrate ready, after drying, for the hot furnaces.

We watched the final refining process. Great yellow-green flames rushed from the top of a furnace. A thin cerise-colored stream of molten copper poured out of the furnace into shallow molds.

When cooled, this is the finished Arizona product: an "anode" weighing about 700 pounds. The copper is about 99 percent pure. Later, at other locations, it is further purified electrolytically.

"Cousin Jacks" Burrowed Under Bisbee

Bisbee claims to be the copper capital of Arizona. It is one of the world's very few nonferrous mining camps that have produced more than a billion dollars worth of ore.

In the early 1900's, Bisbee flourished because of the copper that attracted miners to the town. Almost 4000 Finns, Poles, Irishmen, Italians, and "Cousin Jacks"—men from Cornwall—worked the underground mines. While some of the stores and homes on the original town site are empty, the present-day town still has a prosperous look.

The Phelps Dodge Corporation, the giant of Arizona copper producers, owns almost all the copper land of the district, a hotel, the hospital, and three large stores. In Bisbee, it is known simply as "the company."

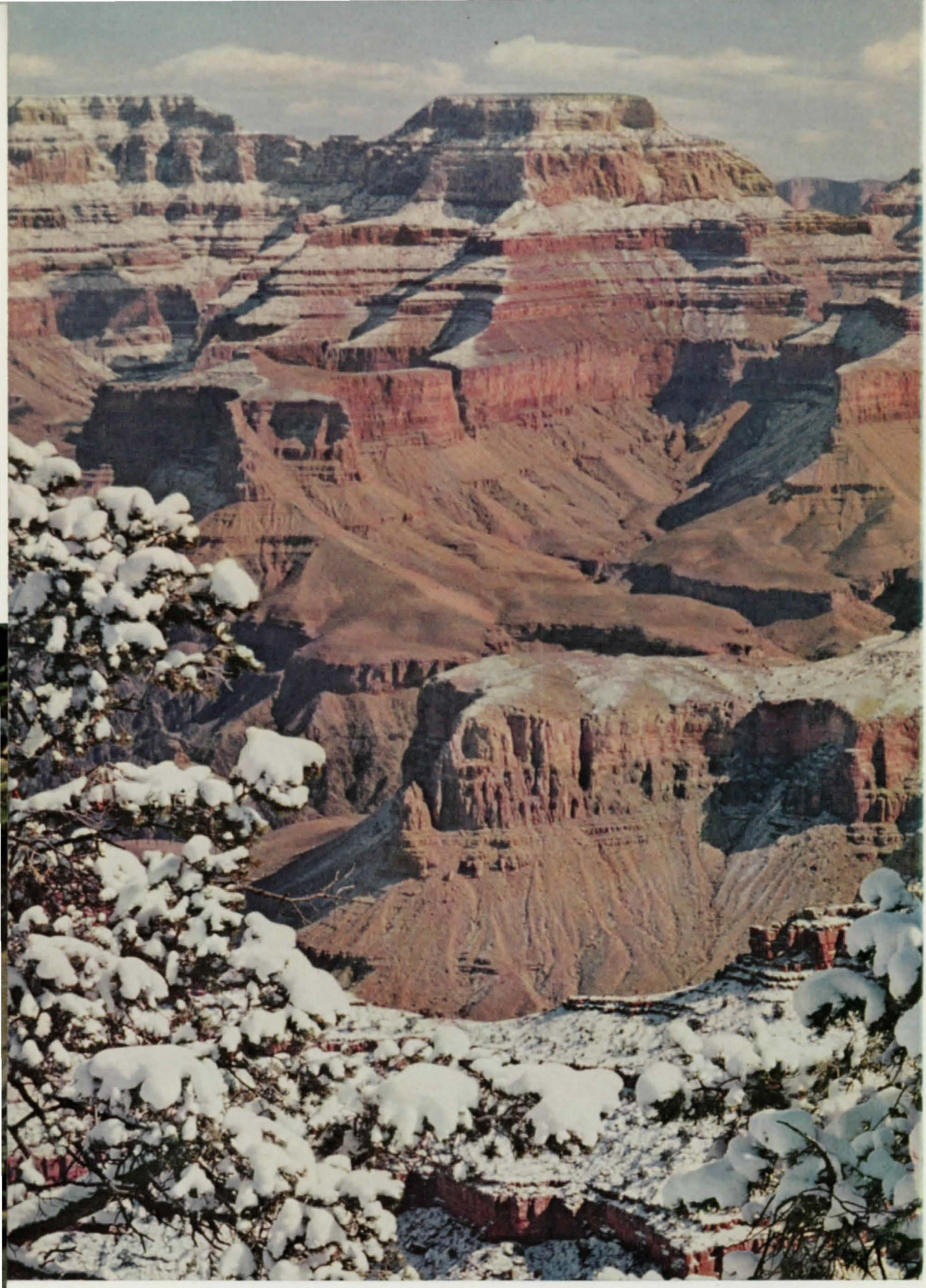
Bisbee grew where copper was found, along Tombstone Canyon. Homes cling to the steep sides of School, Quality, Laundry, and Chihuahua Hills (pages 320-21).

