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THE NATIONAL GEOGRAPHIC MAGAZINE

On the Trail of La Venta Man

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Leader of the National Geographic Society-Smithsonian Institution Expeditions to Southern Mexico

With Illustrations by Staff Photographer Richard H. Stewart

LATE one January the "little yellow horse," as our station wagon had been christened four years before, pulled into the plaza of the picturesque town of Tehuantepec, Mexico. Richard H. Stewart, Mrs. Stirling, and I had just driven across the rugged mountains which separate Oaxaca from Tehuantepec, on the route of the Pan American Highway. The road was under construction and as yet hardly to be recommended for cars other than those equipped with oversized wheels and tires such as ours.

We careened over narrow rocky roadbeds scratched along precipitous mountain sides. We forded rivers and crossed wide boulder-strewn beds where the water came well over our running boards. But bridges were being built and construction was proceeding on the main road at such a pace that soon motorists will be able to glide over this scenic route on a modern roadbed.

We were started on our seventh archeological expedition to southern Mexico under the auspices of the National Geographic Society and the Smithsonian Institution.* Tuxtla Gutiérrez, picturesque capital of the State of Chiapas, was our immediate objective.

We had to store our car while we adopted other means of travel. Since garage facilities are not yet a feature of Tehuantepec, our problem was solved with the assistance of our friend, Mr. Wilbur Barker, and the Municipal President, who generously offered to store our faithful station wagon under military guard beneath the colonnade in the patio of the Municipal Palace.

Enviously passing up air transportation from the near-by airport of Ixtepec because of our heavy equipment, we finally took the train for the tedious trip to Arriaga, on the Pacific slope. Arriving there, we transferred to a truck and made the long, steep trip over the mountains on a good road to Tuxtla, where we established ourselves at our old headquarters in the Hotel Brindis (map, page 140).

