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Nevada, Desert Treasure House

With 16 Illustrations and Map
20 Natural Color Photographs

W. ROBERT MOORE

Europe's Looted Art

With 11 Illustrations

JOHN WALKER

Indians of the Southeastern United States

With 8 Illustrations

MATTHEW W. STIRLING

First Families of Southeastern America

8 Paintings

W. LANGDON KIHN

Animals Were Allies, Too

16 Illustrations

Earth's Most Primitive People

With 10 Illustrations and Map
8 Natural Color Photographs

CHARLES P. MOUNTFORD

This Is My Own

With 14 Illustrations

FREDERICK G. VOSBURGH

England's Wild Moorland Ponies

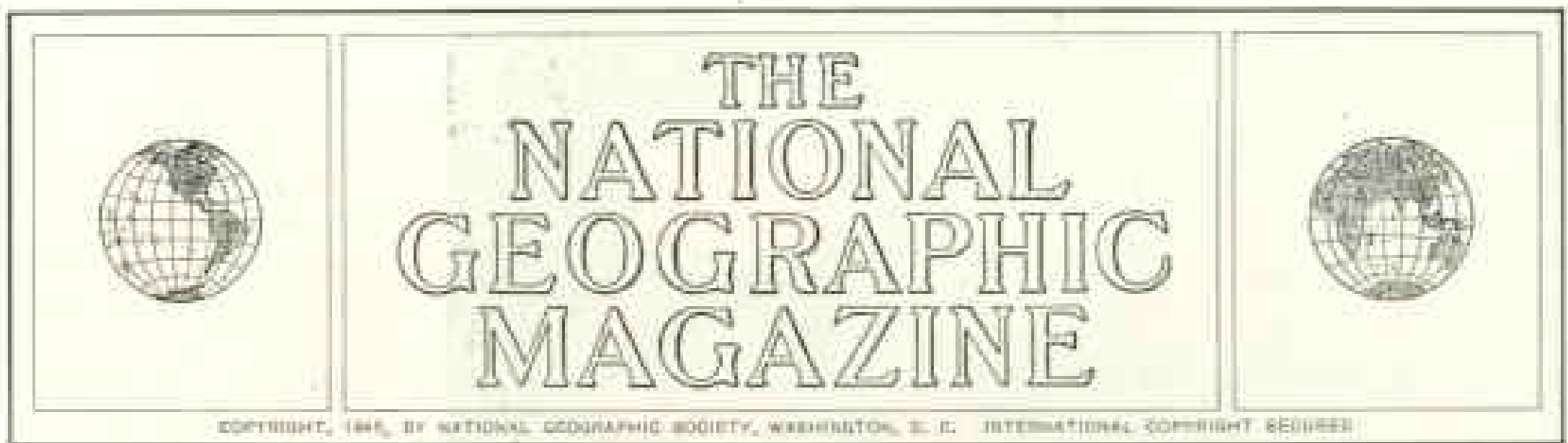
10 Illustrations

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Nevada, Desert Treasure House

By W. ROBERT MOORE

NEVADA has meant many things to many people.

To that surging "golden army," the Forty-niners, who trekked their hard, hot way across the continent to California, Nevada was only an accursed highroad in the desert wilderness—a grueling trail of swirling alkali dust, high mountain barriers, blistering heat, and choking thirst.

Hollow-cheeked men, their eyes reddened with alkali, grumbled that the water—if indeed there was water at all—was like none they had ever tasted before. It was stinking and bitter and hot and would kill their oxen if lack of pasturage didn't.

The sagebrush plains and salt-encrusted sinks soon became littered with broken wagons, abandoned cookstoves, walnut dressers, tools, and skeletons of fallen beasts. Prowling Indians added to the travail and death.

To the Mormons here was a short-lived outpost to Zion, a portion of Utah Territory, where tough, daring pioneers could dig irrigation ditches in the greening valleys and grow precious turnips and a few other vegetables for gaunt caravans that marched the desert route.

Mystery Area of the West

To Jedediah Strong Smith, fur trapper Peter Skene Ogden, John Charles Frémont, and other trail blazers who had gone before, here was the great unknown land, a wide mystery area of the West, that they must probe.

Did the mythical Buenaventura River of the Spanish or some other waterway flow through the land to link the heart of the continent with the sea?

Frémont found that none did. Rivers born in the snow-whitened hills died in inland lakes or on vast salt flats. To the region he appended the name "Great Basin."

"I believe that God never made anything without a purpose," ejaculated Horace Greeley after he had jounced across the Overland Trail in 1859. "But the wilderness I have just crossed is certainly worthless for agriculture. Unless there shall prove to be great mineral wealth there, it has been created in vain."

Nevada wasn't created in vain, as events in that year were to prove!

A small group of placer miners, many of them backtrackers from the California boom, had been gaining slender winnings in the gravel beds of a ravine, grandiloquently named Gold Canyon. Among them was restless, tippling James (Old Virginny) Finney.

One day Old Virginny prevailed upon three of his pals to climb with him to the head of the gulch to see if they could find something better. They found gold, gold enough not only to make a good living but to cause a local flurry in claim staking. As workings progressed, the miners in the vicinity accidentally uncovered some rich deposits, but they cursed the black rocks and bluish sand that kept clogging their rockers.

Out of curiosity someone had that "bluish stuff" assayed. It ran \$3,876 to the ton—three-fourths silver, the rest gold! The blue sand they had been tossing down the hillside was silver sulphide. The Comstock Lode had been struck; the "Washoe Rush" was on!

In the annals of American mining the Comstock still stands as one of the great bonanzas of all time. Its output of silver and gold could be weighed not only in fine ounces but in *tons!*

Headlines of Mining History

Tonopah, Goldfield, Rhyolite, Tuscarora, Eureka, Austin—these and many others are names to conjure with in Nevada's exciting mining history. One after another new strikes



Staff Photographer W. Robert Moore

Hmmm—It Looks Good over Those Blond Tresses!

Miss Nevada wears fancy creations, but also shops for a ten-gallon hat to go with her riding costume. First thing dude ranchers do when they reach the West is to fit themselves out with big-brimmed hats, fancy shirts, and blue jeans or riding pants.

were discovered and new camps mushroomed up all over the State. For years there was a hubbub of excitement.

Some of the mines were destined to be short-lived and their camps abandoned. Others settled down to steady production for years. Some still are producing metal from scientific development of huge deposits.

Spanish tales tell that when Pizarro and his conquistadors marched into the high Andes they imprisoned the Inca ruler and held him at ransom for a roomful of golden ornaments.

If all the gold dug from these bare Nevada hills were cast into a single solid block, it would form a cube as big as a fair-sized room. It would weigh more than 672 tons! And the

silver from this Silver State would form a colossal lump the size of a mansion!

Nor is this all. Were you to cord all the ingots of copper, lead, and zinc that the State has produced into cubical piles, the pile of each metal would rise on the landscape like a 10- to 15-story office building.

To Abraham Lincoln, guiding the Nation through the strained years of the Civil War, Nevada's admission to the Union was worth "another million soldiers," since it would give the additional votes necessary to pass the 13th amendment. And so, in the midst of the conflict, on October 31, 1864, the Territory was given full statehood, adding the thirty-sixth star to the National Flag (Color Plate III).

Its constitution was wired to Washington for acceptance—the longest telegram on record to that time—at a cost of \$3,416.77.

The output and potential wealth of Nevada mines did much to bolster the credit of the Union. These

mines also shared in the fulfillment of Lincoln's prophetic statement, made at the time he signed the bill authorizing the building of western railroads: "The western mines will prove to be the treasury of the Nation."

Today Nevadans like to call their State the "Last Frontier." Frontier it still is, but one in which the turbulent West of its youth has been tamed and streamlined.

Streamliners Supplant Covered Wagons

Swift, sleek streamliners whiz across the State on shining steel rails. Passengers lounging in soft-cushioned Pullmans look out the windows onto the Humboldt River route where thirsty men of the Bidwell party prodded

skinny ox teams to cut the first dusty wagon tracks in the sagebrush and sand wastes 105 years ago.

In the blazing heat of midsummer the quivering mirages and dust whirlwinds, doing dervishlike dances over the alkali sinks, were enough to drive the early emigrants mad—and they sometimes did. Today's trekkers wail if an air-conditioning unit quits and their car gets warm!

Motorcars: rolling along wide, asphalted Route 40, which follows the same path, pause now for gas where the ox drivers sought grass. On windows of many autos hang air coolers to temper the heat.

Splendid Route 50 has replaced the rutted road over which the Overland Trail stages once bounced. Incidentally, passengers still ride "stages" here in the West, but they are huge high-speed buses now. One stage line evokes memories of an earlier day by using the name "Pony Express."

Travelers stopping in Nevada towns have their choice of comfortable hotels, model auto courts, and air-conditioned "motels."

Air beacons sweep the desert skies to guide transport planes roaring overhead.

Because of the long hours of sunshine and the wide unimpeded spaces in the State, both the Army and Navy established air training stations here during the war.

A Modern Mining Land

Indians now live peacefully on reservations and till the soil, tend cattle, and go fishing.

Feathers and buckskin suits are worn only at festivals, and families hop in old jalopies when they ride to rodeos or go to



AP from Press Ass'n

Admiral Halsey Returns from Japan with the Saddle He Did Not Use

He wears a smile of victory as he reaches San Francisco aboard the battleship *South Dakota*, even though he never saw Hirohito's white horse. The silver-decorated saddle was a gift of the Reno Chamber of Commerce in fulfillment of a pledge to present it if Washoe County raised its quota in the 7th War Bond drive (Plate V). The lariat is made of white nylon.

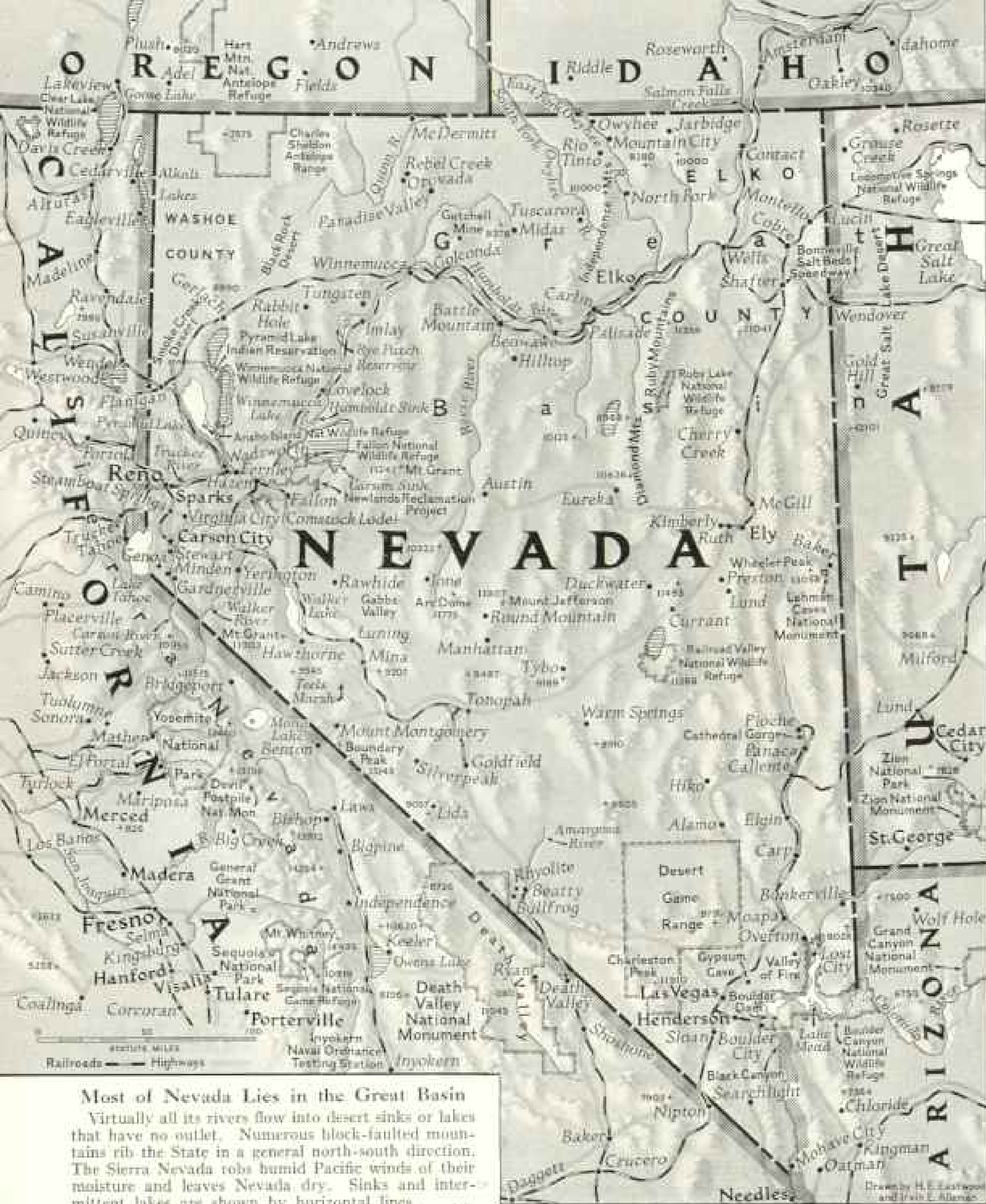
shop and see the movies (Color Plate VII).

Nevada is still a mining land, but with little of the wild scramble of years past. During the last few years the war curtailed mining of gold and silver. Emphasis has been on the production of such strategic metals as copper, mercury, tungsten, and magnesium.

Trim Nevada towns glare at night with big neon signs.

One such sign, arching over Virginia Street in Reno, proclaims that the town is the "biggest little city in the world" (Plate XVI and page 7).

It is big in that it has excellent shops selling



Most of Nevada Lies in the Great Basin

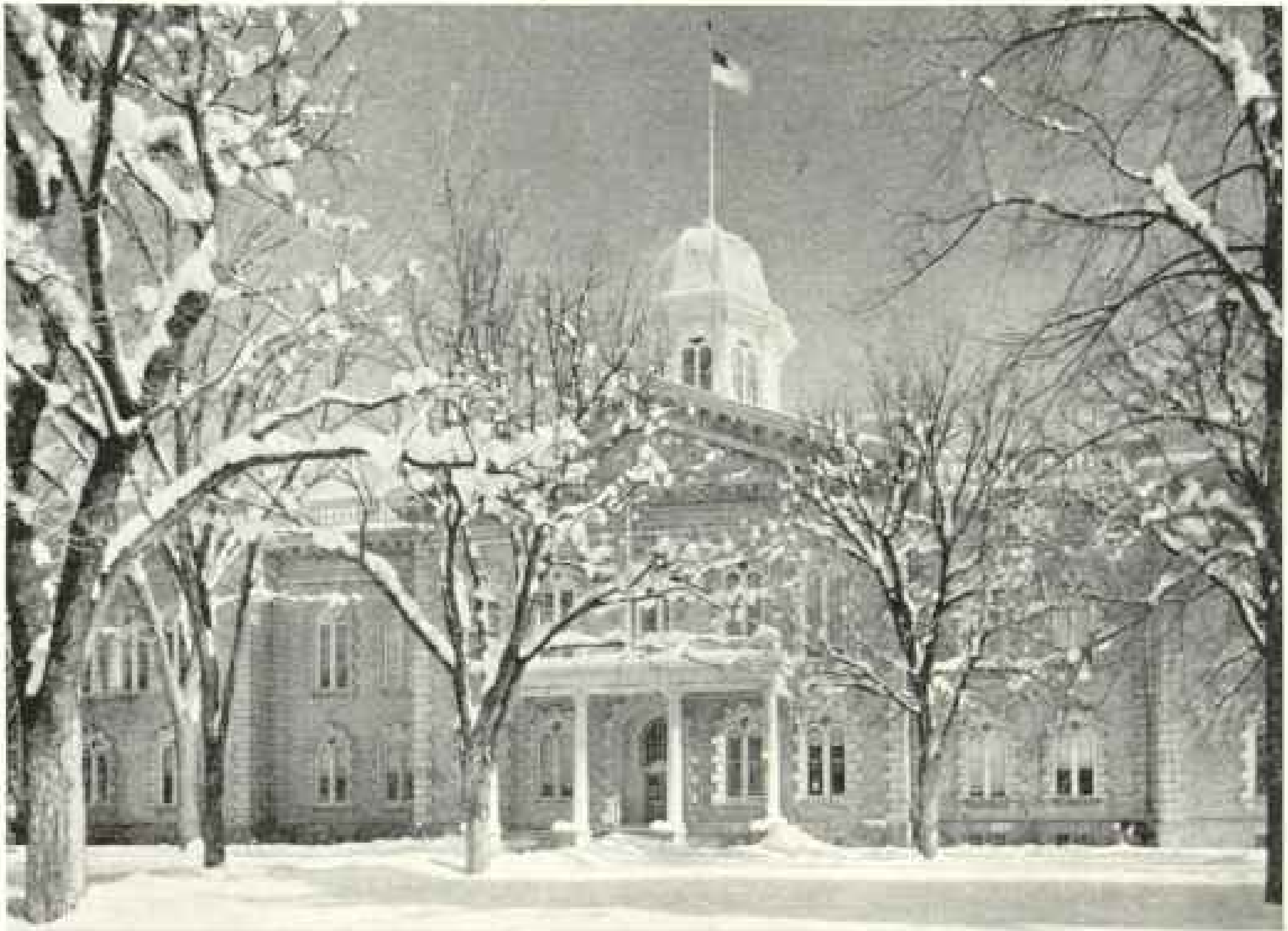
Virtually all its rivers flow into desert sinks or lakes that have no outlet. Numerous block-faulted mountains rib the State in a general north-south direction. The Sierra Nevada robs humid Pacific winds of their moisture and leaves Nevada dry. Sinks and intermittent lakes are shown by horizontal lines.

goods as up-to-the-moment as any store in New York or Hollywood. It has modern hotels, fine homes, shady parks, and public swimming pools.

Neither here nor in any other town throughout the State, however, will you find tall skyscrapers. If you would see those, you will have to look for them in San Francisco, where the wealth from Nevada's mines contributed to

their building. But here, and in smaller communities, you will find a metropolitan aspect that quite belies the size of the city, for Nevada's towns are distribution and shopping centers for extensive districts.

On a lovely tree- and lake-landscaped hill at the north end of Reno sprawls the \$6-acre campus of the University of Nevada. Normally 1,200 to 1,400 young men and women



Nevada State Highway Dept.

A Fresh Snowfall Etches the Branches of Elms Surrounding Nevada's State Capitol

In summer their foliage almost hides the silver-domed two-story sandstone building. Several wings and extensions have been added since the structure was completed in 1872. Carson City, with fewer than 2,500 inhabitants, is the smallest capital in the United States and seat of the smallest county in the State. A number of legislators and State officials commute from Reno, 30 road miles distant.

students attend its Colleges of Arts and Science, Agriculture, and Engineering, which includes also the famous Mackay School of Mines (page 35).

Linked to the University, too, are the Agricultural Experiment Station and Agricultural Extension Division and four State Public Service Departments—the Analytical Laboratory, Food and Drugs Control and Weights and Measures, Veterinary Control, and Bureau of Mines. The United States Mines Experiment Station for rare and precious metals also shares space on the campus.

University Maps State's Future

"The task before us now," said President John O. Moseley, "is to transfer the dynamics of war to the dynamics of peace, for life here at the university is a guide to the future course of the State.

"Here is the laboratory in which the research must be done to further the State's prosperity in mining, oil, soil, water, and other natural assets, and for the stabilization of homes and social amelioration."

Among all the 48 States of the Union today, Nevada, sixth largest in size, has the fewest people. Reno, its biggest city, has about 25,000 persons; Carson City is the smallest State capital in the Nation. Indeed, the 110,000 square miles of area would provide a square mile for each of its residents. Population statistics, however, are no measure of the stature of the State or of its citizens.

To understand Nevada's comparative emptiness, look briefly at its map spot and see why.

Between the Wasatch Range in Utah and the high Sierra Nevada lies the vast region which Frémont labeled the Great Basin. It extends northward into Oregon and southward into California, but the major part of it falls within the boundaries of Nevada.

Actually, the Basin is not a single giant saucer, but many. During early geological ages the earth here underwent many violent contortions of rising and falling, buckling and cracking, and spewing forth wide flows of lava.

But in fairly recent geological times the Great Basin assumed more or less its present form when the earth's rocky shell was split by



Courtesy Calif. Div. of Water Resources

Despite Appearances, They Are Measuring the Size of Summer Crops

"We harvest our snow in the form of irrigation on our fields," explained a Nevada agriculturist. Hiking on skis over the mountain slopes, these fieldmen take many samples of depth and weight of snow with the long aluminum tube. Comparing the results with similar surveys made in previous years, they can estimate the amount of summer runoff of water available for farm irrigation. Such snow surveying was perfected by Dr. James E. Church, Jr., of the University of Nevada (page 8).

mighty cracks, or faults, and its broken blocks tilted up edgewise into mountainous ridges.

These "basin ranges," as geologists call them, rib all Nevada in a general north-south direction. Between them lie numerous basins—lakes, desert sinks, and vast dried mud or alkali flats.

Over most of the State the basin areas range between 4,000 and 6,000 feet in elevation, though in the south they tilt downward and finally dip below sea level in Death Valley, California. Intervening mountains rear to heights of from 5,000 to 7,000 feet above the floor of the valleys.

Lakes Once Filled the Basins

Once the land had an abundance of rainfall. Big lakes filled the basins. The climate then turned drier and warmer, and desiccation began. Again, geologists say, the lakes were refilled and again re-evaporated.

Largest of all these prehistoric lakes within Nevada was Lake Lahontan, which at its maximum covered 8,500 square miles. Its complement, Bonneville in Utah, of which Great Salt Lake now forms a remnant, was more than twice that size.

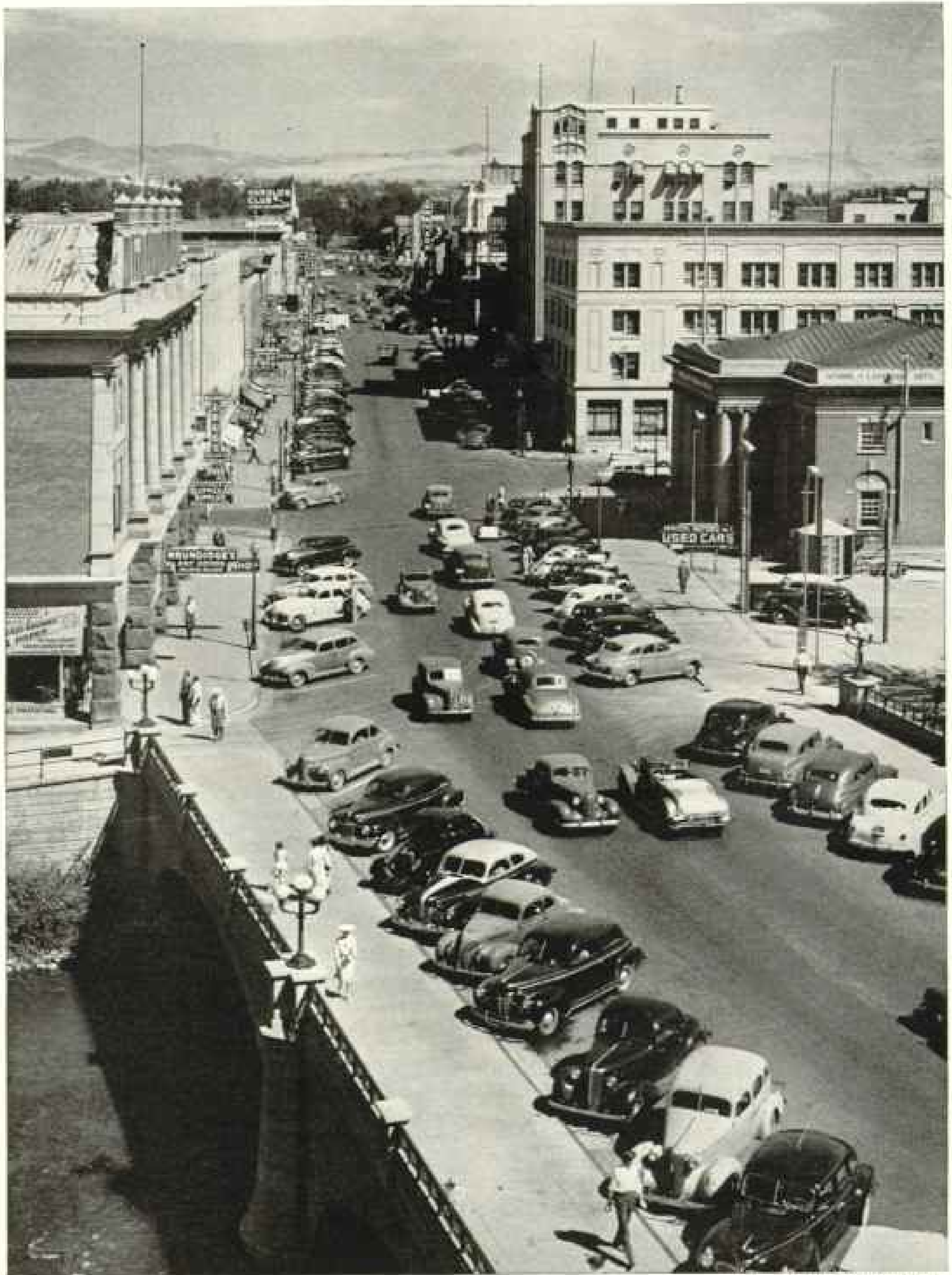
Today Pyramid and Walker Lakes, lying 70-odd miles apart, are cupped in the deepest hollows of ancient Lahontan. You can ride for miles across the desert now in the region of these lakes and see the old beaches of Lahontan still etched on the sides of the mountains high above your head.

Evaporation continues, for the lofty and still-growing Sierra Nevada forms a rain screen to the moisture-laden winds blowing from the Pacific.

Pyramid and Walker Lakes are shrinking and becoming more brackish. Winnemucca Lake has dried up several times since Nevada became a State. The Humboldt, Carson, and scores of other onetime lakes have become either bone-dry salt plains or only shallow sheets of water which vary in size from season to season.

Black Rock and Smoke Creek Deserts, which once formed an arm of Lahontan in the northwest portion of the State, are as desolate wastes as any spot you could pick on earth.

When Swinburne penned the lines, "That even the weariest river winds somewhere safe to sea," he knew not of Nevada's rivers. Nearly all the streams that drain the State



Staff Photographer W. Robert Moore

Automobile-embroidered Virginia Street Is the Chief Thoroughfare of Busy Reno

In the foreground, cutting the city in two, flows the Truckee River. Upstreet, beyond banks and stores, is the arch bearing the big neon sign spelling Reno (Plate XVI). In blocks about it, large display signs point to Harold's, Nevada, and other gaming clubs. On the distant tree-covered slope stands the University of Nevada.

flow into the lakes or sinks within its own confines.

Some rise in the snowy peaks of the Sierras, notably the Truckee, Walker, and Carson. The lowly Humboldt and its tributaries start within the heart of the Great Basin and die within it. Altogether, the Humboldt meanders nearly 600 miles to get 250 miles across the State, but, as someone has quipped, "It starts nowhere and ends nowhere!" After its weary wanderings it vanishes in the Humboldt and Carson Sinks.

Not all Nevada is a desert of sagebrush and greasewood. Today, rivers have been dammed, irrigation ditches dug, and thousands of acres of land turned to cultivation.

But like the Psalmist of old, Nevadans look unto the hills, whence cometh their help. Most of the water that feeds the rivers comes from the deep snows that are precipitated on the mountains in winter.

An Expert on Melting Snows

From Dr. James E. Church, Jr., at the University in Reno, I learned how he had developed a technique of snow surveying from which a forecast is made of the summer water supply derived from melting snows (page 6).

Though he is a professor emeritus of the classics, Dr. Church's interests have been many, and his snow studies have brought him world fame.

Years ago he tramped the high Sierras in winter to sample and weigh the snow that piled deep on the slopes. Now younger fieldmen from the Nevada Agricultural Experiment Station carry on the systematic survey.

Equipped with long aluminum tubes specially designed for the work, they take samples over specific areas of Nevada's watersheds. The tubes are driven through the full depth of the snow—in many places 25 feet deep—and the samples then weighed to determine the water content.

From an accumulation of such data, obtained from year to year, the amount of water runoff during the summer, as compared with that of previous years, can be forecast with a high degree of accuracy.

If sampling, for example, should reveal that snowfall is but three-fourths that of the year before, agriculturists know that they must plan their crop acreage to conform to one-fourth less water for irrigation. In a land where approximately 90 percent of the crops rely on irrigation, such information is of paramount importance.

Out near Fallon, some 55 miles east of Reno, the Federal Government began the Newlands Reclamation Project (Truckee-Carson

Project) back in 1903, the first such irrigation task in the country under the Reclamation Act of 1902.

The Reclamation Act, which has done so much to redeem the thirsty lands in the West, was framed by Francis G. Newlands, who long represented Nevada in both the House and the Senate. Popular "Pat" McCarran, now senior Senator from Nevada, serves on the important Committee for Irrigation and Reclamation. He is doing outstanding work for the development of the National Capital by his service on the District of Columbia Committee, as did Mr. Newlands before him.

A Band of Fertility

Water, here at Fallon, has been diverted from both the Carson and Truckee Rivers to serve 87,000 acres of land in all-year irrigation. A pattern of green fields, mainly lush alfalfa, sprawls in the valley. Famous, too, are the district's Hearts of Gold cantaloupes and the prize flocks of Fallon turkeys.

Much of the length of the Truckee River is bordered by a verdant band which winds through Reno, spreads into the broad Truckee Meadows, and then narrows again into a green ribbon as the river twists through canyons on its way to Pyramid Lake.

The Truckee's source is lovely Lake Tahoe, "Lake of the Sky," cradled high in the scenic Sierras. Tahoe is shared by both Nevada and California, but only about a third of its area lies within Nevada.

While the Nevadans may regret that they do not hold more of the pine-studded mountain shores of this delightful summer resort, they are grateful that the all-important crystal water spills down through the Truckee into their thirsty land.

That all interests around Tahoe may be properly served, the amount of water emptying into the river is regulated down to decimals of a foot! With maximum water level established at 6,229.1 feet and the minimum at 6,223 feet, the State, in effect, possesses a 6-foot-deep reservoir spread over the top of that extensive body of water which stretches 21 miles in length and 12 miles in width.

Along the Carson Valley, where the Mormons established the first permanent Nevada settlement of Genoa and planted their turnip patches, farmers and ranchmen have diverted water and created miles of rich farmlands and pastures.

As we drove down through the spick-and-span town of Minden and past Gardnerville, acres of heavy alfalfa were being cut, raked, and stacked. Balers also were busy (XV).

Some of the trucks hauling bales from the

Land of Sagebrush and Silver



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Illustration by W. Robert Maass

Open Plains, Bush-studded Desert, and Mineral-rich Mountains—Such Is Nevada

Cattlemen of this "Last Frontier" State know the smell of sweat and leather, and many city people like to ride. The young woman recently was queen of the Las Vegas "Hellorado," the city's annual celebration when frontier whiskers, hoop skirts, covered wagons, rodeos, and "kangaroo courts" rule.



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Sheep Pasture in Mountain Valleys Where Melting Snows and Summer Sun Nourish Tender Grass

This flock feeds in a meadow cupped in the high slopes of the mountains around which the highway climbs between Reno and Lake Tahoe. Before heavy snows come, the sheep will migrate to warmer lowlands. Nevada has some 800,000 sheep scattered over the State. Most of them are herded by Basques.



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This Sack of Flour Raised \$275,000 to Aid Civil War Veterans
 R. C. Gridley carried it a mile in Austin to pay an election bet, then auctioned it many times for charitable donations. It inspired Austin's city seal.



Reductions by W. Robert Mount

Nevada Added the 36th Star to Old Glory under Lincoln
 The U. S. flag of 1864 hangs in the Carson City Museum, behind a statue of President Abraham Lincoln. Formerly Nevada's gold and silver were minted here.



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Reproduction by W. Robert Moore

"Yip-ee!" Shouted the Bull-busting Cowboy When the Gate Opened, but the Brahman Needed No Urging

Kicking, snorting, and twisting, the infuriated "critter" gave this buckaroo a rough ride across the corral, but he managed to stay on; others didn't. Riders have only a loose belly rope to hang on to in riding contests such as this held at Carson City.



© National Geographic Society

"They're So Pretty, I Hardly Want to Wear 'Em"

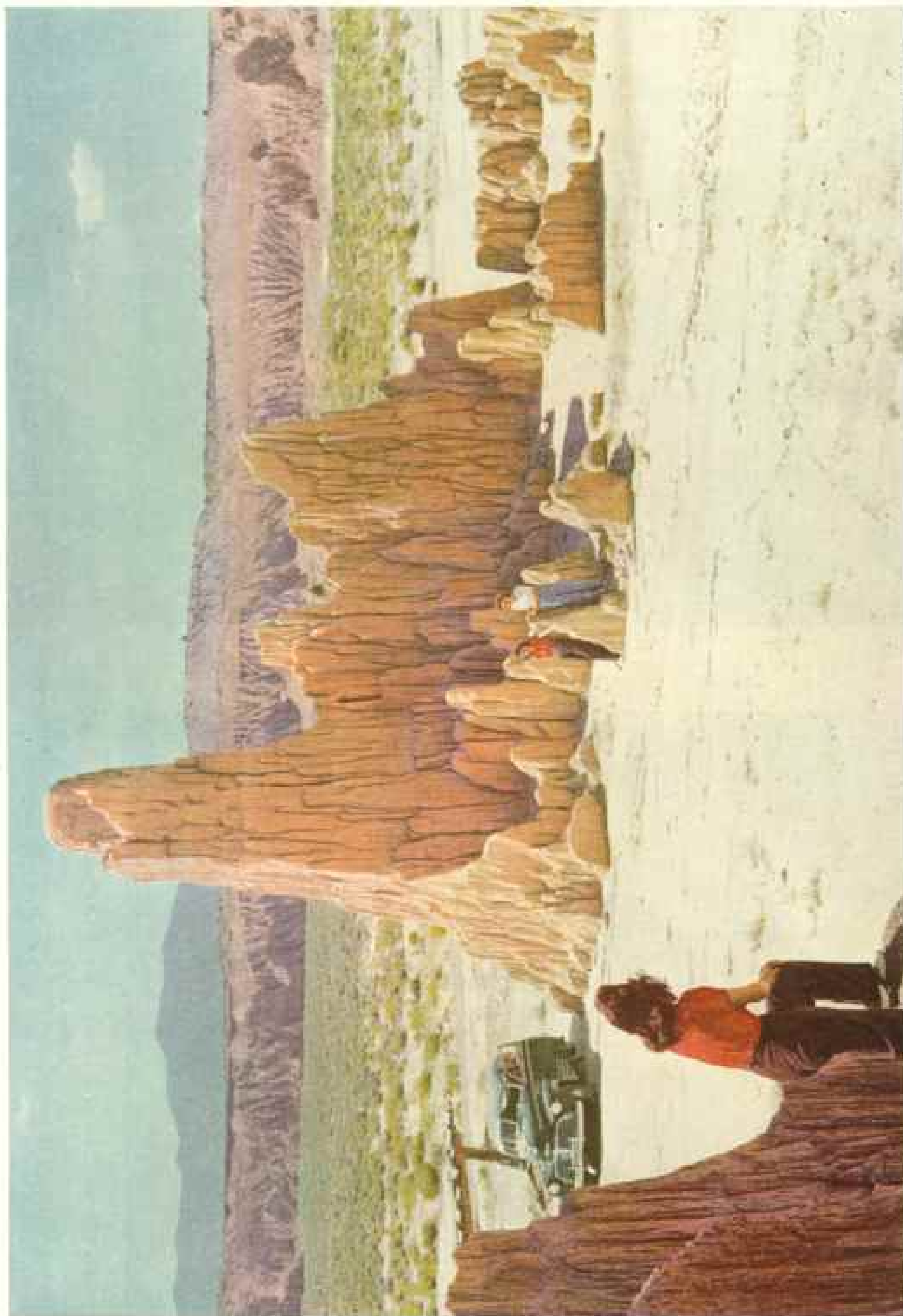
Chaps give leg protection to horsemen riding ranges where brush is high. Bridles, lariats, curryscombs, harness, and other ranchman's equipment fill this Elko store. Leatherworkers here make fine saddles. Elko is center of Nevada cattle ranching.



Photograph by W. Robert Mount

Reno Gave Halsey the Saddle for Hirohito's White Horse

But the seagoing Admiral led no triumphal entry into Tokyo. He laughingly confessed that his toughest war experience was when Maj. Gen. William C. Chase of the First Cavalry Division furnished a white horse for him to ride in Japan. Upon dismounting he said, "I was never so scared in my life."



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Reproduction by W. Robert Moore

From Such Oddly Eroded Formations of Brownish-gray Clay, Cathedral Gorge Gained Its Name

Cathedrals, spires, temples, and skyscrapers appear in the water- and wind-worn walls hemming this valley near Pahrump. If road miles south of Ptoche, narrow channels and recesses cut far back into the cliffs. If Nevada had much rainfall, these comparatively soft pinnacles would soon be washed away.

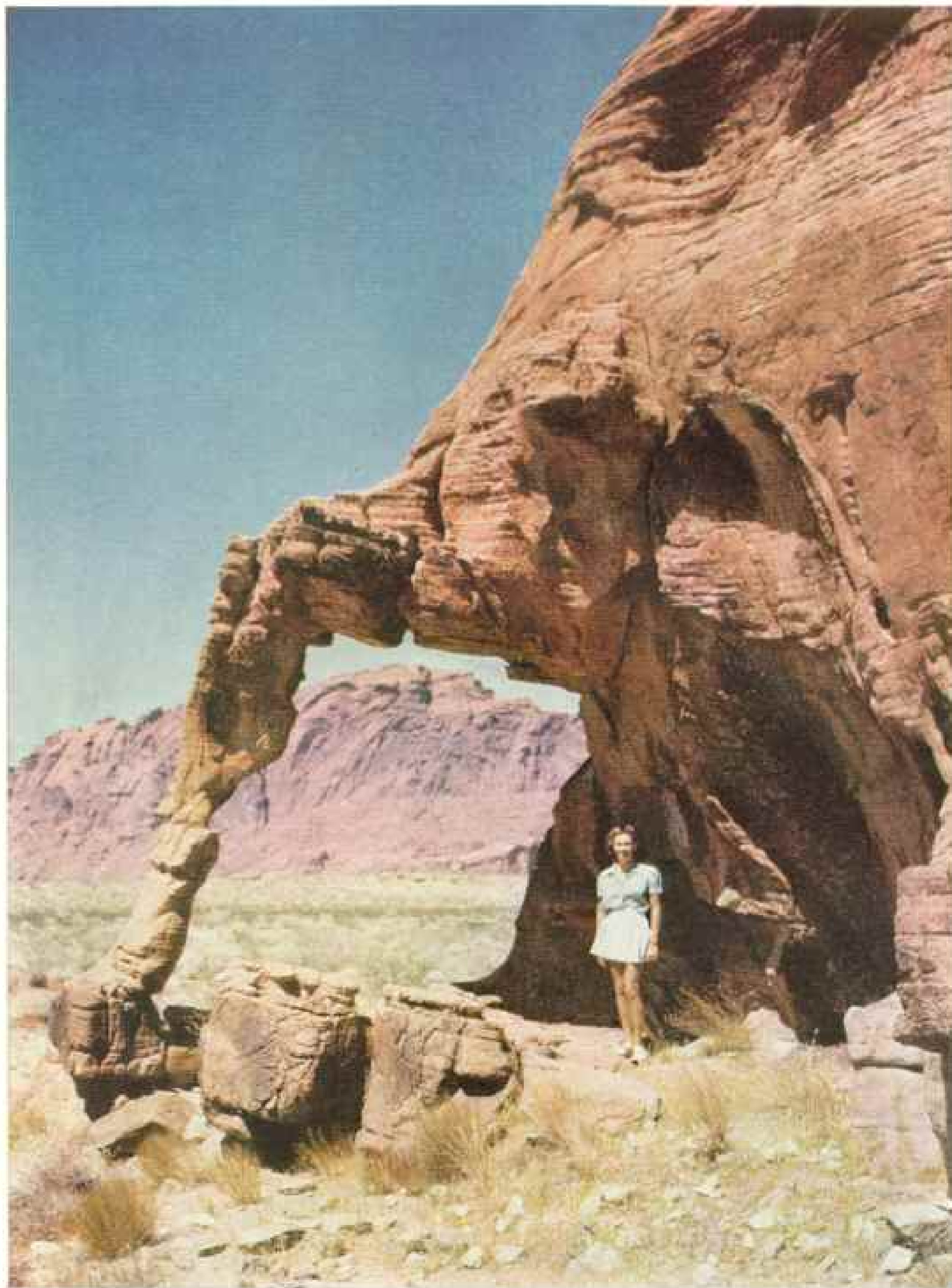


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Illustrations by W. Aubrey Moore

Paiute Indians at Pyramid Lake Reservation Don Feathers, Beads, and Buckskin Suits Only for Festivals

Such costumes, adopted from the Plains Indians, were not worn until recent times. Once Paiutes wore only breechcloths in summer and buckskin suits with rabbit-skin blankets in winter. These people pasture cattle, catch fish in Pyramid, and raise hay and other crops on valley lands of the lower Truckee.



© National Geographic Society

Endscape by W. Robert Shatt

Wind and Rain Shaped This Warty-trunked "Elephant" in Red Sandstone in the Valley of Fire

Huge mushroomlike boulders, balancing rocks, beehives, and other bizarre formations jut above the floor in this 6-mile-long basin northeast of Las Vegas. On some cliff faces primitive red men carved strange petroglyphs. Near this State park, at Overton, is a museum displaying relics of early Indians.

fields were using bale loaders. This novel farm implement was designed as a labor saver during the war.

It is an inclined wheeled elevator which can be attached to the side of a truck. As the truck moves across the field, the heavy bales are mechanically scooped up and borne on the sloping elevator by carrier chains to the men loading the truck.

From blueprints provided by the Agricultural Extension Division of the University of Nevada, these bale loaders are easily built by local blacksmiths; they require only the rear axles of old automobiles, some gear chain, and a few pieces of metal and wood.

Extensive acreage about Yerington on the Walker River, the "Big Meadows" around Lovelock, fed by the Rye Patch Reservoir on the Humboldt, the Owyhee River district, and watered valleys at the foot of the Ruby Mountains are among other sizable oases of cultivation in the State.

Many smaller watered areas form vivid splashes of green against the surrounding dun-colored desert.

Altogether, Nevada has approximately 500,000 acres of crop land, of which about 90 percent is devoted to alfalfa and other hay crops.

Nearly Half a Million Cattle

The preponderance of hay in the State's agriculture is directly linked with her large livestock industry.

In early days some of the soldiers who came to man the forts against Indian attacks settled down and started raising stock. Cattle then were the rangy Texas longhorns—more head, horns, and tail than thick, juicy steaks. Now you see the ranges alive with plump white-faced Herefords.

In all, Nevada normally runs some 400,000 cattle on its vast ranch lands. Large herds graze in the northern portion of the State where moisture is somewhat more plentiful and better grass grows. Big Elko County, particularly, is a cattlemen's land.

Roughly seven-eighths of the State is Government-owned, and much of it is administered by either the United States Forest Service or Grazing Service. Stockmen gain grazing privileges to these lands by Federal permit. Only watered valley pasture and agricultural districts are privately owned.

Some herds roam the range all year round. Others graze in the high mountain pastures during the summer and then winter in the valleys and eat hay. Although cattlemen do not pamper their stock here, as in some States, they have found that it is sound economics to feed and protect it against "winterkilling."

"We have fewer big fall drives to railway loading yards now," explained a cattleman in Elko. "It is cheaper to truck them from the ranches to the railroad than it is to have them walk off their fat."

Nevada's ranges echo not only to the bawling of cattle and plaintive wail of lost calves but also to the bleating of more than 800,000 sheep. Herded largely by Basques, or Boscos as they are called locally, flocks browse on the high hill slopes and isolated grassy canyons during the summer months and move to warmer lowlands when snows blanket the mountains.

Not so many years ago recriminations and open feuds flared persistently between cattle- and sheepmen over pasturage. Rifles were used to force decisions. Both sides even poisoned waterholes where opponents' stock drank. Under grazing control, however, old conflicts have been eliminated, and today some ranches run both sheep and cattle.

An often-told tale in Nevada deals with a prospector who came upon a sheepherder high up in a remote mountain valley and fell into conversation with him.

"I should think that the perpetual baa-baaing of all these sheep would drive you crazy," remarked the prospector, used to the solitude of his task.

"Sometimes it does," admitted the herder.

"What do you do then?" asked the prospector.

"Well," drawled the sheepherder with a chuckle, "then I go prospecting!"

Today the traditional old grubstaked prospector with floppy-eared burro toting his bean pot, blanket, and sampling kit has almost vanished from the Nevada scene. But some are roaming the countryside in old high-wheeled flivvers looking for another Comstock or Tonopah.

Most Are Prospectors at Heart

Most Nevadans are prospectors at heart, either amateur or professional. It's in their blood. Few persons out in the country can resist picking up an interesting rock and examining it.

"Every year we get 5,000 to 6,000 samples of minerals sent from practically every post office in the State," said one of the assay chemists at the State Analytical Laboratory at the university in Reno.

"When men go hunting deer they send in numerous samples for assay. Many persons who have regular jobs go out to prospect during holidays. Women also join rock and mineral clubs and listen to experts who give them lectures on the ores of the State.



Staff Photographer W. Robert Moore

Lot Numbers Are Hammered on Copper Before It Is Shipped from the Smelter

Copper ore is brought from the open pit and mines of Ruth and Kimberly to the Kennecott reduction plant at McGill. Here the ore is milled, concentrated, and smelted into these bars of blister copper, which are shipped east for electrolytic refining. Small quantities of gold, silver, and molybdenite are found in the ore.

"Our laboratory here was organized by an act of the legislature to provide free assay for the citizens of Nevada who might otherwise lose valuable mineral rights from their inability to have them assayed commercially."

"Do they ever find anything worth while?" I asked.

"Oh, yes. As an example, take the persons who once brought in some brownish-white rock and thought it might be barite. It turned out to be scheelite—tungsten ore. They later sold their claim up beyond Lovelock for several thousand dollars."

The faults, or cracks, that once split the Great Basin area are what made Nevada the mining land it is. In the passage of centuries many of these faults filled with valuable minerals; other fractures, earth heavings, and erosion have laid some of them bare.

At Steamboat Springs, a few miles south of Reno, you can see Nature's strange processes still at work. From cracks in the earth rise

sulphurous bubbling waters and clouds of steam. The waters are being commercialized as medicinal baths; and someone with imagination has claimed that one pool tastes like chicken soup!

Of interest to the geologist, however, is the fact that a number of little overflow rivulets are depositing sulphides in the same manner in which some of the ore veins were formed (page 22).

From such minerals in the making, Nevada's geological revelations range back to petrified forests and to footprints left in primordial mud by clumsy mammoths, lithe deer, and strange birds.

To see this land of many surprises, let us take a quick swing around the State.

Pioneer Days of Virginia City

Mount the hills eastward from Steamboat Springs by a new highway that has replaced the tortuous Geiger Grade and you come soon



Staff Photographer W. Robert Moore

This Old Bell from Virginia City Really Rang with "Silver" Tones

Cracked once when its ringers got too festive and vigorous, it had to be recast. During the recasting enthusiastic citizens decided to give it mellow tone and tossed hundreds of dollars' worth of silver and gold into the molten metal. It is displayed in Nevada State Historical Society Museum and Library, Reno.

to Virginia City, redolent in its memories of big bonanzas, gun fights, gaudiness, and genteel living.

Here was a world where poor men became millionaires and millionaires went broke in the vagaries and manipulations along the Comstock Lode. Here miners slept dozens together in "bull pens" and bars were their clubs.

Here Comstock kings banqueted on iced oysters from the coast, costly squab, and imported champagne. Some built mansions with gold doorknobs and European fittings.

Virginia City was anything and everything during the fevered years when fortunes lay in the barren hillsides. Estimates of its boom population range from 15,000 to 40,000 persons.

Shafts drove downward; whole forests from the Tahoe region of the Sierras were carried underground to brace the square-set mines. Here new techniques and new tools for mining

were developed. Deep in the earth the miners hit hot water and sweltering heat.

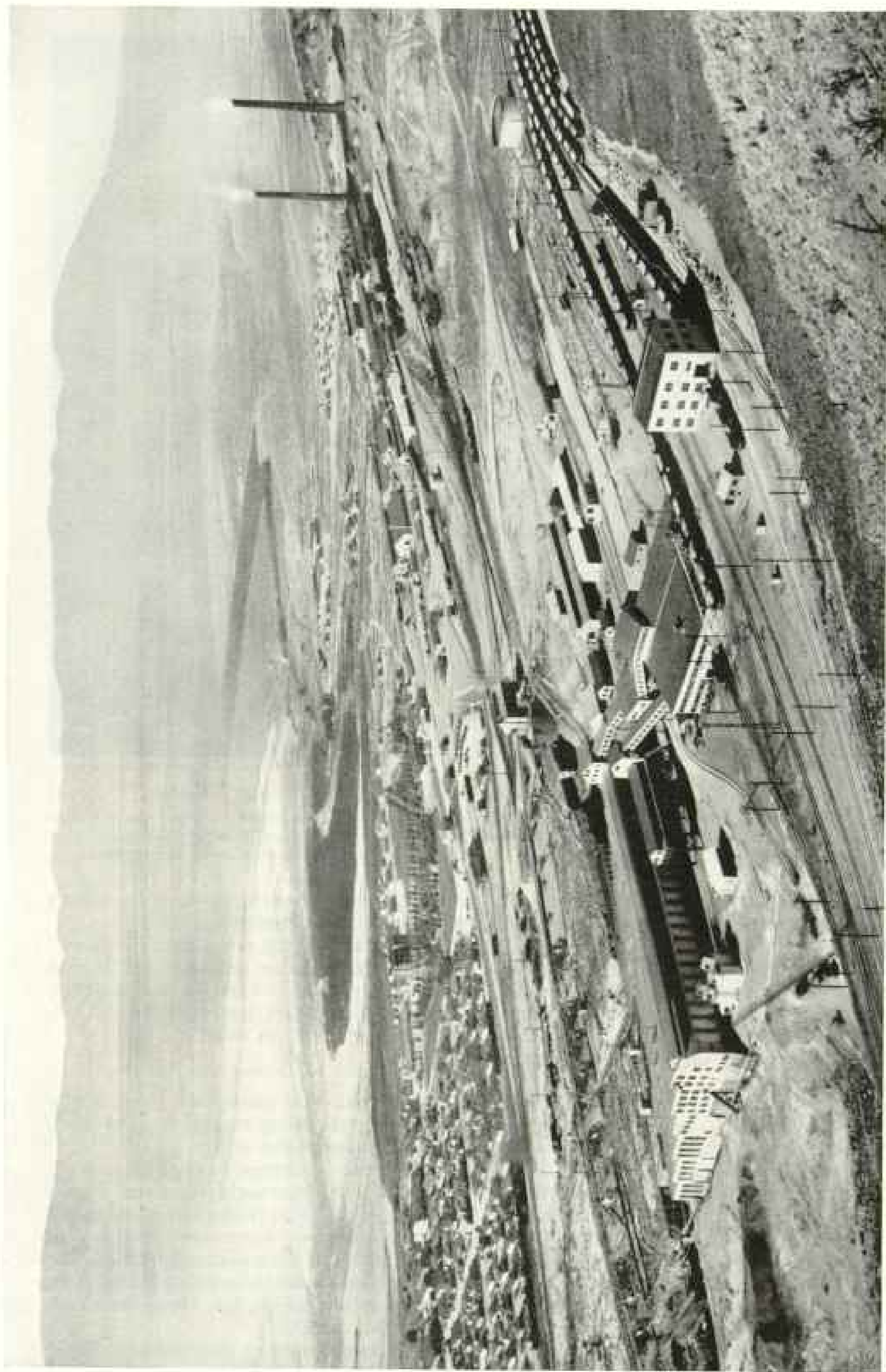
"I operated a pump down in the bottom," one former Comstocker told me. "The heat was so bad we worked only a few minutes, jumped into a tub of ice water to cool off, and then went back to work."

An End to Booms and Slumps

Water, heat, and played-out lodes finally brought an end to deep operations after years of fantastic booms and slumps.