After dinner at the Copper Queen Hotel,

HS EKTACHROMES BY NATIONAL GEOGRAPHIC PHOTOGRAPHER ROBERT F. SISSON © N.G.S.

Traditional hogan, a mud-covered log hut, still houses many Navajos, although cement-block and frame homes have appeared in recent years. Door always faces the east, from which all good spirits come, including the sun, Navajos believe.

Navajos sit on the dirt floor, their guest on the bed, as John and Anna Cly entertain in their fire-lighted hogan. Cly has washed his long hair with yucca-root shampoo; he will tie it with string. Loom holds a rug being woven by Mrs. Cly.



334 Snow-mantled piñons on the South Rim frame the Grand Canyon, earth's mightiest gorge.

JOSEF MUENCH © NATIONAL GEOGRAPHIC SOCIETY

Mile-high mesas hide the brawling Colorado River as it cuts a 217-mile gash in northern Arizona

I wandered up Brewery Gulch. The red-brick brewery, trimmed in weathered green copper sheeting, stood in empty majesty. The street curbs, more like retaining walls, stood five feet high. Steps were cut into the sidewalk as the street lurched up the gulch.

There was a hooting and hollering from a nearby dram shop. I hurried over, thinking I might see a rip-roaring Bisbee saloon brawl, as in the old days. Such are these tamed times, however, that I found the noise was made by a couple of ladies cheering on a shuffleboard game.

Mission of the Cat and Mouse

The most graceful reminders of the Spanish regime in Arizona lie south of Tucson, in the ruined church of Tumacacori and the serene Mission San Xavier del Bac, both on the sites established by Father Eusebio Kino, the Jesuit priest-explorer.

Tumacacori is now a national monument. The National Park Service has stabilized rather than restored the church, doing the work with understanding and love. A model shows how the structures looked when they were in use, and a small museum places Tumacacori in historical perspective.

San Xavier serves, as it has for 165 years, as the mission church for the Papago Indians. It is among the best examples of Spanish colonial architecture in the Nation (page 312).

Seen across the dun-colored desert, bright, white San Xavier gleams like a jewel. Two terraced towers, one unfinished, flank the 52-foot-high dome, a tribute to the skill of the builders. It was built of burned adobe brick and lime plaster, and, possibly, without scaffolding.

The façade frames old oak doors. High on the façade is the figure of a mouse; opposite, a cat.

I looked around and found Brother Austin, a Franciscan in brown habit and sandals.

"Somebody told me the Indians believe that when the cat catches the mouse, the end of the world will come," I said.

Brother Austin's eyes twinkled. "It would certainly be the end of the world for the mouse," he said.

He pointed to the door handle. "Notice that this is shaped like a snake. Inside, there is another figure of a mouse. We don't know why."