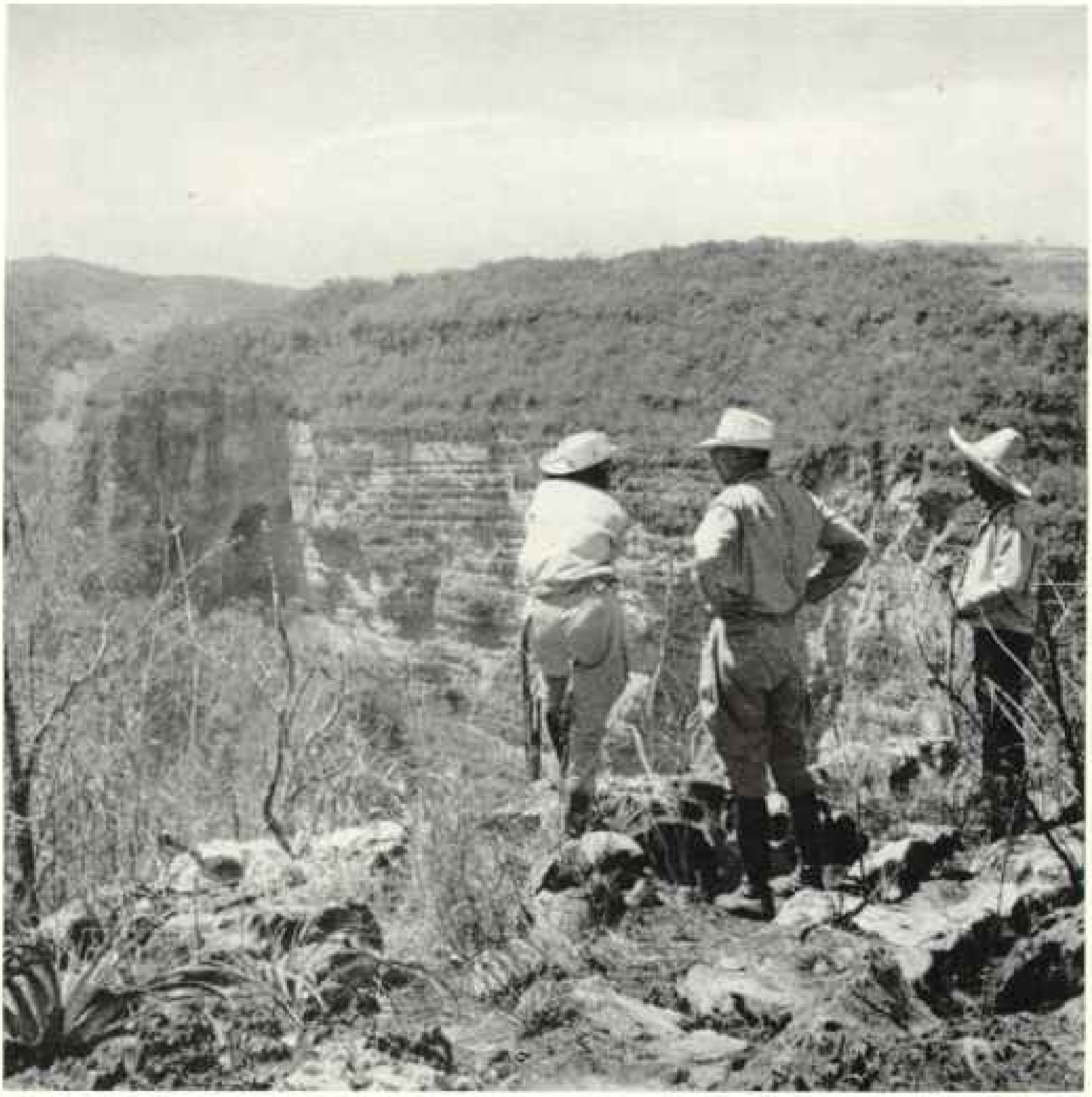
A Taste of Spanish Hospitality

In Tuxtla Gutiérrez we saw interesting pottery vessels from Los Bordos, a place not far from the gorge of the Rio de la Venta. Our good friend Don Vicente Rubiera guided us to the beautiful hacienda El Refugio, where we became the guests of Adolfo Cariles, who runs the big cattle ranch.

He promptly arranged for guides and horses, and next morning we set out for a recently discovered cave said to contain many *trastes* (dishes).

Heading northeastward from the big adobe ranch house, we rode for an hour through rough, broken limestone country toward the Rio de la Venta. Suddenly our guides stopped by a clump of trees growing in a small sink and said, "Here is the cave of the bowls." In a well-concealed spot among the broken limestone blocks they pointed out

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Finding Jewels of Jade in a Mexican Swamp," by Matthew W. and Marion Stirling, November, 1942; "La Venta's Green Stone Tigers," September, 1943; "Expedition Unearths Buried Masterpieces of Carved Jade," September, 1941; "Great Stone Faces of the Mexican Jungle," September, 1940; and "Discovering the New World's Oldest Dated Work of Man," August, 1939, all by Matthew W. Stirling.



In La Venta Gorge a Medieval People Flourished on Two Levels 1,000 Feet Apart

On the far plateau an unknown people cultivated their corn. At the foot of the cliff they built monuments and ball courts (page 155). Because of the limestone formation, drainage empties into the river through caves. Dr. Stirling, Mrs. Stirling, and Don César, their host, stand directly above an enormous cavern.

the entrance, and we wondered how anyone had ever discovered it.

The opening was so narrow we had to force ourselves in sidewise. This entrance extended only about four feet when our flashlights disclosed a good-sized chamber, the floor of which was piled with broken blocks of limestone. Here we could easily stand erect.

About ten feet from the entrance a solid, neatly built wall of squared limestone blocks completely sealed off the cave from floor to ceiling, except for a small rectangular door in the center. Putting our flashlights through this opening, we saw a flight of stone steps leading down to the level of the main cave.

This portion of the cave appeared to be about 30 yards long by 20 yards wide and consisted of two chambers with several openings in the intervening wall. The ceiling was from 8 to 10 feet high.