Today the buildings along famous C Street, the main thoroughfare, stand drunk-enly awry, their paint peeled away. Many of the homes are gone. Some were torn down for the lumber, others fell into caved diggings, and still others were moved to growing towns. One was taken all the way to Los Angeles at a cost of more than \$6,000!

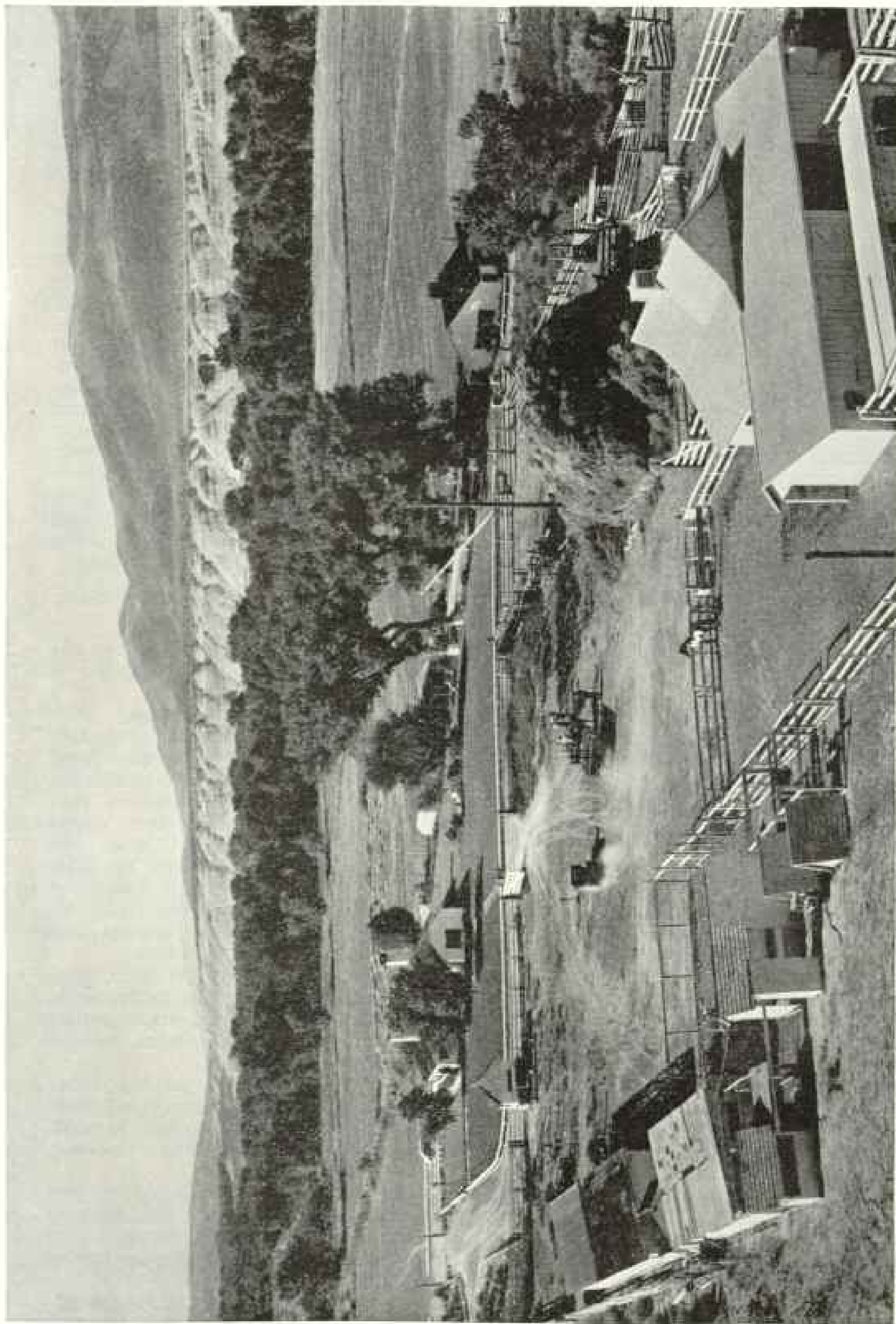
The famous 160-room International Hotel burned down, but the Courthouse, several



Charles D. Goddard

Through This Big Kennecott Reduction Plant at McGill Pass 18,000 Tons of Copper Ore Daily.

Ore cars are tilted bodily in the coarse crushing plant (lower right). Thence the mineral is reduced by fine crushing and is concentrated by flotation in the buildings at lower center and left. Smelter and power plant are beside the smoking chimneys. Tailings and slag dumps spread on the valley floor beyond the town (page 36).



Staff Photographer W. Hobart Mann

High Eroded Cliffs Hem Green Valley Farms and Prosperous Ranches along the Lower Truckee River



Staff Photographer W. Robert Moore

Earth Crack at Steamboat Springs Is a Geologist's Laboratory

Hot waters that bubble from this fault fissure deposit small quantities of common ore minerals and traces of precious metals. Scientists believe many of Nevada's rich ore veins were formed in this manner. It is called Steamboat Springs from large clouds of white vapor which appear in cold weather (p. 18).

churches, Miners' Union Hall, bulky Fourth Ward School, and other landmarks remain.

Piper's Opera House stands unpainted, sagging, and askew. Inside, its flooring gapes in places to reveal the hand-wrought coil springs upon which the floor is mounted. Old posters and a collection of faded programs bear names of theatrical royalty who played on its sloping stage.

McKean Buchanan playing *Othello*, Adah Menken in *Mazepa*, Lotta Crabtree, James O'Neill, child star Maude Adams, David Belasco, Edwin Booth—these and many other stars came to Virginia City.

The Bloody Bucket Saloon now houses a souvenir shop, and the Crystal Bar still boasts

the original elaborate chandeliers.

Virginia City is a symbol of the exciting growth of Nevada, but it is more. It is a vivid chapter of Western Americana.

A handful of people still live in Virginia City. Before war halted operations, several companies worked here and at near-by Gold Hill and Silver City, excavating poor-grade ore and reworking tailings for metal that earlier operators ignored or threw away.

The long ravine down to Devil's Gate is strewn with mining equipment and tailing dumps, old and new.

Our Smallest State Capital

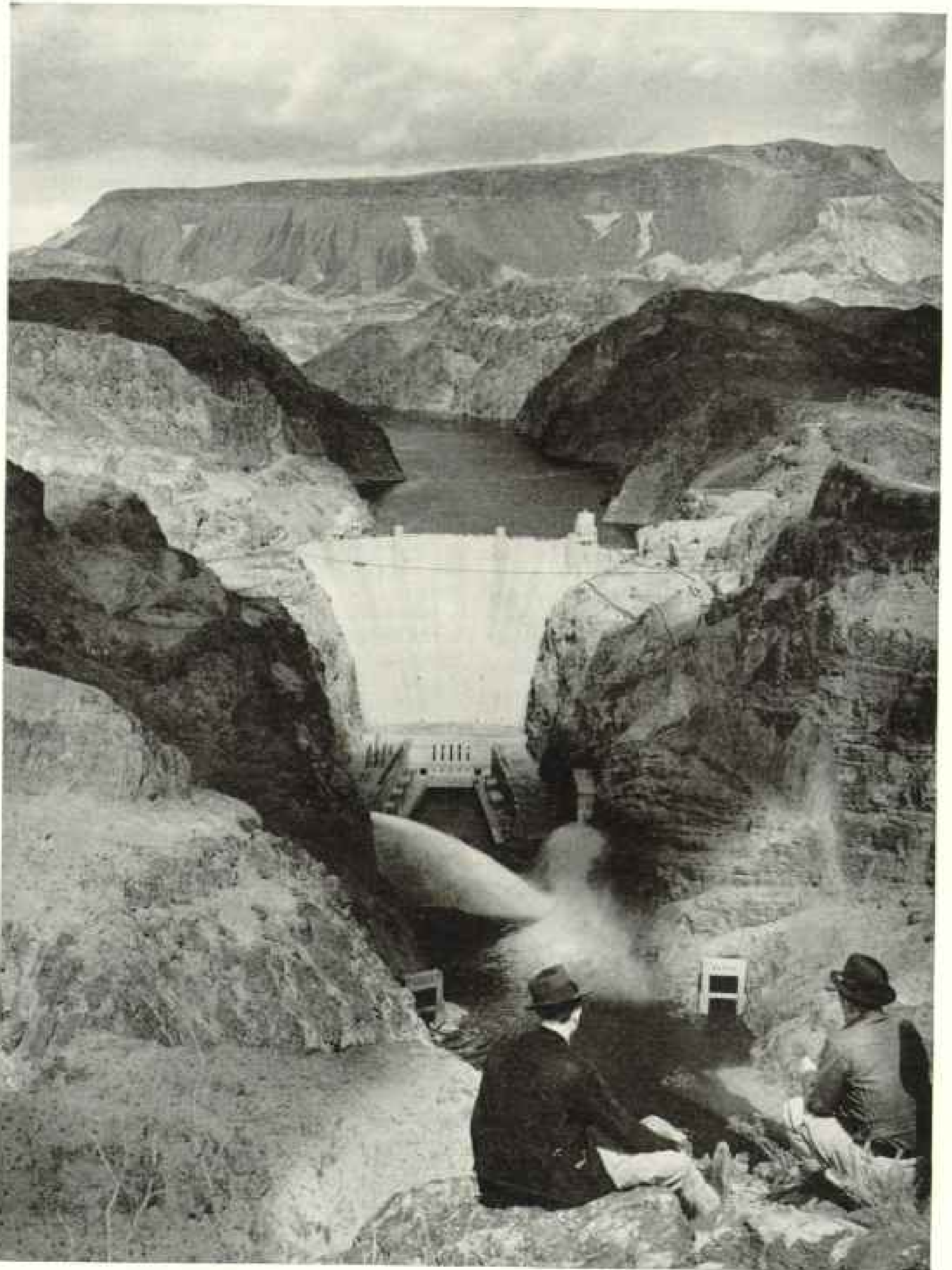
Carson City, the State capital, lies in Eagle Valley only a few miles away. It is mature and serene now, but still small. Fewer than 2,500 persons live in this pleasant tree-shaded town, named for Kit Carson and godfathered by Abraham V. Z. Curry and Maj. William M. Ormsby, who was killed by the Paiutes.

A rival in its beginning to Genoa, a short distance farther south, Carson City soon usurped the other's position as transport and trade station when the rush came to the Comstock.

Though it was then but a gangling shanty town, Carson City was proclaimed as permanent capital of Nevada Territory in 1861, shortly after the arrival of the first Governor, James W. Nye.

Coming across country, while Nye traveled to California by ship, were two Clemens brothers, Orion and Samuel. Orion was to serve as secretary of the Territory, and Samuel as secretary to the secretary.

In a resourceful effort to separate the senate from the assembly when the legislature



U. S. Bureau of Reclamation

Boulder Dam Tamed and Harnessed the Mad, Galloping Colorado River

Wedge between Nevada and Arizona in precipitous Black Canyon, this 726-foot-high block of concrete stemmed river floods and created Lake Mead, 115 miles long. Dwarfed by the dam is the power plant below. It is two city blocks long and has an ultimate capacity of 1,322,300 kilowatts. Dark specks on the rim are cars.

convened in a building loaned by Abe Curry, Orion strung up a canvas partition at a cost of \$3.40. But the United States declined to pay for it and deducted the amount from Orion's salary!

For the truth of the story we have the authority of the secretary's secretary, who later distinguished himself in Nevada—and, need I add, elsewhere—as Mark Twain.

Carson City still claims a home where Mark Twain stayed and has several mansions dating from early years. Its Mint, however, which coined gold and silver until 1893, has now been converted into a museum and displays Indian artifacts, mineral collections, and other things Nevadan.

The elm-shaded capitol and many other State and business buildings are constructed from gray sandstone that comes from a quarry at the State prison near town (page 5). While blasting in the quarry years ago, workmen uncovered an interesting collection of prehistoric bones and found footprints in a deeply buried layer of rock.

Here, in hard stone, is the trail left when big heavy-footed beasts squashed through several inches of hardening ooze beside some ancient lake or waterhole. All around are tracks of birds and what appear to have been deer and other small-hoofed creatures.

Rodeos Replace Indian Clashes

One day when I visited Carson City the towns- and countryfolk had turned out to enjoy a rodeo. The men who wore ten-gallon hats, blue jeans, and high-heeled boots were no dudes. They were sun-bronzed cowmen from outlying ranches who had come to have fun.

Amid swirls of hoof-driven dust they roped steers, tied calves, and took jolting rides—and spills—on bucking broncos and snorting, kicking Brahman bulls (Plate IV).

There was prize money for the winners, but it was the sport that counted. Seconds of time in roping a wild "critter" were to them what a low score is to a country club golfer.

A number of towns throughout Nevada hold rodeos on at least one week end in summer. In most places about the only concession to the mechanical age is that announcers call results over loud-speakers and some riders bring their horses to town in auto trailers.

Main highway through southern Nevada is U. S. Route 95. It winds eastward from the Truckee to Fallon, turns sharply southward to Walker Lake, and thence streaks across the desert to Tonopah, Goldfield, and on to Las Vegas.

Where the last irrigation ditch in Fallon's

farmland ends, the sagebrush desert begins. A narrow banner of green marks the course of the Walker River, but the blue, brackish waters of Walker Lake are hemmed by high barren hills.

For 20 miles the road follows a ledge high above the shore of this picturesque, though dying, inland sea, which gradually is marking ever-receding waterlines on the hill slopes as did its ancestor, Lake Lahontan.

Beyond its southern end, near Hawthorne, the United States Navy has capitalized on the empty areas by utilizing them as another death repository, a big permanent ammunition depot. Innumerable igloos filled with high explosives are scattered over several hundred acres.

Wasteland Rich in Minerals

Only a few tiny settlements dot the route the rest of the way to Tonopah. Each, however, at one time or another has served as a transportation link in the chain of mining operations strung across the desert.

An unbelievable variety of mineral wealth has come from this seemingly empty wasteland.

Off to the south a plain glistens white with borax beds where four companies once worked. In the opposite direction were the gold, silver, copper, and lead deposits of Rawhide and other mines.

Back in the 60's, slow-stalking camels lent a Levantine touch to the dusty landscape when they hauled salt from Teels Marsh to the Comstock.

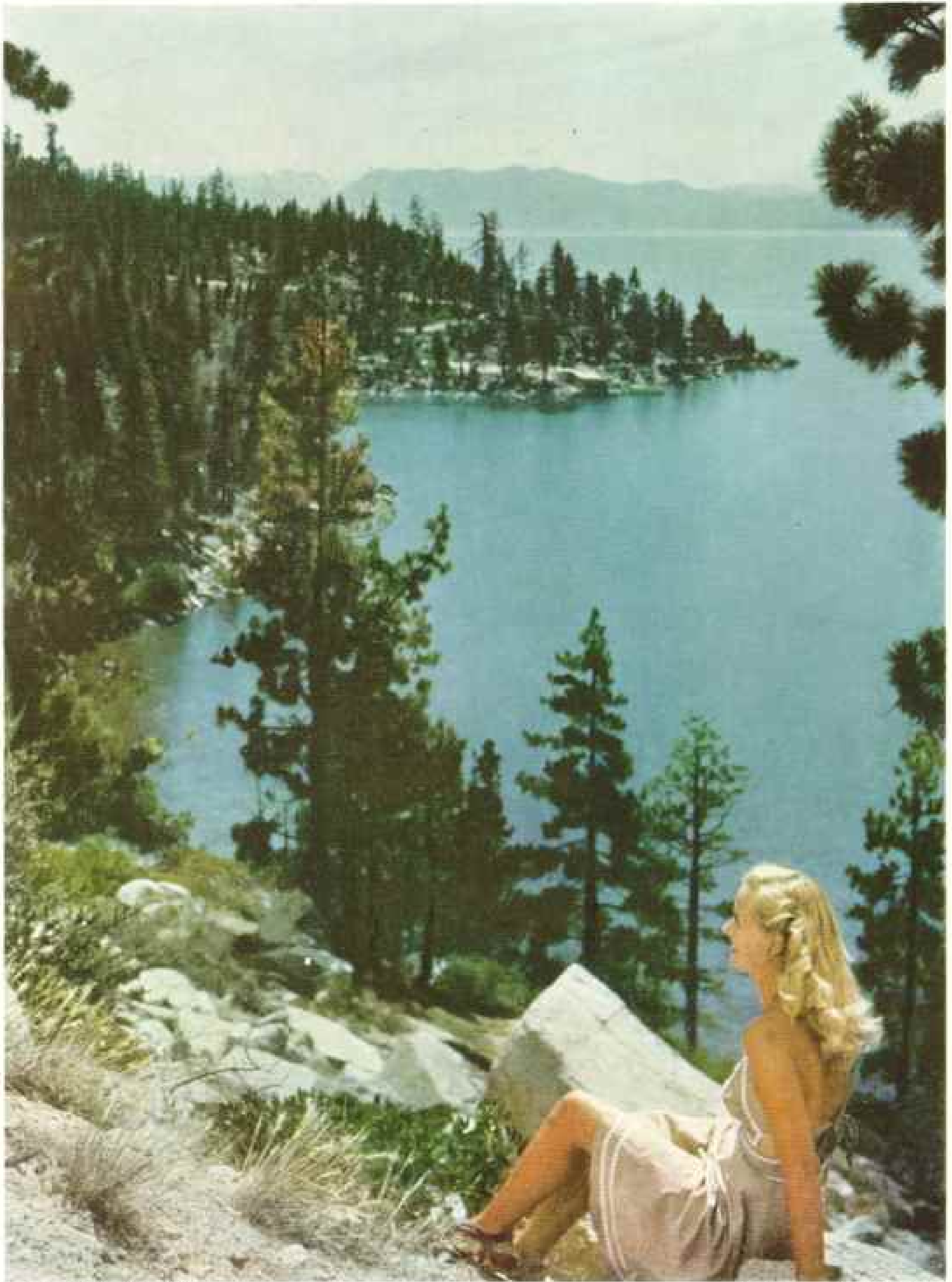
For nine busy months in 1944 twenty-two giant Wells Cargo "teapots," or specially constructed hopper-body trailer trucks, hauled 30-ton loads of magnesite ore night and day from near-by Gabbs Valley to the Basic Magnesium plant at Henderson, beyond Las Vegas.

At the turn of the century Jim Butler, hunting his donkey on a barren hillside, stumbled onto an exposed ledge of ore that gave rise to Tonopah. More enduring than many of the other strikes, its Mizpah, Tonopah, and other mines have brought in \$160,000,000 of doré bullion—silver mixed with a small amount of gold.

After the Comstock, Tonopah is perhaps the greatest name in Nevada mining, in that its discovery came when earlier finds had largely been worked out. In quick succession new prospecting brought in Goldfield, Rhyolite, and other spectacular strikes.

At its height Tonopah had some 6,000 persons. Its business buildings grew high to keep out of the way of the diggings, and few of its streets go far without having to dodge a mine dump.

Land of Sagebrush and Silver



© National Geographic Society

Kodachrome by W. Robert Moore

"Lake of the Sky," Nevadans and Californians Call 6,225-foot-high Pine-girt Lake Tahoe

Twenty-one miles long and 12 across, it is shared by both States. Nevada possesses only about one-third of the area, but gains overflow waters for irrigation through the Truckee River. Summer resort hotels and cottages encircle the lake. Winter skiing places are near by.



© National Geographic Society

Reproduction by W. Robert Moore

This Large Elko County Ranch Has One Foot in the Sagebrush, the Other in Green Grassland

Beyond rise the Independence Mountains, over which the cattle graze during the summer months. Normal precipitation here is only about 8 or 10 inches annually, mainly as snow in winter. Amid the sagebrush, however, grows considerable grass. Hay is cut in the watered valleys for winter feeding of stock.



© National Geographic Society

Over Thirsty Land Bristly Yuccas Lift Arms in Supplication

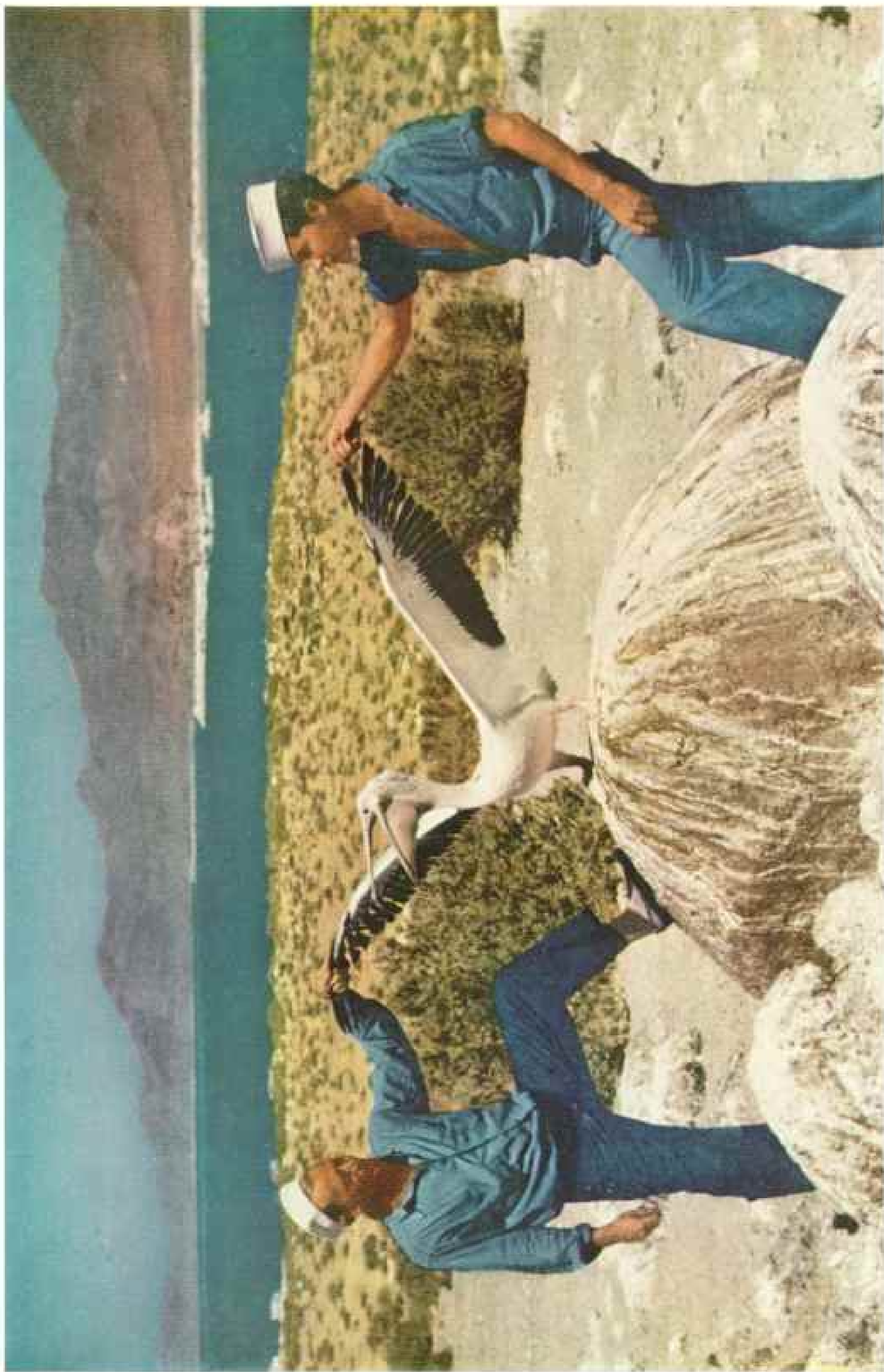
These spiny plants, also called Joshua trees, appear in two areas in southern Nevada. One is near Goldfield, the other about Charleston Peak, northwest of Las Vegas. In springtime they bear flower stalks with creamy-white flowers. Trunks have a corky covering.



Restoration by W. Robert Moore

Petrified Trees Give Proof That the Land Once Was Humid

This large tree bole, together with other logs and stumps, lies in the arid Valley of Fire (Plate VIII). Covered over and preserved eons ago, these forest monarchs were converted into solid rock by the gradual substitution of mineral matter for water in the plant tissue.

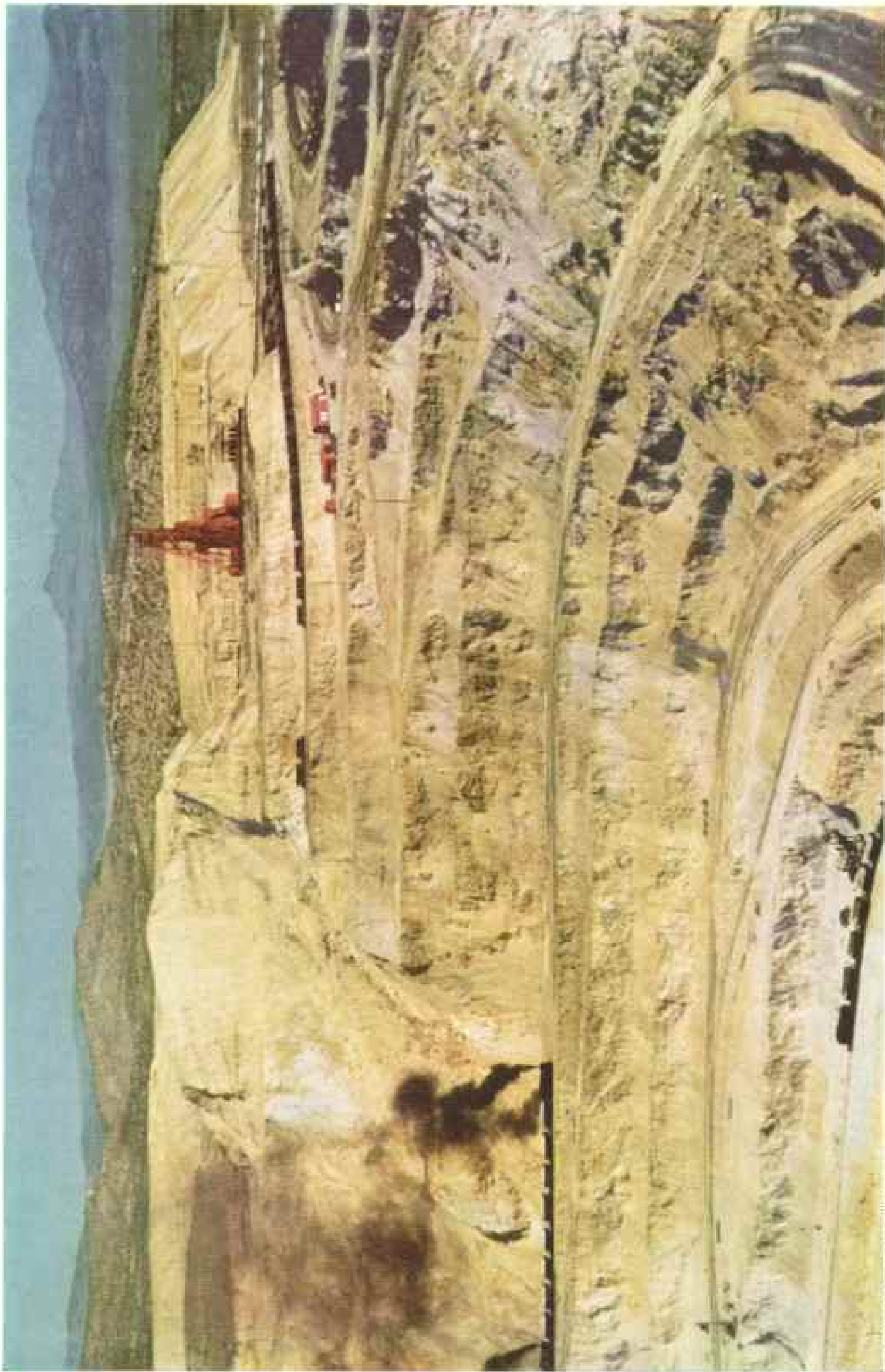


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Reproduction by W. Herbert Moore

With His Famous Bill Gaping, This White Pelican Seems to Say, "Shove Off, Sailors, and Leave Me Alone!"

Although too young to fly, it has a 6-foot wingspread. Some 10,000 white pelicans inhabit this rookery in Pyramid Lake. The lake was named by Fremont in 1844 for the 475-foot pyramid in the distance. White sand on shoreline shows where water level has dropped by recent evaporation. The Navy has an airbase near by.

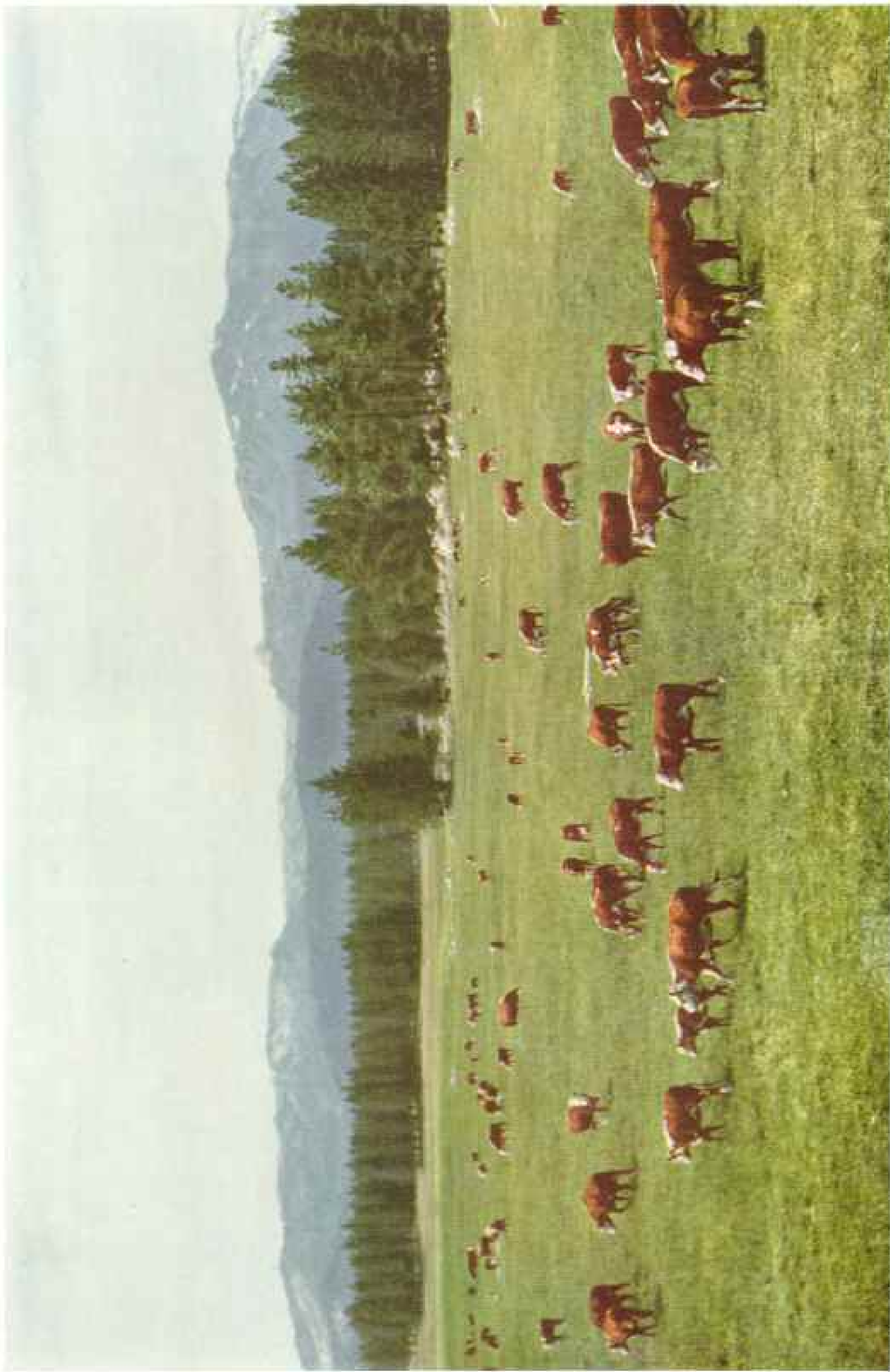


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Redrawn by W. Robert Stout

Engines Chug and Snort as They Haul Heavy Loads of Copper Ore from the Huge Man-made Pit at Ruth

To climb from the bottom to the rim, trains of electrically operated shovel bites 8-ton mouthfuls from an ore bench 700 feet deep. Red structure above is the headframe of a shaft for underground workings. Below, an electrically operated shovel bites 8-ton mouthfuls from an ore bench. The excavation is a mile long, three-fourths of a mile wide, and 700 feet deep.



Some 400,000 Head of Thick-bodied, Bawling Whitefaces Roam Nevada's Wide Ranges

Few enjoy such green pastures as this meadow above Lake Tahoe in the Sierra Nevada. Instead, most herds pick a living in summer on grass that grows amid the sagebrush on hill slopes and mountain canyons. Nearly one-half of the State's remaining income comes from cattle.

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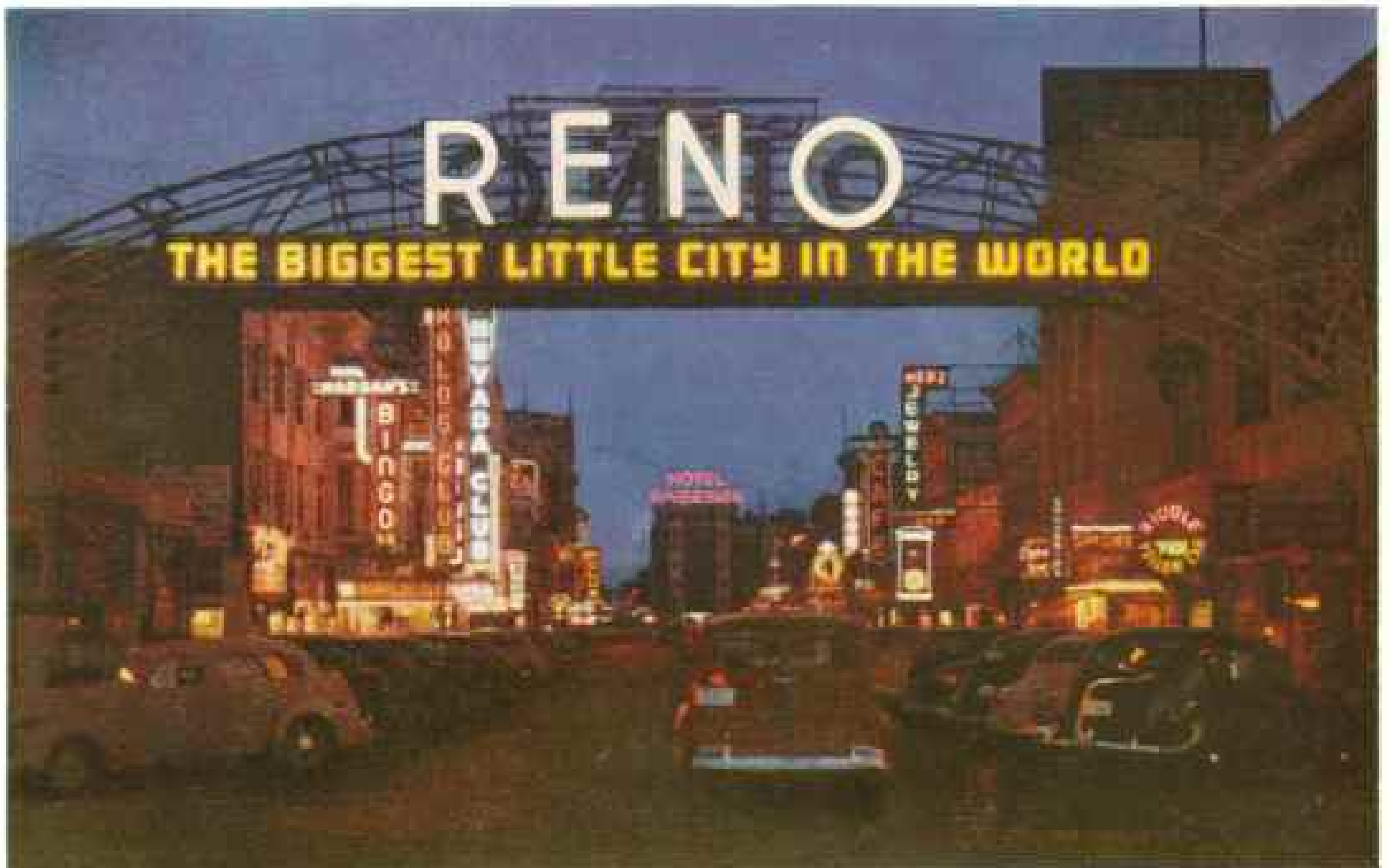


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Reprinted by W. Robert Sharp

"With No Breakdowns, We Can Bale 30 Tons of Alfalfa a Day," Commented This Crew in Fertile Carson Valley

One man drives the tractor down the windrow while the other two sit at the baler to tie the wires with which the hay is bound. Roughly nine-tenths of all harvested land in Nevada produces a hay crop, about 40 percent of it alfalfa. It is stacked for winter feeding of stock.



Familiar Sight to Transcontinental Railway Passengers Is This Brilliant Neon Sign. It arches over Reno's central thoroughfare, Virginia Street, close to the railway tracks. Other signs advertise many gaming clubs, cafes, and stores of this downtown district.



© National Geographic Society

Photographed by W. Herbert Moore

True to Tradition, Carson City Firemen Deal a Friendly Hand While Awaiting a Call. For the picture they have put on shirts and helmets worn when the capital had two volunteer departments, Warren Engine Company No. 1 and Curry Engine Company No. 2.

"We had perhaps 150 miles of tunnels within its three-quarter-mile-wide and three-mile-long workings," a Tonopah mine manager told me. "Ore often moved downhill to the mill at the rate of 2,000 tons a day.

"An interesting note on the mill is that, when the sludge piles widened on the plain, the cyanide water seeped back into the mine wells. Faucets became silver-plated. When the mill was torn down, the water pipes were scaled and yielded \$23,000 in silver!"

Since 1930 the mines have operated on a limited scale by lease, each individual miner getting a small plot along the vein. Some diggings are very lucrative. Not long ago one leaser sent out three carloads of ore in one month. It was \$300-a-ton mineral and brought the tidy total of \$45,000.

Just before the war Tonopah's population had fallen to about 1,560 persons. Homes could be had for a pittance. But when the Army established an airbase near by, hundreds of families flocked in and filled up all available space. Some even fitted up sugging shacks and large garages for occupation. Tonopah seemed almost a boom town again.

Ghostly Goldfield Repopulated

Even ghostly Goldfield, 25 miles to the south, brushed cobwebs and dust from some of its remaining houses for soldier families with cars. Nothing short of a new bonanza, however, could arouse this once-lusty offspring of Tonopah to the glory it knew when its treasure ore brought in as much as \$11,000,000 in a single year, 1910.

Fifty-two blocks of its buildings burned down in 1923; others have since been demolished or boarded up. But a few persons still have faith that more gold is here and are trying to locate it.

Rhyolite and adjacent Bullfrog (named for the greenish-colored ore), outside the little town of Beatty, never ascended the heights of Goldfield, but they have fallen even farther.

Gold ore deposits that gave early rich promise soon were worked out. Vaults of two banks now gape wide; stores are only piles of rubble; the schoolhouse was a skeleton long before the bond issue for its building was paid.

Only buildings intact are a "museum" house made from beer bottles and the railway station, which has been converted into a night club for visitors from Death Valley. The population is three persons!

Southeastward toward Las Vegas the desert seems more lonely. The Amargosa River, which rises in springs and spongy green pasture above Beatty, becomes a dusty gully. Joshua trees that stud the landscape near

Goldfield vanish; sagebrush gives way to creosote bush. But flanking blue mountains assume rare beauty.

About an hour's ride from Las Vegas you skirt the base of lofty Charleston Peak. Its slopes and high pine-studded canyons form a delightful resort from summer heat and a snow playground in winter.

Varied Annals of Las Vegas

Las Vegas is one of the oldest, and yet one of the youngest, settlements in Nevada. Successively, it has been a way stop for water, a stockaded Mormon outpost, a fort, ranch, railway division point, and now the second largest city in the State (page 38).

The present town dates only from 1905 when the railway, completing the link with Salt Lake City, sold lots, provided streets and water, and assured incoming settlers employment in railway workshops.

The construction of Boulder Dam a few years ago gave added stimulus to the growing town, as have thousands of visitors who have since come to see that engineering marvel.

Alert, progressive Las Vegas has found that it has numerous vacation attractions; so it has been building bigger air-conditioned resort hotels, more auto courts, and pleasant homes.

A few miles southeast from Las Vegas is war-born Henderson, where a gigantic magnesium plant grew to utilize Boulder's electrical power for manufacturing strategic metal from Nevada's deposits. Part of the plant that makes chlorine is still operating.

Much has been said about spotless Boulder City, built by Uncle Sam as construction and administrative headquarters for Boulder Dam. More words have been used in attempts to describe the colossal 726-foot-high block of concrete that engineers poured into the awesome canyon to dam the mad, mud-laden waters of the Colorado (page 23).

Boulder Dam is shared by both Nevada and Arizona, but its whirring electrical generators and water control mean power, light, and new irrigation projects to the whole Southwest.

"Has the water in the lake risen since you put in the dam?" an overawed visitor once asked a guide.

"What lake?" he must have been tempted to reply, for 115-mile-long Lake Mead was only a river canyon and dry valley lands before the erection of the dam.

One home owner at now-submerged St. Thomas, nearly 40 miles up one arm of the lake from the dam, refused to move because he felt certain the water would never reach that far. But when waves began lapping at his door, he quickly evacuated!



Senator and Mrs. "Pat" McCarran Visit the Huge Basic Magnesium Plant at Henderson

With Mr. F. O. Case, general manager, the veteran Nevada Senator and his wife inspect some of the silver planks, valued at \$23,300,000, used as electrical bus bars in the ten big electrolytic buildings of this war-born plant. It used power from Boulder Dam and had a capacity of 112,000,000 pounds of magnesium a year (page 33). As stock piles grew the metal plant closed down. Only chlorine units operate now.

Along with St. Thomas vanished the ruins of an ancient Indian settlement and some of the irrigated farmland southeast of Moapa.

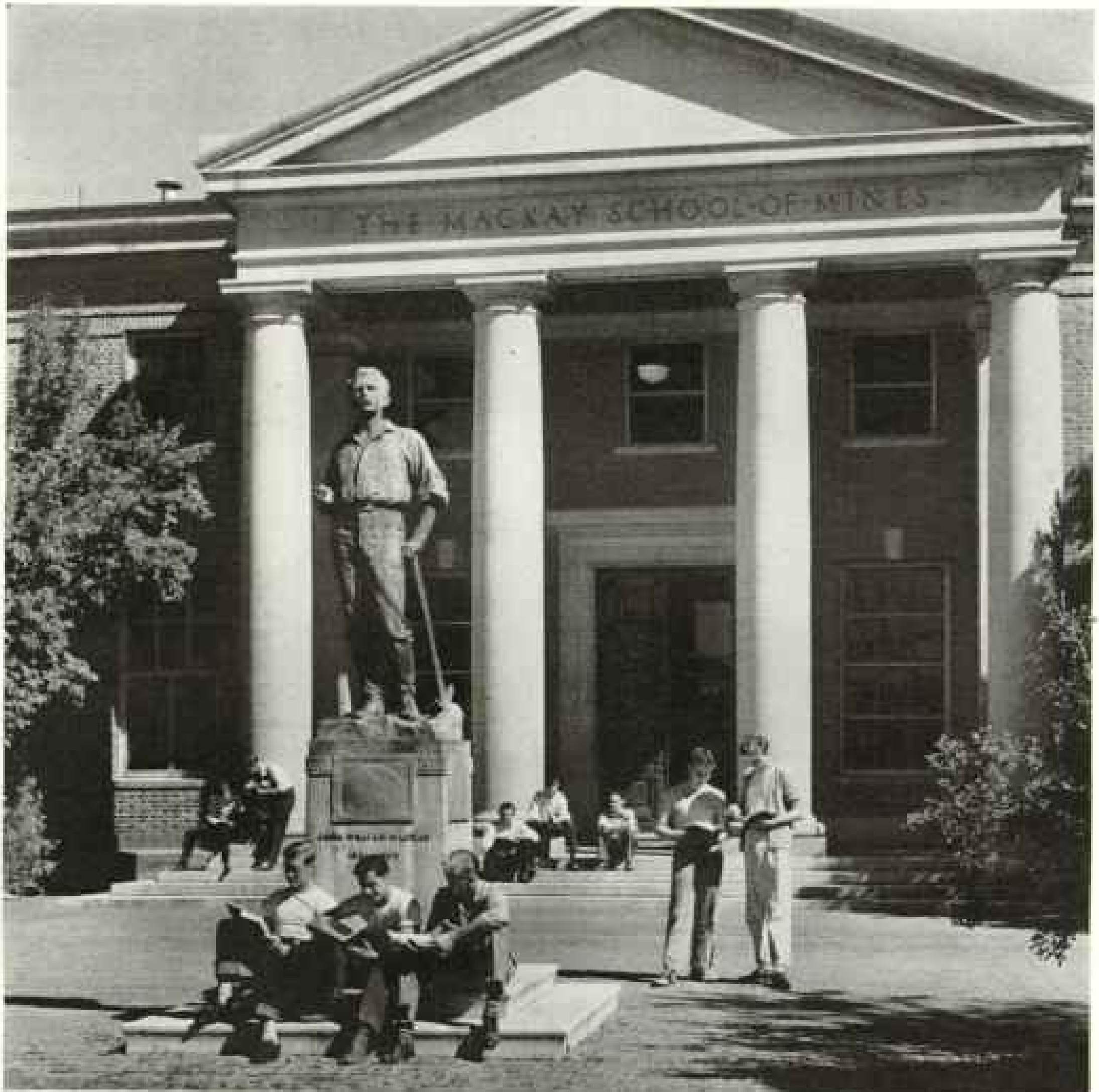
In years to come Lake Mead will become a novel recreation area, for it affords opportunities for swimming, fishing, sailing, and exploration by motorboat through miles of spectacular steep-walled canyons.

Hard by lies the Valley of Fire, where flaming walls and fantastically eroded rocks of red sandstone tower above the valley floor, on which also are scattered petrified trees (Plates VIII and XI). On the face of many of the rocks primitive red men carved strange sym-

bols and pictures. Near by, too, is Gypsum Cave, where prehistoric man and giant sloth once had retreat.

Drive north toward the lead- and zinc-mining town of Pioche and you come to Cathedral Gorge. Here is wasteland where man would erect no tall cathedrals or skyscrapers, but erosive forces have fashioned both (Plate VI).

In massive cliffs of grayish-tan clays, rain and wind have found a comparatively soft, pliable medium with which to do their sculpturing. The walls hemming a narrow valley have been hewn into castles, domed shrines, pinnacles, and columned recesses beyond count.



Staff Photographer W. Robert Moore

Students Study Beneath Mackay Statue Hoping They'll Be Mining Millionaires, Too

Without a cent when he reached the Comstock in 1859, Mackay later became the richest of the bonanza kings. Mrs. John W. Mackay and her son Clarence founded the Mackay School of Mines and furnished funds for the athletic field and training quarters, science hall, and numerous other improvements at the University of Nevada in Reno (page 4).

Eighty miles farther north, southeast of Ely, subterranean waters have created an interesting wonderland in limestone deep within the hill bastions of 13,058-foot Wheeler Peak.

Lovely stalactites and stalagmites of every conceivable size and shape fill the large underground chambers and galleries. Altogether, more than a quarter of a mile of rooms and passages have been developed here at Lehman Caves National Monument.

At Ruth, seven miles outside the prosperous town of Ely, man has taken a hand in reshaping the landscape. In the quest for copper, miners have torn away a hill and dug

one of the biggest man-made holes to be found anywhere on earth (Plate XIII).

Since operations began in 1907, some 230 million tons of earth overburden and ore have been hauled from this single excavation. Today the pit looks like a stadium for giants; it is a mile long, three-fourths of a mile wide, and has a maximum depth of 700 feet.

And it's still growing. Electrically operated shovels scoop ore from the benches deep in the pit and load it onto trains at the rate of 11,000 tons a day.

A company under contract to strip overburden for an extension to the pit is ripping



Staff Photographer W. Robert Moore

Using an Acetylene Torch, He Welds Cattle Brand 59

Brands made by numerals, letter combinations, and odd designs are essential to the cowpunching West. Once burned into leather and recorded in county offices, these symbols are now filed on card indexes. The State has 2,783 brands listed. They must be re-recorded every five years.

away 30,000 tons of dirt daily. The total stripping operation to uncover more ore calls for the removal of 15,800,000 tons of earth!

Trains that haul ore from the crater have to spiral and switch up four miles of track to reach the assembly yards atop the rim.

In addition to the ore extracted from this colossal open cut, underground output by the two companies—Kennecott Copper Corporation and Consolidated Coppermines Corporation—operating here and at adjacent Kimberly totals another 6,500 tons of ore daily. The earth round about cracks and caves from work that goes on underground.

The ore from both mining companies is hauled to the Kennecott reduction plant

at McGill, 22 miles away. There the metal is extracted and shipped in the form of blister copper (pages 18 and 20). Virtually all the 10,000 persons living in the Ely district gain their living from copper in one way or another.

U. S. Route 50, which slices across the center of the State, follows a trail of spent mines. Eureka and Austin are the only towns that have survived. Even they are but shadows of departed prosperity.

Eureka, however, has hopes of staging a comeback. Its earlier mining activity halted when its rich ore vein ended at a fault. Men have persistently probed the earth on the opposite side of the fault to find the continuation of the vein. At last they believe they have found it, far below the level of the other workings, indicating that the earth's crust here has slipped 1,400 feet.

At no place in Nevada are you ever out of sight of bold mountain ranges. To me, however, the most striking

of them all are the Ruby Mountains, whose rocky crests rearing high above the plains are seldom free of snow. As you loop northward from Ely to Wells and cross down to Elko you ride around three sides of them.

Northward also beyond the valley from Elko rise the Independence Mountains.

Large copper and other mines are tucked away in the hills, but primarily these ranges and valleys are pasture lands for large herds of cattle and widely scattered flocks of sheep.

Elko is the stockman's capital of the State. Tall, tanned buckaroos swing along its streets in high-heeled shoes. Hotels, clubs, and bars buzz with the talk of cowmen. In one hotel you seldom hear anything spoken but

Basque, for it is the gathering place for sheepherders in from the range.

Elko is modern and still of the West. New bungalows and apartments nudge Victorian homes of the town's earlier growth; display lamps cast light in windows of beauty parlors and dress shops and in stores selling saddles, bridles, and other horse togs (Plate V).

Although the event was weeks away, every room in the hotel where I stayed had a sign tacked on the door stating that it was reserved for the annual Elko County Fair and stock sale. Almost everyone from the whole countryside converges on the town at that time to see the horse races, prize stock, and rural exhibits. Elko is seldom quiet.

Trains of the Western and Southern Pacific thunder right through the middle of town on their route across Nevada.

Down through Carlin, the red basalt canyon of Palisade, past Battle Mountain, and through Winnemucca along the Humboldt

River, the roads parallel each other much of the way. By agreement, both lines now use one track for all westbound trains; eastbound traffic rides the other.

Sparks, just outside Reno, is division headquarters for the Southern Pacific line. Here the railway maintains roundhouses, switch yards, and large repair shops for reconditioning and rebuilding the big mountain-type locomotives.

When Arsenic Was More Precious than Gold

Northeast of the town of Winnemucca I climbed into the hills to see Getchell Mine, which since 1938 has produced a gross of some \$12,800,000 in gold and tungsten. Largest of the present gold operations in the



Staff Photographer W. Robert Moore

With Such a Jack a Modest Miss Could Pull off Her Boots

The swinging panel on this hand-carved device hid all except her petite toe from the front. With a firm hand grasp, she could tug strongly if tight boots resisted. A short-skirted modern demonstrates this elaborate relic from dusty mining camp days.

State, it continued to function during the war because its by-product, arsenic, was needed by the Government, as was the tungsten it milled.

A rich tungsten mine, one of the three largest in the country, lies southwest of Winnemucca. Although the mills process thousands of tons of scheelite ore, you never see any metallic tungsten. Only a concentrate—78 percent tungsten trioxide and the rest mainly silica—is produced. It looks like heavy gray dirt.