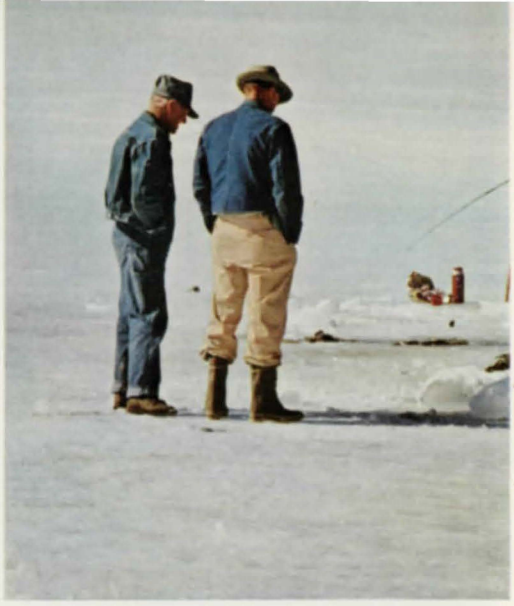
Sign Keeps Old Rivalry Warm

Tucson has always regarded Phoenix as an arrogant parvenu and carries on a commercial, cultural, and just-on-general-principles rivalry with the capital. Ironically, Tucson's tallest building is topped with a sign reading, "Phoenix Title," and it hurts Tucson no less than a dagger in the back.

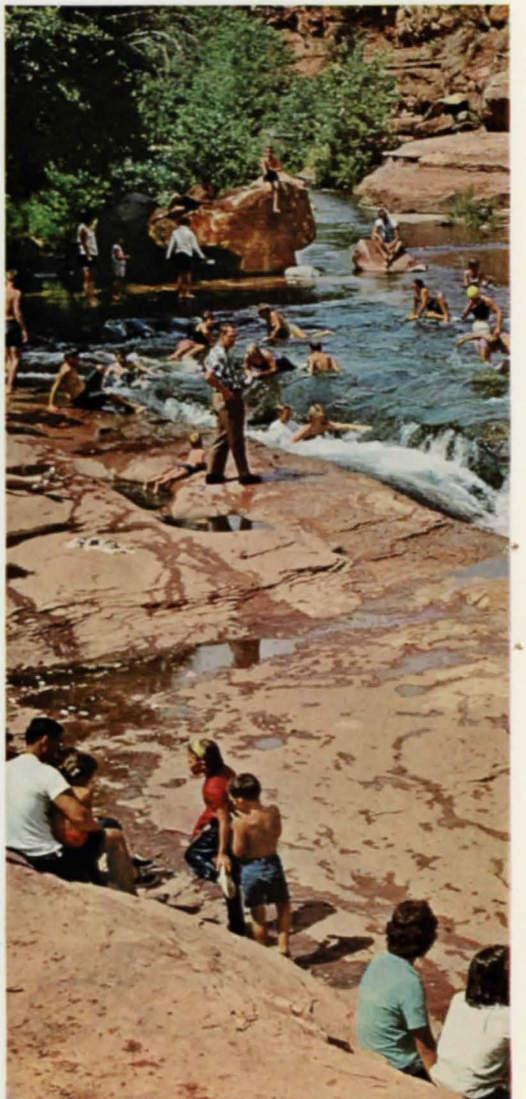
"We're going to put up the tallest building in Phoenix and put 'Tucson' on top of it," I was told.

"Phoenix has changed, but Tucson still retains

(Continued on page 341)



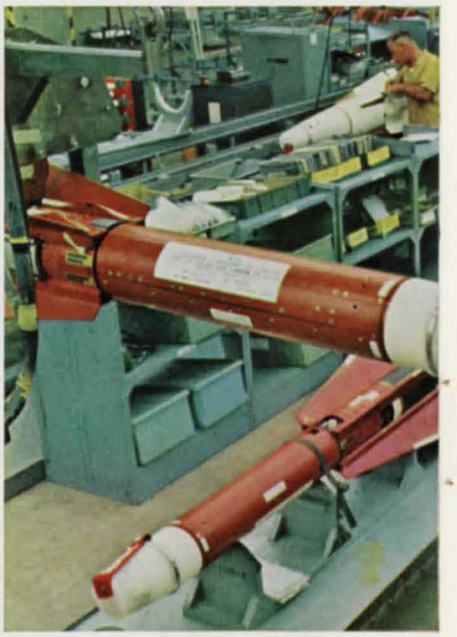
Minnesota? No, Arizona! Sportsmen fish for trout through the ice on Nelson Reservoir in the White Mountains.



JOSEF MUENCH (ABOVE) AND KODACHROME BY NATIONAL GEOGRAPHIC PHOTOGRAPHER ROBERT F. SISSON © N.G.S.