Cache of Primitive Art

The level floor consisted of a deposit of earth. Scattered about were dozens of saucer-shaped vessels of a rather crude brownish-red pottery. Many had the rims painted white. Rafael, our guide, who had been in the cave before, had dug a small hole in the earthen floor near the rear of the cave with his machete, exposing a large number of these vessels.

On the surface were scores of fragments of heavy urns which must have been two feet or more in height, as well as polished black ware with geometric incised designs, enhanced by rubbing red paint into the incisions. Buried beneath the floor of the cave were hundreds of pottery vessels.

Best examples of those on the surface were elaborately made effigy jars in the form of humans, animals, and gods. These had been taken out by the discoverers and some had reached the museum in Tuxtla Gutiérrez. We resolved to return to make excavations, but eventually became so occupied elsewhere that we did not come back to this promising spot.

On the return ride to the ranch, Rafael took us up the side of a steep limestone hill, where at the base of a small precipice was another cave much larger than the first.

This had a natural rectangular entrance about 15 feet high. After going straight into the mountain, the cave made a right-angle turn and continued for some 400 yards. The floor was littered with fragments of broken pottery vessels.

Nature Models an Idol

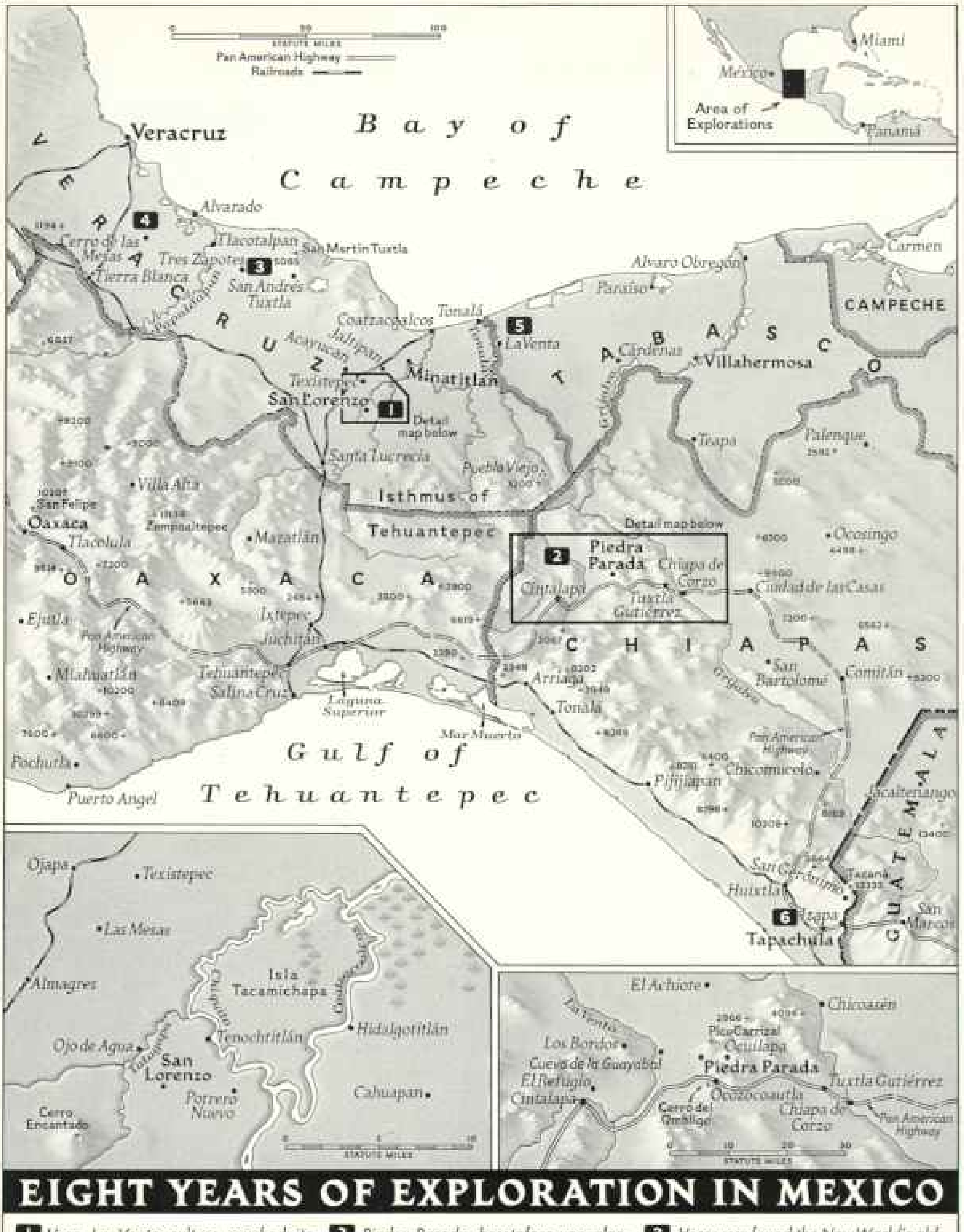
Nature had modeled for the ancient Indians a ready-made idol in the form of a large rounded stalagmite, rising from the level floor to a height of about ten feet. It did not require much imagination to see in it the form of a seated human figure.