Despite the apparent barrenness of wide areas of Nevada, it has an interesting variety of wildlife. Up in the northwestern corner of the State is a sanctuary for large herds of pronghorn antelope. Many deer and a few



Staff Photographer W. Robert Moore

Club Signs on Fremont Street in Las Vegas Emphasize the Frontier Spirit of the City

At night they blaze with bright neon lights. One of the oldest settlements in Nevada, "Vegas" is one of the State's youngest cities. Its growth dates from 1905, when the railroad came (page 33).

hundred elk roam the hills. Its mountain streams are well stocked with trout.

Nevada, too, is on the migration route of ducks, geese, and other water fowl, and in autumn its rivers, lakes, and even municipal ponds are pausing places for the birds in flight.

Riding along the Humboldt one day I came upon hundreds of white pelicans fishing in the shallow stream. They had flown over from Pyramid Lake to feed. Fish are becoming more and more scarce as the lake grows increasingly brackish and irrigation dams in the Truckee reduce spawning.

An island in Pyramid Lake is the breeding ground for thousands of these huge white birds, and as guest of the U. S. Navy I later visited the rookery (Plate XII).

Clambering over the island we found large flocks of waddling young birds not yet old enough to fly. Overhead soared anxious adults, their white bodies and black-edged wings gleaming in the sun against the blue sky. When first hatched, the pelican chicks

are about the ugliest birds that Nature ever created; nesting grounds seem like some reeking, forgotten world of misshapen creatures.

From the pelican rookery we cruised around the pyramidal rock which rises above the water to a height of 475 feet. Frémont, seeing this odd upthrust in 1844, named the lake for it. Hot chemical-laden waters spurt from its sides.

Numerous tufa, or calcareous, formations surround this 30-mile-long body of water. At its northern end stand many pinnacles, atop some of which also nest numerous cormorants.

Pyramid Lake lies within an Indian reservation, but during the war the Navy established an airbase in the vicinity. Here, and on the open plain, pilots gained some of their final practice in torpedo launching, strafing, and bombing before they shipped aboard carriers to the Pacific.

The Navy in the desert—this is but another of the vivid contrasts one discovers in Nevada.

Europe's Looted Art

BY JOHN WALKER

ONE of the greatest piles of looted art in the history of the world was amassed by the Nazis and is now in the custodianship of the United States Army. From one end of the territory we occupy in Hesse-Nassau to the other in Upper Austria, there are more than 400 mines, castles, hospitals, and other public buildings containing objects of art.

This huge accumulation of masterpieces of every epoch and many nations was in part pillaged from France, Belgium, the Netherlands, and Italy and in part evacuated from the German cities.

In one mountain alone are more than 100,000 catalogued items, ranging from paintings and sculpture to furniture, jewelry, and armor, part of it looted from the museums and private collections of the various occupied countries, and part withdrawn from German and Austrian State collections.

Thus, having become the involuntary custodians of a large part of the artistic resources of Europe, we now have the problem of seeing that as many as possible of these myriad objects are returned to the countries from which they were stolen and that in the meantime they are carefully guarded and preserved.

Returning the Lost and Found

The responsibility for this vast undertaking rests upon a division of military government too little known to the American public. It is the Monuments, Fine Arts, and Archives Branch, a group of officers and enlisted men who in civil life were architects, art historians, museum curators and archivists.

They were selected by the War Department on the advice of the American Commission for the Protection and Salvage of Artistic and Historic Monuments in War Areas, a committee established by President Roosevelt in August, 1943, under the chairmanship of former Associate Justice Owen J. Roberts, of the U. S. Supreme Court.

This governmental agency, with probably the biggest name and the smallest personnel in Washington, has its headquarters at the National Gallery of Art. It has been a channel through which special information required by the War Department on questions of art and archives could be provided by American scholars and experts.

In touring France, Germany, and Italy last summer, I was deeply impressed by the achievements of the American and the British

Monuments, Fine Arts, and Archives officers. Their devotion to the cause of European culture, which has cost the lives of two officers, has won them the esteem of people in every occupied, and even enemy, country. The future will acknowledge a great debt to them for the reroofed churches, the salvaged palaces, the reassembled paintings, sculpture, libraries, and archives of Europe.

Never in any war have such efforts been made, by one side at least, to save works of art from destruction. No commander in the past, for instance, has instructed his troops, as did General of the Army Dwight D. Eisenhower, both before the invasion of Italy and again in similar terms on D Day:

"Today we are fighting in a country which has contributed a great deal to our cultural inheritance, a country rich in monuments which by their creation helped, and now in their old age illustrate, the growth of the civilization which is ours. We are bound to respect those monuments so far as war allows. . . .

"It is the responsibility of higher commanders to determine through AMG officers the locations of historical monuments whether they be immediately ahead of our front lines or in areas occupied by us."

As our military forces ground their way across Italy, France, Belgium, and the Netherlands, it was such orders, implemented by the Monuments, Fine Arts, and Archives officers, which saved so much of Europe's resources of art and culture. We have, in fact, because of General Eisenhower and General Sir Harold Alexander, fought a battle in a museum and left an astounding number of the exhibits intact.

Mountains of Nazi Loot

The protective phase of this work is finished; there now remains the problem of unscrambling the loot which the Nazis took from the occupied countries and intended for the enrichment of themselves and the Third Reich.

Nearly every country in Europe has contributed to this huge stock pile of art. Now that we have occupied Germany, we can at last begin to get a picture of the most disgusting example of theft in history, revolting because of its hypocrisy, its nihilism, and its bad taste.

It is true that the French under Napoleon pillaged European collections and that, at the Treaty of Paris, they reluctantly disgorged

only a part of what they had taken, facts noted in a book compiled for Hitler as the basis for German looting. But the French never attempted to destroy, rather than yield, their plunder; nor did they show such utter disregard for the safety of the great monuments of culture which they had carried off.

The Nazis, on the other hand, looted with a rapacious and indiscriminate fervor which would have shocked Napoleon. They varied their methods in different countries, but the result was always the same—a huge agglomeration of works of art of the most fantastically varied quality, pictures less valuable than their frames side by side with the greatest treasures of painting, statues unworthy of a suburban garden stacked against works by Michelangelo, fake antiques of the shoddiest kind piled up beside the finest attainments of the French 18th-century *ébénistes*.

One has the impression that Hitler must have shot, exiled, or simply ignored every German connoisseur. This, in fact, is borne out by a conversation I had in the home of a French collector, who said to me:

"In my apartment, as you see, I have some important 18th-century pictures."

He was quite right, for there were magnificent Fragonards, Lancrets, and Bouchers.

"But," he continued, "the Germans came and, to my great surprise, ignored everything except this painting, which I inherited and have always considered a worthless copy after Watteau. Can I be mistaken?"

I assured him he was not.

"Then," he said, "I can't understand it. Only the arrival of the Allies prevented their carrying it off for their museum in Linz."

Nazis Stupid in Their "Collecting"

In fact, the Nazis were surprisingly stupid, not only in their looting but also in their purchases. Much publicity was given to the acquisition by Hermann Goering, at a huge figure in German manufactured currency, of a newly discovered painting by Jan Vermeer, a Dutch artist of the 17th century, whose entire known work numbers only about 40 panels and canvases.

When I saw the picture this summer at Berchtesgaden, I was amazed at its blatant fraudulence; and, when I returned to London, I learned that a Dutch painter, who was being questioned as a collaborationist, had actually confessed and proved that he had executed this second-rate forgery.

One can only wonder at the courage of the dealers who swindled the Nazi leaders, for, if they had been found out, no torture

invented at Dachau would have been considered painful enough.

On the other hand, one can only hope that Goering, as he sits in jail, realizes that few collectors in history have proved themselves as stupid or been as badly cheated.

By this I do not mean that there are not great works of art in the Hitler Collection and the Goering Collection. When lack of transport did not compel the Germans to select only a few objects, they used a foolproof system. They took everything! Consequently, they caught in their net many of the greatest masterpieces of Europe. Their haul from the Rothschild Collection (page 47), the Collection of David Weill, the Koenigs Collection, and others was especially rich.

Their enthusiasm for French 18th-century painting of a slightly salacious content, however, is the only thing which gives some character to what otherwise seems haphazard pillaging.

In this connection it is interesting to note that Hitler's private library, which was evacuated with his pictures, contained, besides books on the theater, the cinema, architecture, and contemporary politics, a large collection of 18th-century pornography. Works on history, philosophy, or general literature were conspicuously absent from the Führer's bookshelves.

Congratulations for the "Looter in Chief"

German looting in France, Belgium, and the Netherlands began soon after the occupation. A letter dated November 21, 1940, from Goering to Alfred Rosenberg congratulates the "ideological and spiritual leader" of the Reich on his appointment as the authority in charge of cultural goods seized in France, or what amounted to Looter in Chief.

After complaining of the interference of such rival collectors as Von Ribbentrop and Goebbels, Goering continued: "I have promised to support energetically the work of your staff and to place at its disposal that which it could not hitherto obtain, namely, means of transportation and guard personnel, and the Luftwaffe is hereby assigned to give the utmost assistance.

"In addition, I should like to call to your attention that I have been able to obtain especially valuable cultural goods from Jewish owners. I obtained them from hiding places that were very difficult to find; I discovered these a long time ago, by means of bribery and the employment of French detectives and criminal agents. This activity continues, as does the activity of my foreign



U. S. Army Signal Corps, Official

GI Connoisseurs Gaze Upon a Celebrated 19th-century French Painting

The Germans, foreseeing the fate in store for their capital, removed Édouard Manet's "In the Conservatory" and other works from the National Gallery of Berlin to a salt mine at Merkers, Germany. Here they were found by soldiers of the American Third Army and taken to a Reichsbank vault at Frankfurt. Alarmed at first by the enemy's choice of salt mines as hiding places, art experts of the Allied Military Government discovered that the paintings were unharmed, because salt absorbs moisture (page 49).

exchange investigation authorities in scrutinizing bank vaults.

"In both cases the results will be communicated to your staff, which will then be required to seize the articles and transport them. . . . As a matter of course, the Führer has reserved for himself the right of decision over the most valuable part of the collection. An extraordinarily large number of objects remain, however, the total of which will apparently read into thousands."

Ultimately Rosenberg developed his own organization independent of the Luftwaffe or the Army. It consisted of all the necessary personnel, starting with very poor art experts and restorers, then somewhat better packers and shippers, and last and most important, really first-rate mobsters and armed hoodlums.

With their assistance the Rosenberg Task Force, as it was called, stole over 200 private

collections from France, Belgium, and the Netherlands.

Why Some Museums Were Spared

In the "Western Confiscation District," to use Rosenberg's terms, very little was taken by the Germans from State or ecclesiastical collections. The Louvre, the Rijks Museum, the Brussels Museum, and, on the whole, the churches were left intact for the subsequent enjoyment of German tourists.

There were, however, two notable exceptions: the famous altarpiece of the "Adoration of the Lamb" by the Van Eycks, the greatest masterpiece of Flemish painting, and the Louvain altarpiece by Dirk Bouts. These had both been reconstituted after the last war with panels taken from German museums in accordance with the Treaty of Versailles.

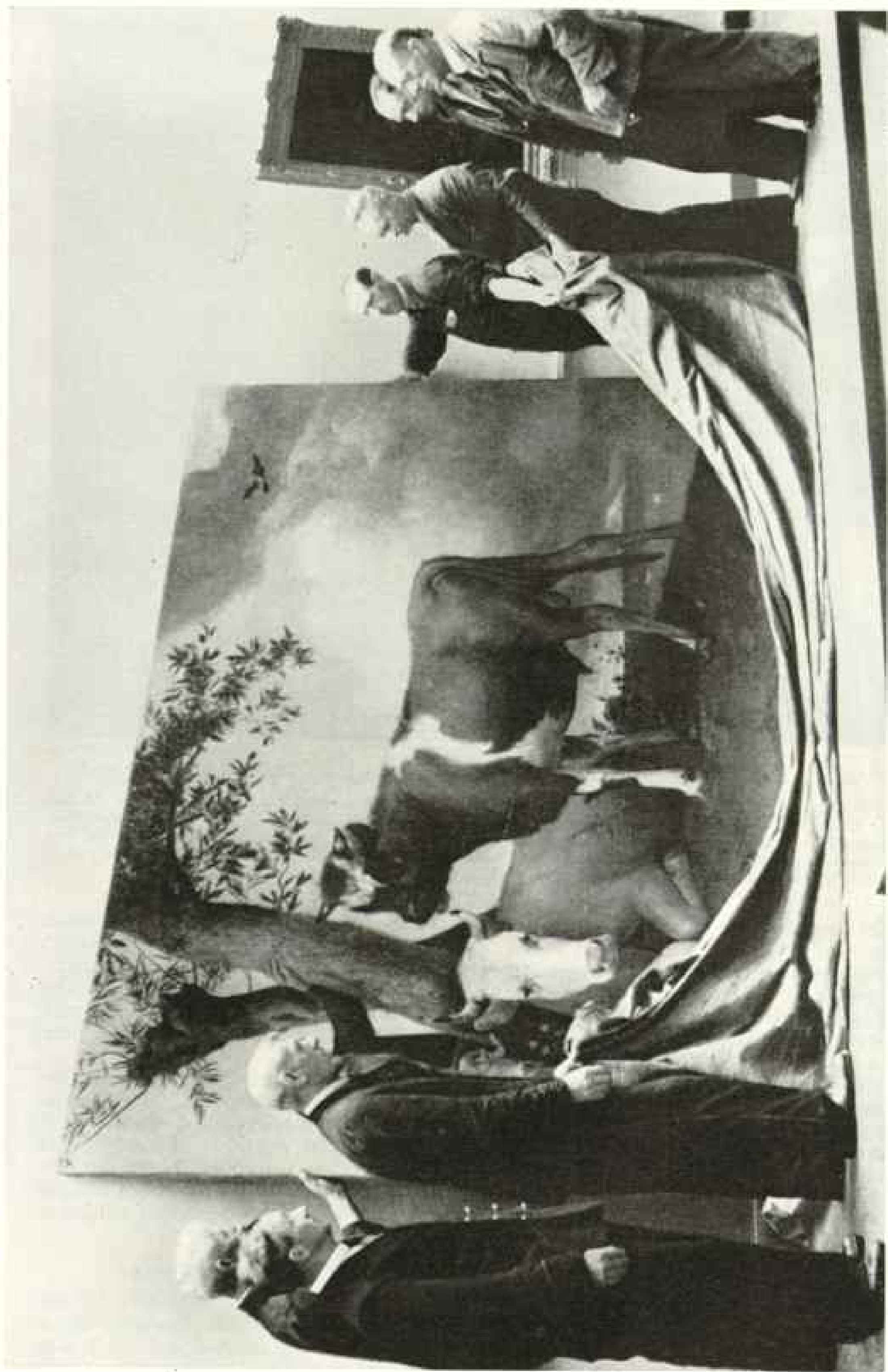
In both cases Hitler, in revenge, arranged



U. S. Army Signal Corps. Official

General Eisenhower Inspects a Salt Mine Treasure-trove after Its Capture by Patton's Third Army

Merkers, 15 miles southwest of Eisenach, was overrun so swiftly by American forces that the Nazis abandoned an underground cache with an estimated value of \$200,000,000. Bullion and paper money as well as art works were found here. With the Supreme Commander are Gen. Omar N. Bradley and Maj. Gen. Manton S. Eddy.



Notwithstanding official

The Netherlands' Liberation Brings Art Masterpieces Out of Hiding and Back to Museum Walls

During the German occupation, Paul Potter's 17th-century painting, "The Bull," and other works of Dutch masters were hidden in underground storage places in the southern Netherlands. Now they are back in the Rijks Museum of Amsterdam, where many Allied soldiers on leave viewed them.



British official

"Welcome Back, Cosimo!" A Battered Medici Grand Duke Returns from the War

Found in its hiding place at Poggio a Caliano, the 8-ton equestrian statue of Cosimo I de' Medici, Grand Duke of Tuscany, proved too heavy for the Germans to carry away. To move the bronze from Florence's Piazza della Signoria, Italians had separated horse and rider. American soldiers brought the two pieces back to Florence on a tank-transport truck, with Italians cheering as it passed and a GI mounted in Cosimo's saddle to cut obstructing overhead wires (page 46).

for the removal to the Reich of the altarpieces in their entirety.

Moreover, toward the end of the war German policy apparently changed, and there was considerable looting of public collections in Antwerp and elsewhere, which resulted in the removal of the Bruges (Brugge) "Madonna" by Michelangelo and other important works, all now recovered by our Army in Austria.

Apart from Poland, about which I have no direct information and which I therefore omit from discussion, Italy suffered the most serious looting of public galleries.

The first important case of German pillage from Italian museums was discovered when our Allied experts arrived in Rome and checked the cases from the Naples Museum, which had first been evacuated to Monte Cassino and then taken by the Hermann Goering Division to the Vatican.

It was noted that while in transit certain important pictures, such as Titian's "Danaë," a "Madonna" by Raphael, a "Holy Family" by Palma Vecchio, and Pieter Brueghel's "The Blind Leading the Blind," together with bronzes, gold objects, and jewelry, had been removed.

When this was stated in a broadcast by the Office of War Information, the Germans immediately accused the "pluto-democracies" not only of this theft but of many thefts they intended to perpetrate themselves. In spite of the German denials, these objects were discovered last summer hidden with other loot in Austria.

Heavy Pillaging in Tuscany

The chief pillaging of Italy done by the Germans was, however, in Tuscany. As a result of the Allied advance in Italy, it was



U. S. Army Signal Corps. Official

GI's Rescue Rubens' "Holy Family" from a Copper Mine Near Siegen, Prussia

Unlike salt shafts, copper mines made poor repositories for paintings, for moisture caused mold to form (page 49). The Siegen mine contained loot from places as distant as Warsaw, including a practically worthless copy of a Titian which the Nazis apparently believed of great value. The "Holy Family" was evacuated from the Wallraf-Richartz Museum in Cologne.

decided by the Italian museum authorities to evacuate works of art from Florence. The paintings and sculpture from the Uffizi, the Pitti, the Bargello, and many Florentine churches were put in 23 depositories in villas near the city. Eight of these fell into our hands very quickly. Some were in the midst of battles (pages 46, 48, 50).

For example, the villa of Sir Osbert Sitwell at Montegufoni was one of the principal evacuation centers. While it was still being fought over, Maj. Eric Linklater, Scottish author who visited the castle to interview India troops, was poking around while the soldiers themselves were too busy returning German shellfire to be interviewed.

He happened on a room with dozens of paintings stacked against walls and piled on top of one another. There he met an excited little man with horn-rimmed spectacles who rushed up and explained that Linklater was

looking at Botticelli's "Primavera" and scores of other masterpieces from the Florentine museums.

The little man said he was Dottore Cesare Fasola, that he was the assistant librarian of the Uffizi, and that, without permission from the Germans, he had walked 30 miles from Florence to try to look after his charges. He had walked from depository to depository in the neighborhood, but shellfire had finally pinned him down.

While the Germans were in control, he had explained to them that they were fighting in the midst of the treasures from his museum, but they were too busy trying to hold off a British attack to pay any attention.

When the attack drove them out, the British, in turn, were too busy repelling a counter-attack to think about art. It was not until Linklater and Vaughan Thomas, of the British Broadcasting Company, got in touch with the



Italian Children Watch Hitler's Collectors at Work

German soldiers are unloading "Faith," by the 15th-century Italian painter Piero Pollaiuolo, and other canvases stolen from the Uffizi Gallery in Florence. Bound for Austria, the convoy ran out of gasoline and the paintings were stored in the disused jail at San Leonardo, near Bolzano, where they were discovered by Allied troops (page 47).

colonel in charge that anything was done to protect the paintings, which fortunately survived in relatively good condition.

Return of an 8-ton Statue

Most of the other depositories south and west of Florence, like Montegufoni, had not been touched by the Germans, and we all hoped the same would be true of those to the north and east. The first shock came when our Monuments, Fine Arts, and Archives officers found that the sculpture from Florence stored at Poggio a Caiano had been carried away by the Germans.

The Nazis took practically everything but

the equestrian statue of Cosimo I de' Medici, which proved a little too heavy, weighing as it does about eight tons. This statue, incidentally, was difficult even for us to replace in the Piazza della Signoria in Florence, where it belonged.

Its triumphal return, when finally arranged, must have been an amazing sight. The huge bronze horse and its dismounted rider were placed on a tank trailer. An American soldier sat in Cosimo's saddle to cut down telegraph wires when they were too low. MPs held up traffic, and the crowds shouted, "*Cosimo, ben tornato!*" (Welcome back, Cosimo).

Even with American tank trailers, bulldozers, and wrecking cranes, it took several hours to transport eight tons of bronze statuary more than 14 miles; with bullock carts, primitive axes, and jacks, the Italians had been several days removing the statue at the beginning of the war (page 44).

The efficiency and the marvelous equip-

ment used to bring about Cosimo's expeditious return clearly indicated to the Italians one of the reasons for our victory.

But, alas, there were very few works of art, like Cosimo, too heavy for the Germans to move. From the Florentine museums alone 493 of the most important paintings were taken, and 153 cases of sculpture were carried off.

From the Villa Bossi Pucci at Montagnana, one of the most important depositories, 291 paintings were carried away, among them the following familiar masterpieces: Botticelli's "Pallas and the Centaur," ironically enough painted as a symbol of the victory of reason

over war; Van der Weyden's "Entombment"; and Rembrandt's "Portrait of an Old Man," both by artists the Germans look upon as representatives of Germanic culture, just as they consider Shakespeare one of their national glories.

Masterpieces Piled in Trucks

All these paintings were piled into trucks without even having been boxed. They were loaded by German soldiers who later slashed to pieces what they could not carry away and left the villa wrecked.

One can imagine the care with which they must have handled what they took with them. In fact, we can actually follow these fragile paintings from Montagnana a little farther on their journey.

A Partisan who escaped across the lines reported them next at a well-known villa near Bologna. The villa, unfortunately, was too small to contain all the loot, and some of the paintings were left outdoors under the porticoes.

A ball was held at the villa, which was decorated with works by Botticelli, Raphael, and Titian. Torches and candles provided the illumination, for there was no electricity, and in this flickering light it must have been a horrible and fantastic sight to see German troops dancing in the midst of many of the greatest works of art in existence.

Shortly afterward the paintings, or what was left of them, were packed on trucks and sent farther on toward the Reich. Ultimately they arrived at San Leonardo, near Bolzano, on their way to Austria.

Here, as there was no further gasoline available, the convoy was forced to stop, and the



International News

Rich Loot from Paris Turns Up in a Bavarian Castle

Sixteenth-century Italian jewelry, stolen from the Rothschild Collection in Paris, is examined by Lt. James J. Rorimer, in civilian life Curator of Medieval Art at the Metropolitan Museum of Art, New York. American troops found these gems and many other art treasures hidden in Neuschwanstein Castle at Füssen in the Bavarian Alps.

works of art were stored in a disused jail. This summer these paintings and sculptures were brought back in American trucks to the Florentine museums. Nine pictures, however, had disappeared before our Army captured Bolzano, among them two of the greatest paintings in the Uffizi, the "Hercules and Antæus" and "Hercules and the Hydra," by Antonio Pollaiuolo.

Other pictures had, of course, suffered damage, for paintings from the early Renaissance are like very old invalids with a tenuous grip on life. This has given them a special beauty, but it has also made them especially vulnerable to any movement or any sudden change in tem-



WILLIAM ORLANDI

Damaged by a Retreating Enemy, Florence's Masterpieces Go to the Repair Shop

As if in response to the beckoning finger of the statue at right, Andrea del Verrocchio's "Doubting Thomas" is rolled into the Uffizi Gallery workshop to have its scars removed by Florentine craftsmen working under the direction of AMG art experts.

perature or humidity. Under the best of conditions their existence was precarious, but one can imagine what they have been exposed to during these last years.

Greece Was Fortunate

Other countries in the Mediterranean suffered less than Italy. Greece was particularly fortunate because, throughout the war, there was the check of divided authority.

The Italians would not give up the works of art to the Germans, and, because of the Germans, they could not remove anything themselves.

At the outbreak of war the Greek museum

treasures were stored in vaults, walled up, or buried in the courtyards of museums.

Shortly after the occupation the Germans wished to reopen the Greek galleries, but the Italians mistrusted their allies. They offered various excuses—that it would cost too much to reinstall the exhibitions, that there was danger of bombing, and they even hinted that something might be stolen.

The Germans denied everything and, in a fury, opened a museum they had built themselves and filled it with works of art from their own excavations. At the inauguration of the new building, which was attended only by German officers, several of the most valu-

able objects in the collection were stolen.

The obvious glee of the Italians at being able to point out that German officers did not hesitate to steal the property even of their own government irritated the Nazis to such an extent that they closed their exhibition and ceased to press for the reopening of the Greek galleries. Consequently, when they had to leave Greece there was not time to uncover the repositories, and everything of first importance remained behind, including the "Charioteer" from Delphi, so often reported as stolen.

The survival of the Greek collections is very gratifying, but what is still more fortunate is our recovery in Germany of a large percentage of Nazi loot from other parts of Europe. The condition, however, of this mountainous treasure of pillaged works of art varies considerably. A few instances will indicate the general situation.

Many Art Works Stored in Mines

Works of art stored in mines, a favorite kind of repository chosen by the Germans for protecting their loot, were safe from bombing and shellfire, but occasionally suffered just as much from the ravages of excessive humidity.

The paintings taken from copper mines, for instance, were covered with a mold so thick that the actual pictures were almost impossible to discern (page 45). On the other hand, paintings stored in salt mines are in better condition, because the salt absorbs water.

In fact, we know that the Germans buried certain treasures in salt mines to conceal them for many years, perhaps forever.

The mine at Bernterode is interesting in this respect. In one of the deepest shafts, 2,000 feet underground, a special detail of officers of the German High Command, with no civilian participation, arranged the hiding place for the coffins of Frederick William of Prussia, of Frederick the Great, and of Marshal Paul von Hindenburg and his wife (p. 51).

Over the coffins they hung the regimental banners of the Prussian armies, and around them they placed portraits of all the German field marshals from the 18th century to the present day. They also deposited the crown jewels and seals of the Hohenzollerns and, of more importance to the world, the great French paintings from Potsdam. This hide-away they hoped would remain inviolate until the restoration of the Reich.

The hopes of the High Command were not fantastic. There was every reason to suppose that what they had buried would have been preserved for some time at least; and so carefully guarded was their secret that these

relics of Prussian militarism, as well as objects of French culture, might well have remained undiscovered had it not been for the alert observation of an American GI.

One of our sappers, who was removing dynamite from the salt mine, noticed the carefully concealed concrete wall, six feet thick, protecting the deposit and persuaded his captain to dig through it. When he crawled into the huge cavern behind the wall, he turned on his flashlight and saw a painting by Boucher. "Here's a nude!" he shouted back. "My God, it must be art!"

Salt Mines Preserve Paintings

Fortunately the greatest depository of looted art in the history of the world was also hidden by the Nazis in a salt mine. At Alt Aussee, in Austria, the SS troops deposited most of the pillage removed from the occupied countries by the Rosenberg Task Force and other German looters. Buried in this mine in various chambers and tunnels were thousands of paintings, innumerable pieces of sculpture, mountains of furniture, acres of tapestries, and every type of art.

I was at first alarmed that so much irreplaceable material should be stored in a mine, worried that it would be attacked by the damp, humid conditions I expected to find. As steel is very susceptible to moisture, I scrutinized the collection of armor to see whether I could discover any trace of rust. I could find none. Nor did the paintings I examined show any indication of mold or bloom.

The atmosphere of a salt mine, though damp, is not ruinous to works of art, provided they do not remain in it for too long a period (pages 41, 42).

The greatest menace to the objects, to those looted as well as to those owned by the German State, was the Nazis themselves. When they realized the war was lost, destruction was their only thought, and in their maniacal fury they sometimes accomplished their purposes and sometimes failed.

In Berlin many of the greatest treasures from the Kaiser Friedrich Museum were stored in what was virtually an indestructible repository, one of the gigantic flak towers built by Hitler.

The Battle of Berlin ebbed and flowed below these huge edifices constructed to shelter thousands of people and resembling medieval paintings of the Tower of Babel. But heavy artillery fire barely chipped the one containing works of art, and all its treasures survived the battle.

Then, two days after hostilities had ceased, SS troops broke into the tower and burned



British Official

Expert Hands Put a Fresco's Jigsaw Pieces Together

To restore the shattered frescoes of the Uffizi Gallery in Florence, an Italian craftsman painstakingly checks the irregular pieces of plaster against a photograph of the original ceiling. As the Allies advanced in Italy, with the Germans pillaging in retreat, many paintings and statues from the Uffizi, Pitti, and other Florentine collections were hidden in villas outside the city. Most of them survived the war in good condition (page 46).

its entire contents. Thus the Nazis, who prided themselves on being the guardians of European culture, had the satisfaction of watching the greatest conflagration of European masterpieces since their ancestors sacked Rome.

In Berlin the SS destroyed the legitimate property of the German people. At Alt Aussee they tried to destroy the immense treasure pile of loot they had collected from all the occupied countries of Europe. In each cavern of the Steinberg salt mine they placed bombs which they intended to explode the moment Allied victory became certain (page 52).

Such an explosion would have brought a mountain crashing down on all the important private collections of France, Belgium, and the Netherlands, and on such famous works from public collections as the Van Eyck altarpiece from Ghent (Gent) (page 41), the Michelangelo "Madonna and Child" from Bruges, the Czernin Vermeer, and the Titiens, Brueghel, and other paintings stolen from the Naples Museum.

Fortunately the bombs were discovered, and through entrances unknown to the SS they were secretly removed by the local miners.

This heroic gesture was due not so much to the miners' love of art as to their fear that the explosion would ruin the salt mine and destroy their livelihood. The miners then took a further precaution to preserve their industry. They blew up the tunnels leading to the interior, thus sealing off the mine, so that the Nazis were prevented from re-entering and replacing the bombs

before the arrival of our armies.

Other caches of loot have fared less well. The Goering Collection of about 1,100 paintings, several hundred pieces of sculpture, and assorted booty was evacuated from Karinhalle to a castle near Neuhaus. Then it was shipped in eleven baggage cars to Goering's hunting lodge at Berchtesgaden.

According to officers of the 101st Airborne Division, who were the first Americans on the scene, two of the baggage cars had been unpacked and the rest were being unloaded by the SS when the village of Berchtesgaden was attacked by a French armored division. Tanks

opened fire and, in the ensuing battle, many paintings were pierced with bullets and scores of statues were decapitated or damaged in other ways.

The 101st Airborne Division also found evidence of looting. However, the commanding officer of the G-5 section of the 101st Airborne Division took very seriously the responsibility of guarding the collections. Before the arrival of the Monuments, Fine Arts, and Archives officers, he had gathered everything together and placed it in a near-by inn, where I had an opportunity to examine the collection just before its removal to Munich. The collection is very uneven and the damage considerable, but the most important works of art from the Rothschild Collection and other collections are, by good fortune, relatively intact.

The best paintings and sculpture from Alt Aussee and the entire Goering Collection from Berchtesgaden have been taken to Munich to several of the largest government buildings which escaped damage.

Here a group of 90 German laborers, packers, curators, and librarians, with some 190 American guards, under the direction of Monuments, Fine Arts, and Archives officers, are preparing the material for restoration.

In all cases where restoration of an emergency nature is absolutely necessary for preservation, German restorers, supervised by American experts, are available for first aid.

Only such essential first aid as removing mold, if it exists, or pasting on paper to hold flaking paint will be given, however; the Monuments, Fine Arts, and Archives officers



Two Swords of Frederick the Great Are Found in a Salt Mine

Two thousand feet underground, near Bernterode, the Germans hid the coffins of Frederick the Great and Field Marshal Paul von Hindenburg, the Hohenzollern crown jewels, and other treasures. Behind the swords is a painting from a Potsdam museum. Concealed by a concrete wall, the deposit might have gone undiscovered, had it not been for the alertness of a GI zapper (page 49).

will concentrate their efforts on the identification and cataloguing of the collections.

This has been facilitated by the discovery of the Rosenberg inventory and other German documents and by the capture of the principal advisers to Goering, who are available for consultation.

Plans for Return of Treasures

When the loot has been inspected and identified, the United States will return it to the country from which the Nazis removed it. The question of individual ownership does not concern our Government, but will be the responsibility of each individual nation.



John Walker

Had These Bombs Gone Off, Many of Europe's Greatest Treasures Would Have Been Lost

American soldiers and salt miners gather around a wooden crate marked "Care—Marble—Don't Upset," which contained the bombs to blow up the mine at Alt Aussee, in Austria. Buried in tunnels and chambers were thousands of paintings and sculptures, mountains of furniture, acres of tapestries—loot of the occupied countries. Fearful that the mine would be destroyed, local miners removed the charges before they could be set off (page 50).

How long will it take to repatriate these looted treasures? Unfortunately I cannot say, for the immensity of the job makes any prediction impossible. All I can state is that we have a number of our best museum men assigned to the complicated task of assembling and inventorying this huge collection, larger, I should judge, than all the collections of the Louvre. They are working as rapidly as careful handling will permit. They are just as eager to get the job finished and to return to their museums as the United Nations are to recover their property.

So much progress has already been made, however, that I believe the time is not far off when this vast pile of loot, varying from the greatest masterpieces to the commonest household furnishings, will have been sorted out and returned to the countries from which it was taken.

Then, to our great relief, the United States' involuntary custodianship of this property will be at an end, and our Monuments, Fine Arts, and Archives officers can at last return to this country and their own professional work.

Notice of change of address for your NATIONAL GEOGRAPHIC MAGAZINE should be received in the offices of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your March number, The Society should be notified of your new address not later than February first. Be sure to include your new postal zone number.

Indians of the Southeastern United States

By MATTHEW W. STIRLING

Chief of the Bureau of American Ethnology, Smithsonian Institution

BEGINNING with the first voyage of Ponce de León to Florida in 1513, historical and descriptive material on the Indians of the Southeast is continuous and more abundant for the 16th century than for any other portion of the United States.*

Colorful accounts of the early Spanish, French, and English explorers reveal rich details of the customs and manner of life of the native inhabitants.

By comparing the accounts of successive explorers, we can trace tribal movements, population trends, and changes in custom under the rule of the Spanish, the French, and the English. The Indian removal ordered by the United States in the first half of the 19th century brought an end to the real aboriginal life of the area.

Gold drew most of the Spanish adventurers, but among them were some slavers, who found it easy to decoy the trusting natives on their ships and then sail off with them. Thus the Indians themselves were converted to gold.

The American Indian made a poor slave. He languished quickly and often died in captivity, but the trade was not stopped until after the West Indies were nearly depleted of their native inhabitants. It seems certain that some of these slavers visited the Florida coast soon after Columbus reached the West Indies and well before the first recorded visit, which was that of Ponce de León.

Maps of the Florida peninsula were published in Europe before this date, and more convincing evidence is the way in which the Florida Indians received all Spanish ships that made early voyages to the peninsula.

Without preliminary palaver, the natives fell upon them so fiercely that no permanent landings could be made for many years. Such conduct would have been unlikely on the part of Indians at their first meeting with whites.

Calusa Were Fierce Fighters

The Indians encountered by Ponce de León and Hernández de Córdoba in these early voyages were the Calusa, who occupied the southern part of the Florida peninsula and therefore were the first Southeastern Indians to meet the Europeans.

Of powerful physique, the warlike Calusa were the fiercest fighters in the New World. They drove back all European attempts to enter their country until their numbers were greatly reduced by the introduction of Euro-

pean epidemic diseases. Before the end of the 18th century they had virtually ceased to exist as a tribe. The few remaining individuals were absorbed among the Seminole when the latter arrived.

In the Southeast, history merges into prehistory as interpreted by archeological research; a clear understanding of the area requires consideration of history and prehistory as a continuous unit.

The area designated as the Southeast extends south from Chesapeake Bay and a line across to the Ohio River and westward to the Mississippi River. Louisiana and parts of eastern Texas, Arkansas, and Oklahoma also are included.

Most important and most typical linguistic stock of the Southeast was the Muskogean. It spread over most of Georgia, Alabama, and Mississippi. In the north it extended across western Tennessee and the western corner of Kentucky. In the south it included eastern Louisiana and the Florida panhandle.

The two great stocks of Florida—Timucuan, comprising the northern half of the Florida peninsula, and the Calusan, spoken in the southern half—were related to Muskogean.

The Creek Confederacy

Typical Muskogean-speaking peoples were the tribes comprising the great Creek confederacy, which occupied the territory now constituting Georgia and Alabama; the Choctaw who lived in central and southern Mississippi (Plate VIII); the Chickasaw of northern Mississippi; and the Hitchiti of western Georgia. The later Seminole, who were primarily an offshoot of the Creeks and Hitchiti, were also a Muskogean people (page 54).

The Caddoan stock was found in northeastern Texas, southern Oklahoma, southwestern Arkansas, and western Louisiana.

When they first became known to Europeans they consisted of about 25 tribes, comprising three or more confederated unions besides several smaller independent units. While their culture in some respects belongs to that of the

* This is the fifth in a series of authoritative articles by Dr. Stirling on the American Indian, illustrated with W. Langdon Kihn's paintings, which are the result of careful study and extensive research. See, in the NATIONAL GEOGRAPHIC MAGAZINE, "America's First Settlers, the Indians," November, 1937; "Indian Tribes of Pueblo Land," November, 1940; "Indians of Our Western Plains," July, 1944; and "Indians of Our North Pacific Coast," January, 1945.

southern Plains, they must be considered in the main a typical Southeastern group.

The Pawnee of Nebraska and the Arikara of the Dakotas, both of which adopted typical Plains culture, are offshoots of the Caddo.

The Iroquoian language was represented in the Southeast principally by the important Cherokee tribe, which inhabited the southern Appalachians from northern Georgia and Alabama to West Virginia, and by the Tuscarora confederation of North Carolina.

The far-flung Siouan stock has a curious distribution. It was spoken by the Biloxi, a small tribe on the Gulf coast of Mississippi, and by a number of eastern tribes, such as the Cheraw and the Catawba of the Carolinas and several small tribes in central Virginia.

Similarly, offshoots of the great Algonquian stock were found in Kentucky, northern Tennessee, and southern Ohio. The Powhatan confederacy of Tidewater Virginia consisted of Algonquian-speaking tribes.

The Yuchi of the upper Savannah River are a small tribe who spoke a language unrelated to any other.

Along the lower Mississippi the Attacapan, Chitimachan, Tunican, and Natchesan have been set apart as small independent groups. Their linguistic diversity illustrates the multiple origin of the people inhabiting the Southeast.

Population Shifted among Indians, Too

In no section of the United States is it more difficult to deal with tribes geographically than in the Southeast, where continual and extensive shifts in population were taking place. Tribes amalgamated, split apart, or were exterminated. Others engaged in continuous and widespread wanderings.

The Shawnee, for example, when first encountered were living in South Carolina. Some time later they were settled in Tennessee, still later in Pennsylvania, and then in Ohio. From here they crossed the Mississippi and established themselves in Missouri, while another part of the tribe went to Indiana.

By 1825 the Missouri Shawnee moved to a reservation in Kansas, but before this the majority of them had gone to the headwaters of the Sabine River in Texas, where they remained until driven out in 1839.

The Kansas Shawnee eventually settled on the Canadian River in Oklahoma. In 1869 the main body of the Shawnee in Oklahoma incorporated with the Cherokee Nation.

This highly simplified account of the wanderings of the Shawnee, which in less extensive form is duplicated by the Yuchi and other tribes, shows why map makers get

gray hairs when they try to locate Southeastern tribes.

The Seminole tribe (Plate III and page 55) did not exist before 1775, but about this date refugee Creeks, Hitchiti, and Yuchi from Alabama and Georgia were joined by a number of runaway Negro slaves.

About the beginning of the 19th century they moved into Florida and began rapidly to overrun the peninsula, occupying the former territory of the important and populous Timucua and Calusa tribes, which had become exterminated largely by diseases.

The entire period of the Seminole migration into Florida was marked by a series of wars with United States troops, who pursued them relentlessly. The fighting culminated in the so-called Second Seminole War, when the majority of the group resisted the efforts of the Government to remove them to Oklahoma.

This war began in 1835 under the leadership of the celebrated Osceola and lasted for nearly eight years, ending in 1842.

That war cost the Government \$20,000,000 and the lives of 1,500 soldiers, but it resulted in all but a few of the Seminole being removed west of the Mississippi. In this war Maj. Francis L. Dade's command of 100 men was defeated by the Seminole. Only one man escaped with his life.

A few Seminole evaded removal by fleeing into the swamps. Today their colorful descendants live in the Everglades,* only remaining Southeastern group retaining a considerable portion of their aboriginal culture.

Seaboard Tribes Had Home Gardens

Tribes of the southern Atlantic seaboard were agriculturists. Each household had its garden plot a hundred square feet or more. To weed and cultivate these gardens they used wooden hoes and planting sticks. They made clearings in the native forest by girdling the larger trees and felling the smaller ones with stone axes. Corn was the principal crop. Four varieties were planted.

They also raised pumpkins, beans, squash, sunflower seeds, tobacco, and gourds from which many utensils were fashioned. Wild fruits, roots, and berries were eaten.

This vegetable diet was supplemented by wild game and fish. Capt. John Smith states that during March and April the Indians lived principally on wild turkeys, fish, and squirrels. In May and June, the planting period, they fed on fish, acorns, and walnuts; or scattered in small groups, gathering fish, game,

* See "South Florida's Amazing Everglades," by John O'Reilly, NATIONAL GEOGRAPHIC MAGAZINE, January, 1940.



Staff Photographer Luis Morden

Seminole of the Florida Everglades Bedeck Themselves Bright as Jungle Parrots

In making a dress, or a shirt for her husband, the woman joins together with her sewing machine cotton strips of many colors. Diamond and geometrical designs are popular; curves are seldom used. The woman's hair-do, often with hair net, is an imitation of the pompadour, popular in the nineties (page 54). Such complicated designs as these are an innovation of the present century.

crabs, oysters, land tortoises, and wild fruits (62). From June through August their diet consisted mainly of fish, berries, green corn, and roots of the tuckahoe, or Indian bread.

In the fall they subsisted lavishly on products of their gardens; later they went on small expeditions toward the mountains, hunting deer, bear, and other large game.

During the winter months their food consisted of stored agricultural products, such as corn and beans, nuts and acorns, and dried fruits and berries, while some hunting and fishing continued. Such subsistence was fairly representative of the Southeast as a whole.

Typical of the Algonquian tribal groups of the south-central Atlantic seaboard was the so-called Powhatan confederacy of Virginia. Extending from the shores of Chesapeake Bay to the fall line of the Appalachian rivers, these Indians were at the peak of their power when Smith and his followers first entered Chesapeake Bay.

The Fate of Two Confederacies

The Iroquois confederacy began in the North at about the same period. However, the Iroquois tribe banded together amicably through mutual consent, whereas the Pow-



Bureau of American Ethnology

Fringes and Feathers: A Pamunkey Fashion Note Early in This Century

Dance costumes of these Pamunkey Indians in 1899 bear little resemblance to the clothing of their ancestors. In early days the women wore simple buckskin aprons and the men breechcloths. Buckskin robes were added in winter. Bodies were elaborately tattooed and painted. At the time of Jamestown, Pamunkeys were the main tribe of the Powhatan confederacy (page 55). Their principal town, near West Point, Virginia, was destroyed by the English in 1625. Now they number less than 100, but still retain vestiges of tribal organization. They have entirely lost their language.

hatan confederacy was based on conquest and personal despotism. As a result, the Iroquois confederacy has continued to modern times, while the Virginia confederacy collapsed soon after the death of Powhatan.

An incident observed by the English in 1608 illustrates his technique. When the Piankatank tribe defied his authority, Powhatan made a surprise night attack. All but a few of the Piankatank men were killed, and all the women were carried away as captives.

Shortly before this, he had invaded the territory of the Kecoughtan when they were disorganized by the death of their leader. He killed all who resisted and forced the rest to go with him and resettle Piankatank in his own territory.

Fired by a prophecy of one of his medicine men, Powhatan made a surprise attack, com-

pletely exterminated the Chesapeake tribe, and repopulated their territory with his own people. He placed his sons and brothers as chiefs in the key towns.

His was an unusual procedure for Indians north of Mexico, where tribal custom and common needs were generally the ruling factors in government. The native name for the Virginia confederacy had the same meaning as that of the Iroquois, "Long House."

The English Come to Jamestown

With the arrival of the English colonists at Jamestown in 1607, Powhatan began to receive a bitter dose of his own medicine.

The Indians of the Chesapeake Bay region had already experienced almost a century of contact with Europeans.

With the establishment of the Jamestown

colony, the doom of the Indians of the region was sealed. By force of their superior arms and threats of burning the native towns, the colonists seized from the Indians most of their winter supply of corn, thus reducing them almost to a state of starvation.

By shrewdly working on Powhatan's one soft spot, his affection for his favorite daughter, Pocahontas, open warfare with the Indians was deferred for some years. In 1622, four years after the death of Powhatan, Opechancanough, his brother, led the Indians in an organized attack against the now scattered colonists and within a few hours killed 347 men, women, and children.

When this news reached England, orders were given the governor to exterminate the Indians, men and women, except for the "preservation of the younger people of both sexes whose bodies may by labor and service become profitable." A "great and singular reward" was offered for the capture of Opechancanough. He escaped, but the Indians were so reduced that it was 22 years before the aged leader was able to organize another attack. In this latter assault even more English were killed than in 1622.

Retaliation followed, and the Assembly of the colony reported in 1646 that the Indians were "so routed and dispersed that they are no longer a nation, and we now suffer only from robbery by a few starved outlaws."

Today the descendants of the once-feared Powhatan confederacy consist of a handful of mixed-blood Indians, some of whom still carry on vestiges of their tribal organization.

Pocahontas the "Playful"

Pocahontas alone among whites and Indians appears to have been able to influence her warlike father. As a girl of 12, she persuaded Powhatan to spare the life of Capt. John Smith when he was held captive by the Indians in 1608 (page 58).

This episode has been questioned by some writers. The only reason for such skepticism appears to be that Smith did not mention it in his writings until some years later.

The affair seems in keeping with what we know of the character of both Pocahontas and her father. Her real name was Matoaka. This, as well as her nickname, Pocahontas, carries the meaning of "playful," referring to her gaiety when a child, a trait which made her a favorite with the English (Plate I).

Among the Indians of the Powhatan confederacy, as with many other Indian tribes, the real name of an individual was known only to a few intimate relatives or associates. Knowledge of the name was believed to give

the holder control over the life and welfare of the person to whom it belonged.

The real name of Powhatan was Wahunsonacock, but he was called Powhatan after the name of his favorite dwelling place, located where Richmond, Virginia, now stands.

In 1613, the English colonists, knowing the affection Powhatan had for Pocahontas, decoyed her aboard a ship and held her as a hostage to prevent Powhatan from warring against them. During her captivity she was converted to Christianity, met and married John Rolfe, "an honest Gentleman, and of good behaviour." As a result of this marriage the belligerent Powhatan kept peace with the colonists until his death.

A Royal Gift for Powhatan

To create more appreciation in England, the officers of the Jamestown colony perhaps laid somewhat too much stress on Powhatan's regal qualities. The colonists were slightly surprised to receive from the home government a royal gift for the old reprobate, consisting of a crown, a scarlet cape, an elaborate bedroom set, a pitcher, basin, and other costly items, with orders to present them to Powhatan and to hold a coronation.

The chronicler dryly remarked: "They had bin much better well spared, then so ill spent: for wee had his favour much better onlie for a poore peece of Copper."

When Powhatan received word that the English king had sent him a fine present, he considered it a trap, and replied that if the English wished to make him a present they would have to bring it to him. This was not a simple undertaking, since Powhatan was on a hunting trip almost a hundred miles away by canoe and wilderness trail.

But the English had their orders and, after a long and toilsome journey, they reached the forest camp of Powhatan with their cumbersome gift. Powhatan was suspicious and badly frightened, but the huge bed was hauled up on the bank of the stream, the basin and pitcher set beside it, and he was persuaded to accept the scarlet cloak.

The coronation was to be the most important part of the ceremony, "but a fowle trouble there was to make him kneele to receive his crowne. He, neither knowing the majestie nor meaning of a Crowne, nor bending of the knee, indured so many perswasions, examples, and instructions, as tired them all."

The exasperated English finally solved the problem by strategy. Two stout soldiers grasped the trembling victim one by each shoulder; then at a signal they bore down heavily, at the same time pressing him behind



Illustration of American Ethnology

Pocahontas Saves Capt. John Smith from Death at the Hands of Her Father's Braves

This drawing, by an unknown artist, of the Jamestown colonist's narrow escape first appeared in *The Generall Historie of Virginia, New England, and the Summer Isles*, published by Smith in 1624. By his own account, Smith was captured by Indians in 1608 on an exploring trip up the James River and taken before King Powhatan, who condemned him to death. His head was resting upon a stone, with the executioners' clubs about to descend, when Pocahontas, Powhatan's favorite daughter, intervened by placing her head upon Smith's. Powhatan then relented and, five days later, formally adopted Smith into the tribe (page 57).

the knees so that he was suddenly forced to kneel. Three others pushed the crown onto his head. This was the signal for the ceremonial firing of a volley of shot, at which the terrified "king" leaped to his feet and attempted to flee, as he was sure, for his life.

He was restrained, however, and when convinced he was to be subjected to no further compulsions, gave to Captain New-

port his old moccasins and mantle (page 61).

This mantle still is in the Ashmolean Museum in Oxford, England, but there is no record of what happened to the luxurious bedroom suite left under the Virginia trees.

A custom of the Southeastern Indians which impressed many early travelers was the ceremonial use of the "black drink." This was a sort of strong tea made by boiling the leaves

of the vine *Ilex cassine* in water. It was used for ceremonial purification.

The Creeks explained that they drank it before council meetings to "invigorate the mind and body and prepare for thought and debate." A strong brew of this drink is both purgative and emetic and, containing caffeine, also is a stimulant.

Leaves and shoots of the plant were dried and roasted, then stored in baskets. Thus prepared, they were an important article of trade among Southeastern tribes. The Creeks made three different brews of varying strength for special purposes. The name of Osceola, famous Seminole leader, means "Black Drink Singer."

In practically all important ceremonies held in the Southeast, the use of the black drink was an essential feature.

The Green Corn Ceremony

A typical ceremony was the busk, or green corn, ceremony of the Creeks, a New Year's celebration. The new year was conceived as beginning in July or August, with the ripening of the first crops, particularly maize. This celebration lasted for eight days in the large centers and four days in the smaller towns. The sacred number four had a prominent place in the rituals; practically everything was done in fours or multiples of four.

The ceremony centered in the square ground or plaza. It was punctuated by dances in which both men and women participated. Singing, the drinking of emetics, and the sacred black drink were important features.

In the ritual the new fire was lighted by friction by a specially appointed fire maker. The four logs for the sacred fire were laid crosswise according to the cardinal directions. All other fires were extinguished and the hearths swept clean. Then new fires were laid and ignited from the sacred fire.

In preparation for the busk, the inhabitants provided themselves with new pottery vessels, new clothing, and other household equipment. Houses were swept and sprinkled with clean sand, and the whole town, particularly the public squares, put in order. Last year's remaining corn and food supplies, all old clothing, and other worn-out equipment were placed in a pile and burned. Old pottery utensils were broken and cast away.

This material renovation was symbolic of the real purpose of the ceremony, which was to provide a moral and spiritual renovation—a new life which was to begin the New Year spotlessly pure.

This concept is reminiscent of ancient Mexico and was probably one trait of the Temple

Mound cult which spread so widely through the Southeast (page 64).

Like all Indians, the natives of the Southeast were fond of games and athletic sports. Some games were social; others had religious significance. Lacrosse was popular, two towns usually playing against each other after the fashion of our modern ball games. The players might number from eight to ten on a side to several hundreds, and heavy wagering accompanied the contest. The play was rough; broken bones were frequent. Unlike their northern neighbors, the southern tribes used two sticks or rackets instead of one.

There is indication that this game originated in the Southeast, from whence it spread into the Plains and up the Atlantic coast to Canada in prehistoric times.

Another popular game was *chunkey*, played on a leveled court or plaza adjoining the ceremonial center. A stone disk about six inches in diameter was rolled along the level court and then a pole with a crook at one end was slid after it. The player attempted to guide the pole so that the disk would come to rest within the crook.

Other versions of this game, played with a pole and a wooden hoop instead of a stone disk, were widespread throughout North America. Beautifully worked *chunkey* stones typical of the Temple Mound period frequently are found in archeological sites.

Games of pure mental skill, such as our chess, checkers, and playing cards were unknown to the pre-Columbian Indians, but games of chance and guesswork were common. Wagers were placed on games similar to dice, played with marked sticks or pebbles.