Bathers in blue jeans scoot down slick Slide Rock in Oak Creek Canyon, near Sedona, where many Arizonans on holiday camp among flaming red rocks that rival the beauty of Grand Canyon. "Pants don't last too many trips," says photographer Sisson.

Masked technician in protective gloves welds a wheel for a turbine generator designed for use in space probes. He works behind a Plexiglas chamber at the Garrett Corporation's AiResearch Division in Phoenix. Inert argon gas in the chamber protects rare metals.



Flooded lawn reflects Motorola's military division headquarters in Phoenix, hub of the state's booming electronics industry. Periodic flooding keeps lawns green the year round.

Threading wires finer than human hair, General Electric employees "sew" the core-memory planes of electronic computers in a Phoenix plant. Each board holds more than 4,000 doughnut-shaped, pinhead-size magnetic cores; four wires go into each core. A single computer requires more than 350,000 different parts and 3,500 man-hours for its manufacture.

NATIONAL GEOGRAPHIC PHOTOGRAPHER ROBERT F. SISSON © N.G.S.

Falcon missiles for the U. S. Air Force receive final touches on an assembly line at Hughes Aircraft plant, Tucson. "Remove before flight" banner tags the protective cap of the missile in foreground. Supported by thin wires, the Falcon moves on an overhead rail (not shown) to another part of the factory.

Boosted by 5,000-pound rocket thrust, dummy pilot and seat soar 400 feet as engineers of Rocket Power, Inc., test their new Zero-Zero catapult escape system near Mesa. Devices free the "man," open his parachute, and lower him gently to earth.

KODACHROMES BY NATIONAL GEOGRAPHIC PHOTOGRAPHERS ROBERT F. SISSON (ABOVE) AND JAMES P. BLAIR © N.G.S.

Water sports in the front yard. Many residents of Phoenix no longer spend hours sprinkling their lawns; controlled inundations by the Salt River Project do the job. Water, flowing through open ditches and pipes, is turned on and off at scheduled intervals.

Green-gravel lawns dress homes in Sun City, a retirement community that opened in 1960 near Phoenix. Developers are confident that the town of 6,000 will expand to 10,000 in five years or less. Arizona's 65-and-over population rose 104 percent between 1950 and 1960.

its personality," I heard. "Tucson is like a colonial Spanish town in the days of sail, with the king 5,000 miles away."

There's truth in that. Tucson, settled in 1776, relishes its age and Spanish background. Streets are named Paseo Redondo, Alameda, Granada. A school is named Ignacio Bonillas, and a pupil's first task is to learn to pronounce it: eeNASeeoh boNEEyas.

Sharing in Arizona's boom, the modern Tucson community has swollen from 45,454 to 212,892 people since 1950, and it has expanded from about 9 square miles to more than 70. It is the hub of a rich copper district, a market center, and the site of a large Hughes Aircraft plant that makes Falcon air-to-air missiles for the Air Force (page 339).

But a main Tucson "product" is sun. As one Wyoming coed wrote, "It's fine, I guess—just one darned delightful day after another."

The warm, dry climate of Tucson is ideal for sufferers from asthma and arthritis, and many dude ranches prosper in the balmy winter climate.*

However, Tucson's real pride is the University of Arizona, long noted for its fine Department of Anthropology, among others. It is a cultural leaven for the whole community. The energetic leadership of President Richard Harvill has changed the university's entire complexion in the past decade. The science curriculum and research program have expanded twentyfold. Electrical engineering and fine arts are booming, as is the new Oriental studies program.

The university has a lunar and planetary laboratory and has gained strength in astronomy. Its program is greatly stimulated by the establishment of Kitt Peak National Observatory, on the Papago Indian Reservation (page 324). Scientists first noticed the 6,875-foot peak while scanning photographs taken by a Viking rocket in 1955.

Desert Museum Teems With Life

I drove 15 miles west of Tucson over a bucking, twisting road through a magnificent stand of saguaros. The giant cacti are so close to the road that their supplicating arms make them look like grotesque hitchhikers.

Set in this forest is the Arizona-Sonora Desert Museum, one of the world's foremost "living" museums.† William H. Woodin, the young Director, met me near the entrance, where chuckwallas, whip-tailed lizards, and other creatures frolicked in the sand.

"This is much more than a usual museum," he said. "It is part zoo, part botanical garden, and part conservation institution. Unlike many museums, most displays are alive."