Piled around its base to a depth of several feet were masses of potsherds. Here, without much doubt, was an important sacred place for the aborigines of the region.

Because we had plane reservations from Tuxtla to Tapachula, we did not penetrate the full depth of this cave or visit those near by.

Out of a Pit Climbs a Shoeless Archeologist

Limestone here has collapsed into a sizable sink, the only entrance to the Cave of Guayabal (page 153). There green parrots swarm out of the gloom like bats. Flashlight in hand, Dr. Stirling explored the spectacular cavern for half a mile. Amid glittering white stalactites he found pottery vessels left by the ancients. To get in and out of the sink he climbed the tree. An orchid plant grows at its tip.



EIGHT YEARS OF EXPLORATION IN MEXICO

1 Here La Venta culture reached its height. Discovered were two colossal stone heads nine feet high and remains of an ancient aqueduct.

2 Piedra Parada, heretofore unexplored archeologically, is in an area of caves containing much pottery, stone structures, and ball game courts.

3 Here were found the New World's oldest dated work, 291 B.C. (Spinden correlation), and ceramic styles covering 1200 years, 200 B.C. to 1000 A.D.

4 Ceramics found at Cerro de las Mesas plus those of Tres Zapotes link a history chain from 300 B.C. to 1400 A.D. A cache of carved jade, 782 pieces, was found at Cerro de las Mesas.

5 Ceremonial center of La Venta culture. Here were colossal heads, carved jade, and mosaic floors of jaguar motif. Tombs of priests contained rich burial gifts of semiprecious stones.

6 Exploration revealed over thirty stone monuments and altars curiously carved with man-beast figures. These highly artistic works indicate a pre-La Venta period, as yet unstudied.

From Tapachula in the extreme southern part of Chiapas we passed through the important site of Izapa, which we had partially explored in 1941. From here we spent a week exploring the beautiful and rugged shoulders of the 13,333-foot Tacaná Volcano in search of archeological sites.

Most interesting of these was located on a coffee *finca* (plantation) called San Gerónimo, where there was a mound situated on a spot commanding a magnificent view. Two large boulders were covered with unique carvings of animals and anthropomorphic beings. There were also smaller monuments, and we learned that a few years ago still others had been taken to Tapachula and then removed to the museum at Tuxtla (page 143).

Rough Roads and Trails

During these explorations we traveled over incredibly bad roads and trails, including part of the proposed southern link of the Pan American Highway, and saw some of the most beautiful tropical scenery in Mexico.

The primavera, or white mahogany, was in its prime. This magnificent tree, particularly abundant here, at this season was a solid blaze of brilliant yellow bloom. It is known locally by the unromantic name of *flor de zope*, or turkey buzzard tree.

After visiting sites on the coastal plain near the Guatemalan border, we returned to Tuxtla to begin our season's work.