History of the Mound Builders

The Southeast area is the home of the Mound Builders, long the subject of romantic, speculative writings which pictured them variously as ancient, non-Indian, and highly civilized. Who were these mysterious builders of great earthworks which our own ancestors found buried in the forests from the Great Lakes to the Gulf of Mexico?

In recent years historians and archeologists have done much to dissolve the mystery that has enveloped these structures (Plates IV, V).

Many of the largest and most impressive mounds were built after the voyages of Columbus. Most of the tribes seen by De Soto were Mound Builders, and the mound-building cultures were at their most colorful peak in his time or shortly thereafter.

It is not clear when the first human inhabitants reached the Southeastern Woodlands area. In various localities throughout this



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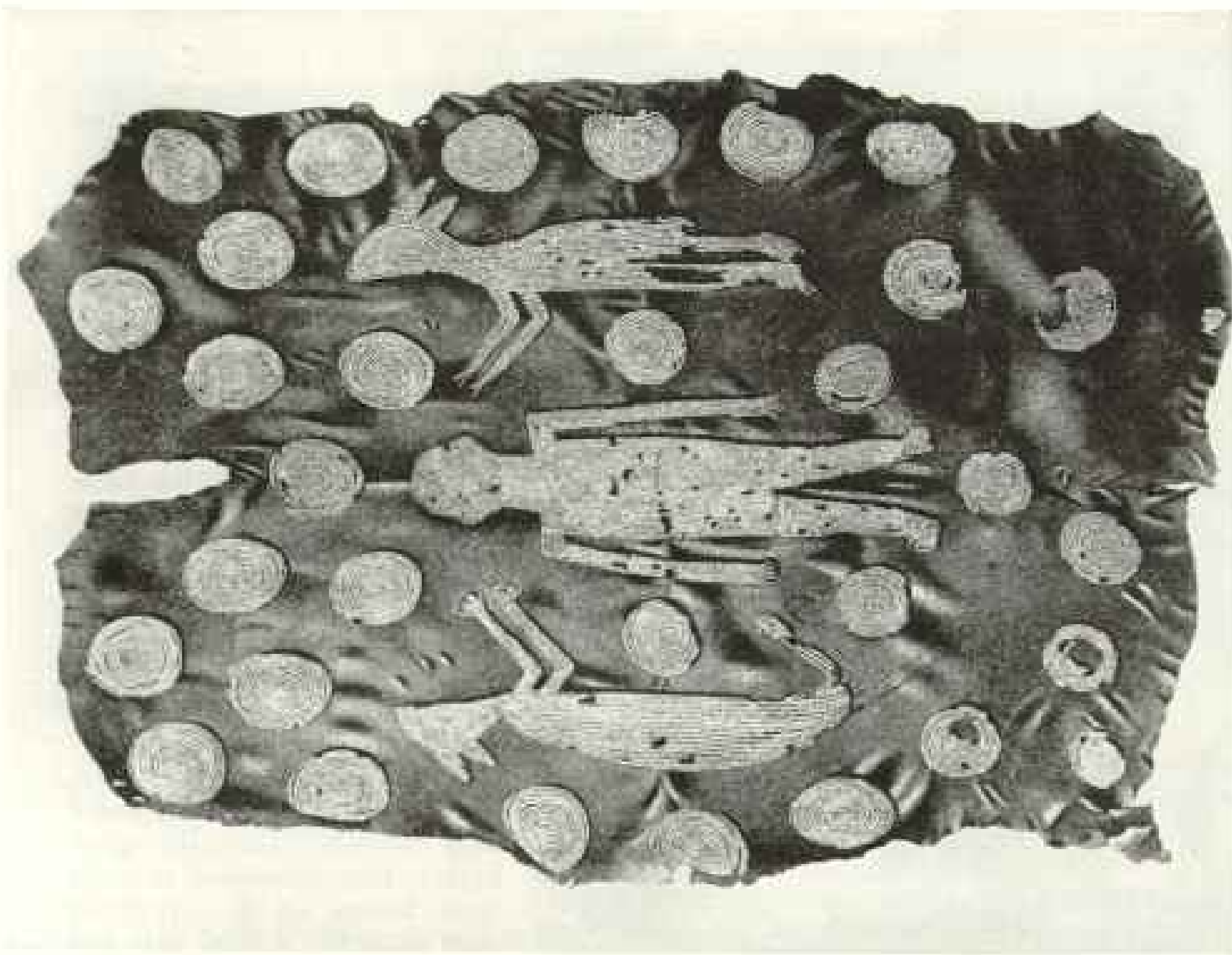
Mississippians and Animals Take Refuge on Indian Mounds When Old Man River Overflows Its Banks

Airplanes dropped food and supplies to refugees on isolated islands. Mounds of this type near Greenville, Mississippi, were built as burial places for the more important dead and as substructures for temples of worship (page 59). To the Indians their use as refuges from floods was incidental.



California's Forest Giants Bear a Cherokee Educator's Name

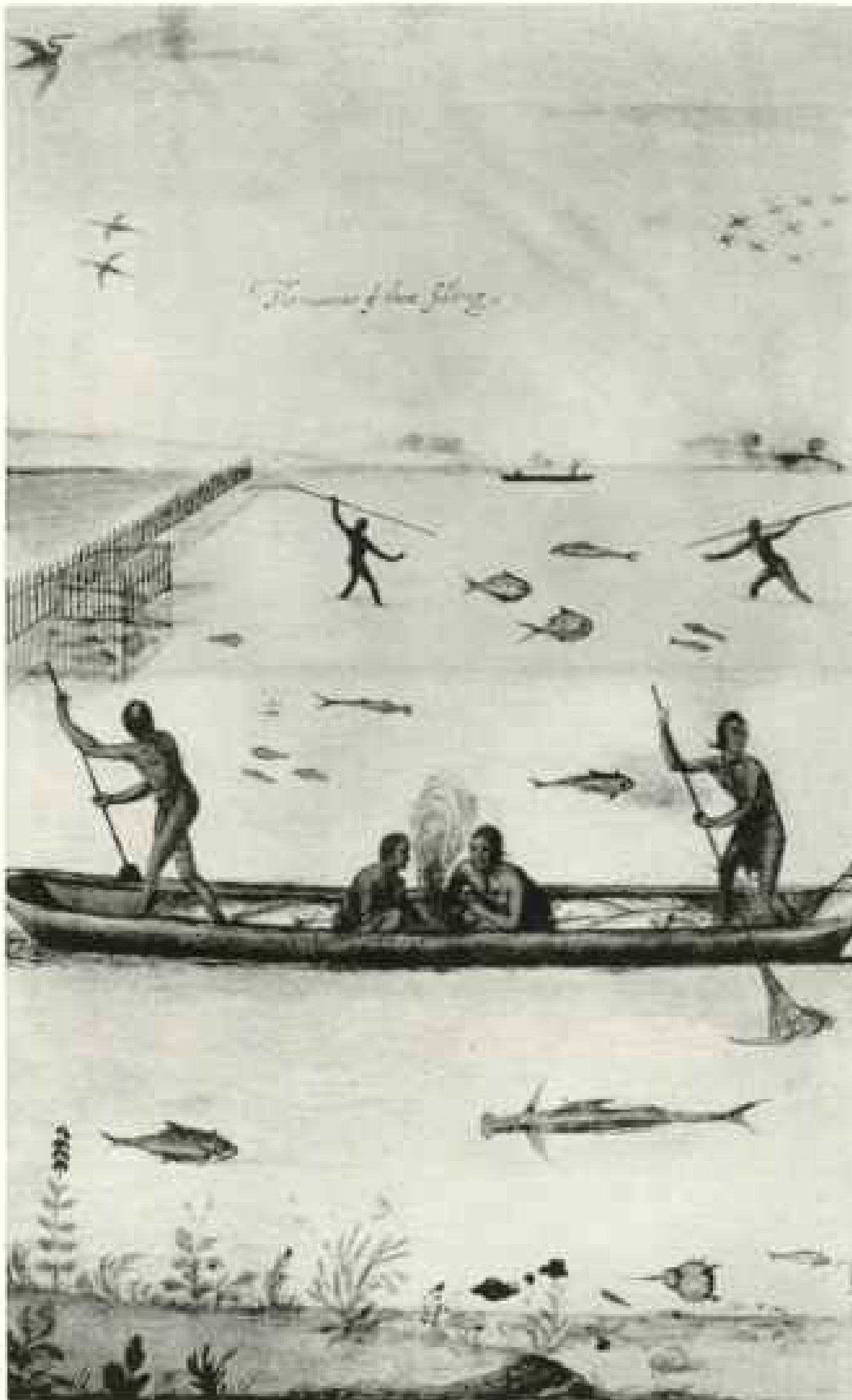
Sequoyah, for whom the genus was named, reduced his tribe's language to 78 characters, the only syllabary ever invented by a North American Indian. Son of a white man and a mixed-blood Cherokee mother, he grew up as an Indian. Sketch was made in Washington, D. C., in 1828 by Charles Bird King.



Bureau of American Ethnology

Sea Shells Adorn the Relic of an Indian "Emperor's" Reign

Powhatan's buckskin mantle, now in the Ashmolean Museum at Oxford, was given to Capt. Christopher Newport, of the Jamestown colony, when the Virginia chief was crowned by the English in 1608 (page 57). Small disks of shell, similar to those on the mantle, were used as currency.



Folger Shakespeare Library

Early Fishermen Took Their Fire Along

On a visit to the Raleigh colony in 1585, John White drew this picture, one of a famous series. The Indian in the stern of the canoe is using a dip net, and in the background two more are spearing fish. At left is a weir, an arrangement of stakes for trapping fish. Seines, bone hooks, and lines, and bows and arrows also were used. To save kindling a new fire, coals were kept alive in the canoe. Dug-outs were typical of the area; bark canoes did not extend as far south as Chesapeake Bay.

region, but particularly along the eastern foothills of the Appalachians and in the Ohio Valley, is found a peculiar type of fluted projectile point similar to those in the high Plains area, where they occur in frequent association with the remains of now extinct animals such as the mammoth, camel, and giant bison. No such association has as yet been discovered in the East, but archeologists gen-

erally agree that the makers of these points were probably related to the early western hunters.

Mounds Were "City Dumps"

The first residents of which the archeologist has definite evidence were a long-headed hunting, fishing, and gathering people who lived along the rivers and seacoast at places where shellfish were available.

During this period, the Eastern Archaic, the population was sparse and villages were widely scattered. Instead of disposing of their garbage, these people let it accumulate where they lived, so that their dwelling place and the "city dump" were one and the same.

As the pile of refuse—shells, house sweepings, and discarded and broken utensils—grew higher, they continued to build their houses on it. At those sites situated on tidal flats and on the low banks of rivers, this increased elevation was advantageous to the village dwellers.

As individuals died they were buried in this same refuse pile, sometimes accompanied by offerings to help the departed in his activities in the hereafter. The burials usually were made by flexing the body tightly, drawing the knees up to the chin, and placing it on its side in a shallow circular pit.

From these objects and from others lost or discarded in the rubbish, archeologists deduce many facts concerning these early people. We think that they did not practice agriculture, but depended upon wild plants for fruits and vegetable foods. They hunted wild game—the same found in these

forests today—not with bow and arrow but with javelins propelled by the spear thrower.

The spear thrower consisted of a grooved wooden rod about two feet long with a hand grip and finger holes at one end and a hook or spur at the other for engaging the butt of the javelin or spear. This device had the mechanical effect of lengthening the arm and increasing the power of the throw.

The beautifully carved and polished stones commonly called "banner stones" and "boat stones," the use of which was for many years an archeological mystery, are now known to have been counterweights attached to these spear throwers to increase their efficiency.

Points for the javelins were made either from bone, antler, or crudely flaked triangular stone points with stems. Nets were employed in fishing, as evidenced by the finding of notched pebbles used as net sinkers. Fish-hooks made of bone were also used.

A Form of Fireless Cooking

Throughout most of the Archaic they did not know how to make pottery, but fire-cracked stones and clay balls in the Archaic sites indicate that they cooked by boiling water in basketry or bark containers by adding such heated objects to the water.

Spoons were made from mussel shells, and larger shells served as bowls and dishes. Wooden bowls and containers were carved and probably often decorated. Awls for leather-working were made from leg bones of deer and other animals, and we may assume that clothing was made from the skins of animals. These were fastened with long bone pins. Grooved stone axes felled trees and split wood.

The Southeastern Indian of the Archaic did not neglect his personal appearance. Red paint for rouge and body painting is frequently found in graves, as are necklaces made from animal teeth and tubular shell beads.

Simple flat stones in place of mortars were used for grinding. This period undoubtedly began before the Christian Era and lasted until approximately the year 700. Shortly before this latter date, the art of pottery making was introduced to the Southeast.

The first vessels were crude and of simple bowl form with rounded bottoms. They were made of clay or muck mixed with Spanish moss and were undecorated. When they were fired, the vegetable material burned out, leaving the ware porous.

Some crude sand-tempered ware also was made at this time, and a little later simple fingernail indentations and straight lines were used for decoration. Towards the end of the Archaic, more elaborate forms appeared in the westerly part of the area, but for most of its duration the Archaic was without ceramics.

Shortly after the introduction of this simple pottery the second major period of Southeastern prehistory begins. Archeologists call this the Burial Mound period. At this time, about the year 700, a new set of ideas came into the lower Mississippi Valley and spread rapidly to the north and east.

These new traits centered about an elaborate cult of the dead, apparently introduced by a people who came into the region from the west. They did not displace the Archaic peoples whom they found already living in the Southeast, but rather merged with them. Their arrival, however, brought about profound changes in the general manner of life.

The most conspicuous features of this new cult were the conical burial mounds. The materials found in them give much evidence of the new traits which were introduced. The bodies in these mounds were usually secondary burials—that is, the bones were first stripped of their flesh, the skeletons disarticulated, and the bones placed in bundles. A few burials of the old flexed type were still made in the flesh, and cremation was practiced.

Sometimes these mounds covered the burial of an important personage who was placed in a pit under the center of the mound. Pottery was not usually included among the burial offerings, but most objects placed in the mound for the dead were "killed" by breaking them so that the "spirit" of the vessel would be released to accompany the owner.

Early Use of Tobacco

Tubular smoking pipes show that the use of tobacco had begun. The grooved ax was replaced by the polished stone celt. Quartz crystals were often placed with burials and round shell breast ornaments came into use.

These burial-mound sites are found in lands suitable for farming, unlike the Archaic sites whose location was determined by the existence of abundant shellfish. This suggests that agriculture had been introduced, probably with corn as the principal crop. In some areas the practice of artificially deforming the skull in infancy is found at this early date.

The use of copper for tools and ornaments spread into the Southeast from the Lake Superior region, where native copper occurred abundantly. Simple bracelets, circular ear spools, finger rings, and massive celts were typical of the early copper culture. As the period advanced, very large burial mounds were built in important centers. Typical were the famous Grave Creek Mound of West Virginia and the Adena Mound of Ohio.

Log tombs containing the extended burials of important persons were covered by these mounds. In some instances, as in northern Kentucky, several such tombs may be found in a single large mound. Sometimes the central tomb is made of stones and throughout the mound are scattered stone slab-lined graves, each containing one or more individuals.

As time went on, the civilization of these Mound Builders became more advanced, culminating in the so-called Hopewell period, which reached its highest development in the Ohio Valley (Plate VI). The increase of food supplies brought about by the introduction of agriculture permitted a corresponding increase in population and more leisure for activities other than food getting.

Great ceremonial centers were built with huge rectangular and circular enclosures surrounded by earthen embankments, which in turn were surmounted with palisades.

In and around them were constructed the burial mounds, which must have been the scenes of some of the most dramatic and colorful ceremonies ever staged on the continent. Effigy mounds were in the form of birds, animals, and serpents.

At the height of the Burial Mound period, extensive trading was carried on to obtain ritualistic materials. In a single site in the Ohio Valley might be found obsidian from the Rocky Mountains, marine shells from the Gulf of Mexico, galena from Missouri, and mica from North Carolina.

Work in the arts reached a new high for the continental area north of Mexico. Exquisitely carved and polished stone tobacco pipes were often in realistic animal forms. The tubular pipe of Archaic times was replaced by the "monitor" style and by the simple elbow form.

Work in cold-hammered copper was developed in the making of headdresses and ornaments cut out from sheet copper. Pearls from fresh-water mussels were lavishly used.

The Burial Mound period finally terminated about the end of the 15th century, or, more properly speaking, merged into a new culture which in large part replaced it.

Archers Displace Spear Throwers

About the beginning of the 15th century there was a striking increase of round-headed people, who deformed their skulls, entering the lower Mississippi Valley from the southwest. The spear thrower was still in use, but the bow and arrow began rapidly to displace it as a weapon. Pottery with a much greater variety in form and decoration was made in larger quantity than in the preceding periods.

Early European explorers repeatedly commented on the excellence of this ware, an appraisal confirmed by more recent archeological excavations.

The most notable feature of this new period, however, was the building of square platform-shaped mounds around a rectangular court, usually with the two principal mounds of the group placed one at each end of the court.

Oblong or round temples with wooden frames covered with mats or thatch were erected on the flat tops of the mounds.

Within the temple was a clay-lined fire basin. These temples were evidently connected with a sun cult, and the basins were to hold the perpetual fire by which the groups maintained contact with their sun-god.

As in Mexico, these temples were destroyed at intervals and the mounds enlarged, new temples being built after each reconstruction. Mounds excavated reveal as many as a dozen stages of construction. Because of this feature, the final epoch of aboriginal occupancy has been called the Temple Mound period.

Important typical sites are Cahokia in southern Illinois, a group which contains the largest mound in the United States; Etowah in Georgia; and Moundville in Alabama.

When De Soto passed through Georgia and Alabama in 1540-1542, it is possible that the mounds at Etowah and Moundville had not yet been built.

During the Temple Mound period there was still much preoccupation with the disposal of the dead. In many sites large clay-lined cremation pits were constructed in the plaza. In others, bones were picked clean or the bodies exposed for periods on a scaffold in charnel houses, and later mass interment of the bones was made in shallow pits without accompanying offerings. New basic religious ideas had entered the Southeast with features which produced the visible aspects of the Temple Mound period. Probably these ideas revolved around an intensification of sun worship.

These mound groups did not mark the sites of cities or even of villages. They were constructed by the combined efforts of the tribal group and constituted the ceremonial centers for widely scattered agricultural communities. Ordinarily the only occupants were the priests and attendants with their families. Only during ceremonial periods did the people congregate there in large numbers.

The ritualistic equipment of the latter part of the Temple Mound period, as shown in the art work of the Indians themselves and from specimens found in archeological excavations, was the most elaborate of the entire mound-building era. Sheet-copper ornaments were decorated with engraving and in repoussé or in cutout silhouette patterns.

In Florida similar ornaments were made from gold and silver from wrecked Spanish ships. Shell gorgets were engraved with elaborately costumed dancing or fighting figures, or with rattlesnakes or fighting turkey cocks. Beautifully carved stone batons and monolithic axes and large stone tobacco pipes in the

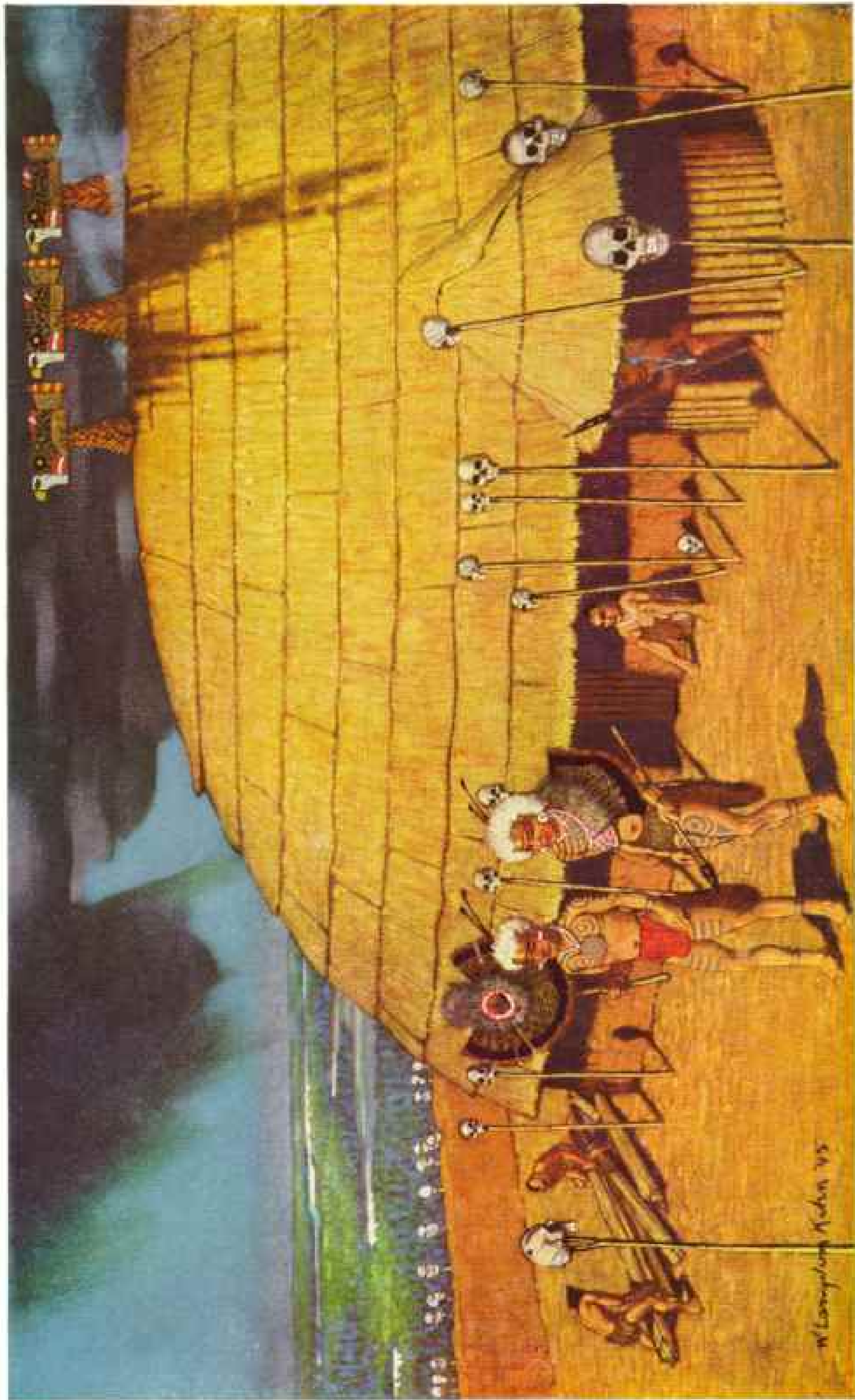
First Families of Southeastern America



© National Geographic Society

Painted by W. Langdon Kilg

Pocahontas, Powhatan's "Dearest Jewel and Daughter," Proudly Wears a Turkey-feather Robe
With features from a portrait of 1616, this likeness shows the Indian princess before she "renounced idolatry."



© National Geographic Society

Past Battle Trophies Mounted on Poles, Priests of the Taensa Leave Their Temple

Painting by W. Langford Kuhn

This tribe of the lower Mississippi Valley was ruled by a despotic "representative of the sun on earth." A perpetual fire, tended and guarded by four older men, was kept burning within the temple in the god's honor. The figures atop the temple are stylized eagles, which face the rising sun. This temple was the repository of the bones of departed chiefs, which were kept in baskets. La Salle visited this tribe in 1682 and found Spanish arms among them, obtained from some early Spanish expedition.



© National Geographic Society

The Dugout Canoe of a Seminole Family Silently Glides Through the Placid Waters of Florida's Everglades

The name Seminole, a Creek word meaning "runaway" or "separatist," was first used about 1775. Later the Seminole migrated from Georgia and Alabama to Florida. Occasional Seminole raids into Georgia, plus the tribe's harboring of runaway slaves, caused Andrew Jackson to invade Spanish Florida in 1818; it was annexed a year later. Attempts to remove the Seminole to the West in 1832 precipitated a war which lasted nearly eight years and cost the United States 1,500 lives and \$20,000,000. Although seven American generals failed to conquer the Seminole completely, the majority were rounded up and sent to Oklahoma.

Painting by W. Langdon Kuhn



© National Geographic Society

Painting by W. Janssen Kille

The Chief of a Temple Mound Tribe Greeted His Elder Brother, and Shows Him His Course Across the Heavens

Temple Mound building, probably receiving its inspiration from Mexico, was practiced in the Mississippi Valley and other sections of the rich Southeastern agricultural lands from the 14th through the 17th centuries. In some areas their chiefs claimed kinship to the sun. Temples and the chief's lodge were built on great flat-topped artificial mounds of earth. About 1540 the Spanish explorer De Soto saw Temple Mound building at its most colorful peak.



© National Geographic Society

Painted by W. W. Langdon, 1845

Planning a Murderous Ambush for Their Wily Enemies, Macon Braves Powwow in Their Ceremonial Earth Lodge

Archaeological excavations near Macon, Georgia, revealed a peculiar council chamber of the early period of the Temple Mound builders, probably around 1400 A.D. Circular in shape, it showed only its cone-shaped roof above the ground. Hollowed out of red clay, the chamber had seats for fifty braves around its circumference. Before each seat was a hollowed receptacle for pipe, tobacco, and magical charms. The raised platform is in the conventionalized form of an eagle, especially sacred to the Southeastern forest dwellers. The kneeling figure wears a headdress called a "roach," similar to crested Greek helmets. These people may have been ancestors of the historic Creeks.



© National Geographic Society

Painting by W. Langdon Kuhn

Stocky, Pearl-decked Hopewell Women Beat Out a Tribal Rhythm in a Harvest Ceremony

The spectacular Burial Mound development in the eastern United States preceded the later Temple Mound period. The climax of the Burial Mound culture was achieved in Ohio. One of several famous sites is near the present Hopewell. The painting shows a Hopewell burial mound in its primary stage. Succeeding mounds of earth will be added to it, giving it a tall dome-shaped form. Headdresses and copper-covered antlers are drawn from figurines and specimens uncovered by archeologists. These Indians produced realistic stone carvings, considered by authorities the best ever made north of Mexico. Pearls were their favorite adornment. Such high mounds were erected to cover the ashes of prominent dead. Scientists estimate that the Burial Mound cultures flourished between the years 700 and 1500.

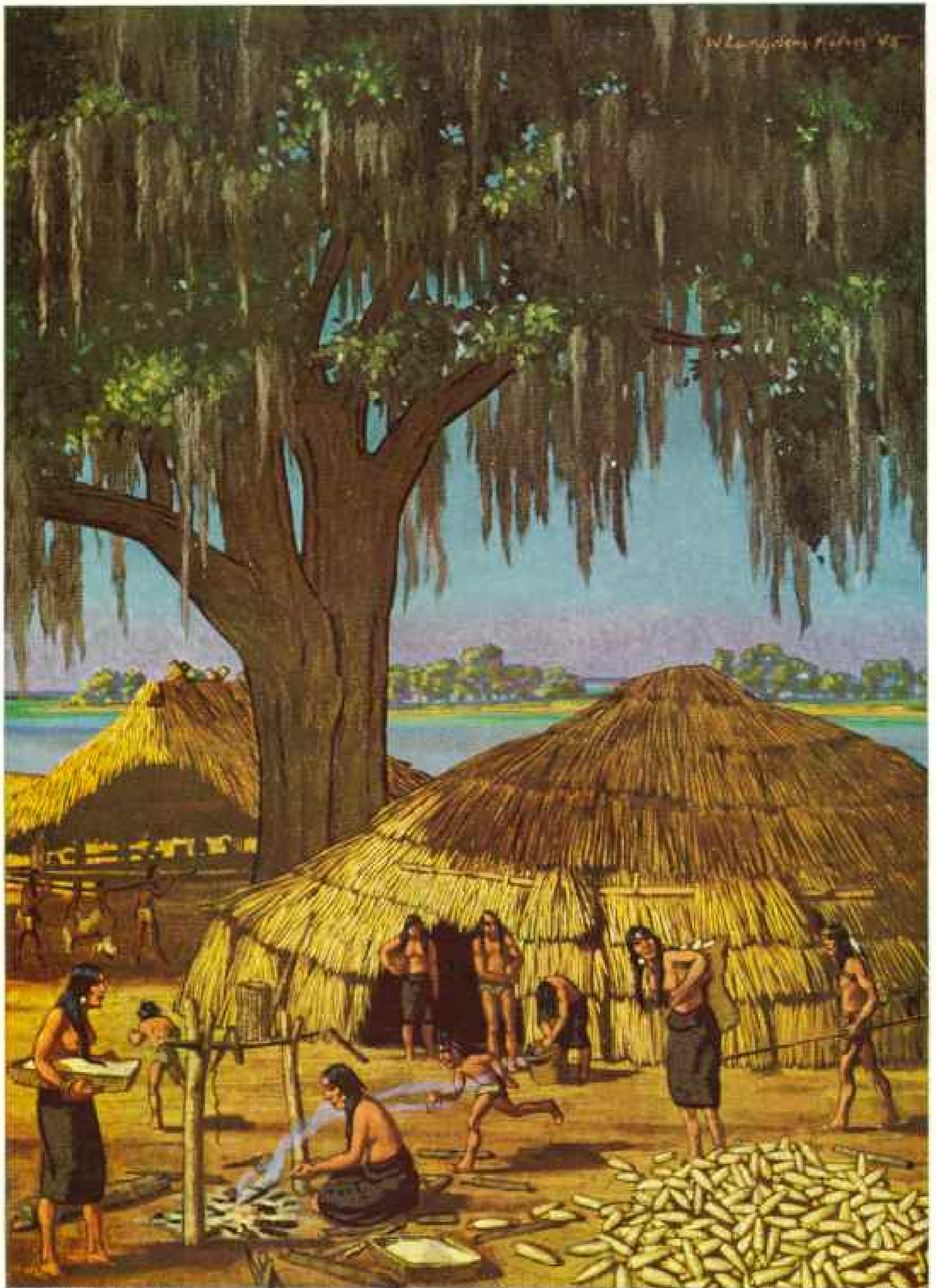


© National Geographic Society

Painting by W. Langdon Kellin

"Your Father Is Dead; It Is Very Grievous. As for Me, I am Going with Him to the Country of the Spirits"

Thus spoke the favorite wife of the Natchez chief, Tattooed Serpent, to her children when she learned of the Great Sun's death. The Natchez pictured a happy future land and ceremonially strangled with bowstrings the wives and attendants of deposed chiefs, who were called "Suns." To accompany a chief into the spiritland was a great honor; it bestowed nobility. Before the ordeal, each victim swallowed six tobacco pills, a primitive anesthetic. The Natchez bound the heads of babies to achieve an elongated effect. This painting depicts a historical ceremony witnessed and described by French explorers in 1725.



© National Geographic Society

Painting by W. Langdon Kilmer

Corn Was the Staff of Life for the Choctaws of the Louisiana Bayou Country
The Choctaws were agriculturists, practiced head binding, and used the blowgun.

form of crouching human figures were typical.

The Temple Mound period, as stated, began about the year 1400, developed slowly for a while, and reached its peak between 1550 and 1650, during which time the biggest mounds were built.

Although the dates for the extinction of the old culture differed in different sections, it can be said that the mound-building period came to an end about 1700. After this date the Southeastern tribes scattered widely and decreased in numbers. The final blow came in the second quarter of the 19th century when the Government forcibly removed most of the survivors west of the Mississippi.

The warlike nature of these Indians was indicated by the fact that their villages were usually surrounded by stockades made of wooden stakes, a practice which began in the latter part of the Burial Mound period. But their peaceful pursuits in organized religion, agriculture, and the arts reached such a peak that the Temple Mound period of the Southeast marked the highest development achieved by any Indians north of Mexico.

The Natchez of Mississippi

Fairly representative of this culture were the Natchez of Mississippi (Plate VII).

At the end of the 17th century there were seven towns in the Natchezan group in the region of the present city of Natchez, Mississippi. Probably the Taensa also had previously belonged to this group, as they spoke the same language and their customs were closely related (Plate II).

From 1716 to 1729 the Natchez had three wars with the French, the last breaking their strength and their organization as a tribe.

In 1731 the remnants of the group were attacked by the French, and 450 of the survivors were captured and sold into slavery in Santo Domingo (Dominican Republic). Those who escaped scattered far and wide, most of them going to South Carolina. The Natchez are now extinct.

The Natchez were divided into nobles and commoners, or stinkards, as the latter were called. The nobles group consisted of chiefs, or "Suns," nobles proper, and privileged men. The children of the women of the aristocratic group inherited their mother's rank, but children of common women fell one grade below the rank of their father. There were means by which a man could raise his rank, but only to the lower grade of nobles.

As did most American Indian tribes, the Natchez peopled the universe with Nature spirits in human form. These varied in importance, but the most powerful was a sky god

who lived in the sun. Sun clan individuals were considered to be descended from him and therefore had a divine right to extravagant honors. The head of the Sun clan was the direct representative of the sun-god and was regarded as a deity, a concept almost identical with that of the present-day Japanese.

In brief, the government of the Natchez was a true theocracy. The supreme god lived in the sun. A relative of the supreme god came to the earth, taught the people their religious customs, and set up their manner of government. He then had himself transformed into a stone which remained with the people as the most revered object in their temple.

His direct descendants ruled for him and, as members of the Sun clan, acted as liaison between the people and the sun-god.

The sacred perpetual fire was believed to be of solar origin and therefore constituted another link between the people and the sun.

The sacred stone was an elaboration of an idea held by many other Indian tribes and has its analogy in the sacred stone of the Kiowa, the sacred arrows of the Cheyenne, and the flat pipe of the Arapaho.

The sacred bundles of many Plains tribes contained relics which linked the people with their supposed creator, and the proper care and ritual connected with them were considered necessary to maintaining this contact.

Sacred Fires Kept Burning

Most of the tribes of the lower Mississippi region had a principal temple built on a mound in which the perpetual fire was kept burning. This served as a repository for the bones of their dead chiefs. Such sacred objects as rock crystals, figurines, and parts of totemic birds and animals were stored in baskets or wooden boxes.

Here also were offered the first fruits of the fields and the forest. After being presented to the sun, these were brought by the keeper of the temple to the head chief, who distributed them as he pleased.

The sacred fire seems always to have been made from three hickory logs radiating from a common center. The keepers of the fire were no vestal virgins but old men carefully chosen for this position of honor. If the fire were allowed to go out, it was believed that disaster would fall upon the tribe.

Apparently there were rare occasions when this happened, and to appease the deity large numbers of human sacrifices were made at these times.

So striking were the ceremonies of the Natchez and their neighbors on the death of one of their important chiefs that we have



Staff Photographer J. Taylor Roberts

Since Before the Days of De Soto, Cherokees Have Tilled North Carolina Soil

More than 3,000 members of the eastern tribe live on the Cherokee Indian Reservation in mountainous western North Carolina. Family groups are assigned tracts of land, on which they engage in farming, dairying, and forestry. In the Folger Shakespeare Library in Washington, D. C., is preserved the earliest real-estate prospectus for American land, Thomas Hariot's *A Briefe and True Report of the New Found Land of Virginia*, published in 1590. To encourage wealthy Englishmen to invest funds in the Colonies and to attract immigrants, he painted a rosy picture: "I can assure you that . . . one may prepare and husband so much ground . . . with less than four and twenty hours' labor as shall yield him victual for a twelve month."

many detailed descriptions of them, from early French explorers and missionaries.

When among the Natchez a male or female Sun died, a score or more individuals were put to death so that their spirits might accompany him in the other world. Some of these sacrifices were determined by their relationship to the dead Sun.

Anyone else who wished to do so might volunteer, and as a rule the majority of the victims belonged to this group who wished to honor their leader. Parents also offered up infants and young children under the age of three, and these were deemed an essential portion of the human offerings. The parents of children so sacrificed acquired considerable honor and respect.

The ceremonies at the death of a Sun lasted several days and were conducted with great

pomp and display, featuring the human sacrifices, the principal group of which terminated the obsequies. The adult victims were given large pills of tobacco to numb their senses, and were strangled by a cord around the neck.

While it is certain that most sacrificial victims were pleased to be so honored and that many, without their relationship making it necessary, freely volunteered their lives for this purpose, it is also evident that a good number were skeptical of the honor. Now and then an individual ran away to save his life.

It is unfortunate that no European observer wrote of the really huge centers of Cahokia and Etowah when they were at their height, thus giving us a picture of the real apex of the civilization attained in the most populous section of the aborigines of the United States, the Southeast.

Animals Were Allies, Too



U. S. Army Signal Corps, Official

Straining at His Leash, a Doberman Goes into Action—a Jap Hunt Was On!

A member of the Quartermaster War Dog Platoon, he served the U. S. Army on Biak Island, off the coast of Netherlands New Guinea. Caves, jungle, and wrecked bamboo huts were scoured for lurking Japs. Along with German Shepherds, fast, intelligent Doberman Pinschers make efficient dogs for police and Army work.



Caesar Rides Back to a Dressing Station after Saving the Life of His Handler

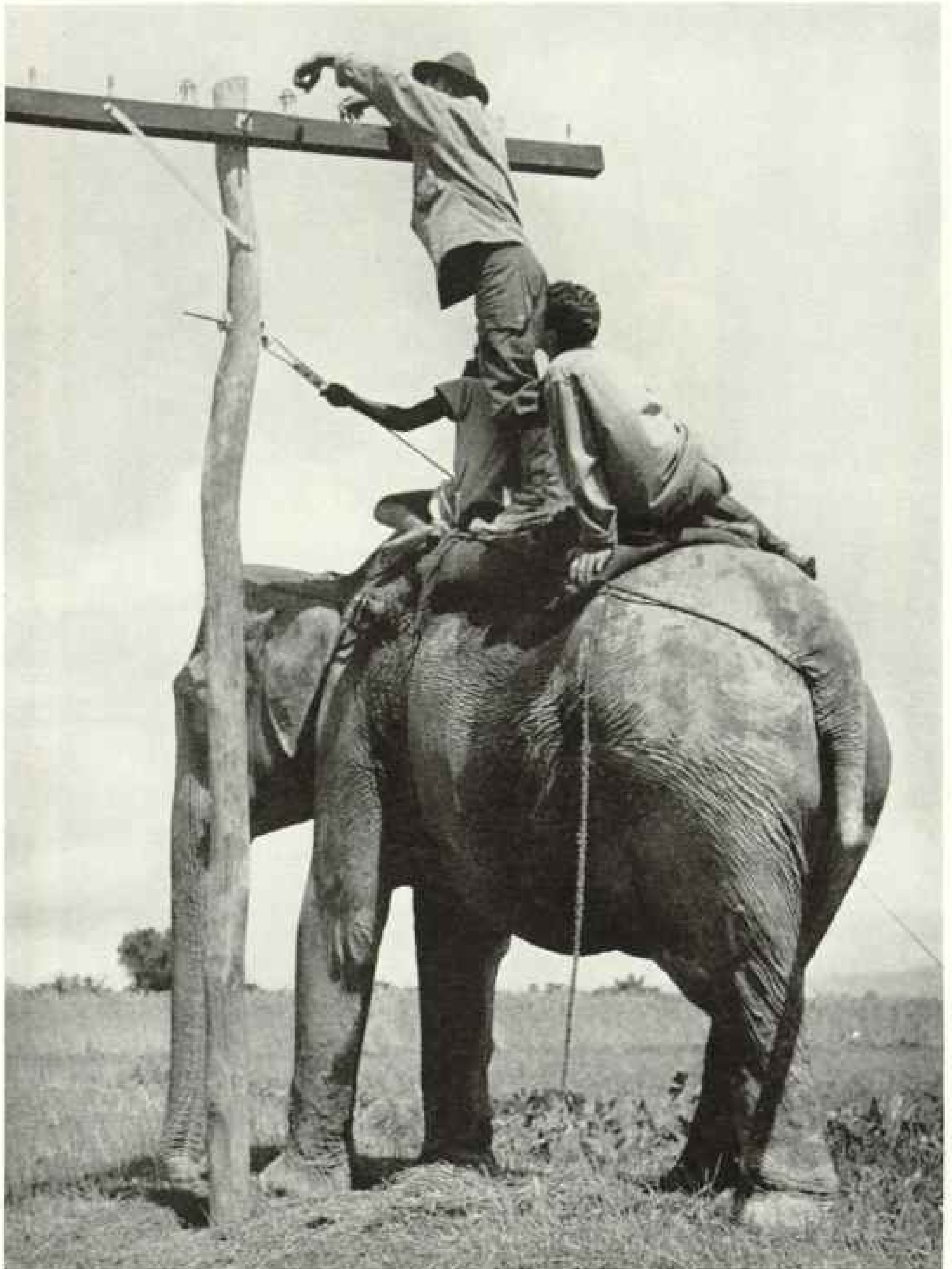
This German Shepherd, donated for war service, was commended by Gen. Thomas Holcomb, then U. S. Marine Corps Commandant, for outstanding performance against the enemy on Bougainville. As a messenger dog he made nine official runs, two of them under fire. He was wounded when a Jap sneaked up to his handler's jungle foxhole. Attacking the weapon arm, he forced the enemy to flee.



U. S. Marine Corps, Official

As Soon as His Side Wounds Heal, Caesar Will Be Ready for Evacuation

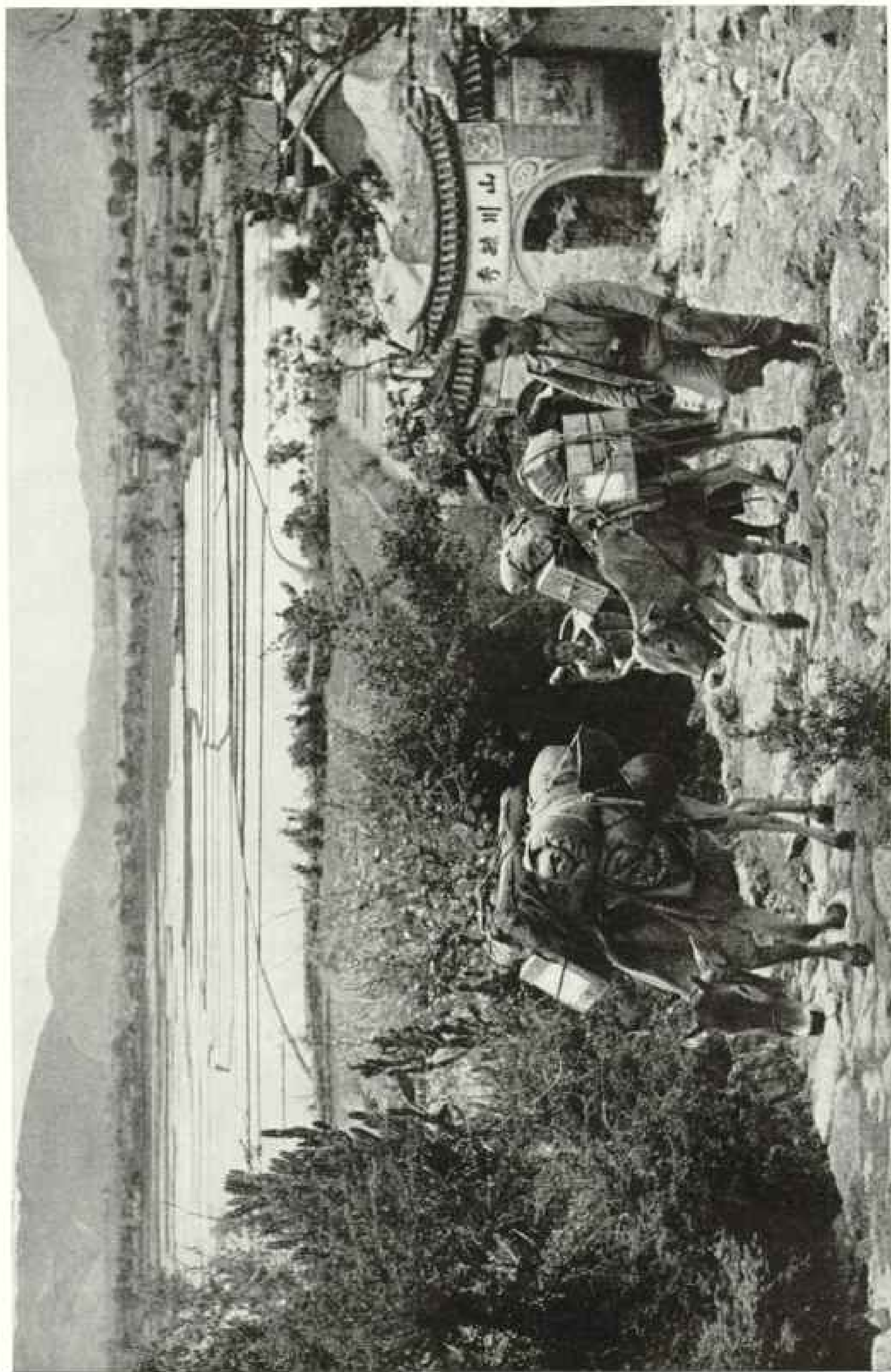
Marines find dogs invaluable as messengers, scouts, and guards. Each has two handlers, one of whom is stationed with an advance unit. At command, "Report," he dashes between the two, carrying messages.



U. S. Army Signal Corps, Official

Jumbo Affords a Convenient Movable Platform for Signal Construction Crews in India

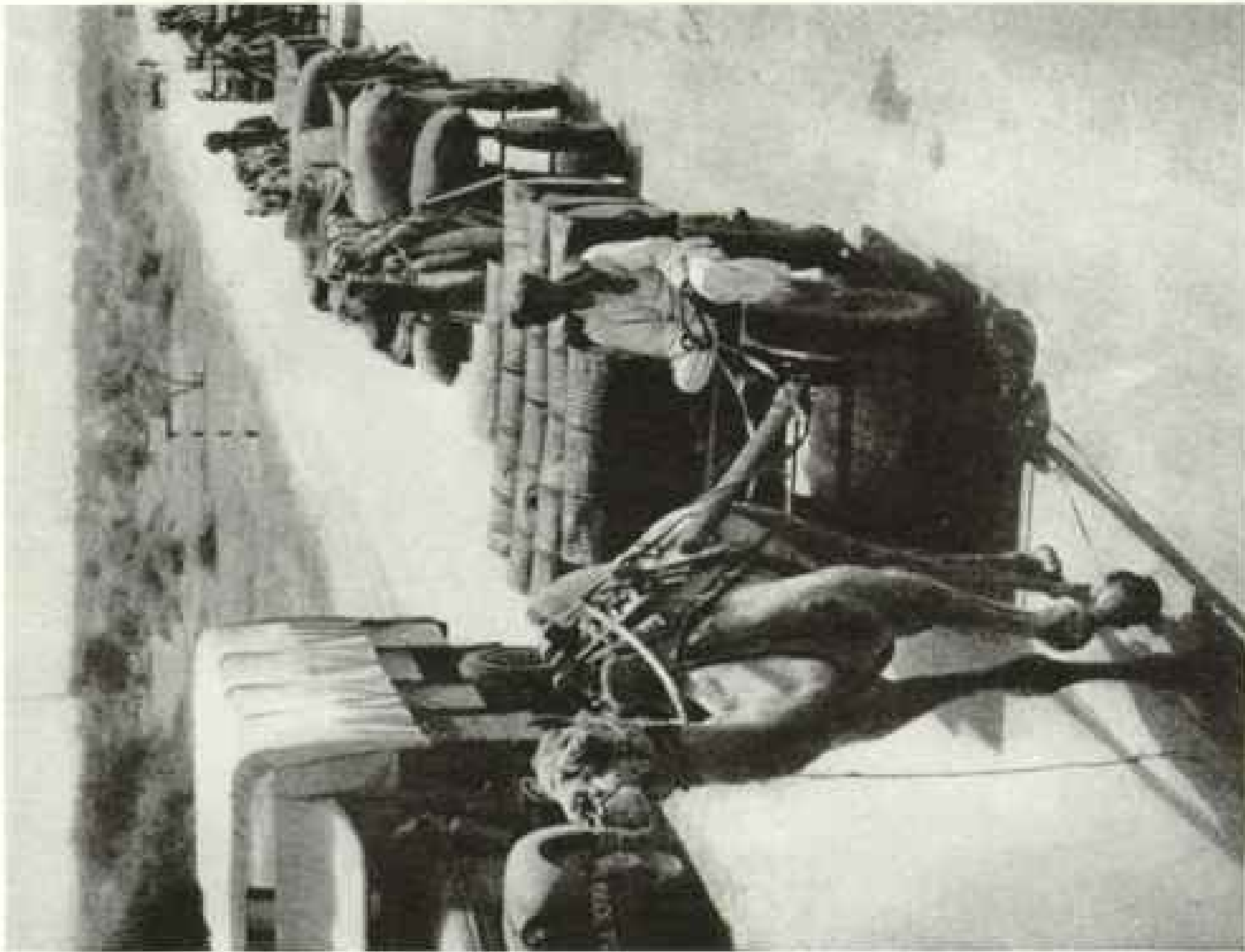
From her back the men can reach pole insulators on telephone lines strung in Assam, which served as a base for the battle of Burma and a road to China. If necessary, she can push through jungle that would bog a tank. Instead of a howdah, a thick mat has been roped to her wrinkled back.



U. H. Aron, Signal Corps, Official

Pack Cattle Provide Transport for a Signal Corps Photographer on the China-Burma Front

He was en route to Task Force Headquarters operating in the Salween River area. Such cattle caravans, together with pack burros, are used extensively by traders in South China, Burma, and Siam. This stone-paved trail emphasizes the ancient Chinese proverb: "A road is good for seven years and bad for four thousand."



Haughty Camels Ignore Speeding Trucks

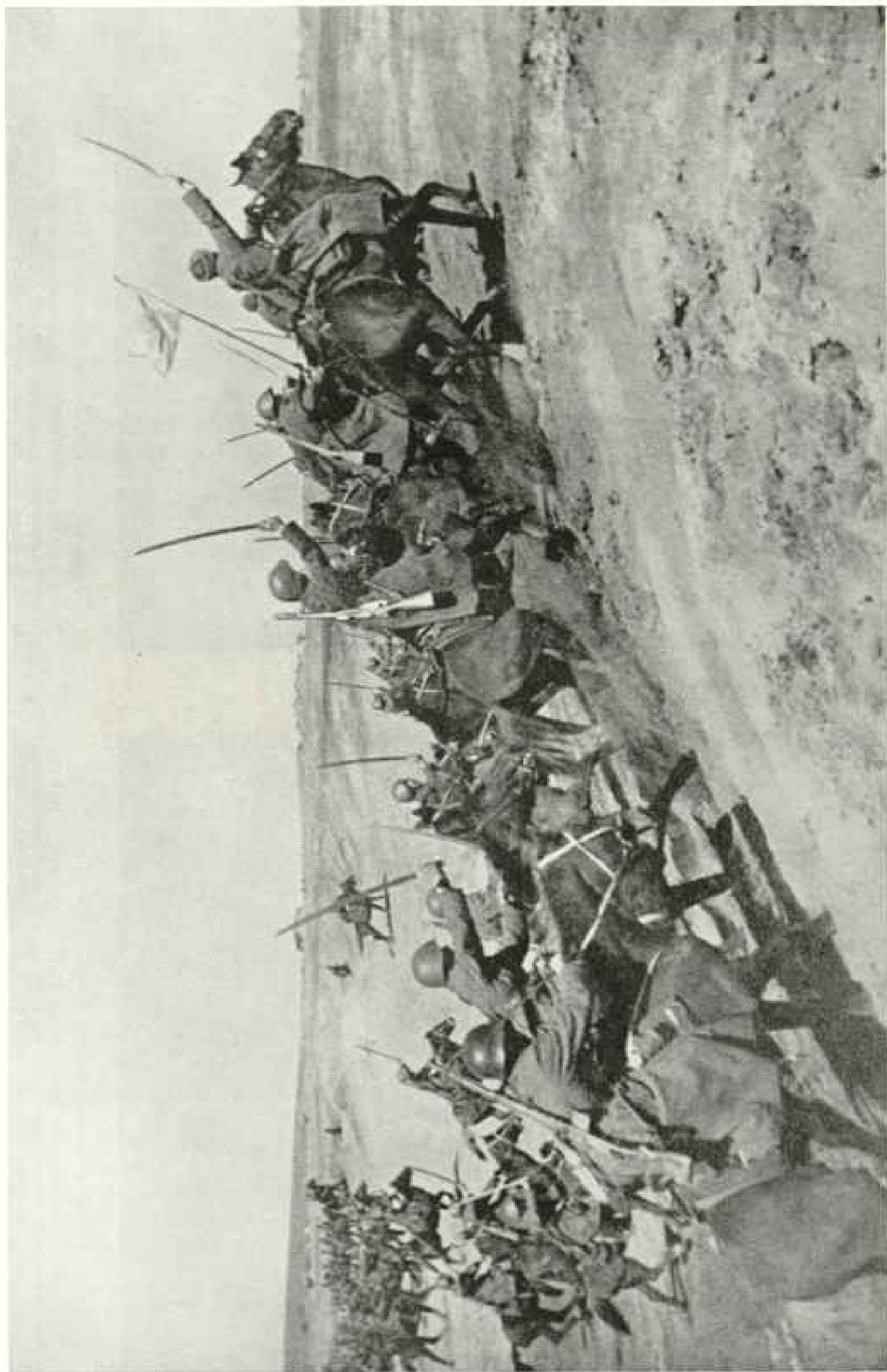
"Whiz past if you will, but we refuse to look," they seem to say. "It's humiliating enough to haul wagons without being taunted about our slowness." They are carting oil drums and other supplies to U. S. Army bases in India.