In a low adobe building, snakes, centipedes, scorpions, and small rodents were on display. The museum buys 70,000 meal worms and 1,000 crickets a month for such charges.

Along "animal row," bears, a family of javelinas, Mexican wolves, margay and ringtailed cats, a beautiful jaguar, and four varieties of skunk seemed happily at home.

A dozen or so desert tortoises clambered around a sand-filled pit. "Visitors welcome inside this enclosure," said a placard.

"People find it hard to believe they can get right in with the tortoises," Bill Woodin grinned. "I guess they are used to being kept out of such places."

University Enrolls 16,000 Students

I visited Arizona State University at Tempe to see Dr. Herbert Stahnke, world renowned for his work on venomous animals. I was early, so I wandered about the grounds.

It was a revelation. Before World War II, Arizona State College—as it was known then—was a sleepy place, with only three buildings for its 1,250 students. On the day I was there, the campus swarmed with students; more than 16,000 are now enrolled. Everywhere I looked I saw new buildings.

The Life Sciences building forms a hollow square, around a re-created patch of desert that serves as an ecological laboratory.

I looked through a big observation window at hummingbirds and doves, jack rabbits, tortoises, squirrels, and soft-shelled turtles in a little pond. Two chuckwallas stood rigid sentry duty on a rock pile.

"We've seen the soft-shelled turtles eating pigeons here," Dr. Stahnke told me when I commented on the laboratory. "They lie just under water. When a pigeon comes to drink, they grab its head and hold it under water until the bird drowns. To my knowledge, it's the first time that's ever been observed."

I mentioned my own disappointment in not having seen much life on the desert.

"You could probably go out into the desert for years and not see a rattlesnake," he laughed. "Arizona has 18 kinds of rattlers, but the population is low. And, of course, most desert life is nocturnal."

"I am nocturnal," I assured him.

*This dude-ranch country is described in "From Tucson to Tombstone," by Mason Sutherland, NATIONAL GEOGRAPHIC, September, 1953.

†See "Arizona's Window on Wildlife," by Lewis W. Walker, NATIONAL GEOGRAPHIC, February, 1958.

Telephone in the swimming pool symbolizes the luxury of estates in Paradise Valley, near Scottsdale. Suburbia's developers, thrusting ever deeper into the countryside, offer houses with backyard pools for as little as $10,000. Air conditioning has conquered the desert, once a wasteland where only the tough or lucky could survive.

Citrus grove on the outskirts of expanding Phoenix produces its most profitable yield,

"Go out some night: drive slowly, lights dimmed—you'll see plenty of action."

That night I ranged the desert beyond Scottsdale with my headlights on lower beam, driving at seven miles an hour. This went on for a long time, and the only gleaming "eyes" I saw were the bottoms of beer cans.

But when my engine and lights suddenly conked out and I was plunged into the desert night, the desert came alive. I heard—or thought I did—the rustles, rattles, scrapings, slitherings, and mutterings of gila monsters, rattlesnakes, scorpions, centipedes. . . .

The night was full of these evil sounds, and I thanked my stars for a cowardly heart that had kept me on a paved road.

In a little while a car came along, and Herman "Skip" Schmidt gave me a ride back to town. It is not often that the man who rescues you from a desert also suggests a good restaurant, but this one did.

"Just drive out this road for another five or six miles," Skip said as he dropped me off in Scottsdale. "Then turn off toward Pinnacle Peak. It's all marked. Name of the place is the Pinnacle Peak Patio. Steaks two inches thick, broiled over mesquite. Plenty of beans and a big salad."

A few nights later, I picked up my daughter Barbara and her husband Mike and headed for the place. Everything was just as Skip Schmidt had promised. There was the good smell of steak broiling, pretty waitresses in Western garb, and occasional whiffs of mesquite smoke. We ate at outdoor tables.

Pinnacle Peak was a rugged shadow against the flaming sunset sky. A tall saguaro was silhouetted at exactly the proper place.

Over coffee cups we watched, not saying much, as the fiery sky ran the spectrum into peaceful, purplish dusk.

It was enough, I thought. It *was* enough to make a man call a newspaper just to say how much he liked Arizona. THE END

a crop of houses. Land that once sold for 25 cents an acre now brings $5,000 to $8,000 343

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