The site we had selected was a place called Piedra Parada, about 30 road miles northwest of Tuxtla and 12 miles from the town of Ocozocoautla. After heaping the truck high with wheelbarrows, picks, shovels, kitchen supplies, cots, and camp equipment, we perched ourselves on top of the load and set out.

On reaching Ocozocoautla, the truck driver optimistically opined that maybe he could drive cross country to our camp.

After a hectic trip which must have shortened the life of his truck, we finally came to a halt at a steep arroyo two miles from our destination.

By this time night had fallen. The truck was unloaded and our valiant driver set out on his return trip, leaving us and our big pile of equipment forlornly abandoned in inky blackness on the arroyo bank.

Our guide disappeared in the night in search of further transportation, while Dick, Marion (Mrs. Stirling), and I opened some cans and ate a dinner that was much overdue.

Eventually two oxcarts appeared with their drivers and after several trips transferred our equipment to our camp. The last load arrived about midnight.

Wearily we unfolded our cots and slept till morning, somewhat discomfited by the fact that we found the cots full of thorns picked up as the truck scraped under an overhanging spiny tree.

Housing Problem Solved

César Maza, elderly owner of an adobe house, generously offered to share it for the duration of our work. The small, tile-roofed structure had two rooms without windows and a porch that ran the length of the house.

At one end of the porch was César's corncrib. At the other end was the kitchen, consisting of an earthen bench raised about three feet from the floor level, on which bricks were arranged to serve as a stove.

César and his son, Umberto, whom we hired as our foreman, moved into one room with their belongings, and we set up housekeeping in the other.*

While we were putting things in order, a vivacious young Zoque matron appeared with a basket of eggs for sale. Liking her appearance, Marion asked her if she would accept a job as our cook. Natividad, or Nati, as she preferred to be called, was delighted, and promptly became a member of the household.

Since space was at a premium, the problem was where she should sleep. It was decided that she should share the bachelor quarters of César and Umberto. To observe the proprieties, the 8-year-old daughter of a neighbor was recruited to act as chaperon and sleep with her nights (Plate III).

For three months César's house was our home. Since there were not enough men living in the vicinity for a full work crew of 20 men, ten were recruited from Ocozocoautla to fill our quota. The ten local men lived and had their meals at home. The Ocozocoautla crew, returning home each Saturday night, came back Monday mornings with their bags loaded with enough tortillas, cheese, jerked meat, and coffee to last them the week.

They solved the problem of quarters by sleeping on the ground at the end of our house. The mound directly behind the house served as a windbreak, and nights when it rained they slept under our porch.

Tamales á la Chiapas

Nati, always concerned with their welfare, occasionally boiled them a big pot of coffee or furnished them with fresh fruit.

Nati excelled in making tamales. Chiapas prides itself on more varieties of tamales

* See "Jungle Housekeeping for a Geographic Expedition," by Marion Stirling, National Geographic Magazine, November, 1941.

than any other State in Mexico. We preferred the chicken kind wrapped in banana leaves.

The tomato, onion, chile peppers, and spices were ground on the *metate* to make the sauce. Fresh corn cut off the cob was ground to a mash and spread thinly over a section of banana leaf which had previously been passed over the fire to toughen it so it wouldn't tear. Slivers of chicken, olives, raisins, and almonds were heaped on, plenty of sauce poured over it, and the leaf folded over like an envelope.

After 30 minutes of steaming, there emerged a tamale that really whetted the appetite.

Compared with our lush jungle camps of previous years, Piedra Parada in its semiarid locality was the land of plenty.

We had meat, fruits, and vegetables brought out from "Coyta" two or three times a week. (The name Ocozocoautla was too time-consuming even for the natives, who called it "Coyta" for short.) There were pineapples, bananas, melons, mangoes, carrots, onions, cabbages, turnips, and potatoes in abundance.

Since the meat was always fresh-killed and tough, we usually had *puchero*, or stew, for our noonday meal. In the evening we would have some Mexican dish, such as *empanadas*, *enchiladas*, or tamales, all of which use chopped meat as fillers.