U. S. Army (Himal. Camp, Official)

Donkeys Triumphed over Motors in Deep Italian Mud

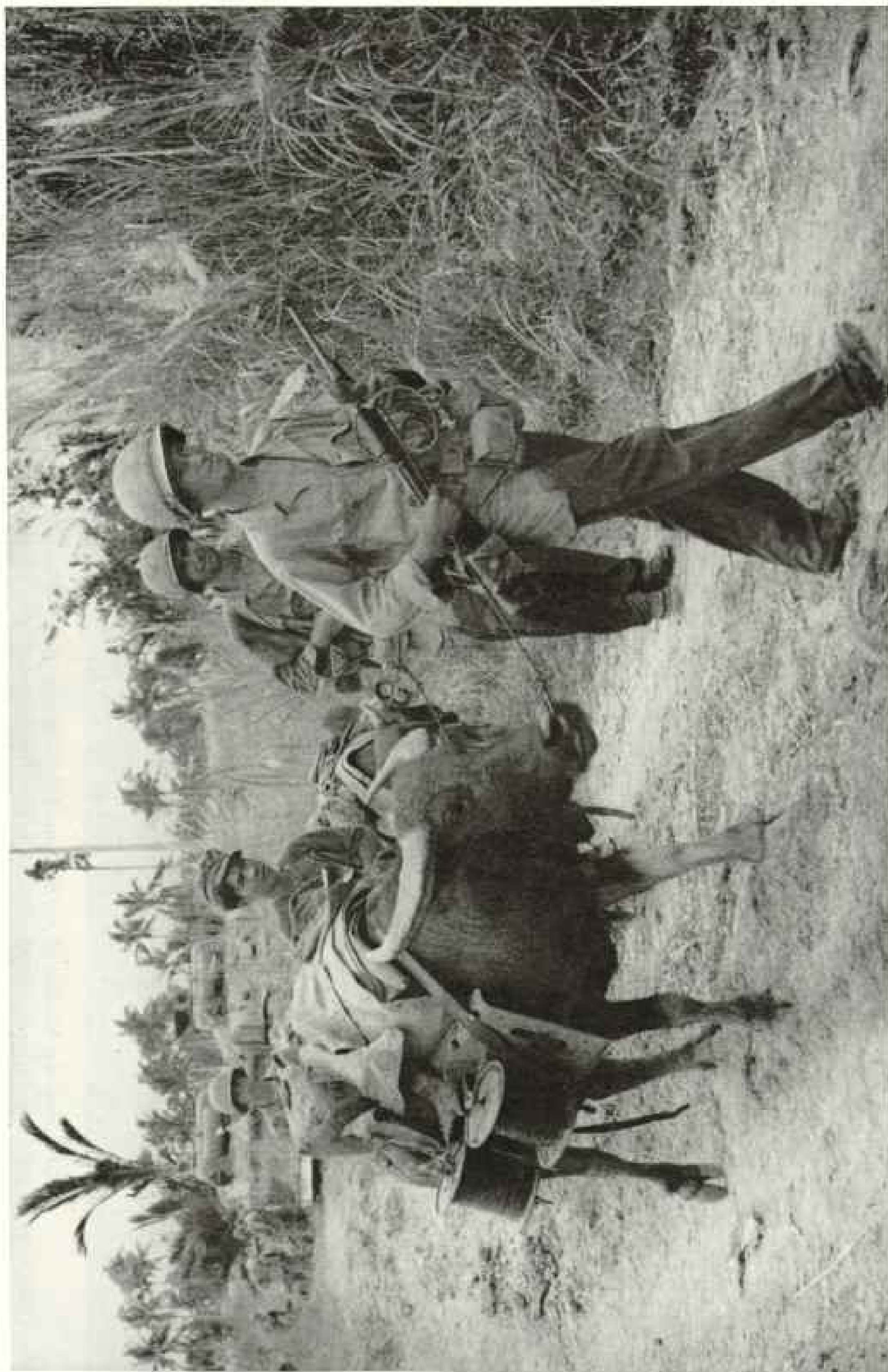
Heavy rains frequently turned the southern front into a slippery mire, making difficult the movement of supplies by the Fifth Army. While trucks skid and flounder in deep ruts, the burro carefully picks his way toward the lines.



Horizon

With Sabers Held High, Russian Cavalrymen Race to an Attack on Their Southwestern Front

Though tanks, self-propelled artillery, and other mechanized weapons have largely replaced cavalry as the swift striking power of an army, horses still are effective in some sweeps across rugged territory. Russians used many horses for pulling supply wagons and artillery.



U. S. Army Signal Corps. Official

Yanks Landing at Leyte Enlist Plodding Carabaos for Signal Corps Duty

Slung at their sides are heavy spools of field telephone wire for battle-front communications. Docile with their native masters, water buffaloes are sometimes hostile to strangers. These willingly follow American lead, but a Filipino goes along. Crows of two tanks confer in the distance.



U. S. Army Signal Corps, OMMO

G.I.'s Find the Moving of a 2,600-pound Refrigerator Easy—When They Have an Elephant to Help!

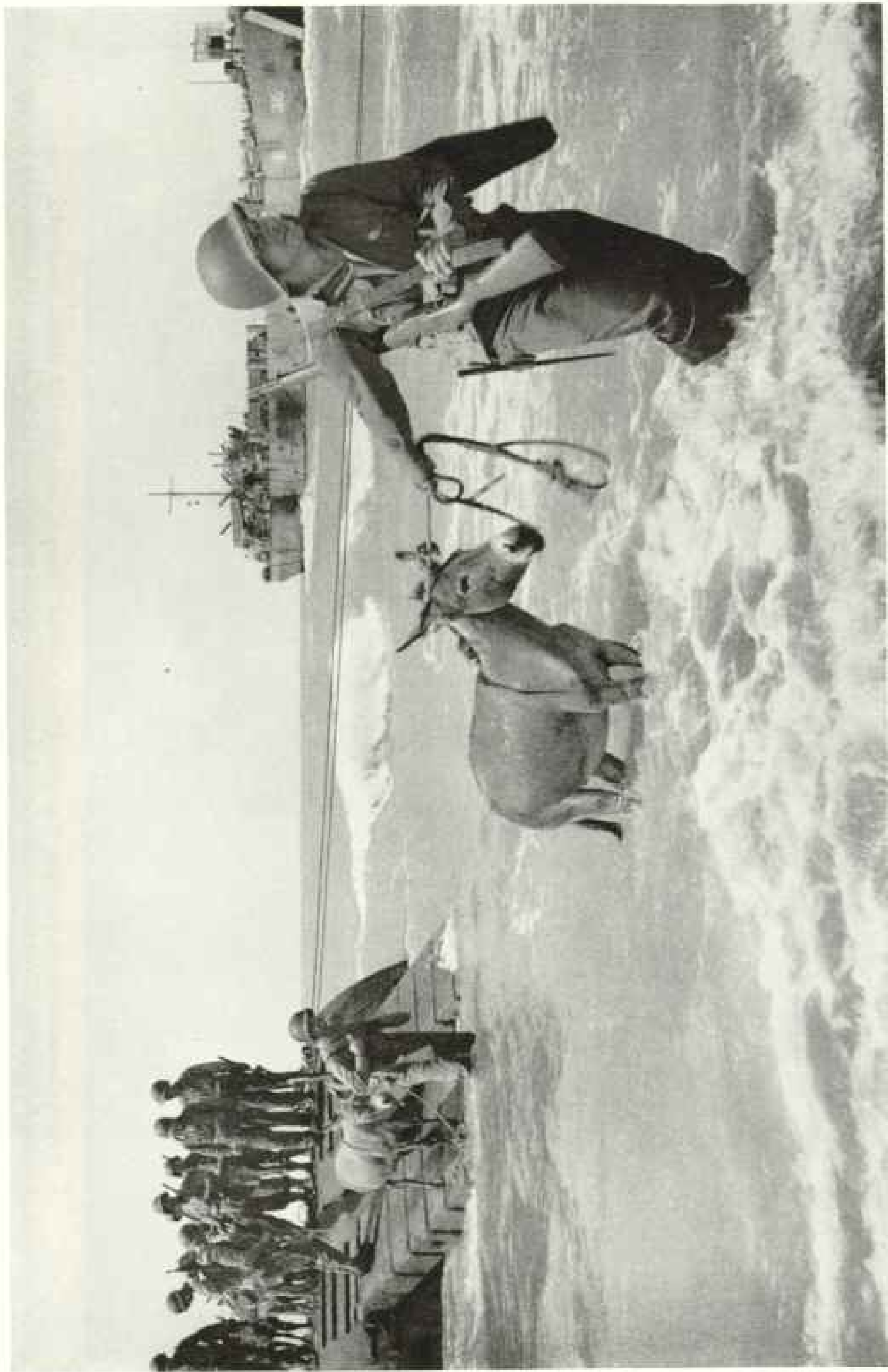
The captain in charge of the Post Exchange at Southeast Asia Command Headquarters, Ceylon, directs the shifting of the heavy unit. But Karunavathi, a 35-year-old elephant, is the most effective helper. The Army used these powerful beasts in both India and Burma.



British Official

British Tommyes of an Antitank Regiment Clear a Road Through Snow-blocked Italian Mountains

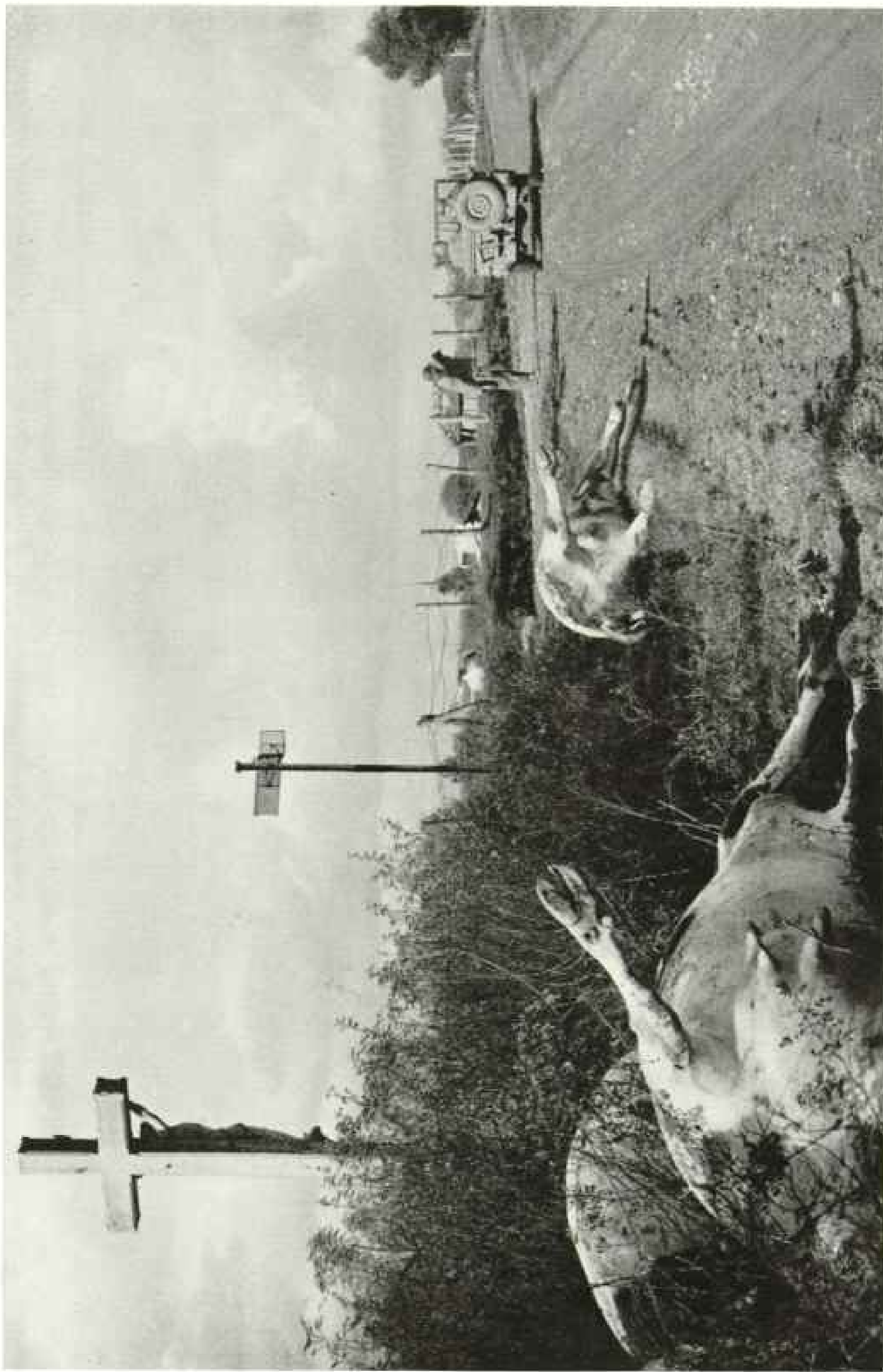
Drafted to the job of hauling the crude handmade snowplow is a span of handlebar-horned oxen, used in summer by Italian farmers to cultivate high hill farms and vineyards. While some guide oxen and plow, other men ride to supply weight.



U. S. Army Signal Corps, official

Wading Through Heavy Surf from an LST, GI Troops and Donkey Draftees Hastily Reinforce Sicily Beachheads

From here at Licata and near-by Gela, American forces started their encircling drive through central Sicily. British and Canadian troops landed in the vicinity of Augusta. Sure-footed donkeys make excellent pack animals over narrow, difficult trails.



U. E. Amar Signal Corps, Official

French Cattle Fell Victim to Mine Traps Which German Soldiers Set for Yank Troops

The enemy, fleeing into the Vosges, southeast of Nancy, planted land mines at this crossroads in an attempt to slow onrushing American forces. The route has been cleared, and men in a passing jeep pause to question the guard on conditions up forward. German prisoners are removing thousands of mines buried in French farms.



U. S. Army Hospital Corps, Official

"Bite His Ear, Sarge; That'll Take His Mind off the String of the Branding Iron!"

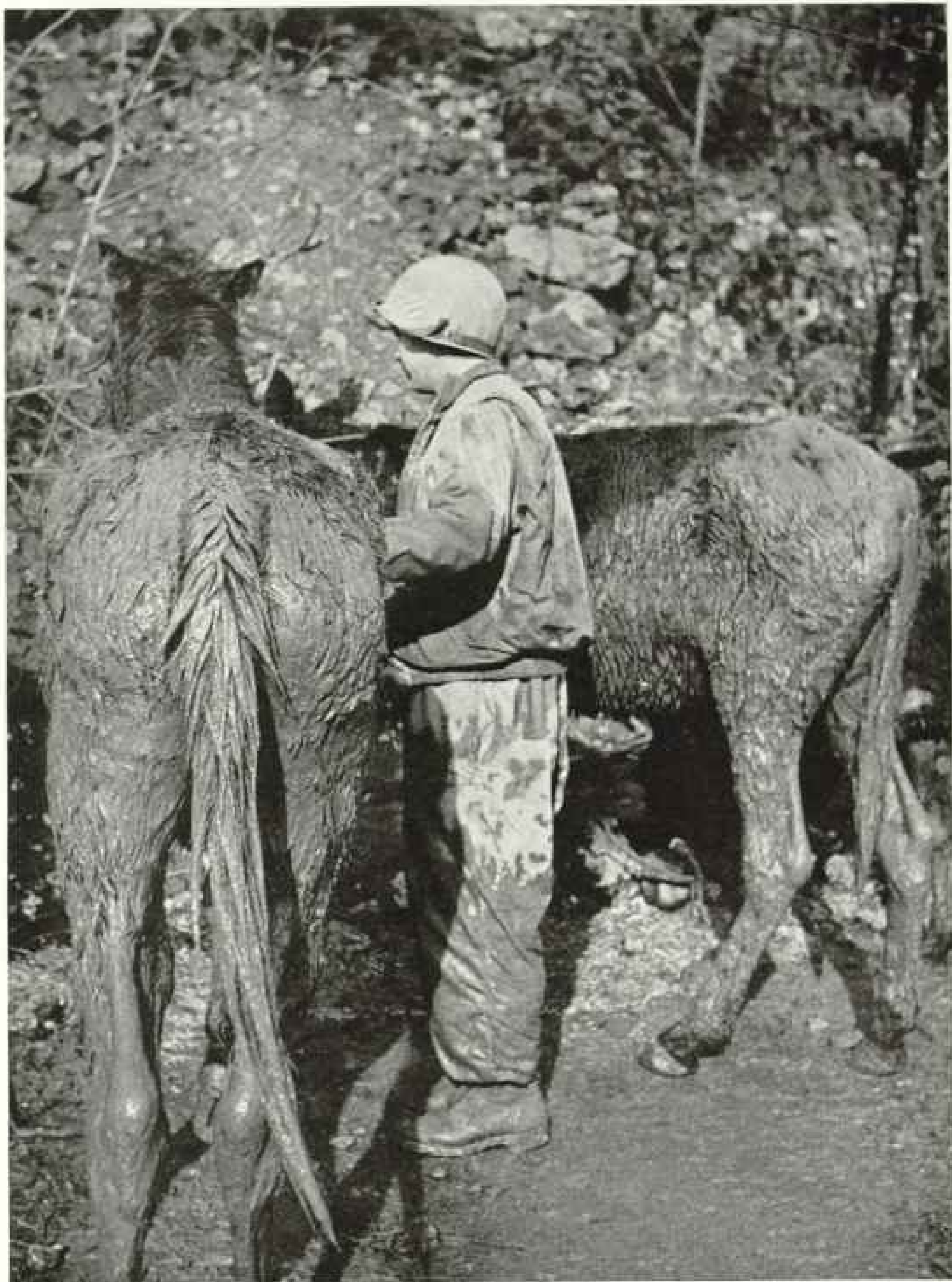
So Sgt. Fred Parker of Orona, Texas, clamps his teeth down on a sizable mouthful of the mule's floppy ear during branding operations in India. Mules carried light artillery pieces, ammunition, and other supplies on jungle paths and in hill areas of the China-Burma Theater, where motorized transport could not go.



U. S. Marine Corps, Official

Three Warrior Pals—a Marine, a Monk, and a Dog—Catch 40 Winks Together in the Pacific Sunshine

Prince, the pup, and Eighthball, the monkey, snore beside Marine Cpl. Albert E. Apuzzo, of Chicago, a veteran of Tarawa, Sulpan, and Tinian. Our world-scattered forces have acquired such odd pets as kangaroos, macaws, mongooses, parakeets, and wild pigs. Some mascots of air crews have flown hundreds of hours.



George Aarons from Yank

What a Job the GI Groom Will Have Carrying These Mud-caked Animals

Vividly they show what an ordeal of mud confronted the Fifth Army during some of the fighting on the Italian front. After plowing through bogged roads and flooded valleys and fighting in snow-choked mountains, no wonder some Yanks asked, "Where is this 'sunny Italy' we've heard about?" Small Italian horse (left) and mule.

Earth's Most Primitive People

A Journey with the Aborigines of Central Australia

BY CHARLES P. MOUNTFORD

With Illustrations from Photographs by the Author

ON BOTH sides of the lonely western section of the border between South Australia and Northern Territory there is a tribe of about 300 aborigines who are living probably the most primitive existence on earth today.

Their homeland is so inhospitable that few Europeans have ventured into it. Indeed no white man can live there unless he carries his supplies with him.

Yet the aborigines, without a stitch of clothing and with only five implements to aid their bare hands, have been able, for untold generations, to wrest an adequate livelihood from their desolate surroundings.

When the Board for Anthropological Research of the Adelaide University asked me to lead an expedition to observe and photograph the art and culture of these people, I accepted with alacrity. I took with me only my wife, who was to help in the study of the life of the women; Mr. Lauri E. Sheard, who was to inquire into the social organization, games, and art of the women; Tjundaga, a half-caste camel man, and Tjundaga's full-blood wife, Nibiana.

Scorning superstition, we started on May 13 and traveled 650 miles on the fortnightly train through a vast, sparsely inhabited region to Oodnadatta. The trip took 40 hours. Beyond Oodnadatta we proceeded by motor over roads so bad that we were more than 30 hours covering 350 miles (map, page 91).

On the Edge of a Stone Age Land

We made our main camp at the outlying Ernabella Mission Station. There we stayed a month while we were obtaining information from the aborigines about the distribution of their tribal lands, the location of the water holes, and any other data that might help us in our later research.

We quickly made friends with the dark folk, particularly the children. They were the continual companions of my wife, often getting in her way, I am afraid, when she was performing her share of the camp chores.

There was one attractive baby that everyone seemed to love, for it was the center of attention. Men, women, and children wanted to carry it about and fuss over it. Only at mealtimes did we know who was the mother.

The life of the aboriginal child is full of all the love and affection that one could wish for any child. I have yet to see an aboriginal child chastised by its own people.

As I watched them day after day, rolling in the dust, sitting in the damp sand of the water hole, and climbing trees, I realized the advantage they had in not wearing clothes. They had nothing on to tear or get dirty.

Early one morning I heard the sound of music behind a low pile of rocks close to our tents. Judging something unusual was afoot, I picked up my camera and strolled over.

Paintings on Human Bodies

There I came across about twenty boys, seven to twelve years of age, painting with charcoal, chalk rock, and red ocher symbolic designs on one another's bodies (page 99).

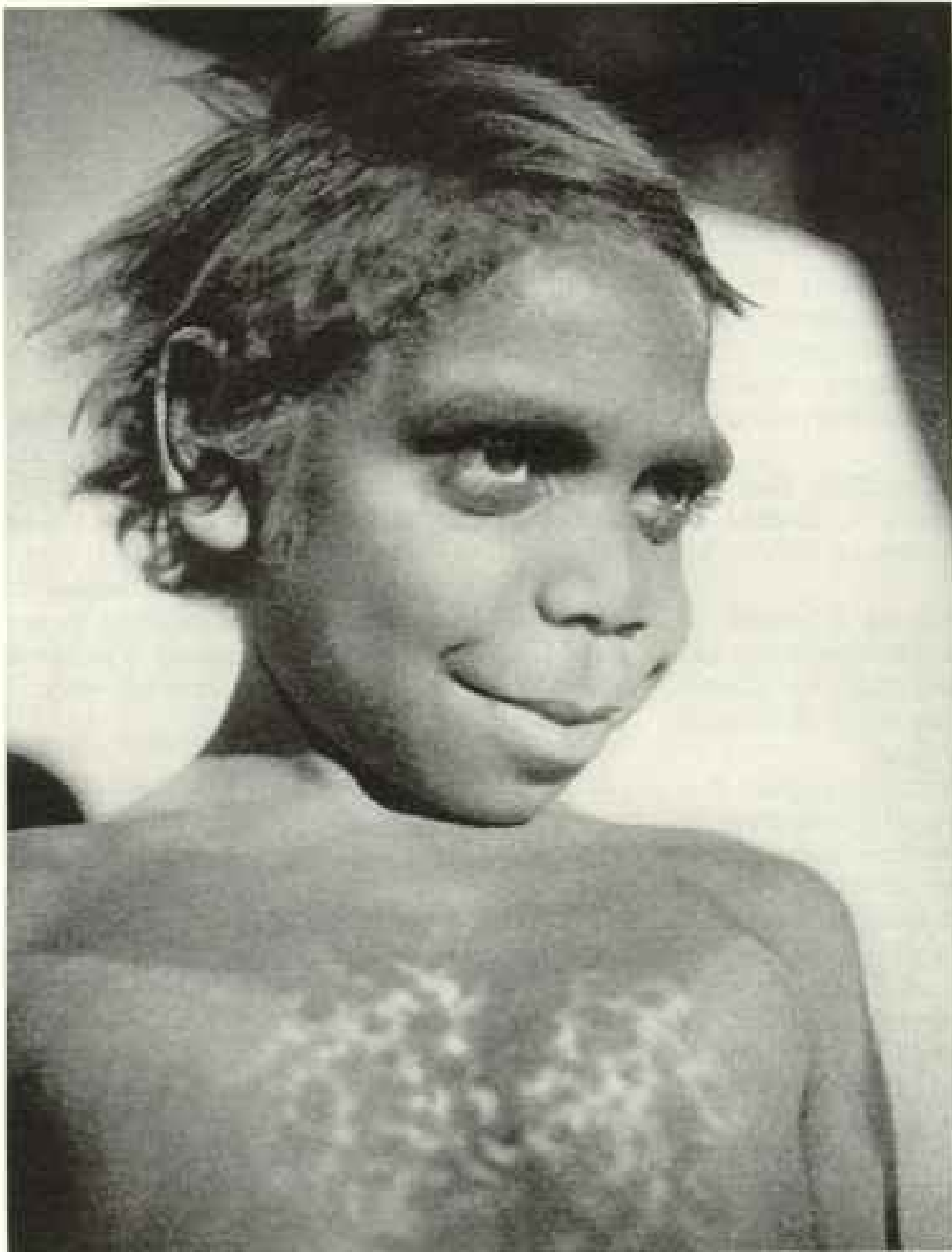
They were getting ready for the ceremony of the mountain devil. This ceremony belongs exclusively to the young boys. No women or girls are allowed to come near, nor do the elder men attend.

The leader, himself little more than a youth, directed the body paintings and the performance of the rituals that told of a time in the long-distant past when, according to legend, the mountain devil (a fearsome-looking, but perfectly harmless desert reptile) with his companion, the sleepy lizard, invited all the small birds and lizards to a ceremony.

The little creatures came from near and far, for no one refused such an invitation. But as they were busy painting each other for the coming rituals—just as the boys I watched were doing—someone lit a fire that set the whole countryside ablaze.

Before that time the birds had had glossy white plumage, but in that disastrous conflagration all the little birds were badly scorched. Some were burned black all over, some only in patches, while many of the other birds and lizards were so badly smoke-stained that they carry the colors even to this day.

The clean-limbed naked boys, led by their tutor, himself extraordinarily graceful, danced the story of the mountain devil and his unfortunate companions. I have seen no other performance to equal that one for sheer beauty. The stage was a grass-covered plain and the backdrop a tumbled pile of granite boulders.



Windili, Age 12, Made the Long Trip with the Author

His chest is scarred from burns suffered while carrying fire sticks to keep him warm on the march (page 99). With no clothing to hamper his movements or to get dirty, and with a stomach well filled, he was happy as any child could be. Red dust gives him a rusty color.

The aborigines were curious about many things in our camp, but I think most of all about my wife's luxuriant golden hair—something they had never seen before. She wore it in a large coil on the back of her head.

Among the tribespeople only fully initiated men are allowed to wear their hair in this manner; the women carry theirs in a roll over the front of the head. They were thoroughly puzzled to see a woman coiffured like a fully initiated man. Several times I saw men walk up behind her when she was busy, look closely at her hair and the manner of wearing it, then go away and discuss the matter gravely among themselves.

These surreptitious inspections went on un-

til one day Lauri and I persuaded my wife to unbind her hair and let it fall down just to see what would happen.

Instantly there was a commotion. The natives near at hand let out a call. Everyone came running—children in dozens, women with babies bouncing on their hips, and staid old men still carrying their spears and spear throwers. They crowded around my wife in a circle, chattering excitedly.

"*Nandaraku!*" shouted one youth. "Him big fella hair, that one, him all-a-same sun close-up bin finish!" (Much hair, the color of a sunset.)

All this attention was too much for the lady. In spite of our entreaties, she broke away and fled to her tent.

A few days before our departure from the camp at the mission, Lauri and I were made members of the tribe. This was a considerable honor and a great help to our research, for now, having been accepted as part of the tribal organization, we

were assured that nothing relating to the ceremonial life would be withheld from us.

Into the Weird Land on Camelback

We used camels for our transport because they are the safest and most reliable means of crossing the arid sandy wastes of central Australia. A motorcar might have negotiated the journey, but a breakdown between water holes, a hundred miles apart, often would have meant just another bush tragedy.

Our camels were descendants of those brought to Australia in 1866 with their Afghan drivers by Sir Thomas Elder, patron of Australian exploration. To his encouragement and aid is due much of our knowledge of the

desert topography, fauna, and flora of South and Western Australia.

These dromedaries, we find, stand up better than any other animals to the strain of the long, waterless journeys. They will endure all kinds of hardship, drink any water, however foul, without any aftereffects, and actually fatten on the wirelike twigs and plants of the desert trees and shrubs.

We had nine pack and three riding camels, just enough to carry ourselves and our food, scientific gear, and precious water supplies. Of course everything had to be unloaded each night and reloaded in the morning.

It was obvious, from the first time I saw the "string"—it was composed of either very old or very young camels—that it would not safely carry enough food for the journey I had planned to make. I therefore divided our travels into two stages: the first to go northwest across an extensive sandy desert and return for more supplies; the second to travel westerly along the Mann Range, the country of the Pitjendadjara (page 98).

I returned my wife to civilization. The difficulties that faced us were certainly not for her.

Mysterious Landmarks in the Desert

On the first stage we were to visit three remarkable topographic features—Mount Conner, sheer-sided and flat-topped; Ayers Rock, an enormous boulder, and Mount Olga, a group of lofty pillars (Plates II, IV, V).

Mount Conner, the Atila of the aborigines, is a mesalike formation of fine-grained rock, probably quartzite, that rises 800 feet above

the surrounding desert. As we approached from the south, it made a striking picture—straw-colored spinifex and red sand in the foreground, and beyond that the flat-topped mountain, almost rusty-red in the glow of the late afternoon sun.

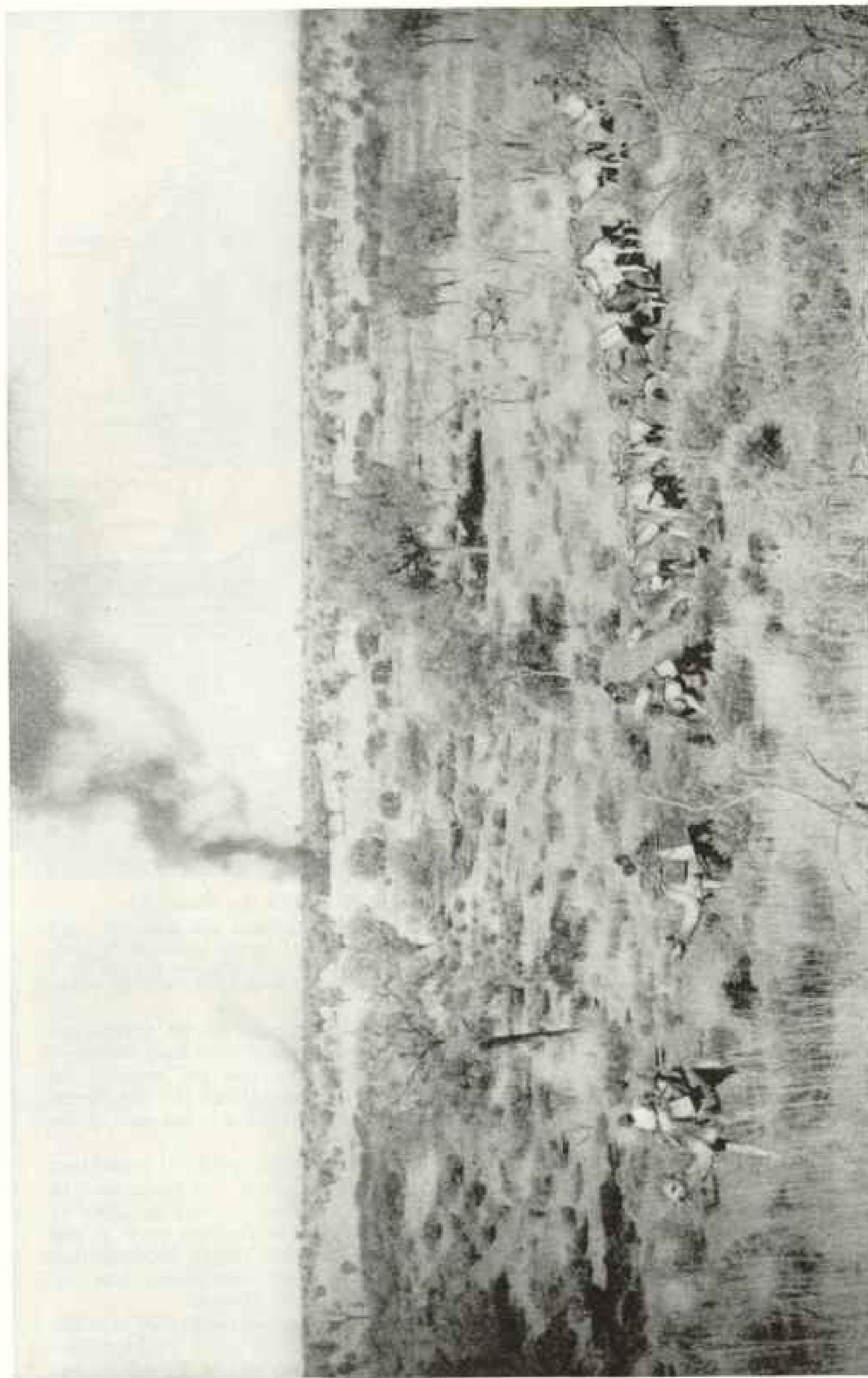
The aborigines have a delightful legend that accounts for the origin of this mountain. In "creation" times, they believe, a camp of *Ninya*, or Ice Men, made their camp at this place. When they left for an abode farther north, Mount Conner miraculously rose out of the ground to mark the spot.

Ayers Rock was our next objective. On this section of our journey, I had a good opportunity to test the bushcraft of Tjundaga, our



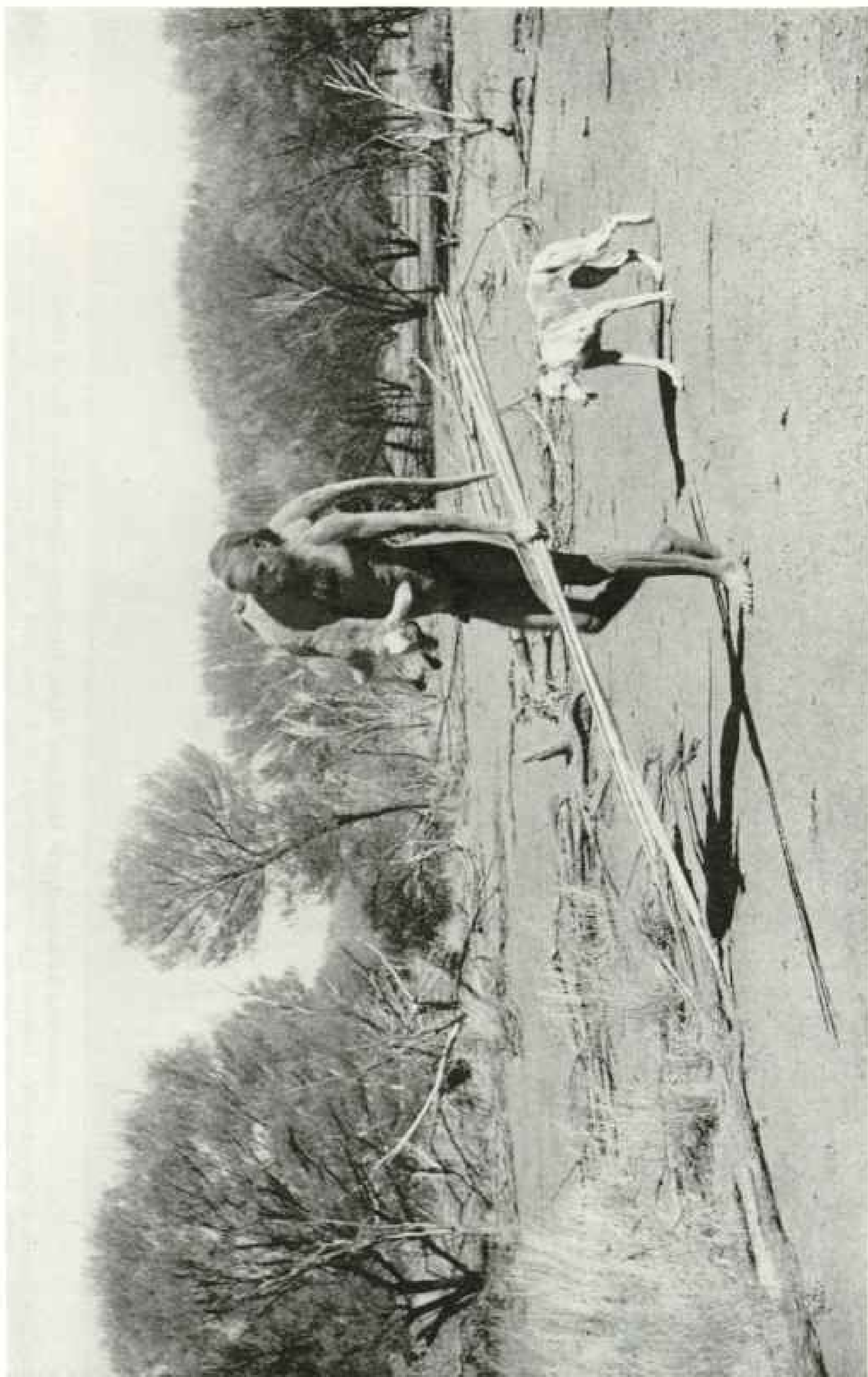
Part of Central Australia Is Still in the Stone Age

In an area of sand hills virtually unknown to white men some 300 naked aborigines live well off country that to civilized people seems utterly uninhabitable. This primordial land, northwest of Adelaide, was reached by a 650-mile rail journey, a 350-mile motor trip, and many days' travel by camels.



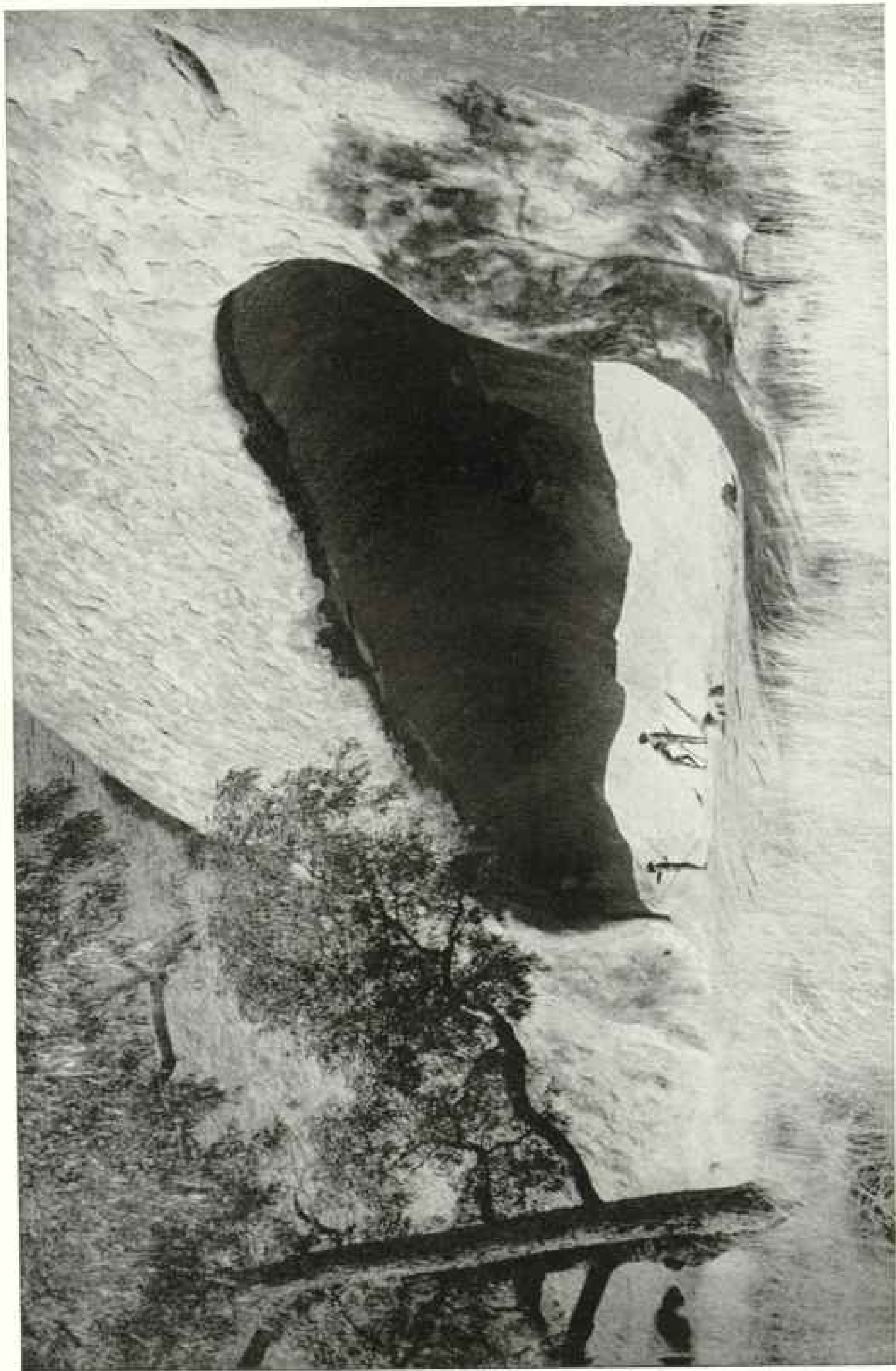
Through Desolate and Forbidding Sand-hill Country Small Fires Guide the Natives

The expedition traveled many hundreds of miles across this terrain, the string of twelve camels skirting the edge of one of the sand ridges to find a suitable place to pass. *Spinifex* (*Triodia* sp.) covers much of the surface. The smaller trees are mulga (*Acacia aneura*), and the larger, desert beefwood, or "she-ook," (*Carpuraria* sp.). Two of the smoke signals lit by the camel man to enable him to hold to a straight line can be seen here. The distant one is almost burnt out (page 95).



An Aboriginal Nimrod Brings into Camp a Kangaroo He Has Speared

In his left hand he carries his primitive hunting equipment—spear and spear thrower. The dog is a crossbreed between the indigenous dingo and a European greyhound. When the natives creep upon a kangaroo and spear it, a tribal feast is assured. According to traditional custom, the animal is roasted in the hot mud and embers of the campfire and distributed. (page 104).



According to Legend, the Mursupial Mole, Itjaritjari, Created This Sacred Cave

The little creature is believed to have hollowed it out from the western side of Ayers Rock as his wet-weather shelter. His summer camp was a huge bowl 500 feet across, high up the side of the rock. On the walls of this huge chamber crude paintings depict the traditions of the tribes (Plate 1).

half-caste camel man. From the summit of Mount Conner I took a compass bearing on Ayers Rock, but instead of using it I decided to try out Tjundaga's ability to travel "blind." Our guide had not been to Ayers Rock previously. The moment he descended Mount Conner, he would not possibly see his objective for several days.

A Marvel of Desert Navigation

I did not give him a direction, but just told him where I wanted to go. To my astonishment, on the evening of the second day when I climbed to the top of a high sand hill to find Ayers Rock, that landmark, the hill on which I stood, and Mount Conner were in a straight line!

My illiterate half-caste camel man had worked a miracle of direction-keeping with no mechanical aids.

Thinking back, I remembered that Tjundaga had lit clumps of spinifex as we traveled (page 92). These fires had given him a series of smoke "markers" by which he had kept in a straight line. But how he had determined the right direction to Ayers Rock is more than I know.

We were more than a week at Ayers Rock, copying and photographing the extensive galleries of cave paintings, collecting the legends, and mapping the shape of the rock for the purpose of plotting totemic places (Plates I and VII).

Our survey proved the monolith somewhat kite-shaped, about two miles across the major diameters, and 1,100 feet high. It was just an enormous boulder, rising perpendicular for hundreds of feet above the plain, its sides so smooth and steep that no grass or trees can find a foothold, and unscalable, except at one place along the crest of a steep saddle on the western face.

I climbed that rock twice, not from bravado, but because I missed the water hole I was looking for on the first visit. The high climbing angle increased the danger, for had one of the loose fragments from the scaling surface slipped from under my feet, nothing in the wide world could have saved me. There was no projection, tree, or even grass on the steep slope that would have checked my fall.

The summit of Ayers Rock is comparatively level, but scored from end to end with hundreds of steep-sided, parallel gutters that were difficult to cross. The summit was almost as devoid of vegetation as the sides. I saw only one tree and a small patch of spinifex.

By now I had fourteen aborigines in our party, and it was one of the pleasant sights, when I was writing up my notes in the

evening, to look up and see the flickering fires of the family groups all around me.

One evening, when I returned to camp well after sunset, no campfires were visible.

I went across to Tjundaga's camp to ask what it was all about, only to find him and Nibiana, his wife, crouching over a fire so small as to be almost useless.

"Whatever is the matter?" I asked. "Why are all the campfires out?"

"Big fella *kadaitcha* about," said one of the men near by. "Me and *tjitji* (child) been see'm blood longa rock. Him been drop blood all about."

This was confirmed by Tjundaga, who explained that a *kadaitcha*, a man on an avenging mission and armed with special magic to kill people without touching them, often dropped blood on the stones as he walked along. The people certainly had had a bad scare, and Tjundaga was as jittery as any of them, so much so that when later he came to our camp he was armed with a loaded gun.

Later in the evening most of the men came over to my camp, for the night was cold and the fire was burning merrily.

I asked them if they were not exposing themselves to danger standing in the light of so bright a fire, but they explained that they were quite safe. No *kadaitcha* would dare to come near a place where there were so many "clever" things about.

Power of an Evil Spirit

I did not see a native fire that evening, even though I worked until the small hours. Next morning I was pleased to find that nobody was ill. These folk have such implicit faith in the power of the *kadaitcha* that if one of them had developed a slight pain overnight, he would have attributed it to the *kadaitcha* and probably died.

Everyone was inclined to laugh about the incident next morning, especially when I suggested that we should have a look for the drops of blood. Search as closely as they could, not a drop could they find, although Matinya, the older man, asserted toward the end of our search that he distinctly saw *two* drops.

While we were returning to camp, Tjundaga was deriding the aborigines about their superstitious fears and boasting to me that he had not been taken in by their stories about the *kadaitcha*. But he could not offer a satisfactory explanation why his fire was so small and why he had brought a loaded gun with him when he came to my camp last evening.

Mount Olga, or Katatjuta, was the most distant point on the northwesterly journey. The



At a Place Called Owellinna Was Found the Only Running Water on the Trip

The author and his assistants drank this unboiled. It came from a large spring in the hillside, ran strongly for about a mile, then disappeared in the sandy stream bed. Less finicky than white men, the natives would slake their thirst from stagnant pools, simply filtering out the green scum by digging little holes in the sand near the shore and waiting for them to fill.

native name, Katatjuta (Many Heads), is particularly apt, for the whole group is composed of enormous round-topped pillars of rock, each separated from the other, to ground level (Plate V). The tallest of these, Mount Olga, is 1,400 feet above the plain.

I found, to my surprise, that the group was laid out in the form of a hollow square, and as I sat in the middle, possibly the first white man to do so, I was surrounded by these huge monoliths. I estimated that 30 were more than 1,000 feet in height, and possibly an equal number were more than 500 feet.

Geologically, this is an unknown land. Mount Conner, Ayers Rock, and Mount Olga are entirely different geological formations, and no one knows the reason.

I wanted to make sure about the water hole at Katatjuta. Previous reports had indicated that it was neither large nor reliable,

"How big is Katatjuta water?" I asked Matinya, who belonged to that country.

"Him *kapi bulka*" (big water).

I had been caught on those "*kapi bulka*" stories before. A water hole of one hundred gallons is a *kapi bulka* to an aborigine, who requires it only for drinking, but five times that amount would be insufficient for our party and the 12 camels.

So I pursued the questioning a little further.

"How big is Katatjuta water? Him as big as Mutiguluna or Mungaruka or Inindi?" (Three water holes we both knew.)

"Him more big than Mutiguluna, him plenty fella big water," Matinya still asserted.

Still I was not satisfied. Mutiguluna, the water near our present camp, was one of the best supplies in the country. It was unlikely that Katatjuta was as large. So I tried again to get some sort of comparison.

"S'pose him water along Katatjuta bigger than Mutiguluna, how big is he?" I asked.

Matinya tried to visualize the extent of the water hole ahead of us.

"Him as big, as big—" I could almost hear Matinya's brains working as he searched for a simile—"him as big as the sea!"

I gave up questioning and decided to risk it. Matinya had never been near the sea, but he had probably heard about it at the mission station and had made a bold guess.

Water "Big as the Sea" a Disappointment

It was only a day's camel journey—20 miles—to the "mighty" water hole, but everyone was so slow in getting under way in the morning that it was well after dark on a very cold night when we stopped to make camp at the entrance of a narrow gorge in which the water hole was situated. The gorge led back between two of the huge rock pillars.

Just as Lauri and I were unloading our camels, I saw Matinya take a blazing stick from the fire and walk quietly away, obviously to have a look at the water hole. We left everything and followed him, for I wanted to know the worst about that water supply.

There was pitch blackness almost the moment we entered that gorge, for the steep high walls cut off what light there was. To make things worse, our track led between masses of great boulders that had fallen down from the heights above.

When Matinya reached the "water as big as the sea," the light from his fire stick revealed that it was only about five feet long and a few inches deep. It was filled with green stagnant water not sufficient for two camels, let alone 12.

He tried to cover up an awkward moment by waving his blazing fire stick over the water hole, saying with a merry smile, "Kapi bulka, him big fella water all right."

Lauri and I returned silently to our camp. Though the ethnological data were rich and varied and the topography was particularly beautiful, we were able to stay only three days at Katatjuta. The camels were crying for water. It would be five days before they could get a drink, and, when we left to reach the Ayers Rock water hole, we had in the canteens only a gallon of water for 14 people.

We had little to drink at that midday meal.

Now we were on the first stage of the return journey to our base camp. I had made arrangements for an old Musgrave Range aborigine to meet me at Mount Conner on the way home. With his guidance we were to go to a water hole called Erliwunyawunya (Plate III), fill the canteens and everything else we

had with water, and make a dash of a hundred miles across a waterless desert to Piltadi, in the Mann Range (page 101).

Unexpected Guests Change Plans

But things did not work out according to plan, as so often happens in dealings with primitive people. By the time we had reached Erliwunyawunya, about 200 aborigines from the mortuary rituals of a man recently dead had attached themselves to our party.

Since we obviously could not carry enough water or other supplies for so many, we had to recast our plans and follow a circuitous route along a line of small springs to Oparina on the western end of the Musgrave Range. From there we could reach Piltadi over a much shorter "dry" stage.

Erliwunyawunya, our camping place, was a large basin or rock hole that fills after heavy rains. During the dry months of the year, the water it contains stagnates and becomes progressively greener and fouler.

Although the aborigines seem to be able to drink this water without ill effects, they prefer, whenever there is a sandy margin, to drink from a hole dug in the edge—a thoroughly sound idea, because all the decaying material is filtered from the water in its passage through the sandy bed. For ourselves, every drop of water that we drank, with one exception, was thoroughly boiled (page 96).

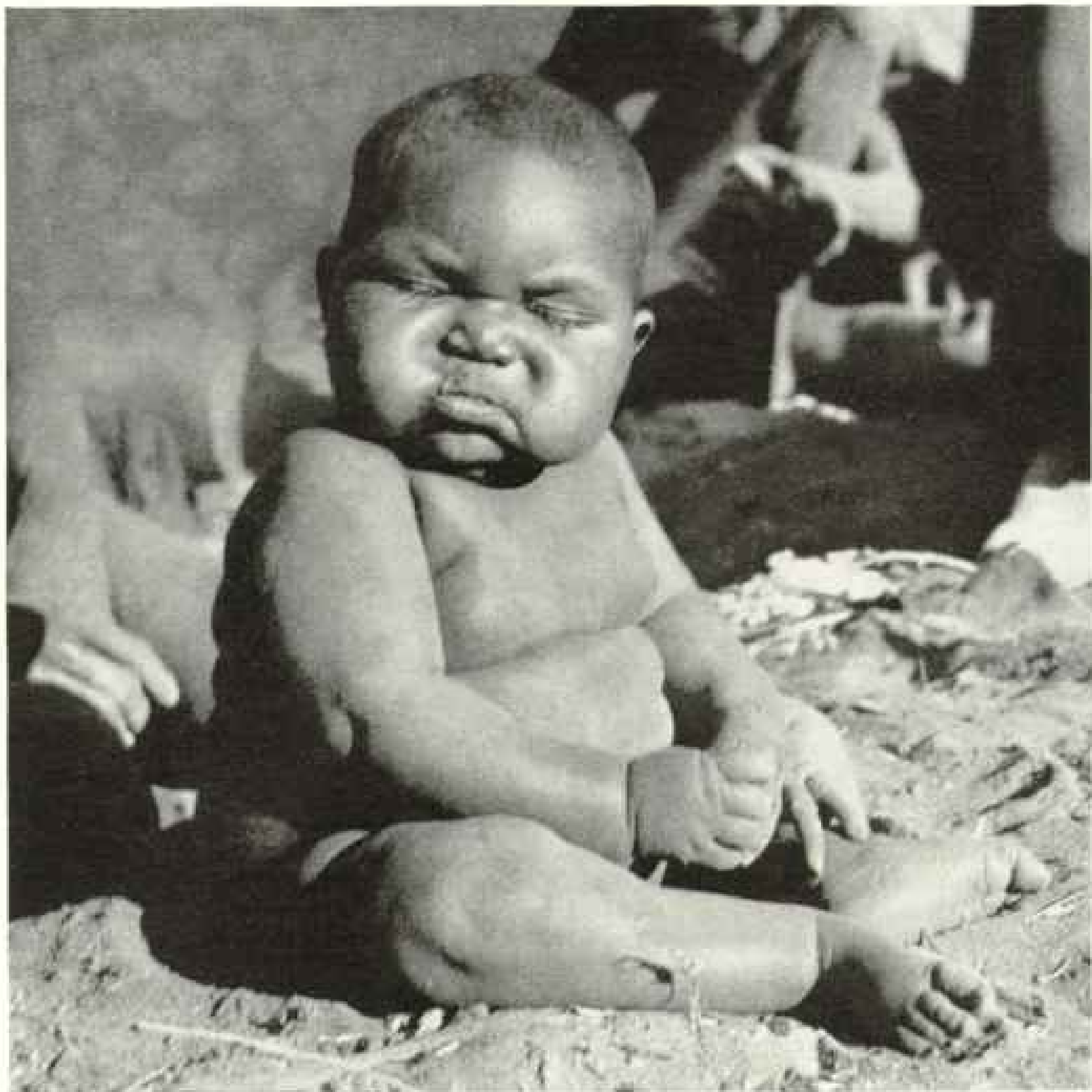
We traveled as fast as possible on that journey to Oparina, so that we could leave as many of those aborigines behind as possible. So successful were we that, when we arrived at our destination, we did not have many more than our original number.

At the lunch camp, in the middle of the fourth day from Erliwunyawunya, Tjundaga, without consulting me, emptied the last drop of water from the canteens to give one of his friends a drink.

This did not place us in any real danger. Oparina was only about four hours' camel journey away, and all previous reports, both from explorers and our own natives (although I was a bit suspicious about their "big waters"), spoke of it as a good permanent spring.

Nevertheless, the moment I knew that all the water was gone, I became unaccountably thirsty. This was thoroughly foolish, for I had had ample to drink at the midday meal. I suppose that I was subconsciously, but not consciously, afraid of dying of thirst, a not surprising mental trick when so much depends on the reliability of the water holes ahead.

By the late afternoon, however, we had reached Oparina, which lived up to its repu-



"Don't Bother Me When I'm Playing"

Fat and saucy, a native baby thrives on a diet of mother's milk, white grubs, and honey ants. The child's home is in the Mann Range (text below), where previous travelers' reports indicated that the country was too bad to support even aborigines. The author found the aborigines particularly fond of their babies, always fussing over them; he never saw a child spanked (page 89).

tation. It was a deep, clear spring at the mouth of a gorge. I decided to stay here for a few days to learn something of the training and initiation of the aboriginal youth.

The Mann Range was the home of the Pitjendajara tribe, of which most of my informants were members. Here I hoped to gather an almost complete picture of the tribal lands, the associated myths and legends, and their totemic relationships.

These Pitjendajara folk have equipment possibly simpler than that of any known race living. The men possess little else but spears

and spear throwers; the women, wooden carrying dishes, grinding stones, and digging sticks (Plate III). They do not even know the boomerang or shield, nor do they wear any clothing.

Physically, they have adapted themselves remarkably well to the difficulties and rigors of their surroundings.

Their lack of clothing seems not to have inconvenienced them to any extent. In the dry weather, though the temperature on the still-frosty nights sometimes makes a considerable drop—I have measured it at 17° below freezing—they sleep quite well behind a



Youths Adorn One Another in the Ceremony of the Mountain Devil

Here an older boy paints a snake design on the back of a smaller one. The design on the body of each is symbolical of some reptile or bird. For pigments, charcoal, chalk rock, and red ochre are used. Afterwards there is a graceful group dance which relates in pantomime a tribal legend (page 89).

low windbreak of boughs and between two small fires.

If the night is still, this method of keeping warm is probably more efficient than might appear at first, for the heat from the fire forms a blanket of warm air above and around them. But on the windy nights, when this heated air is quickly carried away, they must become cold indeed.

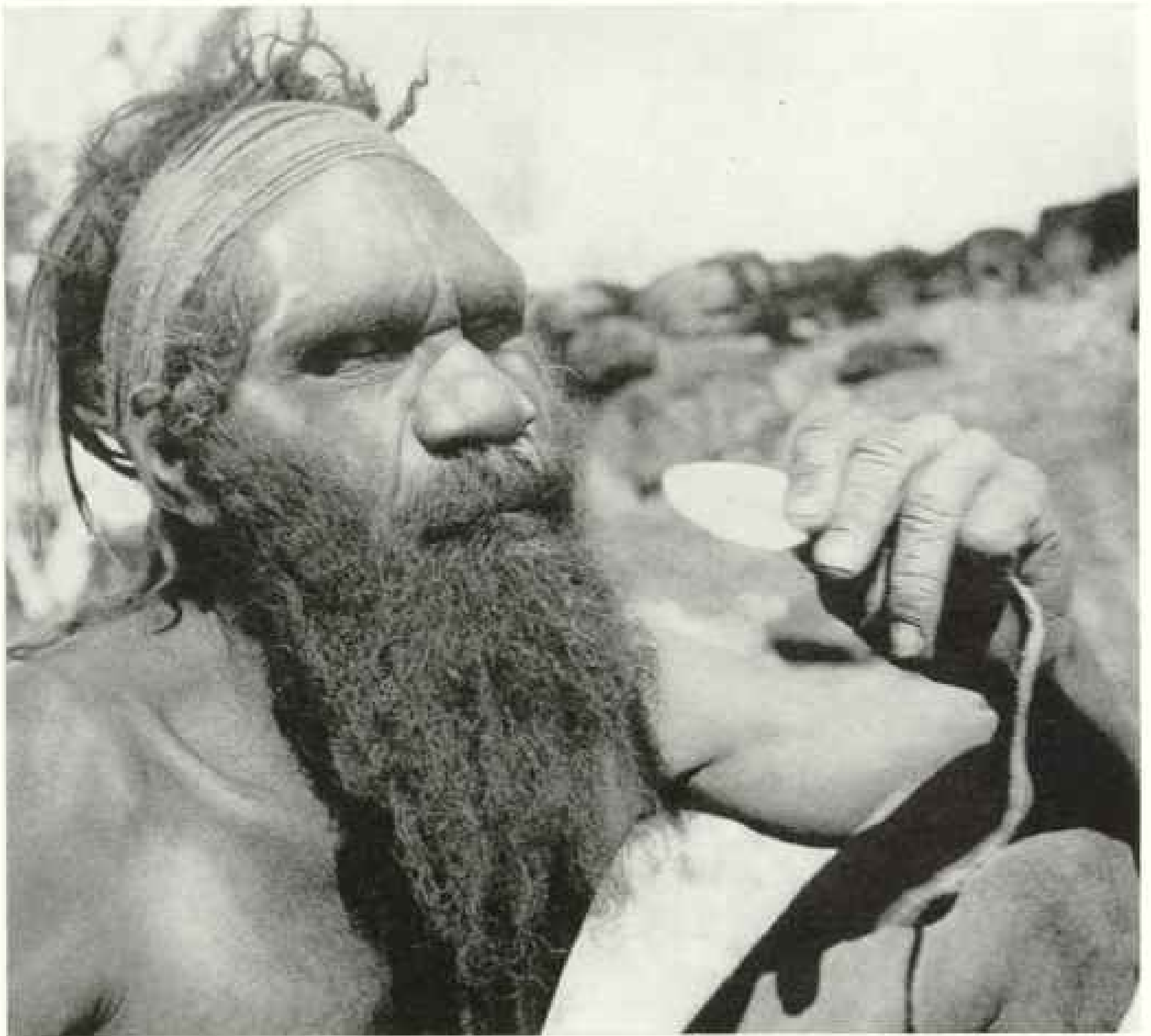
I used an abundance of blankets and, although I too slept between fires, I felt no need to discard any of my bedclothes.

Some scientists think that the aborigine has retained, or developed, a special mechanism in his skin that enables him to survive the biting

cold of the frosty nights and the high temperatures (often 120° Fahrenheit) of the summer days.

When the aborigines are traveling on a cold day, they carry blazing fire sticks in their hands. The size of this portable fire varies with the inclemency of the weather. On particularly cold, windy days it consists of a large handful of blazing bark.

I was so cold one day despite my thick clothing that I asked old Jabiaba how to make and carry a fire stick—not so simple a trick as one might imagine. When I acquired the technique of both carrying it and keeping it alight, I found it was a thoroughly sound



The Rain Maker's Magic Worked, in Spite of the Doubting White Man

After sucking a fragment of pearl shell, the chief performer spits into the air (page 101). The aborigines believe that the object is full of the "essence" of rain, which, when drawn out and projected toward the sky, forms the starting point for storm clouds. To the author's amazement, this man's prediction of rainfall three to five days after the ceremony was accurate.

idea. The hot air rising from the blazing wood kept me warm and comfortable.

Food Not Inviting but Palatable

The menu of my companions was certainly varied; in fact, they ate everything that was edible—grubs, lizards, ants, kangaroos, emus, grasses, and seeds of many kinds. I have eaten many of these foods with relish.

The large white wood grubs, although loathsome in appearance, are particularly palatable, although I must admit it took a lot of determination to eat the first one. They are, indeed, surprisingly similar to roast pork. Lizard tastes like chicken, and kangaroo like delicately flavored beef (pages 93, 102). Honey ants are as sweet as any honey.

But I have not tried all their foods. Dingo

(Australia's native dog) and cat are erased from my menu. I have my limits.

The day before we departed for the Mann Range, two young girls came in from the west and reported that all the water holes in the range had dried out, except Piltadi, the first one on the eastern end. That was low, and, before they could get a drink, they had had to pull out a number of dead dogs and kangaroos. This was the water hole that we had planned to reach from Erliwunyawunya. The arrival of that crowd of aborigines seemed almost providential.

This news was a severe blow to my hopes, for I had expected to gather much information from the research of this area. Despite the news, Lauri and I decided to give it a try. We reduced our food supplies and staff to the

minimum for a flying journey to Piltadi—if one can make a “flying journey” on camels.

If the water hole was dry when we arrived, we should have to retrace our steps immediately. The camels would probably last the double journey, provided the weather remained cool (which it did not); but if they collapsed, we could get back by carrying our own food and water for the last few days. It was a gamble, but there was little personal risk involved.

Naturally, such a change in our plans caused much comment among the aborigines. But being acquainted with most of them (which had not been the case at Eriwunyawunya), I was able to explain why I could take only three men. The others would have to wait until the “rain times.”

A Rain Maker Works His Magic

On the midday of the last afternoon one of the aborigines called me aside.

“S’pose you want’em rain, Tjamu” (my native name), “we been mak’em alonga you.”

They were actually offering to make rain for me! I accepted on the spot; first, because I could not refuse so kindly an offer, and, second, because we had no knowledge of the rain-making ceremonies of these folk and here was a wonderful opportunity right at our door.

The rituals, which are forbidden the women and uninitiated youths, center around the *ringili*, a fragment of oval pearl shell which, unknown to them, came from the northwest coast of Australia. It so happened that a colleague and I had put in a long time in finding out the origin and distribution of these pearl-shell fragments. They are passed from tribe to tribe across Australia, some of them actually reaching the southern coast—a trade route of more than 2,000 miles.

The Pitjendadjara do not know their true origin, but the myths relate how they come from a place where great lizards (crocodiles) lived in the water and ate people. Their myths were not far wrong, either.

The aborigines believe that the pearl shell is full of the concentrated “essence” of water, and the rituals and the songs are all designed to release that essence, project it into the sky, and make it form large clouds and finally rain.

This was accomplished by the leader first sucking the pearl shell to extract the essence, then spitting it into the sky, so that the droplets would form nuclei for future clouds (page 100). He took the pearl shell, lightly touched the small clumps of mulga grass (which, they claim, resemble small clouds), then returned to elaborate the previous rituals. The first was to make the clouds grow larger,

then stick together, and finally release their rain.

The rituals were a perfect example of sympathetic magic.

When it was all over, I asked the old leader, “How long before it rain?”

“Three days,” he asserted confidently, “s’pose him rain been close up. Five days, s’pose him rain been far away.”

“But,” I queried, “s’pose it no more rain?”

“Him rain all right,” answered the old man testily. “Me been mak’em rain; him always come.”

I had not the slightest faith in his rain-making powers. The ceremony was staged on August 29, in the middle of a long drought, and the normal rainy season, such as it is, does not start until late November. But it rained the fourth day, just as I reached Piltadi—rained enough to leave water in the rock holes and ensure our being able to make a complete circuit of the ranges, almost a month’s journey!

Camels Have Amazing Water Capacity

At Piltadi all the water for the camels had to be carried from an upper rock hole in four-gallon buckets, which gave me an excellent chance to measure how much camels would drink after a “dry” stage. The five camels, in two drinks a few hours apart, actually stored away 140 gallons! I do not know where they put it, for they were little different in appearance before and after the event.

We continued our journey along the Mann Range with full canteens and fuller camels. A heavy responsibility was temporarily lifted from my shoulders.

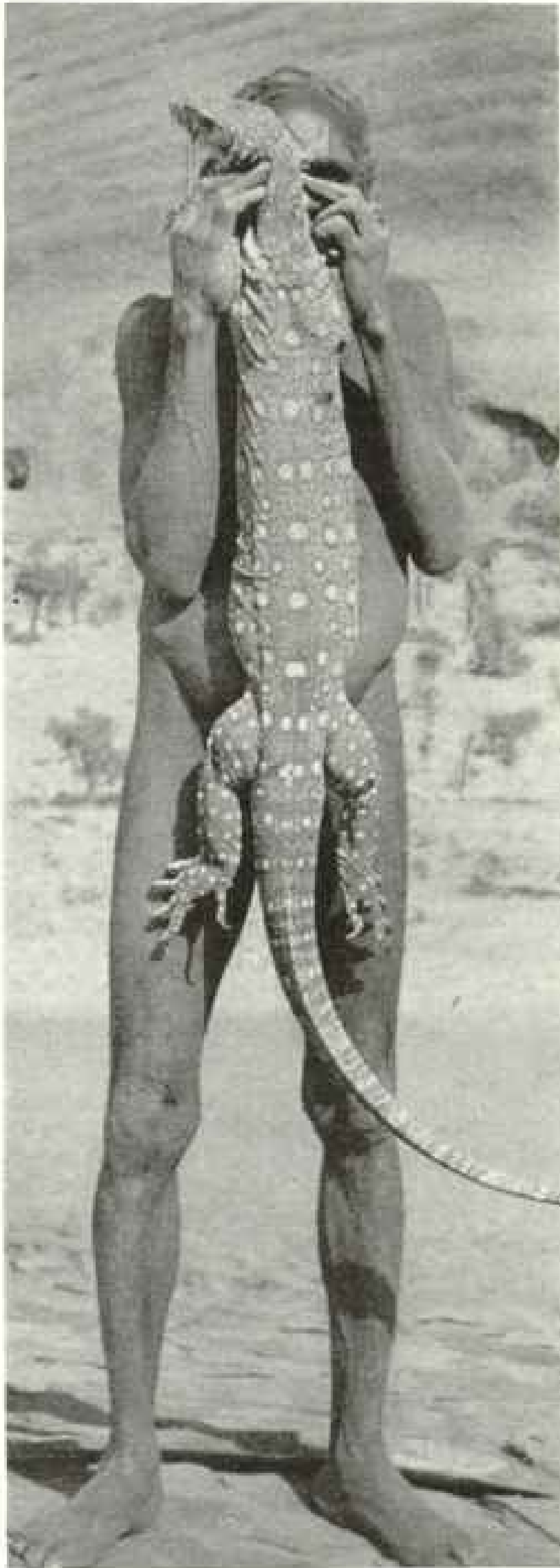
The surroundings were now rich beyond my fondest expectations with legendary stories and related topographical features. On every hilltop, creek, and valley were some striking and often beautiful rocks, trees, or creeks that linked up with the legends.

Perhaps the most delightful, although not the most important, place was that relating to the woman Malili and the curiously shaped rocks that commemorated the myths.

At the time of creation, Malili was traveling along the ranges carrying a dish of grass seed. As she looked over the plain, murderous giants sneaked up and killed her.

The dead body is now a block of stone that still shows her head, body, and legs; her dish, a large hollowed boulder; and the pile of grass seed, a low rounded boulder which the natives rub when they want to produce more grass seed.

Lauri and I had been invited to be present at the display of the *kulpidji* (sacred engraved ceremonial objects near the Kanbi rock hole).



A Giant Lizard Is Eagerly Sought as Food

When the meat supply gave out, the author was forced to eat the poultrylike flesh of the huge lace monitor, which the natives call "parentic." Hunters kill the reptiles by jabbing spears into rock fissures. Claws are cruelly sharp, but the bite is not poisonous.

Now, I was a "honey ant" man; that is to say, in the early days of the world my ancestors were honey ants, curious desert insects that store honey in the abdomen of chosen members of their own colony.* No doubt my affiliation with this group was responsible for the invitation (page 90).

We were not allowed to go near the sacred storehouse, but had to sit on a low flat rock until the *kulpidji* were cleaned, and rubbed with grease and red ocher "to mak'em look pretty fella," as the men explained.

Then, to the accompaniment of chanting and much ceremony, the sacred objects were carried to where we were sitting, pressed one after another against our chests, and laid on the ground at our feet, while the meanings of the curious designs were explained.

Each of the aborigines then reverently picked up the *kulpidji* and rubbed them over his body. Since they believe that the objects are full of "good health," they are thereby passing some into their bodies. Then they presented me with one that belonged to my totemic land, the land of the honey ant.

I never saw my tribal lands, although, for purely sentimental reasons, I should like to have done so. I had absorbed, to some extent, the natives' manner of thinking. I still remember how proud I felt when my tribal "son" passed through the painful circumcision rituals without a murmur.

The aborigines told me I could take the *kulpidji* to my "white man's" country, as long as the aboriginal women did not see it. I sewed the sacred object in many layers of bagging, but even then, I think, some of the poor old chaps almost had heart trouble every time the women came near my tent.

Where Babies Come From

It may seem incredible, but research, up to the present time, supports the fact that the aborigines are not aware of the facts of procreation. Their beliefs lay down, and they affirm, that the father has no part in the birth of the child, but that tiny spirit children (*yulanya*) come out of special boulders and go about searching for a woman that they would like as a mother. When they have made their choice, they enter her body, without her knowledge, and start life as human beings.

I had heard a great deal about the boulders from which the spirit children originated, but every time I asked old Jabiaba, in whose land they were situated, where they were, he would wave his hand airily toward the west and say, "Him that way, little bit far away."

* See "Living Casks of Honey," by Jennie E. Harris, NATIONAL GEOGRAPHIC MAGAZINE, August, 1934.



Natives Believe Deformed Children Come from This Stone

Should a woman give birth to a child with a twisted mouth or face, it is taken for granted that someone has deliberately rubbed this boulder and caused a misshapen spirit child to escape. Under ordinary conditions, no aborigine man or woman will touch the boulder, which they believe is full of malformed spirit babies.

Finally, Jabiaba admitted that they were half a day's walk, about seven miles. At last we were on something definite, and we saddled the two camels and went to see them.

We found them in the middle of a small level plain, not far from a water hole called Nirunya. They were two egg-shaped stones close together and another, slightly broken on one end, some little distance away.

Jabiaba explained that the first two were filled to overflowing with the spirits of unborn children, so small that only the medicine men could see them. The little ones had long white hair, and, when they were looking for mothers, they carried a stick across their shoulders as the women do when they are traveling.

When more children are desired by the tribe, the men place small twigs alongside the yulanya stones to entice the little sprites to leave.

I asked Jabiaba to show me how this was done, but he did so with very bad grace. "Too many babies all about," he grumbled. "No more get any sleep nighttime."

The third boulder of the group is somewhat feared, for should someone interfere with that, deformed babies will be born. If some unfortunate woman gives birth to a malformed child, everyone is convinced that someone has been tampering with that boulder.

For several days after leaving the yulanya stones, we had been without meat. The poor natives were meat hungry, and even Lauri and I were getting thoroughly tired of "damper" (a dough cake baked in hot ashes) and jam.

We sighted a few kangaroos, but they had seen us first and were busy increasing the distance between us as quickly as possible. The aborigines could never understand the limits of a firearm. Whenever they saw an animal, no matter how far away, they would always gesticulate excitedly and call out, "*Kuka bulka*" (meat, large), fully convinced that its days were numbered.

One morning, when there was a strong wind blowing from the north, I again heard the now familiar call. This time there was a possibility, for upwind, well out in the spinifex, were three emus, about a quarter of a mile away.

I slipped off my camel—thank goodness, the roaring wind drowned her cries—and crept toward the birds. There was little cover about, but by using low bushes I succeeded in getting within about 300 yards of my quarry. Then I was stumped. The intervening space was open country with only low spinifex, something well beyond my ability to cross without being seen. I set the sights, took steady aim, and hoped for the best.

One emu dropped; the others, not knowing what had happened, came running toward me, stopping puzzled only about a hundred yards away. I felt sure of the second bird, but in my excitement forgot to lower the sights. The shot sailed harmlessly over my target.

There were general lamentations from the rear, for no one but I had seen the result of the first shot. But when the aborigines saw the dead bird on the ground, they were greatly excited. They danced in a circle around me, spears erect, as they loudly chanted a hunting song. Really, I felt quite a hero!

When Tjundaga examined the bird, he found that it had been shot in the neck—a rather keen shot at three hundred yards with a heavy cross wind. I like to forget about the one I missed at a hundred yards. I assured Tjundaga that every emu that I had killed I had shot in the neck. It saved spoiling the body. I had to admit later on, under his continued questioning, that this was the only one that I had killed.

Jabiaba quickly took some of the fur string from his hair and tied the bird into a neat parcel so that we could continue our journey, for we could not take time to cook it until the evening.

The water supplies were getting low again. Every rock hole we had visited during the last few days had been dry. Three of our canteens were empty and the fourth only about three-quarters full.

Tjundaga assured us that the next water hole on our track, Puka, was a "big water"; so we need not be anxious. But I remembered our previous experience at Katatjuta (Mount Olga) and accepted that statement with reserve (page 96).

When we did arrive, there was very little there, but sufficient for our purpose, about 20 gallons of black stagnant water lying in a shallow basin.

The camels smelt the water, too, and started to cry for it: they were thirsty, but could still keep going an extra day. I called to Tjundaga to send the canteens across but not to release the camels. However, feeling tired and somewhat disgruntled, he disobeyed me and let the loads slip from their back. Instantly they were on their feet and walking straight to our precious water supply.

The camels drank every drop of that water. Nothing could stop them; they almost licked the surface dry trying to collect the last drops. I said nothing to Tjundaga. Lauri and I went back to watch Jabiaba cook the emu.

The aborigines employed a much more complicated technique in cooking the emu than that they used with any other animal.

All other creatures are simply buried in the hot sand and ashes after a minimum of preparation. But not so with the emu. The skin was first carefully stripped from the body, then stuffed with grass and the long feathers that had been plucked from the tail and back.

The legs were cut from the trunk, and all the parts—legs, skin, and body—placed in a hollow in the middle of a large fire that had practically burned out. They were then covered with hot ashes and left for about an hour.

The Hunter Gets Glory but Little to Eat

So that I could more fully understand their food-distribution system, I obeyed them myself—within limits. Whenever I shot a beast, I passed it to the aborigines to cook and distribute according to their laws, and then accepted my share as a hunter. The hunter's share was never very much.

This investigation of their food-distribution system brought me another of many surprises. The man who catches the game has no say in the cooking or the distribution of the food and receives only a lesser part of the body.

Whenever I shot a kangaroo, my share as a hunter was the head, the heart, and the lungs, an unpleasant-looking parcel that had little meat indeed. All the fleshy parts, the hind legs, the tail, and the lower part of the body were distributed to others according to tribal custom.

But my share of the emu was even less: the head, which had no meat whatsoever, and the heart and liver, which are not noted for their size. Something had to be done about the matter, for we had no meat.

I knew that I had received the share of a single man, which, according to the tribal law, was correct, for my wife was not with me. So I asked Jabiaba what I would have received had she been there.

"One leg belongs *minma*" (wife), said the old chap.

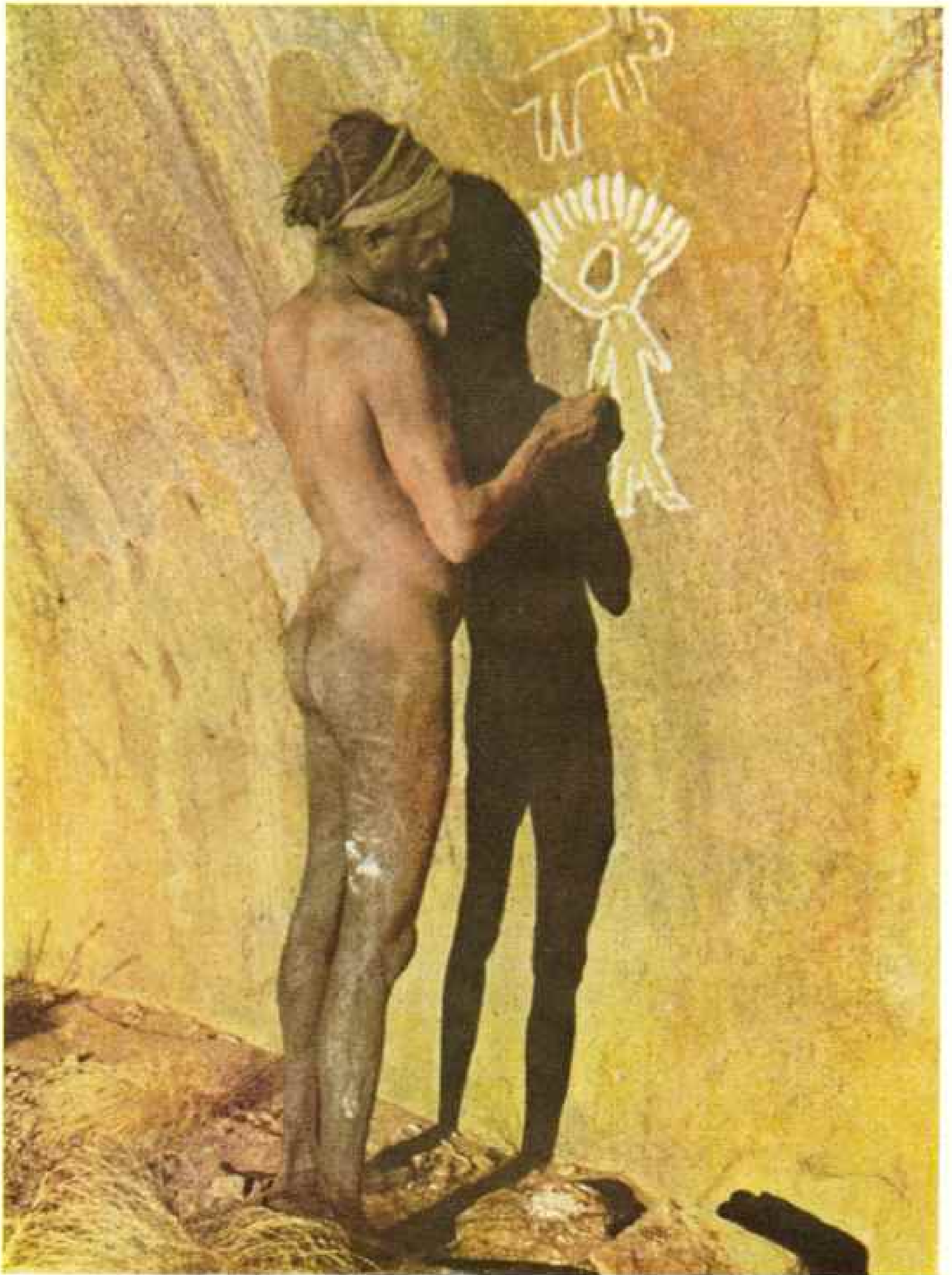
I suggested that on this occasion they had better consider that my wife was with me. Jabiaba saw my point and passed over the leg, an ample meat supply for several days.

By the middle of the next morning we were able to replenish our canteens at a rock hole and were on our way home.

We arrived at Oparina ten days later, to find everything in the tents just as we had left it a month before, even though all the aborigines except Nibiana, the wife of Tjundaga, had had to hunt for food. Such honesty is commonplace among aboriginal people.

Within another eight days we were at the base camp, packing and preparing for our return to civilization.

Australia's Stone Age Men

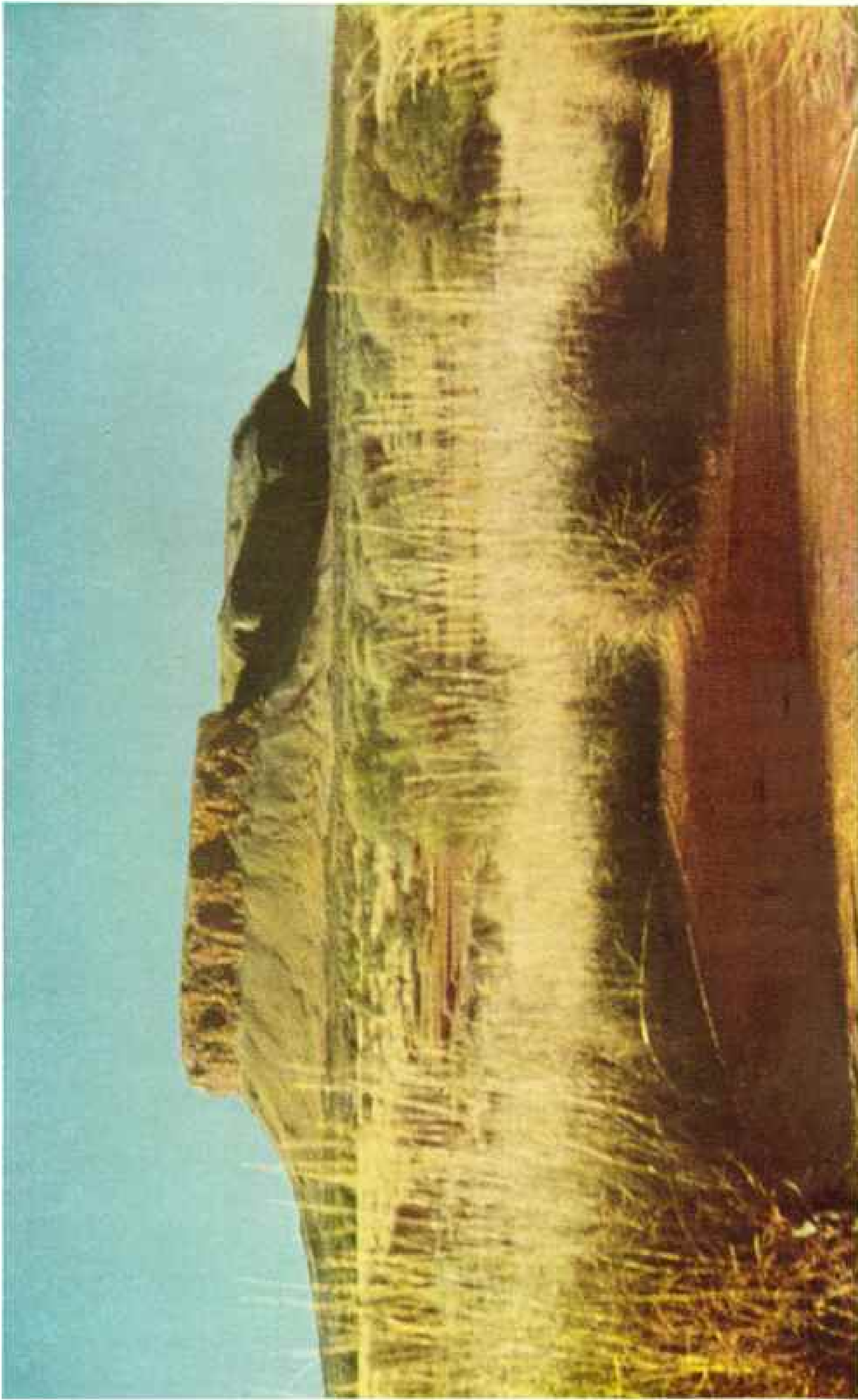


© National Geographic Society

Kodjitrone by C. P. Mountford

Customs of 20,000 Years Ago Still Exist among the Aborigines of Central Australia

Using fingers and strips of bark for tools, a native artist paints on a wall of the sacred cave in Ayers Rock a mythical kangaroo-man ancestor, wearing ceremonial headdress. The upper drawing shows a kangaroo. This cave art, like the aborigines' lives generally, is comparable to that of the Stone Age of prehistoric Europe.



© National Geographic Society

Richardson for U. P. Mountainford

Smallest of Three Great Landmarks of the Central Australian Desert Is 800-foot Mount Connor

This mighty mass, Ayers Rock (Plate IV), and Mount Olga (Plate V), are the only eminences rising above the otherwise flat, sandy plain. Their hard, resistant rock has withstood the endless erosion of centuries. Natives explain Mount Connor as the camp site of two giant Ice Men of "creation times," who, they believe, still dwell deep in icy caverns beneath a salt lake near by. During a hot spell, native women dance and sing to entice the Ice Men out to cool the air. In frosty weather the men chant to drive the giants back to their frigid caverns.



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Beside a Water Hole Sit an Aboriginal Man and Woman with All Their Worldly Possessions

The man owns a spear and spear thrower; the woman, wooden carrying dishes, prying sticks, and digging stick. These are the tools with which they wrest a living from their arid and inhospitable homeland. They wear no clothes. In cold weather they carry burning "fire sticks" to keep warm. Temperatures may descend to 17° F.

Illustration by C. P. Munnford

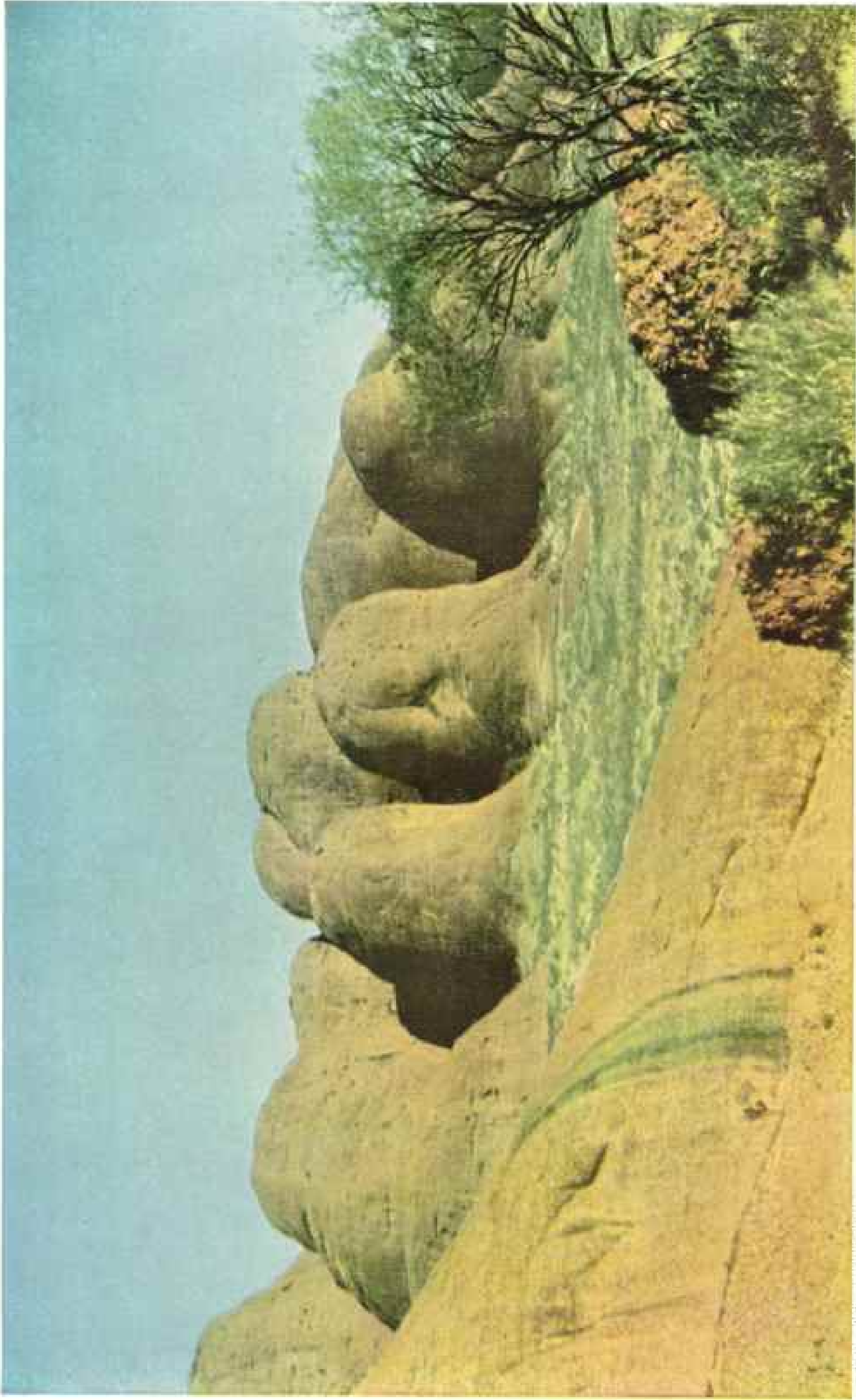


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Illustration by C. F. Mowattford

Twice the Author Scaled the Slippery Heights of Ayers Rock to See a Water Hole That Never Goes Dry

This enormous kite-shaped rock is two miles across and 1,100 feet high. Neither grass nor trees can find a foothold on its steep, smooth sides. Man can ascend only along the dangerous crest of a narrow ridge. High on the summit, reflecting the sky, is the remarkable water hole Uhart.

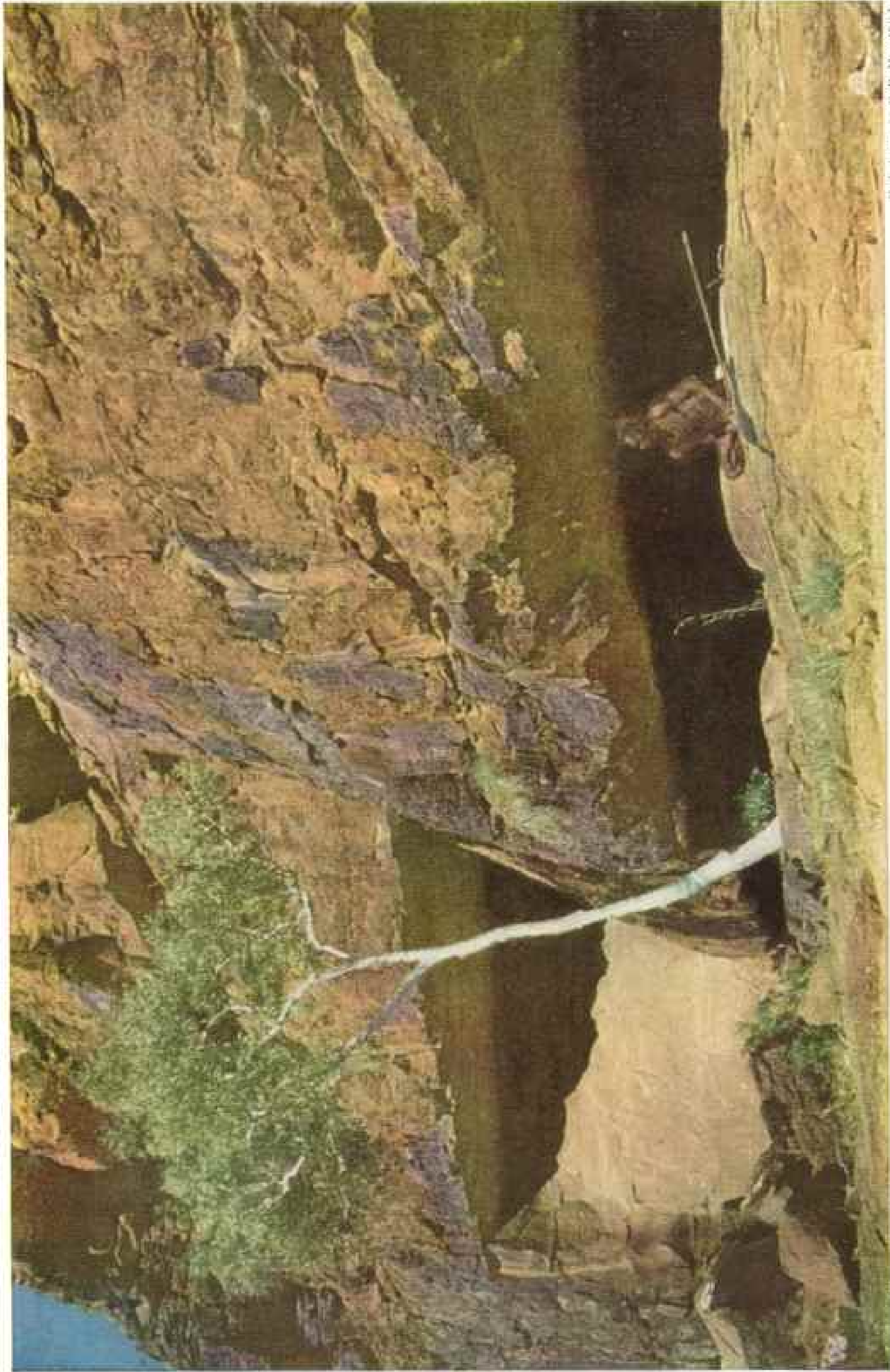


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Natives Call This Curious Rock Formation "Many Heads"; the Tallest Would Tower above the Empire State Building

White men know this hollow square of colossal pillars as Mount Olga, westernmost of the three unusual rock formations. The highest "head" reaches up 1,400 feet. The author estimated 50 pillars over 1,000 feet high, another 30 over 500 feet. A series of tribal legends explains the origin of every rocky height and deep gorge. The expedition was unable to explore the area thoroughly because the water hole on which it depended, described by the native guide as "big as the sea," turned out to be only five feet long and a few inches deep.

Reproduction by C. F. Mammitt



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Illustration by C. P. MunnDoherty

A Crouching Native Ponders the Beauty of a White "Ghost Gum" Etched upon a Somber Mountain's Shadows

This lovely tree, one of the 300-odd species of eucalyptus in Australia, seems to prefer steep precipices and rocky hillides near the continent's arid, lonely heart. Natives use the white powder which covers its trunk for body decoration. The long spear is the natives' chief provider and only weapon.

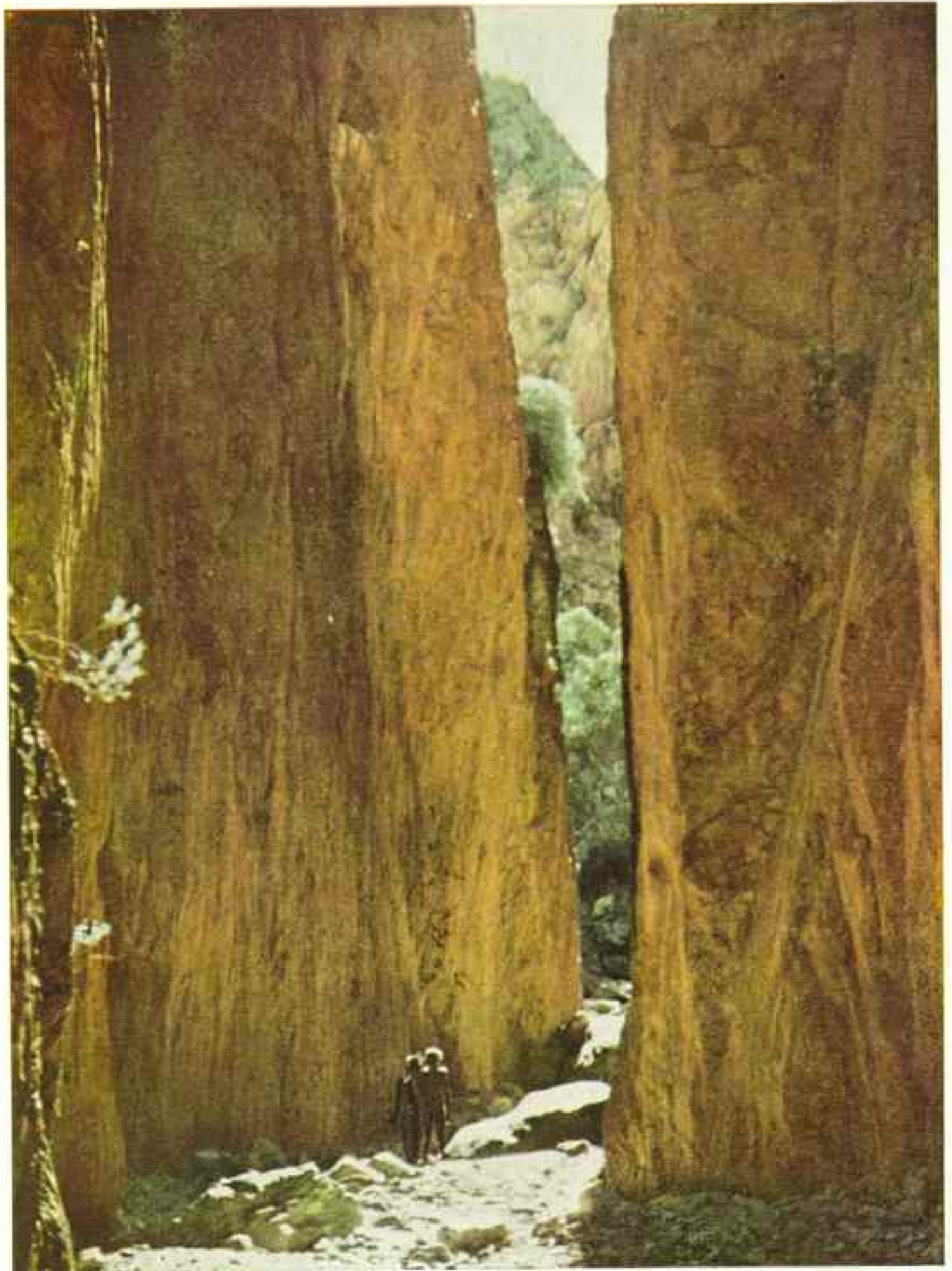


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Redrawn by U. P. Mountjoy

In a Sacred Cave for Men Only, a Native Who "Owns" Ayers Rock Tells the Ancient Story of Its Creation

The aborigines "possess" certain land areas, and all legends connected with a native's land are his personal possessions. No one else may repeat these sacred stories. The family of the man on the right has owned Ayers Rock for generations. The cave is associated with the initiation rituals of aboriginal youth.



© National Geographic Society

Illustration by C. P. Mansfield

The Macdonnell Ranges Can Be Crossed "on the Level" Through Narrow, Slitlike Canyons

Curious features of these central Australia mountain chains are the gigantic chasms, cut by wet-weather streams, which score the east-west ridges at right angles. Standley Chasm, pictured here, is 30 feet across at its floor, while its sides rise vertically for hundreds of feet. Such a gorge may be the only opening in many miles.

This Is My Own

How the United States Seems to a Citizen Soldier Back
from Three Years Overseas

BY FREDERICK G. VOSBURGH *

SLANTING rays of the setting sun were canceling out the eleventh day of the voyage from Britain when at last the crowded Liberty ship came within sight of the land.

All night the transport lay offshore while the lights of that magic coast winked at us like tantalizing sirens. "Can't land tonight. Too late. You'll dock first thing in the morning," was the word.

"Oh, well," shrugged one of us. "What's one more night when you've been away for years?" On the sleeve of the philosophical one gleamed the gold of six "Hershey bars." †

Others found their eyes automatically measuring the distance ashore, wondering whether they could swim it, and considering the chances, if any, of evading the long arm labeled "MP." After balancing home against guardhouse, all 738 of the returning soldiers eventually gave it up and tried to sleep.

Drugstores and Phone Booths

But in the dreams of one, at least, those mocking lights danced up and down. Street lights meant towns, and towns meant drugstores. In every drugstore was a phone booth; and from each booth a wire stretched straight to the most wonderful place on earth. Over it would come a voice unheard since that last gallant godspeed in dark, dismal 1942.

The long night passed, as all nights must, and they went ashore in the morning sun. The heavy bags they bore were light, and their feet felt light in their heavy shoes, for the ground they trod was home.

With jokes and cracks they tried to hide the way they felt inside.

"Easiest landing we've made since Normandy," grinned one.

"The natives seem friendly," said another, casting sheep's eyes at a smiling, buxom, sweetered miss doing man's work on the docks.

"Ah, the land of milk and honeys," cracked a third as Red Cross girls went down the line with doughnuts and, incredible sight, pint bottles of delectable ice-cold milk.

"Real drinkin' milk," sighed a lad from the South in the respectful tone he usually reserved for the expression "good drinkin' lickin'."

The cold milk seemed especially good, for the men in the warm woolen uniforms of the

European Theater of Operations found the air of their homeland oppressively hot.

Boston, where they landed, is more than 600 miles farther south than Cardiff, Wales, from which they had sailed, and the air lacked the balmy, oceanic quality, the dampness and the rawness of the island Kingdom they had left. They sweated in their ribbon-bright olive drab as they boarded the waiting train that would take them away from the dock.

Many of the men had long been suffering from the affliction known as being "ETO-happy"—a chronic homesickness analogous to the mental state of the boxer who has fought so long and taken such punishment that his mind is cauliflowered like his ears; "punch-drunk" or "slug-nutty," he stumbles when he walks and may do such incongruous things as cutting out paper dolls.

For the ETO-happy there is a sure cure, and the name of it is "home." Already it was taking effect, like the miracle-working sulfa drugs. Men who had been moody, even sullen, brightened like the rising sun of the morning.

To eyes conditioned for years to the shorter distances and smaller dimensions of many appurtenances of life in Europe, the lavish scale of America made this country seem mightily magnified.

Freight Cars vs. "Goods Wagons"

Freight cars in the railroad yards seemed vast in proportion to the little "goods wagons" of Britain and the "40 and 8" cars of France.

Automobiles were standard size, with hardly a midget among them. The soldiers marveled at their size and number—shining, streamlined cars thronging the busy streets or arrayed in resplendent rows in factory parking lots.

In wartime England the workers came and went by bicycle, and you could fly over the island every day for years without finding such arrays of parked automobiles as greeted the men fresh off the boat. Prewar cars, yes, but they did not look it. Here a workman came to

* Lieutenant Colonel Vosburgh, a member of the NATIONAL GEOGRAPHIC MAGAZINE editorial staff, served for three years in England, France, Luxembourg, and Germany as an intelligence officer with the Eighth and Ninth Air Forces.

† Soldier slang for overseas stripes, each denoting six months' service abroad; derived from Maj. Gen. Lewis B. Hershey, who, as Director of the Selective Service System, launched millions of military careers.



International News

An Easier Landing than the Ones in France

Comely Wacs wave ruby-nailed hands at a lucky Seventh Army soldier, greeted as the 100,000th GI to debark at the Port of Boston. Like him, the man behind wears the Seventh Army shoulder patch, a pyramidal red, yellow, and blue figure symbolic of the letter "A." On his left sleeve are five "Hershey bars," each representing six months overseas. Below them slants a service stripe, denoting three honorable years in the Army. The heavy barracks bags feel light on the last few steps to the soil of home.

his lathe in a sleek bullet-shaped car of a type reserved, in Europe at war, for a cabinet minister or a three-star general.

As the soldiers tramped aboard the train, the long one-celled cars with doors at each end seemed strange after the many-celled cars of Europe with doors at the side (page 116). But somehow it seemed good, like home.

As if they were at home indeed, the men relaxed on the green plush seats and shed the too-warm battle jackets. The long cars filled with men and voices, in gay, excited ribaldry. But in a flash the language changed as comely Wacs walked through the train to answer questions.

"Yes, boys, you'll have real sheets on your beds."

"You'll only be at the reception center over night. They know you're anxious to get home and they get you out in a hurry."

The tone of the talking had swiftly changed to friendly boy-girl banter. The soldiers' favorite words had died, as if a dose of DDT had swept through the train.

"Boy," said a serious-minded youth, "we've got to fumigate our language, now we're home!"

Stifling in New England's late-summer heat, the men began opening the windows. They stuck, and an all-out attack was launched, amid observations to the general effect that these so-and-so things were harder to open than a so-and-so Kraut pillbox. One soldier stoutly maintained that he liked it; sticking car windows, he said, made him feel he was really home.

With a jangling jerk the train lurched forward. "They've still got the same old engineer," a private, first class, jeered. "This is America, all right."



Major Pauluk from York

Eyes Glazed with Fighting and Fatigue Saw Fleeting Visions of Home

Three weary infantrymen take a break on a muddy hillside on Okinawa before going on to capture a Jap strongpoint in the last tough summer of the war. These veterans have their weapons in easy reach. At right, muzzle up to prevent fouling by mud, rests a Browning automatic rifle. On the rock at left two bazookas lie ready. Note C-ration can in the mud and that many-purpose implement, a steel helmet, inverted to hold water for washing.

As the clickety-click of the wheels increased, the engineer cut loose with a quadruple whistle blast wholly unlike the comparative peeps emitted by Europe's discreet locomotives. "Whoooooo-whoooooo-who-whoooooo," it came drifting back, deep notes strangely haunting and stirring as the voice of one long dead. For a few seconds nobody said anything.

Boxcar Names Spell Home

Even the names on the boxcars spoke with a strange, spine-tingling eloquence: Great Northern, Union Pacific, Pennsylvania, Grand Canyon, Rio Grande, Santa Fe—names redolent of home and the open spaces, where a man can wander, free, and stick his head in the clouds, and maybe do a little fishing. . . .

As the troop train chugged through the streets of Boston and the outlying towns, it suddenly became as conspicuous as an actor on

a stage. Even the most cynical soldier felt the warmth of this welcome home.

There had been a reception in the harbor—an Army tug, with a band and big welcome banners, and Wacs on the upper deck dancing with each other while dance-hungry GI's watched across 100 tantalizing yards of Boston Bay. But that had been an Army show, stereotyped, impersonal. This was different. This was a civilian welcome, spontaneous and individual.

Thousands upon thousands of returning veterans had passed this way in the long months since the Germans surrendered. Waiting our turn, we had been "sweating it out" for an interminable time before at last our own particular dream boat came home. By now, we thought, homing soldiers would be an old story to Americans. But it was not so. These people came running. They remembered.



U. S. Army Signal Corps, Official

"These Cars Are Like the Old Sidewinders We Used to Ride in England"

Soldiers en route to Britain on furlough board third-class coaches at Etretat, France, bound for a Channel embarkation point. Such cars with doors opening at the side and with no passageways were tricky to the uninitiated. Sometimes GI's opened the doors unwarily and found themselves alighting on the wrong side, in danger from an oncoming train.

Factory windows blossomed with heads and shoulders, male and female, arms brandishing whatever came to hand. One girl waved her welcome with an old pair of slacks. People stopped in the streets and waved. Train whistles roared and car horns blared.

On an upstairs porch a woman with a baby in her arms dashed to the rail and waved till we were out of sight. Perhaps, in a way, she was waving to her own absent soldier husband. An older woman in a window kissed her hand at the boys, maybe thinking of her own son far away.

Youngsters were everywhere, going to the movies, playing ball, wandering along the streams, Huck Finn fashion; or going down to the "deepot" to meet the train.

"More kids than I've seen in any country since Germany!" an infantryman exclaimed. "That was certainly a baby factory, under Hitler."

"These are the first kids I've seen in three years who don't holler for 'choon gum,'" another observed.

Everywhere in Europe sweet-starved kids had begged with awful earnestness for the luxury of a stick of gum.

Things are surely different here, the soldiers thought. All morning it had been dawning on them how rich was the land in which they lived. How wonderfully well-fed the youngsters looked, after the pinched, peaked children of the war-wracked Continent!

Front Porches and Goldenrod

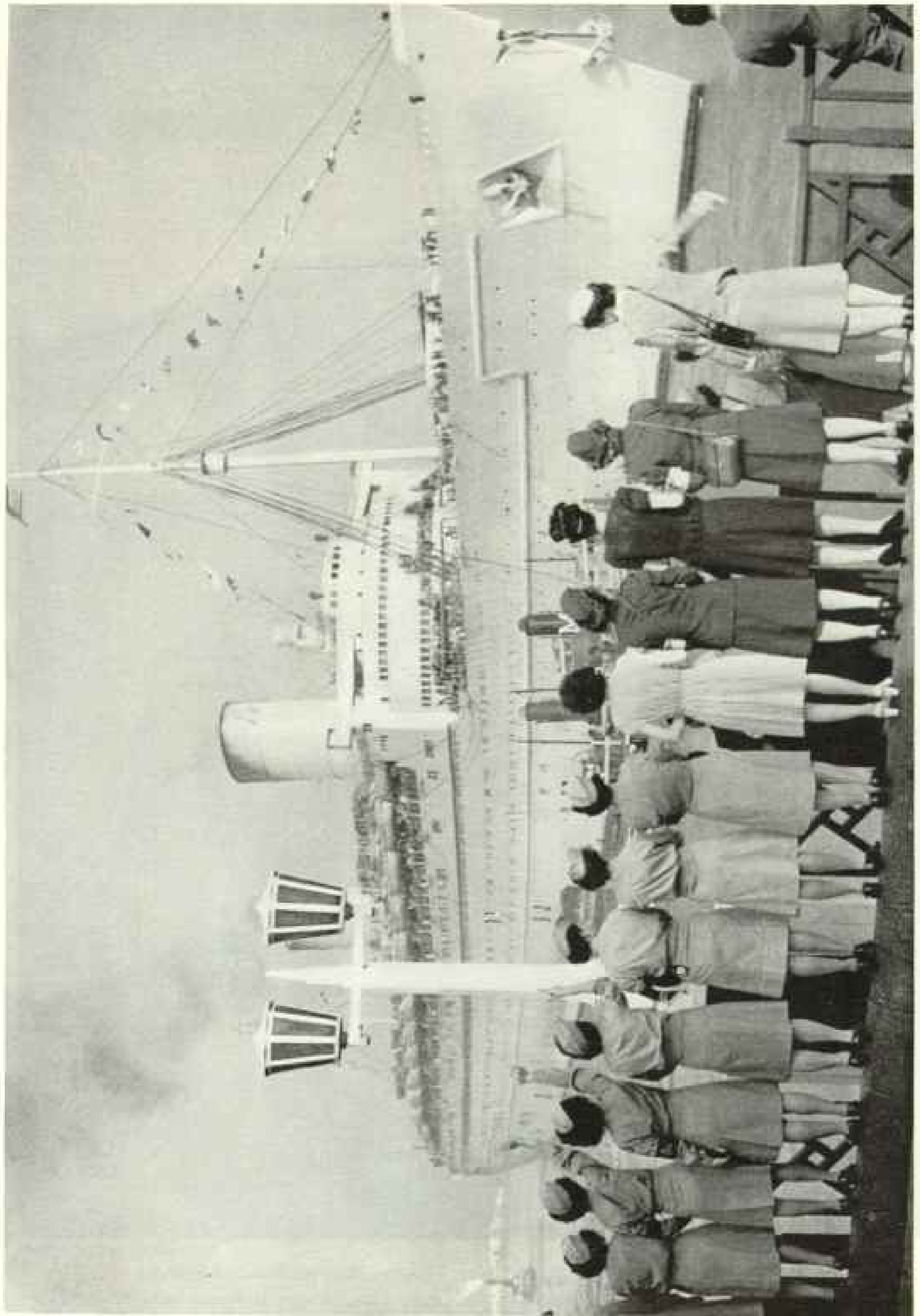
Many things the soldiers saw as if for the first time—simple, homely American things, such as wooden houses with big front porches. In Europe most of the houses were stone, brick, or stucco, and the porch was just a brief transition stage, not a place for rocking, swinging, or courting on balmy summer evenings.



F. S. ARNE STANT CORP. 006141

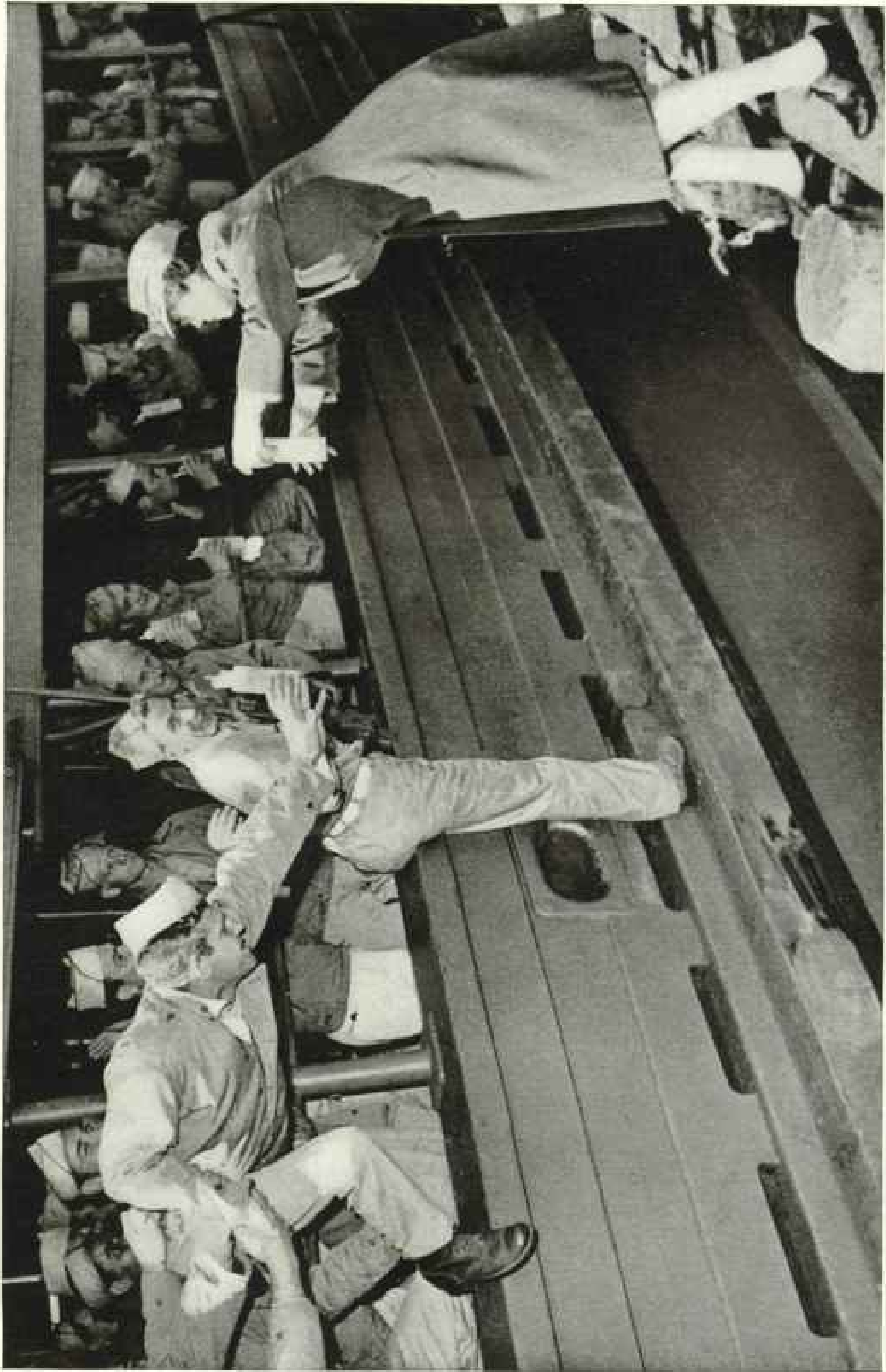
Is Life "Tough in the ETO"? Not Today—They're Headed Home!

Smiling infantrymen of the 44th Division board a train for a staging area in France on their way to the United States. Many troops traveled for three or four days in rough-riding little railroad cars similar to those of "40 men or 8 horses" capacity which their fathers rode in World War I. Steps lead to the brakeman's cab.



Arms

Army Nurses, Waacs, and Red Cross Girls Cheer as Britain's Mighty Queen Elizabeth, World's Largest Ship, Brings 15,000 Home



APRIL

"Real Drinkin' Milk! Boys, Let Me at It"

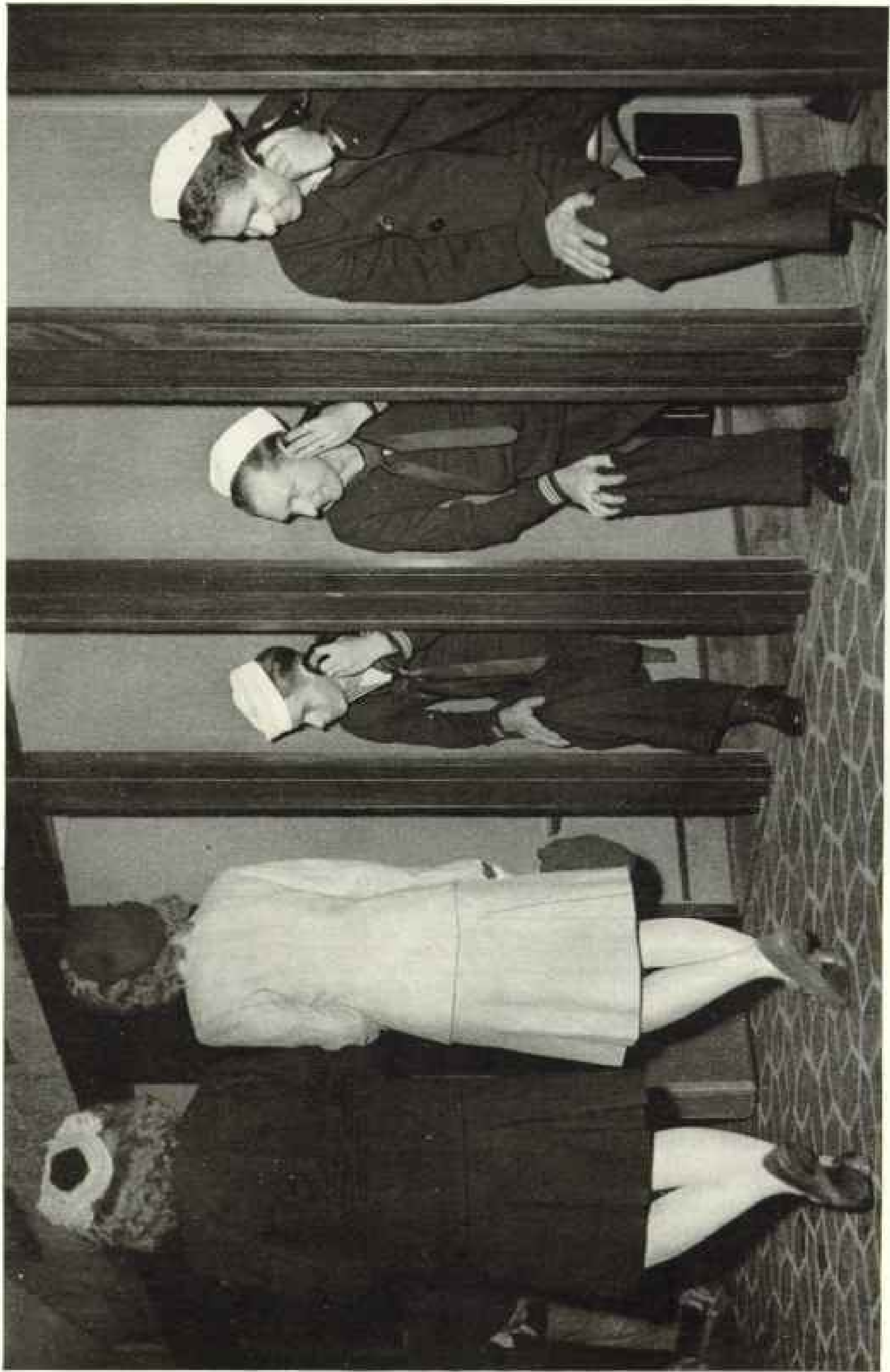
For the engager had at the left, this is the "home stretch" he has been waiting for. The containers of ice-cold milk handed out by Red Cross workers at San Francisco had these home-coming veterans of the Pacific reaching far over the side (page 113).



Star Photographer Edwin L. Whitford

As American as Pie à la Mode Is the Glory of a White-painted Wooden House

With detachment bred of years overseas, returning soldiers see for the first time the simple beauty of such scenes as this in Litchfield, Connecticut. The snow of a New England winter strikes a pleasing, poignant chord for those who have "sweated out" the war on torrid tropic isles (page 112).



"Hold the Wire a Minute, Honey!"

Three sailors off the aircraft carrier *Midway* were calling up the best girls that sailors have in every port—according to the photographer—when two interesting unidentified craft called serenely past the booths at the 79th Street Pier, New York. Result: a simultaneous "eyes right" and a momentary halt in the phone conversations.

International News



International News

"Time to Wake That Army Boy Sleeping in the Phone Booth"

To keep tired service men from missing early trains, the United Service Organizations use a callboard system in Grand Central Terminal and Pennsylvania Station, New York. The blackboard lists Army, Navy, Coast Guard, and Allied men as sleeping in odd places, including the piano. But a good soldier or sailor can sleep any time, any place.

It was almost worth being an exile for years to behold with these newly opened eyes the glory of a white-painted wooden house, as American as pie à la mode; of elm trees arching a village street, or goldenrod gilding September fields.

The woods here seemed oddly unkempt, after the highly manicured, parklike forests of Europe. Dead trees were lying where they fell; in France or Germany every scrap would have been lugged away long ago and added to the woodpile. A pioneer people who fought the forests, we do not yet appreciate how precious is a tree.

Corn waved green in the fields as we passed.

In Germany the commonest crop was potatoes; in England, wherever we looked, grew cabbage and Brussels sprouts.

"Fewer flowers here than in England," said an Air Force man, "and the grass is not as green. Less rain."

"That's right," a comrade said. "But look at the tomatoes on those vines—twice as big as the little plum-size things you get in England."

"Hey, there's an autobahn!" exclaimed an Armored Force lad whose outfit had followed such landscaped, dual traffic arteries deep into the heart of Germany.

"Learn English," chided an Engineer companion. "That's no autobahn, but a good old U. S. express highway. We've had 'em since Hitler was a peanut politician trying to get himself elected dog-catcher."

Engineers Spot New Construction

The Engineers noted, too, that much new construction had taken place during the war, particularly new industrial plants, additions

to old ones, and housing for the teeming war workers. This impressed especially those who had seen the bomb-flattened industrial cities of Germany.

"Here you see new construction," said one. "There all you saw was new *destruction*."

Not yet had they become accustomed to a land where the cities were not cratered and rubble-strewn, the railroad yards not torn to bits, and the bridges not all dangling in the rivers.

Towns along the way boldly told you their names in big letters on the railroad stations. Until the final stages of the war, this had not been the case in England. When invasion



Staff Photographer Willard B. Culbert

"We're Back in the Land of Milk and Honeys"

In the harbor craft that bears them from ship to shore, these veterans returning through New York crack jokes and sip ice-cold fresh milk. Many overseas soldiers have gone years without a drink of milk and have almost forgotten the taste of the genuine article, neither powdered nor canned.



"OK, Chief. I'll Have the Works"

Mud packs, massages, shampoos, shaves and tonsorial trimming with the latest-type tools—all these are unaccustomed luxuries to such returning Americans as this Third Army soldier at Camp Shanks, New York, preparing to put his best face forward when he meets the folks.



Staff Photographer Willard H. Culver

First Meal Ashore Is a Steak Dinner—17 Items

Behind loaded trays at Camp Shanks, GI's launch the big push. Without resorting to knife, fork, or other weapons, a young staff sergeant wearing a combat infantryman's badge attacks a large steak singlehanded.

threatened, the British obliterated every name. If they were to fight in their streets and their fields, there was no sense giving the enemy any help in getting his blasted bearings.

The train sped on, and past its windows raced the pulse-quickening parade of Americana—"diner" lunchrooms, shoeshine parlors, baseball diamonds, handsome schools in the poorest towns. There was a big red-faced Irish cop; here a railroad section gang, bossed by a little Italian. Now and then a blatant billboard blotted out a verdant view.

The Birds Are Different, Too

Across a meadow a goldfinch made his way in characteristic looping flight—up-down, up-down, up-down—as if every few seconds he ran out of gas. From lawn to elm a flicker flew, his beating wings making a haze of gold punctuated by his white shirttail. On the grass the robins probed for worms, pausing now and then with head on side as if making a grave decision.

Other birds in other lands came back in sudden recollection. There was a day on an advanced landing ground in Kent. A pair of skylarks had made their home here. But invasion of Europe was in the wind, and a new kind of bird had taken over the field—big, burly, roaring Thunderbolt fighter-bombers. The grass had been cut, and fat rubber tires raced right over the precious nest, again and again, while the field rang to sounds not much like a skylark's song.

Here was a real invasion problem. The birds moped about, sad little bundles of flustered feathers. But you can't keep a skylark down for long. That afternoon the indomitable male went winging up from the tire-bruised grass and soared skyward, singing, like a bubble borne upward by the flood of his own lilting song. Higher and higher he went, singing all the way, until at last he was lost to sight and sound, as if he had sung himself completely loose from earth, its troubles and cares.

Europe's tremulous-throated blackbirds and thrushes, its shy nightingales and neat little robins, its stilt-legged storks on the chimney tops, its rooks calling about the old castles, its cuckoos crying in the budding trees—each of these has its own appeal, proclaiming quietly that Nature lives on, untroubled, though men fight and kill.

But to an American, only the birds of his homeland are interwoven in the strings of his heart, as grasses and straws are interwoven in the building of a nest. The very sight of these old friends is one more welcome home.

Even when we were far at sea a feathered

delegation had come aboard—a flock of nuthatches, quiet and confiding—to rest in the rigging and ride a while before going on about their inscrutable bird business. Just as land birds greeted the discoverer of America, so they had saluted its rediscoverers returning from the war.

Newspapers with Meat on Their Bones

When peering from the troop-train windows palled, some of the soldiers resumed leafing through the newspapers bought in Boston. After living for years on the thin ration of news provided by the skimpy four- and six-page papers of Europe at war, the reader felt as if he were suddenly drowning in a sea of newsprint!

Huge headlines hit him between the eyes, strip after strip of comics beguiled him, and cunning, spectacular advertisements grappled each other for reader attention. In some papers a man on the track of the news had to burrow his way through endless pages of ads, with often only a column or two of news on a page to interrupt the assault on his sales resistance.

These thronging advertisements bespoke a standard of living fabulously high compared with the mere subsistence level of life in belt-tightened Britain. True, many items were scarce and rigidly rationed here. The civilians of America had sacrificed much and accomplished the incredible in this two-front war.

Every soldier had cause to be aware of that fact, for many saw the vast tides of war material which flowed unceasingly to the fronts, and all were well acquainted with the bountiful "chow" which made ours the best-fed Army ever to take the field. But now it was apparent that Uncle Sam still possessed plenty more to throw into the scale, had more years of war made it necessary.

The Resources of America

"How lucky we are!" one soldier thought, as he mused on America's resources—forests of oil wells in the great Southwest, oceans of wheat rippling in the sun of the Plains, countless cattle lowing on the western ranges, cotton ripening in the Deep South, mountains of metal on the Great Lakes and in the Rockies, giant dams wringing power from surging rivers, industrial plants turning out marvels of mechanics and chemistry.

He thought of resources of another kind, too—human resources, compounded of the fusion of men and women of every origin and yielding the energy, ingenuity, and "know-how" to harness and use the inanimate resources of the land.



AP from Press Ass'n

Hearts Leap as Father and Son Meet for the First Time

Admiration was mutual when the smiling mother introduced her private, first class, husband to the equally first-class son he had never seen. Returning from Europe with the 86th ("Black Hawk") Division, the father beclined to this happy home reunion in Upper Darby, Pennsylvania.

Deep inside him the soldier was thankful—not smug, but humble, and fully conscious that all this was only by grace of God. He knew that many things were wrong, not only with the world but with his country, and only hoped that in setting them right Uncle Sam would acquit himself as well and as wisely as he and his nephews and nieces had done in helping to win the war.

The sun was high and appetites were soaring, too, when the train at last slowed to a halt at Myles Standish, one of the Army camps which have burgeoned all over America. Through here thousands of soldiers filed, bound overseas, in the tense days of war—strong tide of picked manpower ebbing out from the New World to the Old. Now the tide was at its happy flood, and through here the thousands were funneling again—those who had lived.

In a big, cool auditorium a khaki-clad band swung into martial tunes as the veterans filed

to their seats: "Off we go, into the wild blue yonder . . ." "What do we do in the infantry? We fight, we fight, we fight . . ." "Where'er you go, you will always know that the caissons go rolling along . . ." Then, like a happy augury of free civilian life again, came a sentimental popular tune, "I'll Buy That Dream."

Memories came thronging back, of the songs America was singing when we went away. "The spurs go jingle, jangle, jingle, as I go riding merrily along." That was one. There was another more plaintive thing: "There'll be bluebirds over the white cliffs of Dover, tomorrow when the world is free."

"Not a Bad Army—After All"!

From the rostrum an officer was speaking now—straight to the point, no soft soap, as if he knew how you felt.

"We're going to get every man of you out of here within 24 hours." (Loud cheers.)



Staff Photographer Willard R. Colver

"Like a Hospital Anteroom Full of Expectant Fathers"

That's how one returning soldier described the telephone centers, taut with tension, where the men make that first call to mother, wife, or sweetheart. Here at Camp Shanks, New York, busy girls jot down the calls and give the men numbers to be announced by loud-speaker when their party is on the wire (page 128).

"If any of you men have any complaints or problems during the brief time you are here, I want you to come to see me."

He grinned.

"When I was a young fellow like you," he said, "I decided that if I ever got to be the boss I'd be darned if I'd be the boss and do the work, too. So come in and see me if you have any trouble. I'll only be sitting there reading the newspaper."

They laughed. This unpretentious Joe was OK. In a lot of ways this wasn't a bad Army. In fact, there were some things a fellow would miss . . .

Going through the chow line, then, the soldiers found themselves suddenly face to face with the enemy. German prisoners of war, each with a big PW on his back, were ladling out the good American food.

"Spoils my appetite," grunted an infantryman who had lost some good pals to just such Krauts. "The dirty unprintables!"

"Calm down," soothed another. "That's why we don't pull any details in this camp. You wanna do KP? Let the Krauts peel the spuds and scrub the garbage cans. They think war is wonderful. At least, they did when they were winning."

The well-fed Teutons dishing out vegetable soup, beef, potatoes, carrots, and ice cream brought up visions of other Germans, sorry "supermen" in ragged green uniforms, plodding homeward from the gluttoned prisoner-of-war cages to work in the potato fields which would largely determine whether next winter they should eat.

The sight of these recent enemies strolling with their frauleins in the summer evenings used to make the GI's in Germany burn with rage and hot frustration. "These guys lost the war, and here they are, home with their women, while we're still sweatin' it out!"

Well, our turn had finally come. Where were those telephones?

The telephone centers turned out to be models of quiet efficiency.

In a neat room furnished in chrome and leather a squad of genuine American hello girls behind a battery of switchboards functioned with the speed and coordination of a crack howitzer crew.

"Operator, Give Me Home!"

All the chairs were occupied, and some soldiers were pacing about, as if unable to stand still. In the chrome ashtrays, cigarette butts piled up at a feverish rate.

"Looks like the anteroom of a maternity ward," said a soldier, "with a hundred young fathers having their first baby."

As calls were placed, each soldier was given a number, and when his party answered, his number was announced. Numbers were being sung out every few seconds, and men who had endured shellfire without flinching jumped nervously if the number was close to theirs.

To men long unaccustomed to American telephone efficiency, the speed with which the calls were put through was amazing. Thousands of miles were bridged in little more than a moment.

Here at last there was no language difficulty, as in France, Luxembourg, and Germany; no "Button A" to push, as in England. That was one of the things the Americans in Britain never seemed to learn; and if you forgot to push "Button A," the person on the other end could not bear a word.

A Moment Imagined for Years

Such musings were cut short by the soldier's own number and, feeling a bit faint, he stumbled to a booth.

A man's baritone voice was saying "Hello." For a moment the soldier thought he had a wrong number; this voice he had never heard. Yet it was somehow familiar. Then it spoke again, and suddenly he knew. The boy he had left three years ago had become a man.

Now the voice of a boy, breathless from running upstairs, chimed in on the extension phone; then their mother, and old, familiar words unspoken for three years.

Another soldier, calling home, learned that his wife had just suffered a heart attack. Immediately, special arrangements were made for him and he was en route to her by plane.

Sometimes the shock of suddenly hearing the voice of a son has been too much for a mother's heart. This is especially true if the man has been believed killed or missing and through error this report has gone uncorrected. Camp officers advised that in cases of doubt

the soldier call his father, or someone else who could break the news gently.

Some men come home to find that theirs is the fate of Enoch Arden. Others hear for the first time the baby voice of a son or daughter unborn when they went away (page 126). Joy and sorrow, hope and heartache, love and disillusionment—all the emotions of human life are here in these first conversations.

The soldiers came out mopping their brows and sought refreshment.

Like the embodiment of a familiar dream was the soda fountain in the post exchange. Shining marble and chrome, it was the same soda fountain each soldier knew of old in his own home town. And the strawberry sundaes it produced were even better because they were the first in years.

Drinking Fountains and Barber Shops

The wonder of the newness of it all still remained with the men as this first day waned: a well-equipped American barber shop, a drinking fountain in which the water keeps running, copper screens on the windows.

In wartime England and France the barbers worked with outworn, old-fashioned tools.

Drinking fountains were rare, and in any case the water could not be allowed to flow continually because flowing water requires power, and fuel is scarce.

Window screens were almost never used. But fortunately the mosquitoes there seem to lack the aggressive proclivities of our own bloodthirsty breeds. Maybe the climate has something to do with it, the soldier mused vaguely as he strolled to his quarters in the fading light.

Fall was near and it was growing cool. A few leaves were beginning to turn. Another month and their red and gold glory would flaunt all over the countryside. The World Series, football games. Made a fellow feel good to be home.

Darkness in summer came much earlier here than it had in England. The moon was coming out. What was that song we used to sing in training down in Miami? "Rolling home, rolling home, by the light of the silvery moon." Well, it won't be long now. We start rolling out of here first thing in the morning.

Other lines ran through his mind as he lay on his cot:

Breathes there the man, with soul so dead,
Who never to himself hath said,
This is my own, my native land!

He looked out the window at the trees, silverplated by the moonlight, and said aloud, as he fell asleep, "This is my own."

England's Wild Moorland Ponies



Sold! The Auctioneer's Cry Ends the Freedom of an Exmoor Pony

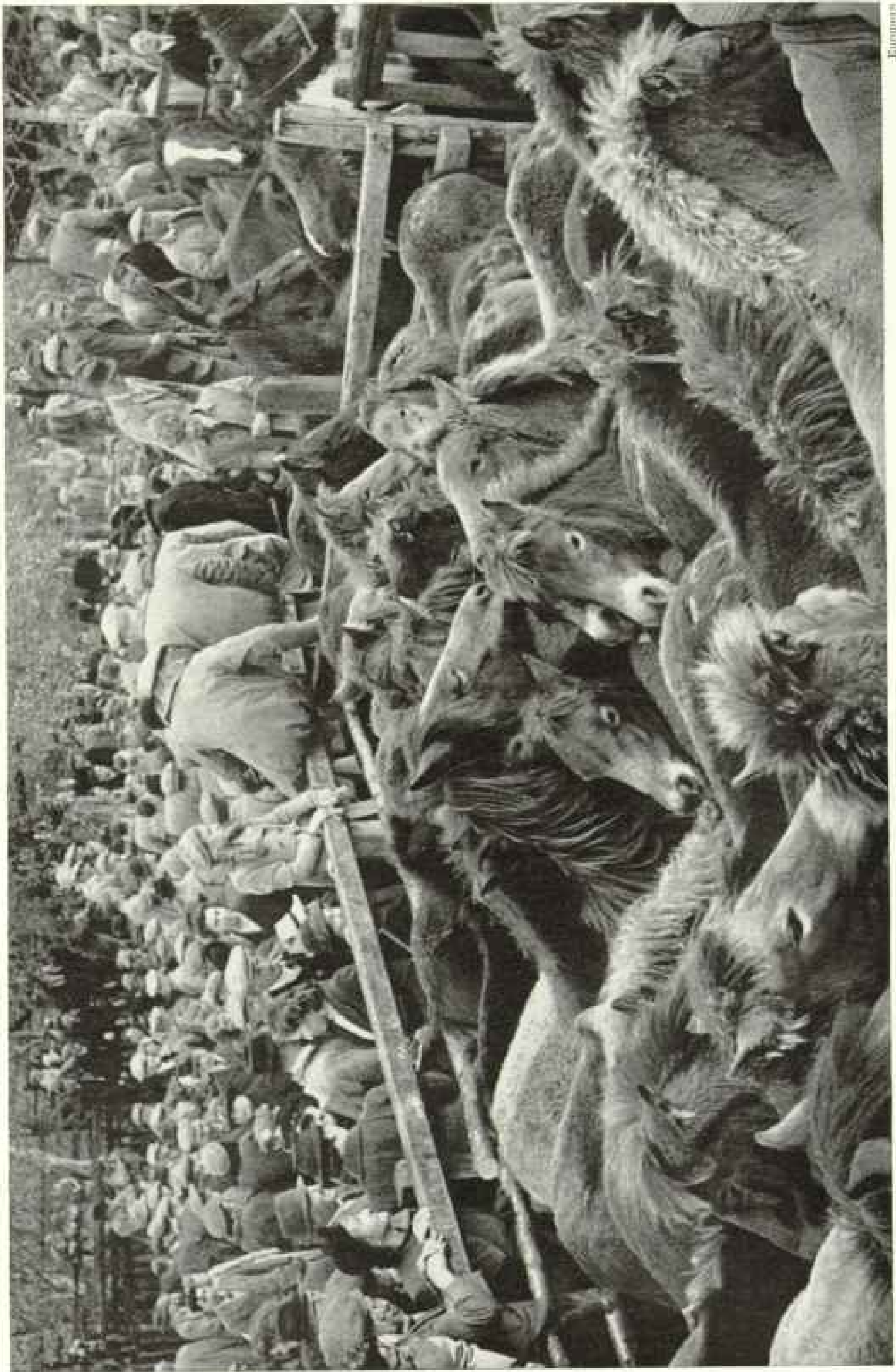
Each October wild horses of the Devon and Somerset moors are rounded up and carted off to Bampton Fair. Buyers bid them in at prices ranging from \$12 for a 6-month foal to \$60 for a full-grown animal.



Kingman

Pampered and Petted Shetlands Eye Their Cousins Arriving from the Moors

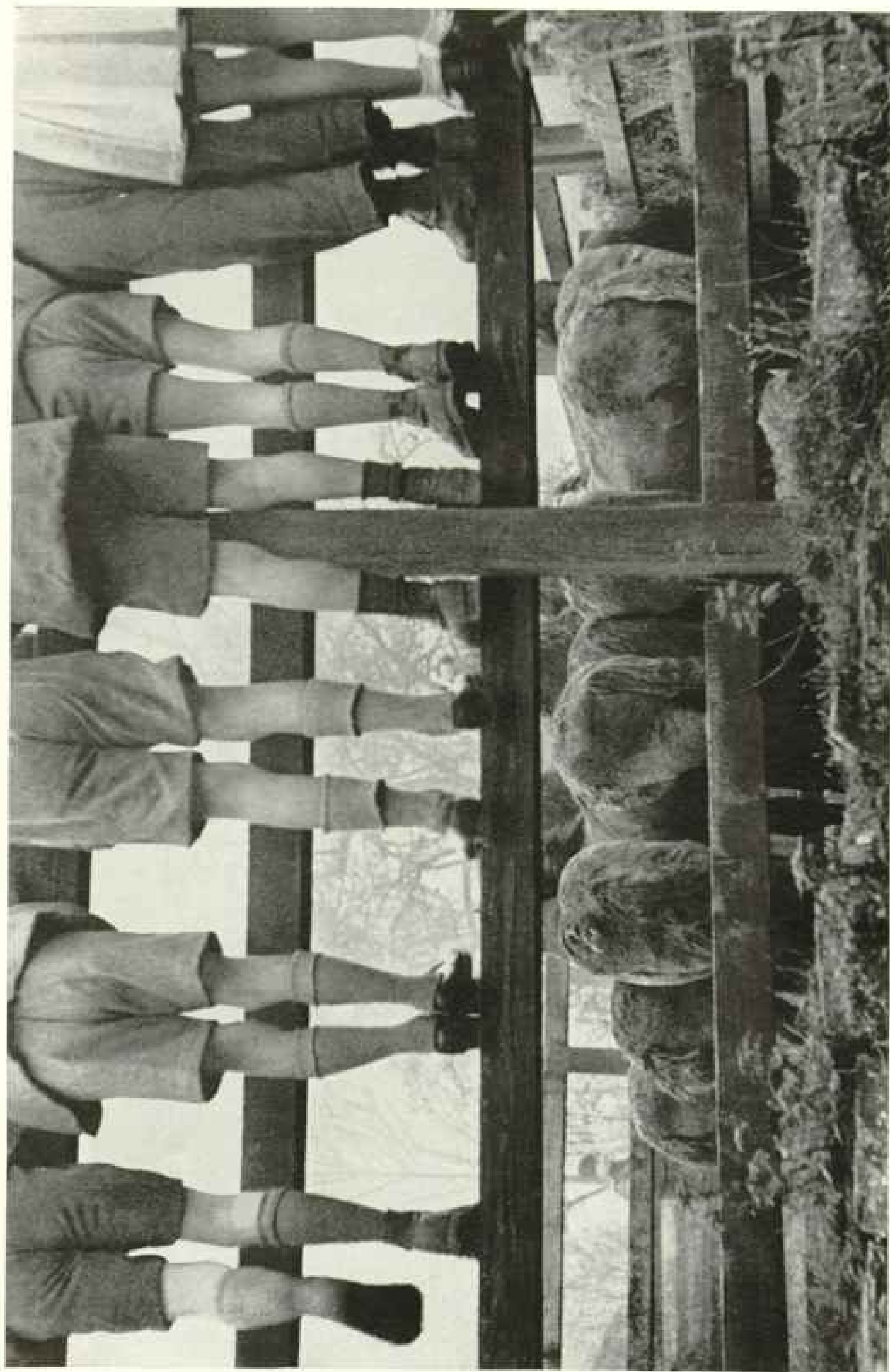
Smaller than Exmoor ponies, Shetlands, too, are sold at Bampton. Although Americans know them mostly as pets, Britons use Shetlands for a variety of draft purposes. America has seen few Exmoor ponies.



—Eumura

Penned Up at Bampton Fair, Exmoor Ponies Endure the Stares of Future Owners

"Are they buying us, or are we selling them?" the animals might well be asking as they mill about in their corrals. Grooming and carrying will remove the moorland mud and thistles from their hides, tails, and manes and prepare them for their new roles in life.



Critical Young England Mounts the Corral Fence for a Rear View of Mud-caked, Untamed Horseflesh

A lucky few of the Exmoor ponies wind up as pets. Most, however, become useful draft animals. The breed has been called the best type of pony, closely resembling the Arab in conformation. Improved by Arab and thoroughbred blood, the Exmoor pony becomes suitable for polo.

Emerson



Linnaeus

The Buyer Must Brave a Milling Mass of Kicking, Biting Animals to Capture Her Pony.

Almost as wild as the red deer of their native Exmoor are the ponies when they reach the Bampton pens. After purchase, new owners must catch and halter their ponies for the trip home. The fair has been held annually since the 13th-century reign of King Henry III. Dealers from all over Britain attend.



**"That One's About My Size." Hopeful Youngsters
View the Crop**

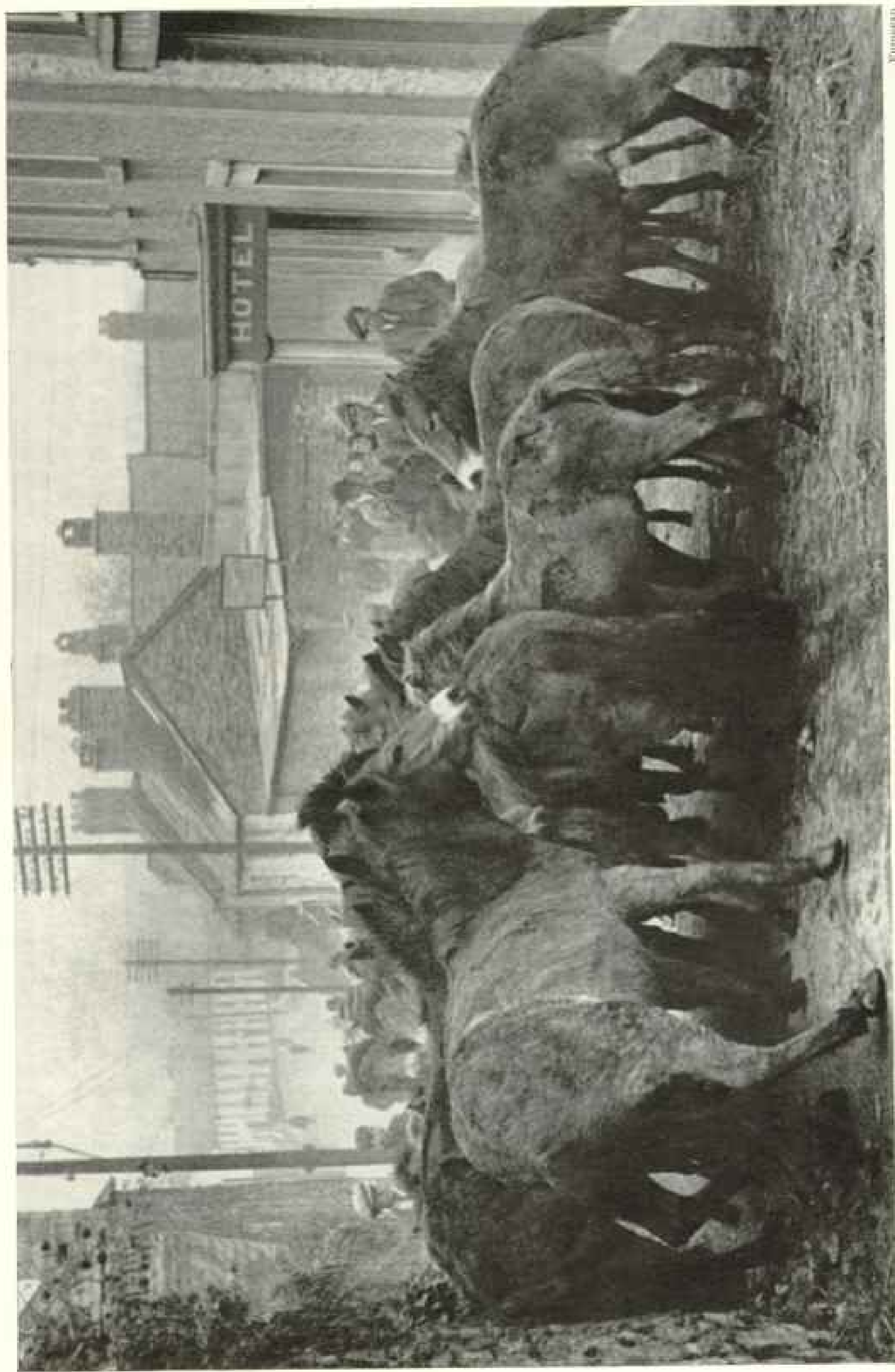
Becoming docile with proper care and training, Exmoor ponies serve well as mounts for children. Standard colors are bay, brown, and occasionally dun.



**An Irish Brogue Stands Out among the Voices
Bidding at Bampton**

Typical of bidders at the annual pony sale is this horse dealer, who has come from Ireland. When he goes home, he'll take a hundred animals with him.

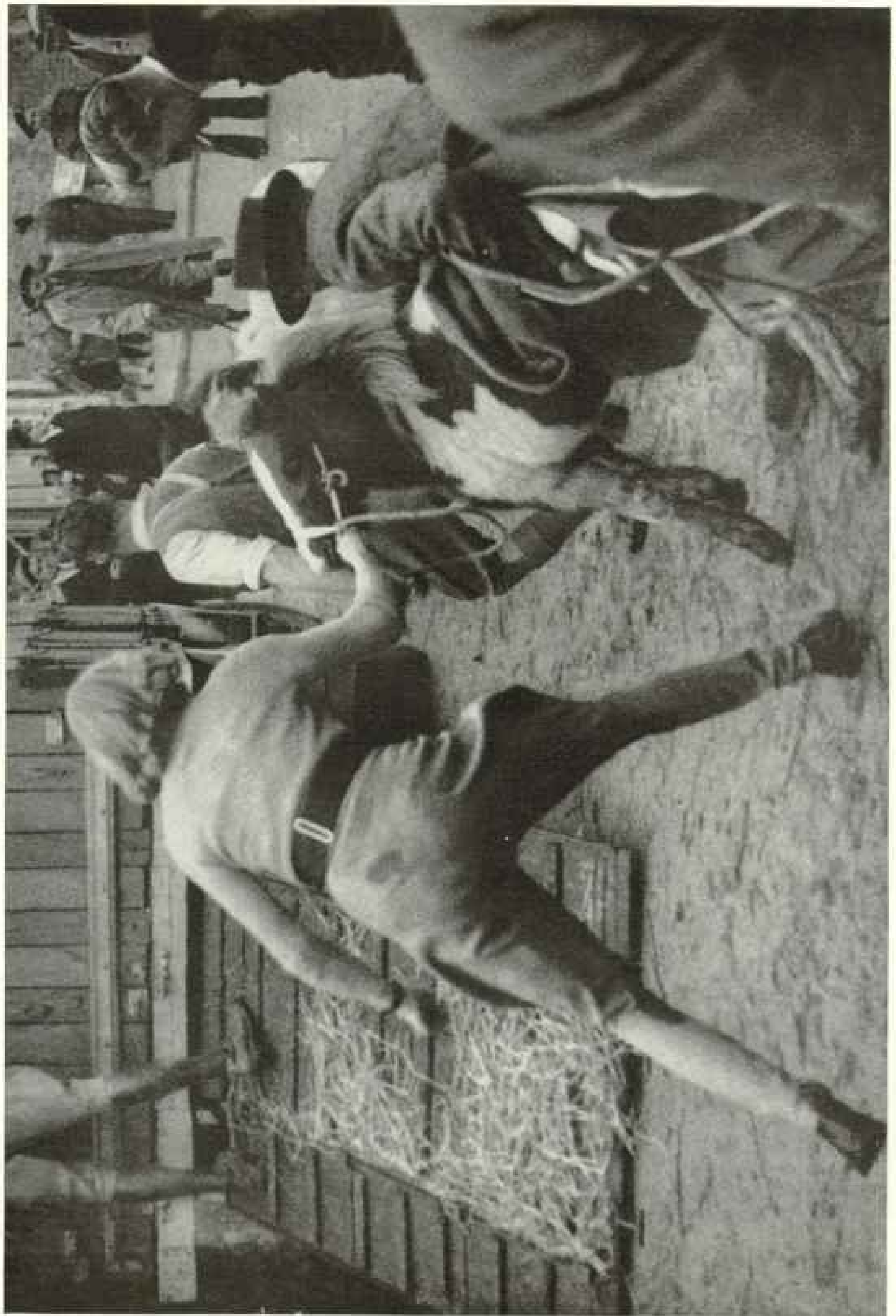
European



European

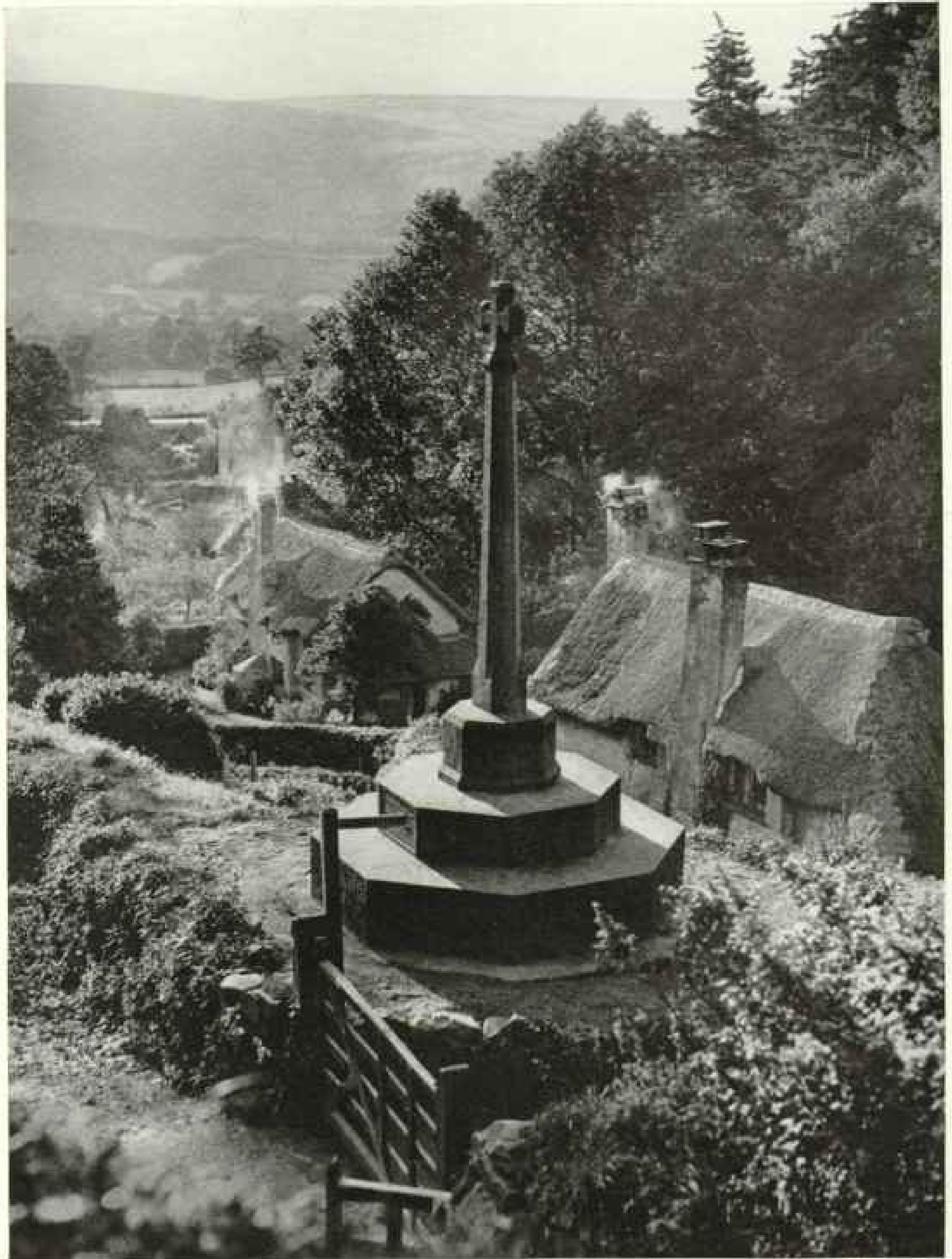
To a Wild Exmoor Pony, the World of Human Beings Is Full of Terrifying Sights and Sounds

Arriving at Bampton straight from the wind-swept moorland, many of the ponies see men for the first time. Behind them are carefree days of roaming among the boggs and heather, and ahead are years of hacking and pulling delivery wagons. Some will "go underground"—to the coal mines.



"Come Along, You Little Rascal!" This Unbroken Shetland Pony Balks at Obeying Orders

European



© Herbert Pottin

Selworthy, an Exmoor Showplace, Overlooks the Home of Wild Ponies and Red Deer

A modern war memorial contrasts with the thatched cottages of this village in Somersetshire. The village is part of a large tract donated to the British National Trust by Sir Thomas Acland. Bearing owners' brands, the ponies roam the moor between sales. Pensioners of the Acland estate occupy the cottages.

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ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

To carry out the purposes for which it was founded fifty-eight years ago, the National Geographic Society publishes this Magazine monthly. All receipts are invested in The Magazine itself or expended directly to promote geographic knowledge.

Articles and photographs are desired. For material The Magazine uses, generous remuneration is made.

In addition to the editorial and photographic surveys constantly being made, The Society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the northwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, The Society's researches solved secrets that had puzzled historians for three hundred years.

In Mexico, The Society and the Smithsonian Institution, January 16, 1939, discovered the oldest work of man in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November 4, 401 B. C. (Spinden Correlation). It antedates by 200 years anything heretofore dated in America, and reveals a great center of early American culture, previously unknown.

On November 11, 1935, in a flight sponsored jointly by the National Geographic Society and the U. S. Army Air Corps, the world's largest balloon, *Explorer II*, ascended to the world altitude record of 72,305 feet. Capt. Albert W. Stevens and Capt. Orvil A. Anderson took aloft in the gondola nearly a ton of scientific instruments, and obtained results of extraordinary value.

The National Geographic Society-U. S. Navy Expedition camped on desert Canton Island in mid-Pacific and successfully photographed and observed the solar eclipse of 1937. The Society has taken part in many projects to increase knowledge of the sun.

The Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda, during which a world record depth of 3,028 feet was attained.

The Society granted \$25,000, and in addition \$75,000 was given by individual members, to the Government when the congressional appropriation for the purpose was insufficient, and the forest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California were thereby saved for the American people.

One of the world's largest icefields and glacial systems outside the polar regions was discovered in Alaska and Yukon by Bradford Washburn while exploring for The Society and the Harvard Institute of Exploration, 1938.



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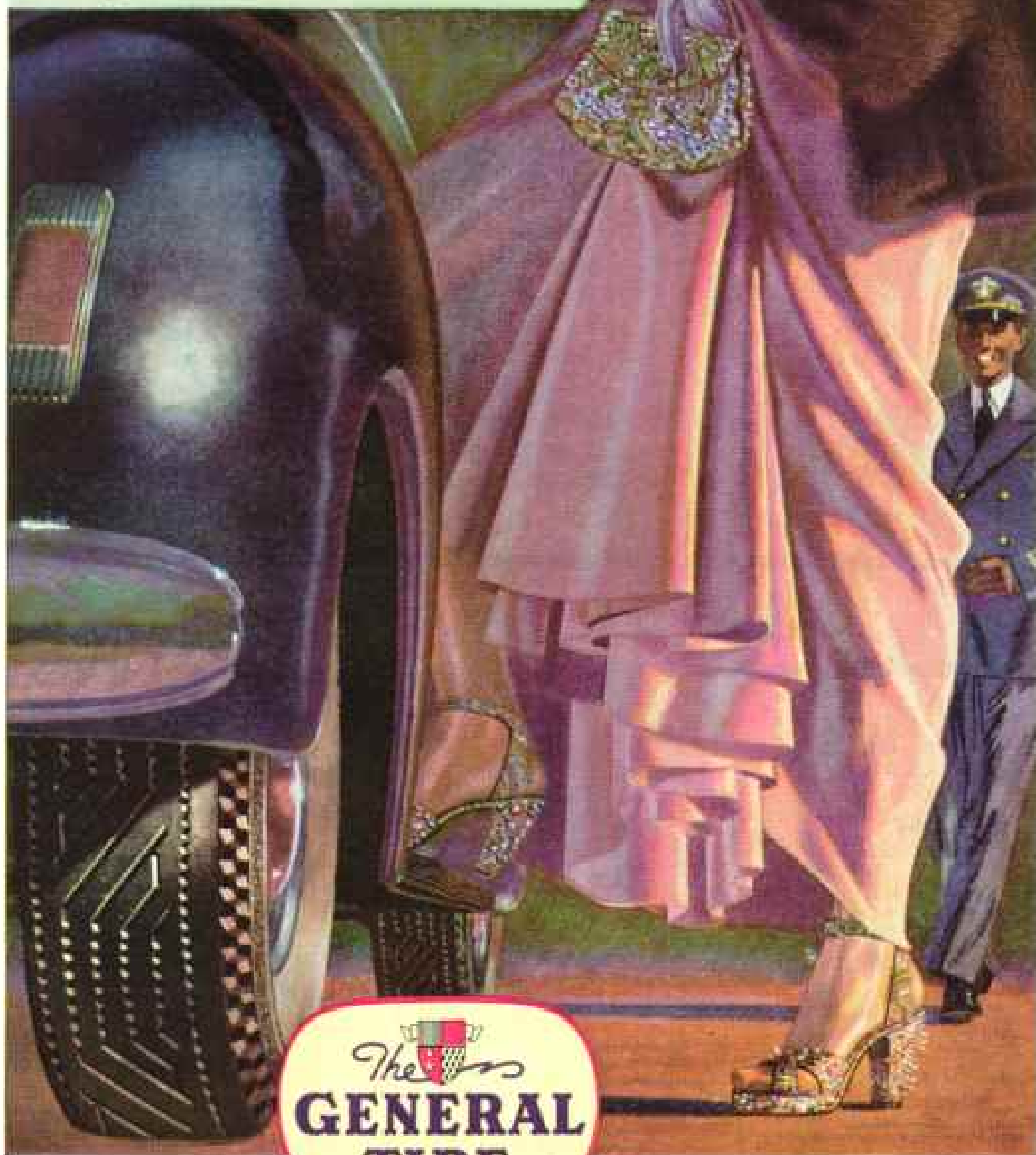
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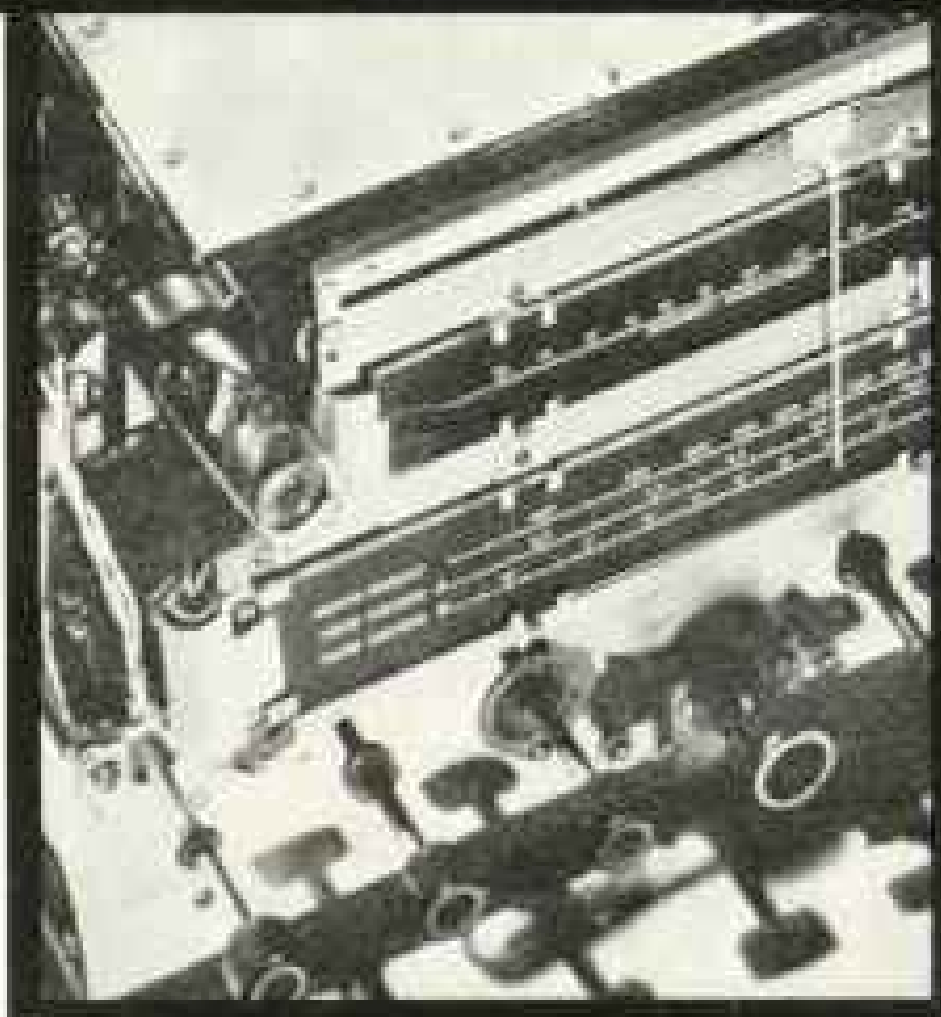


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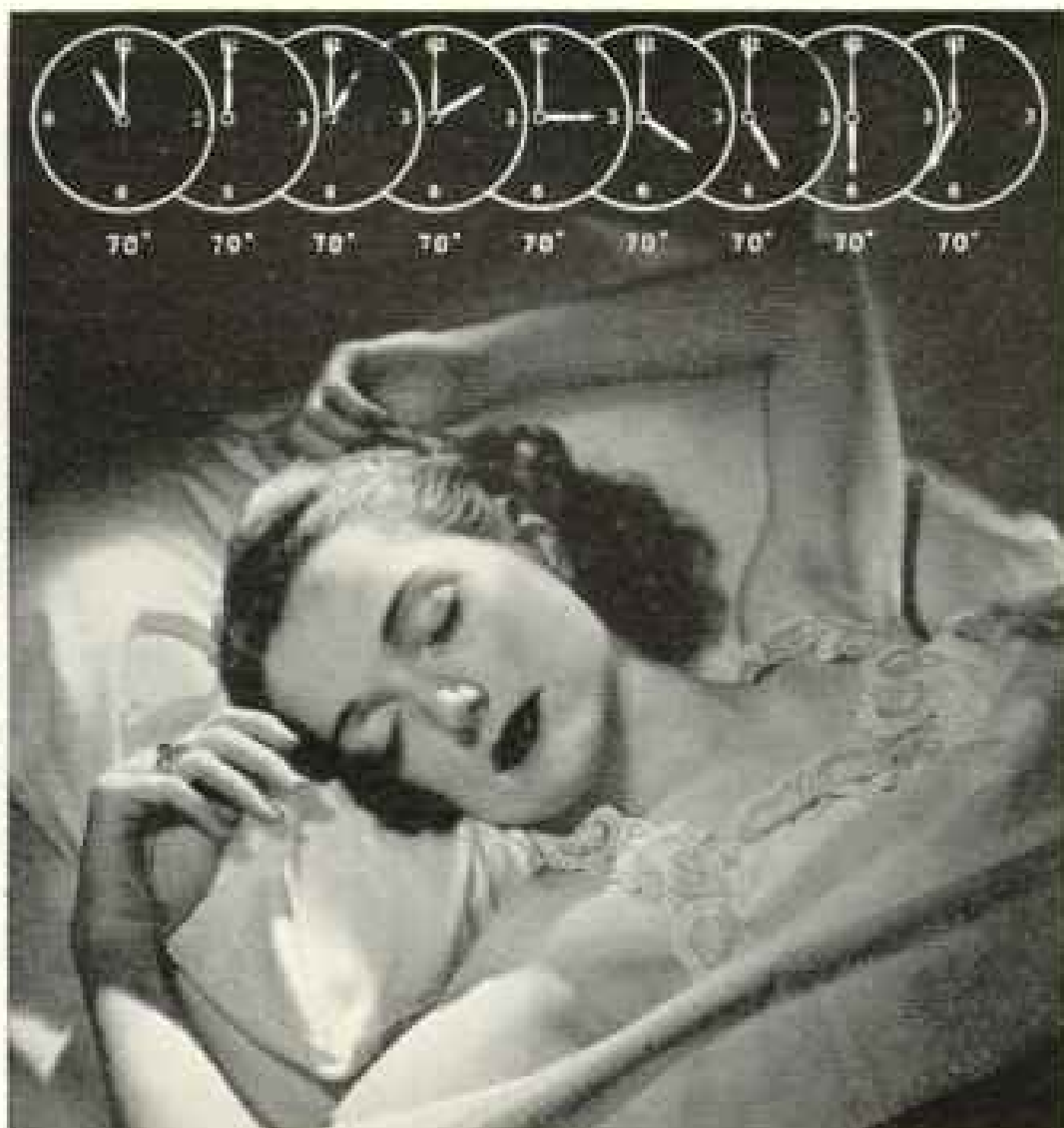


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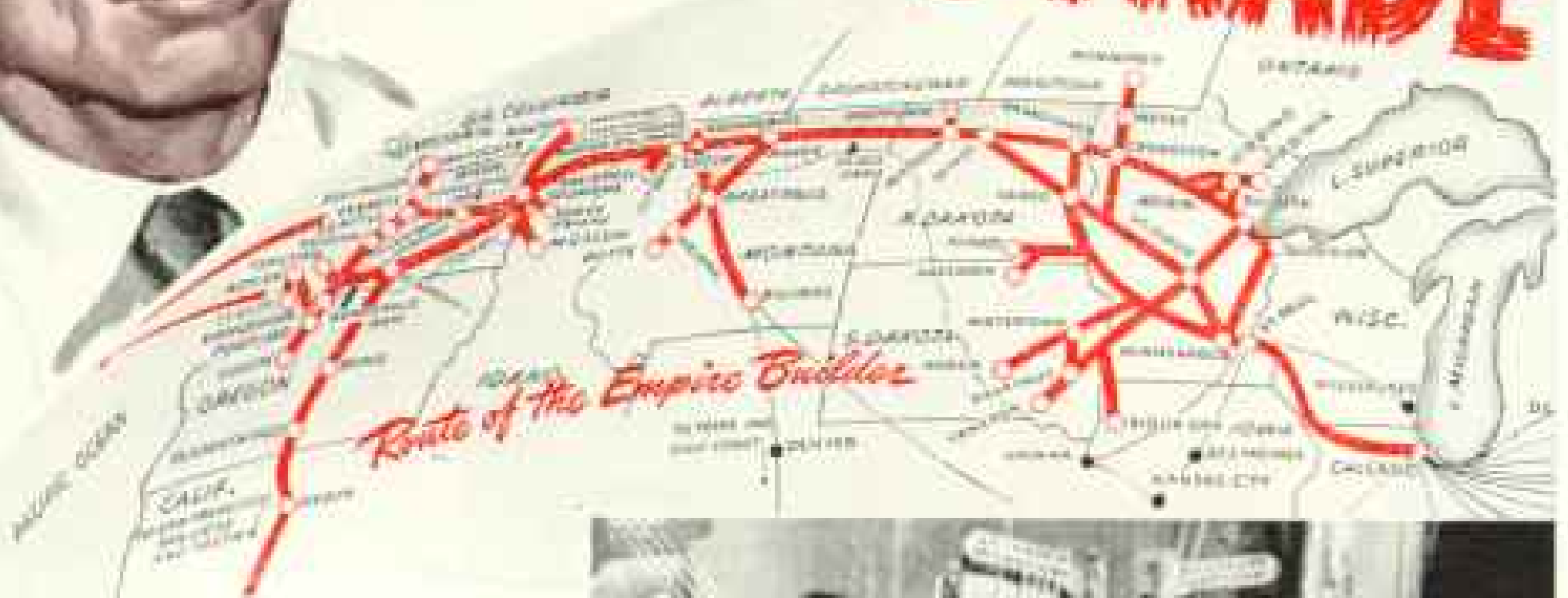
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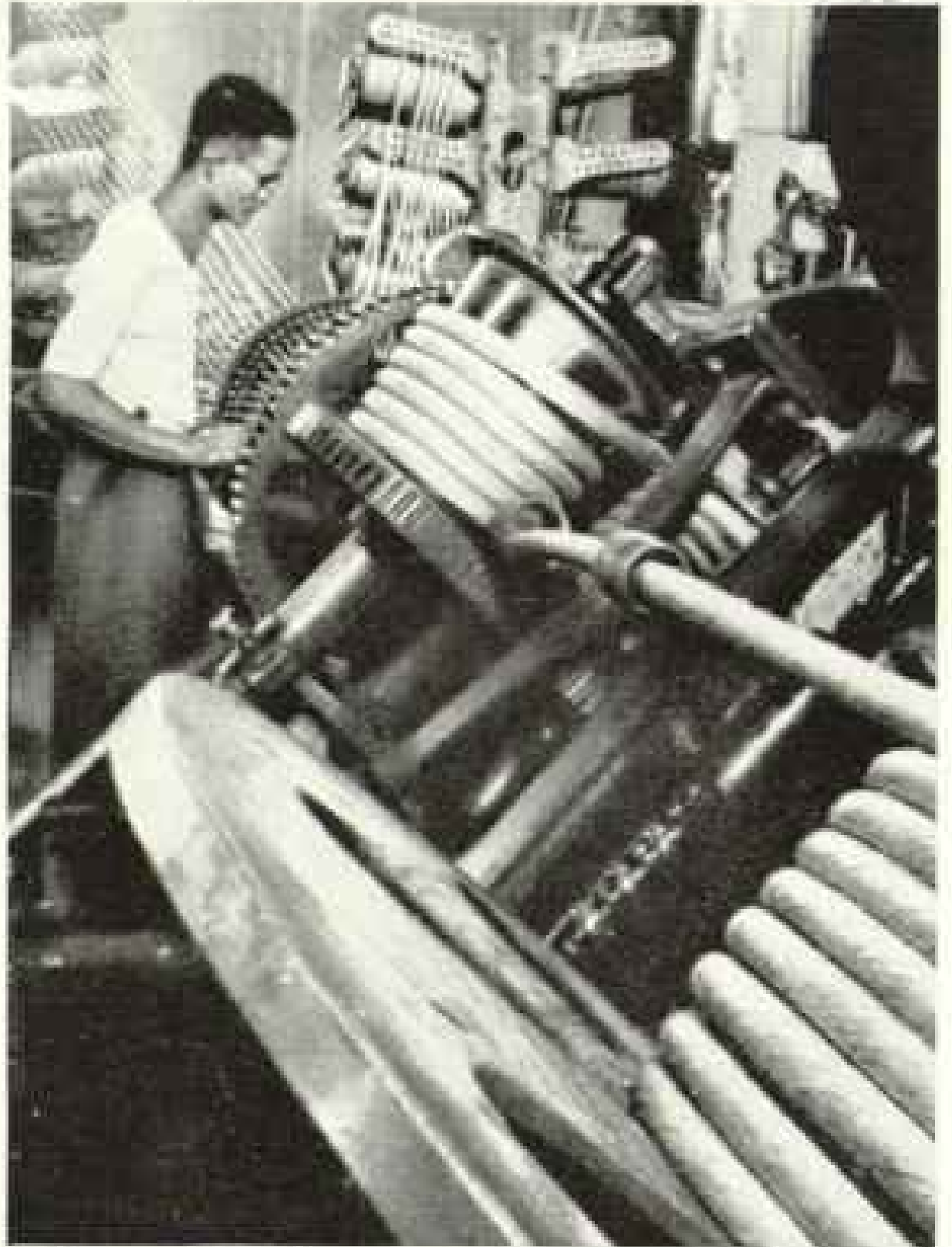
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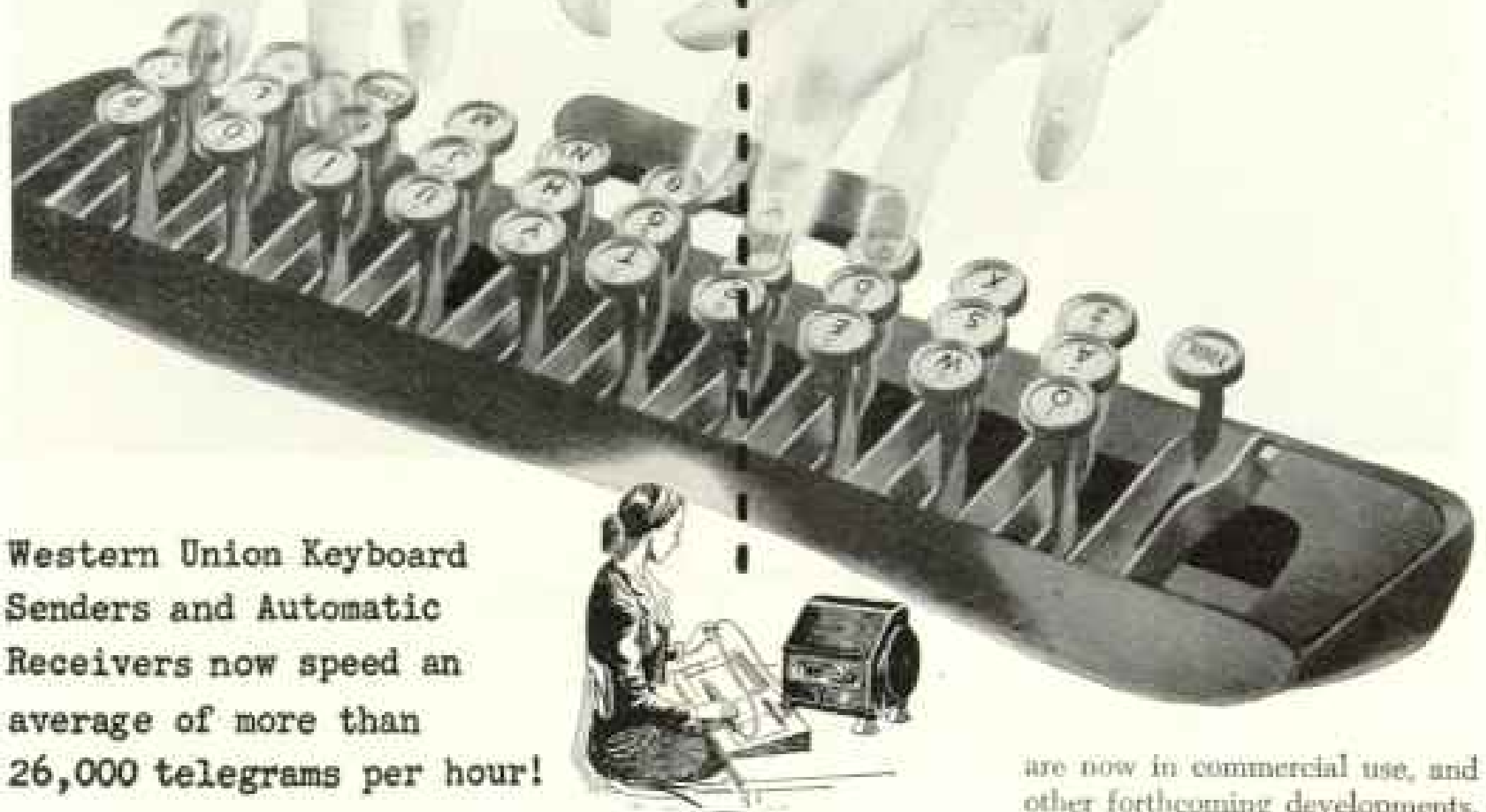
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How Phantom fingers broke a bottle-neck



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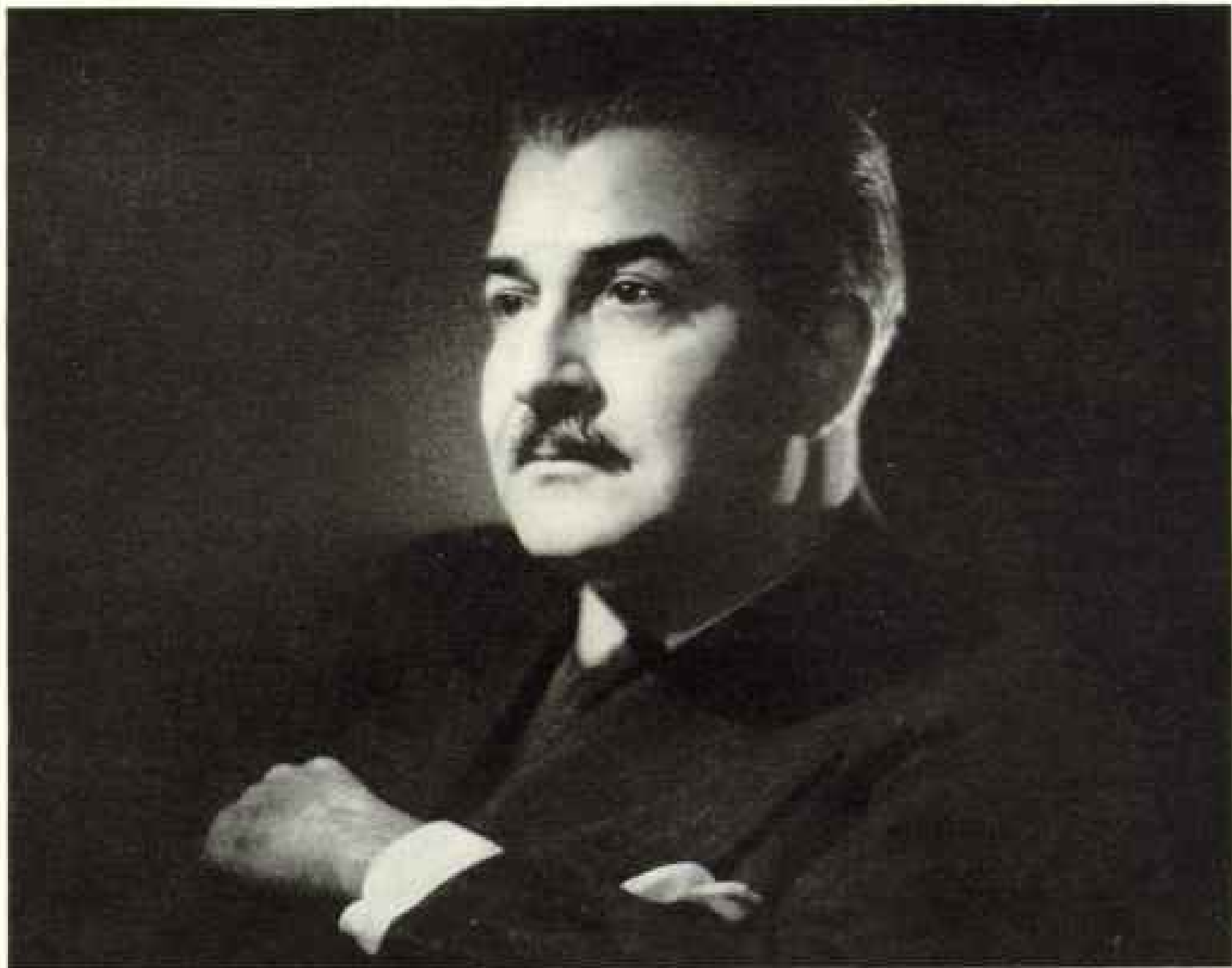
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*Every automatic receiver has a flesh-and-blood attendant who checks constantly on operation, removes the printed tape from the machine and sticks it on the delivery form.

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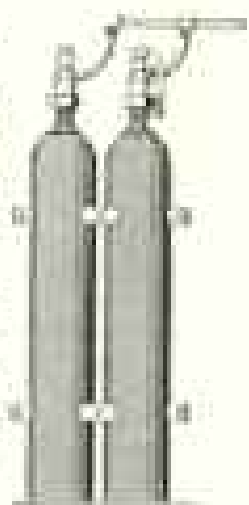
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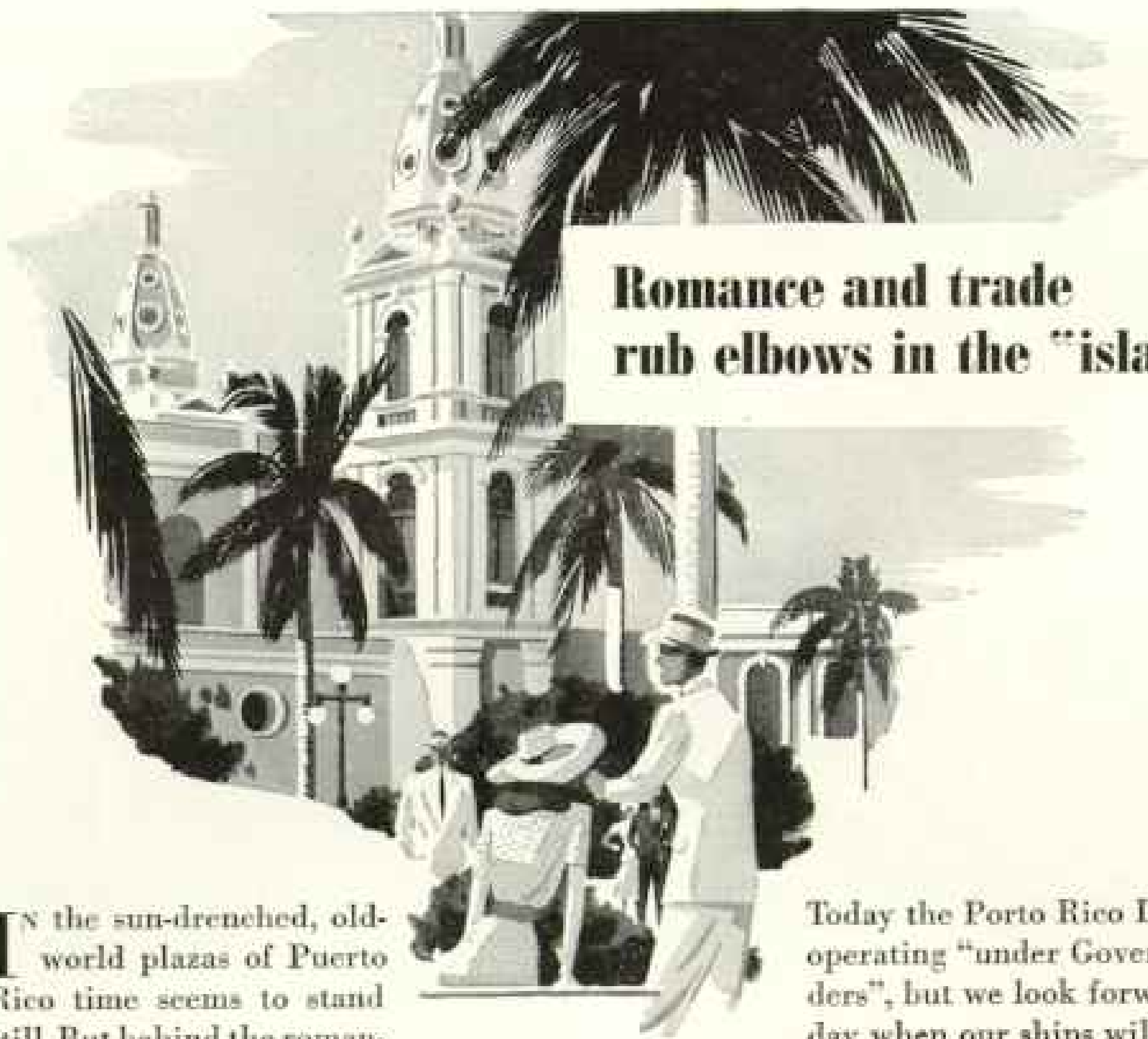


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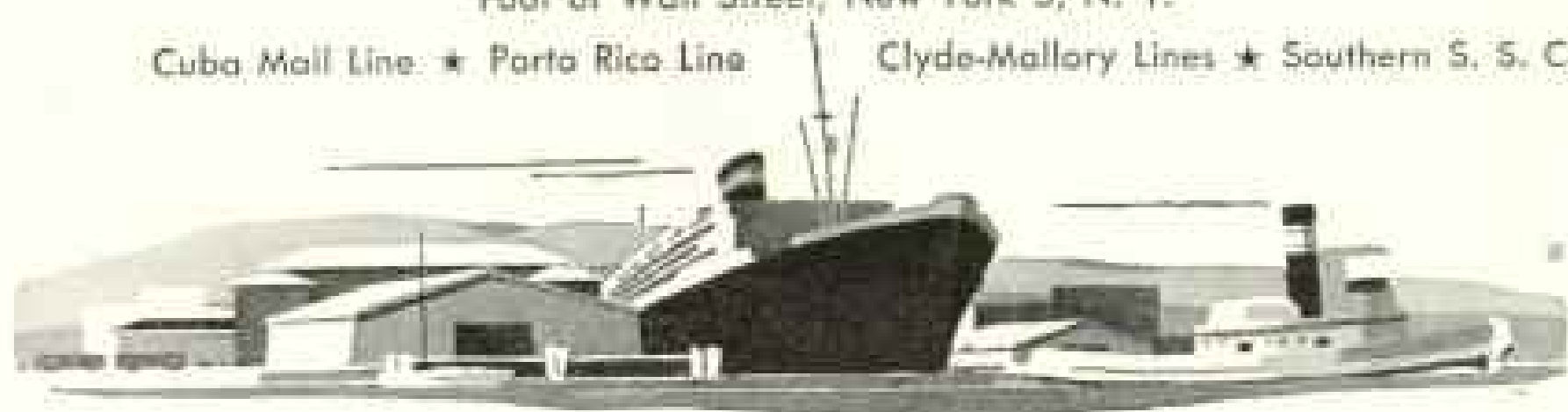
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Hardly does a soldier thump his barracks bag down on the dock before he dives for an ice-cold carton of milk. When a whole division lands at once, it takes about 35,000 half-pint containers to satisfy their thirst!

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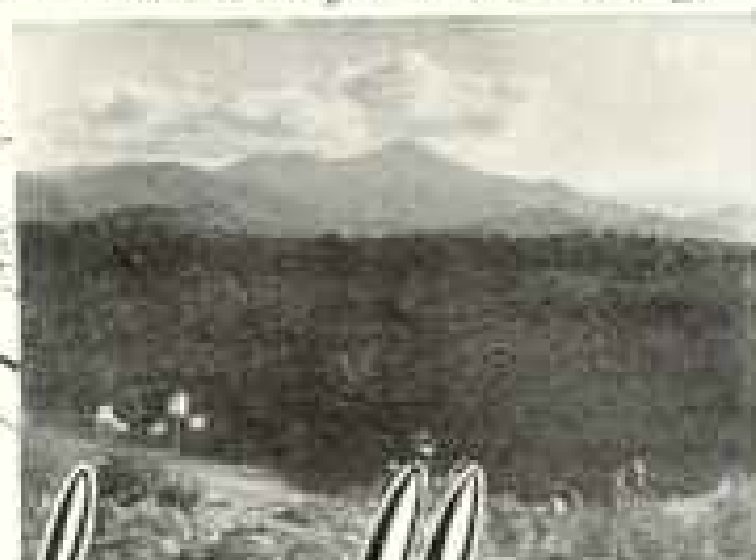
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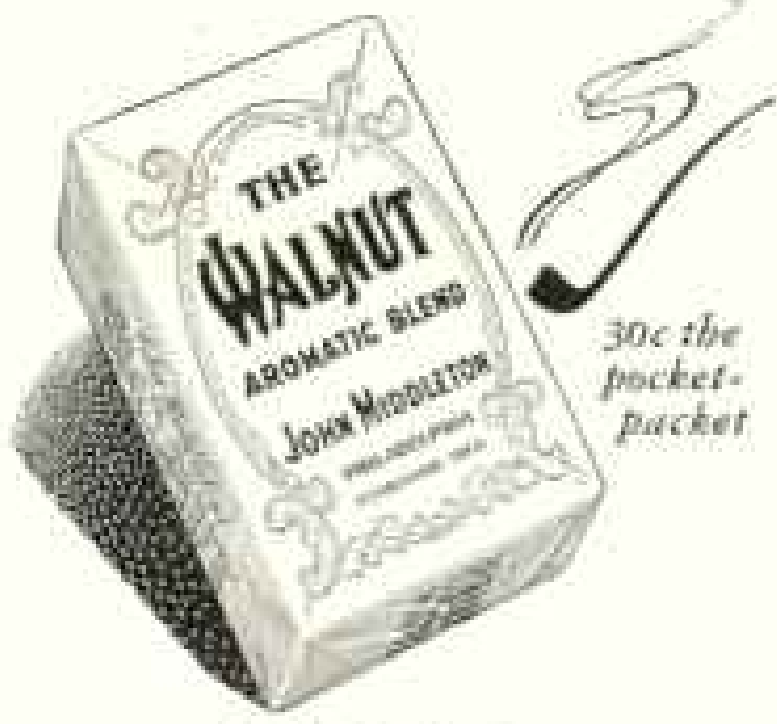
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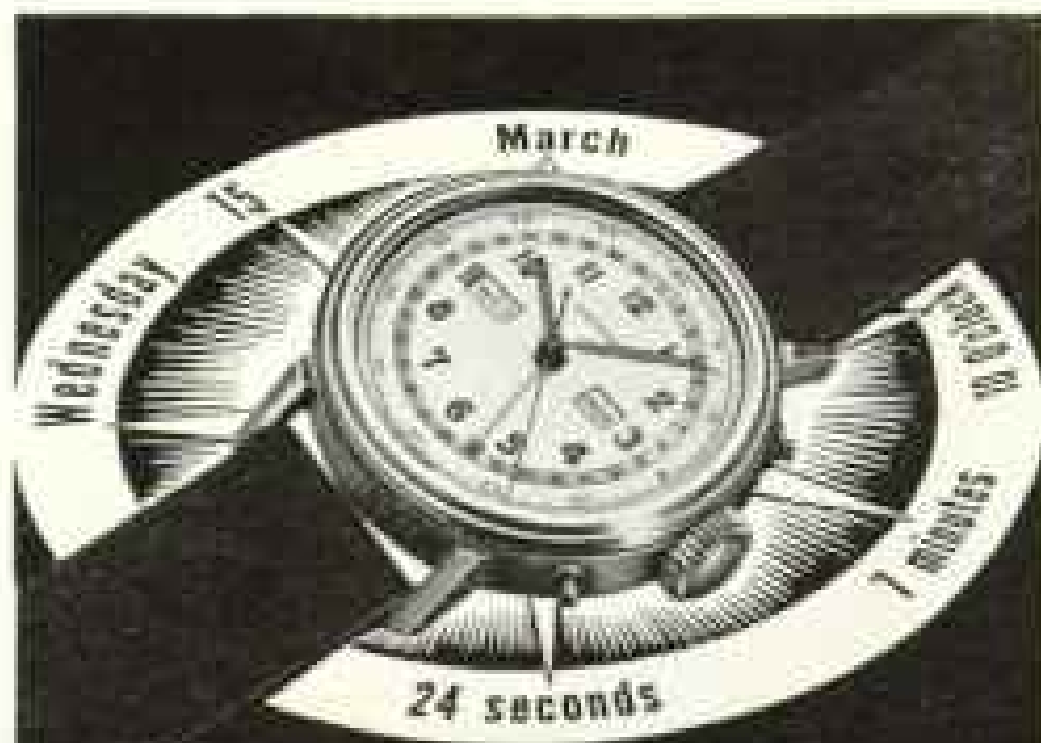
HOW RADAR WAS BORN

During RCA experiments at Sandy Hook in the early 1930's, a radio beam was shot out to sea. Men listening with earphones discovered that this beam produced a tone upon hitting a ship that was coming into the New York harbor.

Later on the question arose, "If radar could 'hear' couldn't it be made to 'see'?" So the viewing screen—or scope—was incorporated into radar. This scope is an outgrowth of all-electronic television that was invented and perfected at RCA Laboratories.



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If you start to snuffle and sneeze, take care of yourself—for a severe or protracted cold is often the forerunner of pneumonia.

Drink plenty of fruit juices, milk, and water. Go to bed if possible. If the cold is a bad one, or hangs on more than a few days, consult your doctor.

Pneumonia's first warning is often a severe chill, followed by a fever. It may already have attacked if you have coughing accompanied by pain in the side or chest, rapid, labored breathing, or thick, rust-colored sputum.

If any of these symptoms appear, call a doctor at once! Go to bed and remain absolutely quiet.

Only your own physician can determine whether it is advisable to use serum, sulfa drugs, or penicillin in your case. Even then they should be used only under his direct supervision.

Unfortunately, certain infections such as virus pneumonia do not respond to such aids. In cases like these, *prompt diagnosis and medical and nursing care* are even more essential, and will increase tremendously the probability of recovery without serious complications.

While medical science is helping to bring pneumonia down in the "cause-of-death" list, its *prevention* is still up to you! For further information about pneumonia, send for Metropolitan's free booklet, 16-N, "Respiratory Diseases."

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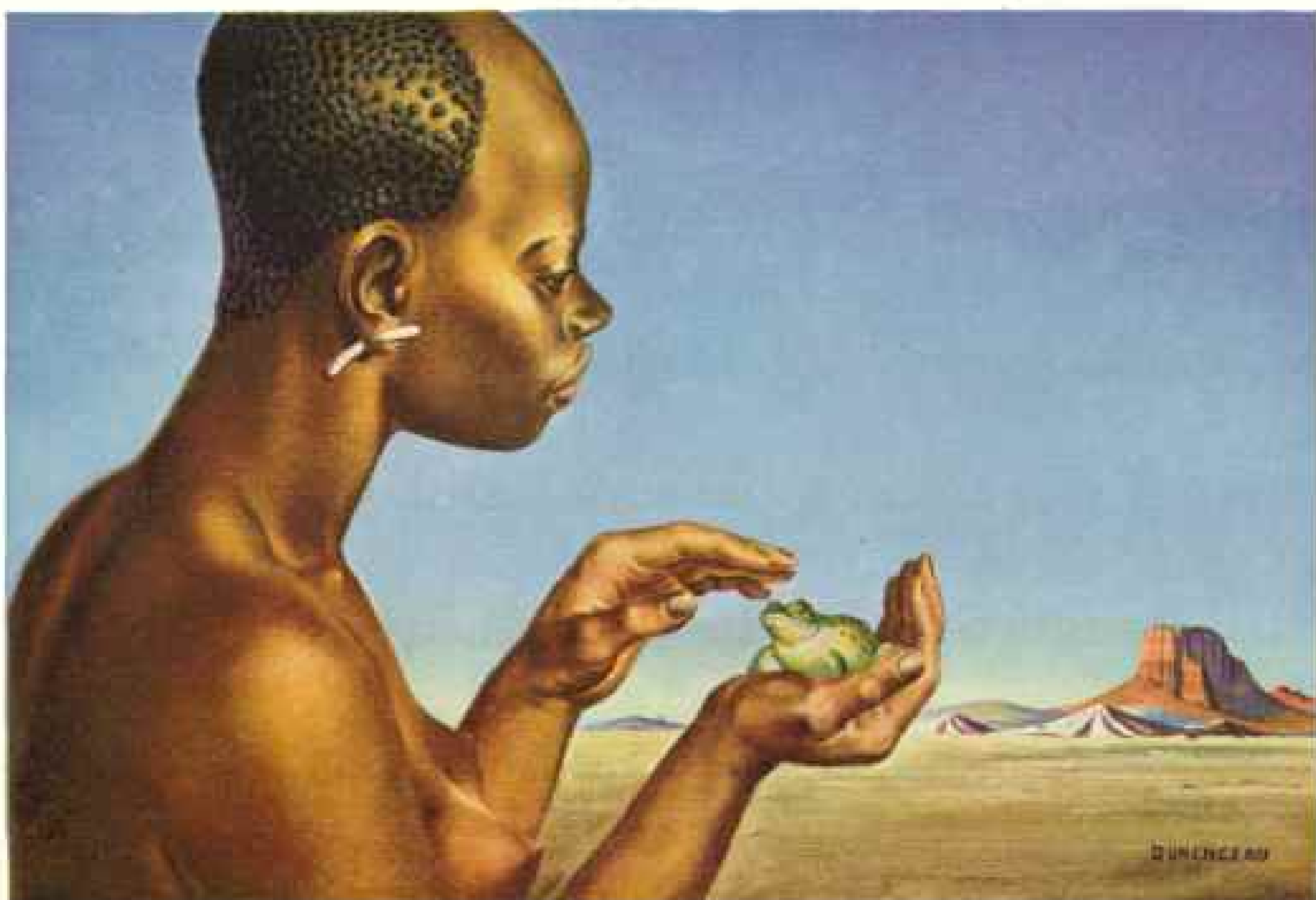
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The toad that makes a piker of the camel

TRAVELERS in the arid, upland plains of Australia report that the natives have an unusual way of finding water.

A native girl will sniff along the ground like a hunting dog. Suddenly, at a particular spot, she'll stop and dig until she unearths a medium-sized toad. Seizing the luckless animal, she'll squeeze enough water out of him to fill a wine glass.

This toad, *Phrynosoma platycephalus*, makes the camel look like a piker when it comes to going a long time without a drink. He lives in a country which may not get a drop of rain for months at a time.

When the rains do come, they pour down hard. In the resulting puddles, the toad mates, lays its eggs and croaks joyfully all night long. But the rains don't last more than a week or two. So when they stop, and the puddles start to shrink, *Platycephalus* gets ready for the long dry spell that follows.

He fills his body cavities and certain tissues beneath his skin with water, so that he swells to twice his size. Then he digs a hole in the mud and disappears.

A day or so later, the blazing sun beats down on a dry, hard-baked surface beneath which the toad rests patiently in his mud prison, living on the fluid he has stored up and waiting for the rains to come again.

This problem of preparing, during a period of plenty, for a future time of need is one that faces many of Nature's creatures—including man.

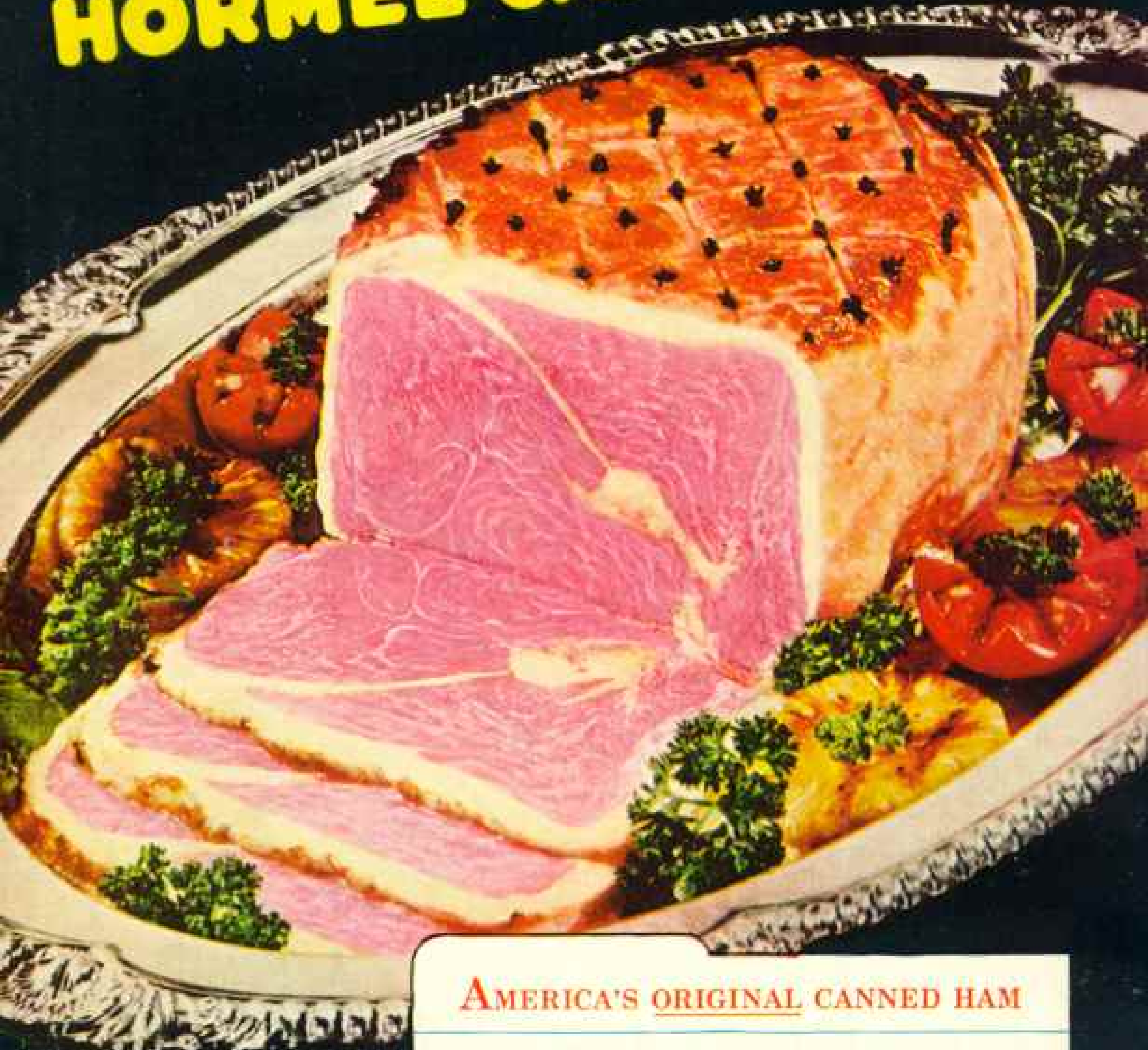
The toad solves his problem by storing up water. Man, if he is wise, solves his by carrying insurance.

Instinct doesn't always warn man when hard times are coming, as it does the toad.

But through insurance—and, these days, through insurance almost alone—a man can make certain that neither accident nor old age, nor even death itself will ever bring a period of scarcity and want to him or his family.

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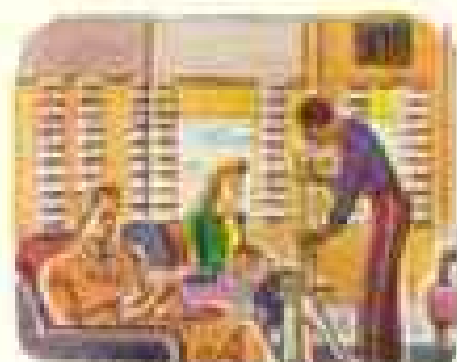
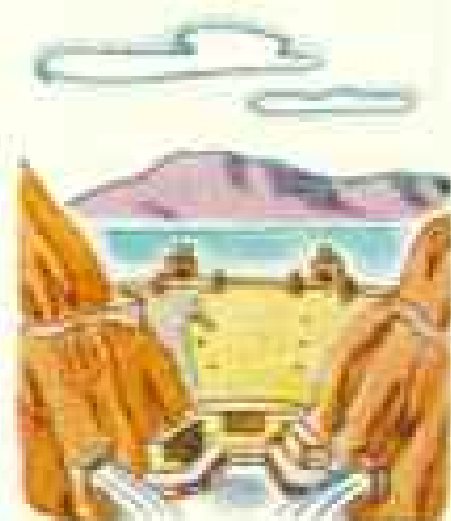
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California, a beehive of industry in war years, is getting its house in order to receive guests from all over the nation.

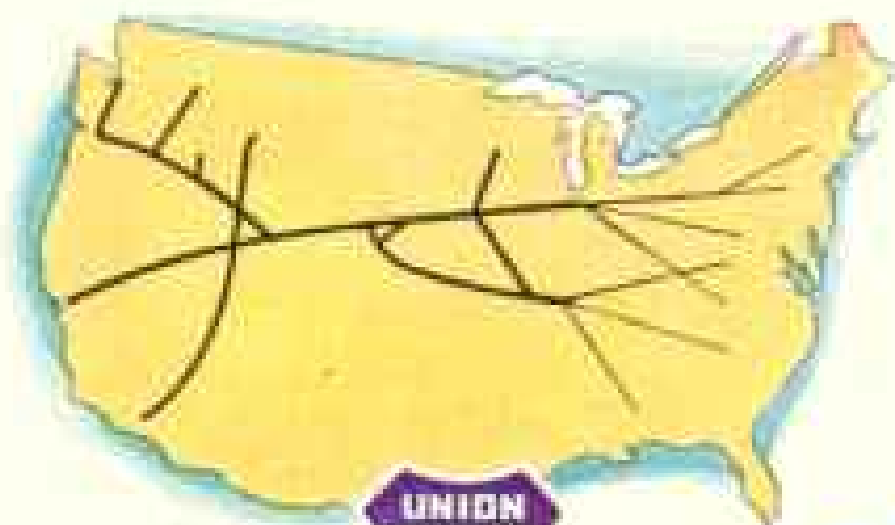
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