Chiapas is famous for its cheese. Best and costliest is a white cheese of butterlike consistency, encased in red or yellow wax balls like Edam cheese. It has a creamy Roquefort flavor, is an excellent substitute for butter in a hot climate, and a gourmet's delight when eaten with black beans.

Nati made clear, strong coffee in Chiapas dripolator style. After pulverizing the beans on a metate, she put the grounds in a cone-shaped bag and poured boiling water through them, much as we strain jelly.

Stewart's Birthday Cake

When Nati learned that Dick Stewart was to have a birthday, she immediately launched plans to celebrate. She sent word to her mother to have a "crown of bread" made by the town baker. It looked like a head-size doughnut decorated with bits of dough pinched into the forms of birds and animals. We admired the lifelike appearance of the tiny wings and beaks and marveled that Nati's brother could carry it out on horseback.

Since we had no oven, our birthday cake was a chocolate pudding decorated with letters formed from slices of coconut and proudly supporting one big altar candle.

The afternoon before the birthday there was high excitement about camp. At 7:30 that evening a pilgrimage of our neighbors arrived. The Cruz family brought a crown of roses.

Umberto shot off numerous skyrockets, while Don César removed the flower crown and replaced it with the most astonishing crown we have ever seen or expect to see.

Thirteen ears of corn were tied perpendicularly to vine circlets, with the tassel ends up. Fancy cookies were sewn around the edge of the crown to hide the cords and were built up to a pyramid in front. The open top was covered with red, white, and pink roses. Dick swore the decoration alone weighed more than 12 pounds (Plate V).

Nati had made a punch of rice, sugar, and pineapple peels, to which she added hot water. Radio music alternated with the serenading guitar players (Plate IV).

One morning while Marion was busily engaged in sorting potsherds on a cot in front of camp, the married son of the old woman who was building a little house just below us came up the hill leading a horse loaded with a dozen or more trough-shaped roof tiles. He detached one from the load, handed it to Nati, and proceeded on his way.

Nati brought it to Marion and asked, "Do you know what this is for?" Marion said, "Why, yes, that is to put on a roof."

"No," said Nati. "This is an invitation to a housewarming party. Whenever anyone builds a house here, he leaves a certain number of tiles off the roof. These are carried to friends as invitations to a fiesta.

"The tiles must be decorated with crepe paper or flowers and carried to the party, along with some skyrockets and a bottle of *mixtelas* [fruit-flavored brandy, or *aguardiente*, usually made from sugar cane].

"Señora González wants to give you a tile, too," she added. "But she doesn't know whether or not you would know what to do with it."

Christening of a House

Since the house was to be officially christened next day, Nati scoured the camp for suitable paper. A cooky tin produced pleated, ribbonlike strips. Nati made a boat and put in it pictures of Carmen Miranda and other figures, clipped from magazines we had on hand. We had to send to town for the other requisites (Plate VII and page 172).

The next day we attended the ceremony. After all the guests had arrived, the host climbed a ladder to finish his roof. The completed house looked very festive with the varicolored paper streamers waving in the breeze.

The skyrockets were shot off as the tiles

went into place, and guests drank toasts and danced to the music of the marimba and guitars. The festivities lasted all night, though we excused ourselves at what we thought a reasonable hour.

Shortly before we arrived at Piedra Parada, Nati had been cook for Nectar, the famous bandit of the Ocozocoautla region, who had killed some 15 people during a hectic career. Nati insisted he was a very pleasant fellow except when drunk.

While we were in camp, Nectar made the mistake of killing a soldier who was trying to arrest him while he was on a spree. Nectar was wounded and concealed himself in a house in town where he was discovered by a detail of soldiers. He attempted to shoot it out with them and was killed, much to the relief of the ranchers in our vicinity.

As in other camps, we picked up many bits of philosophy.

Florinda, the wife of one of our workers, always came up to get our garbage for her pigs. One day we were talking about Tuxtla Gutiérrez.

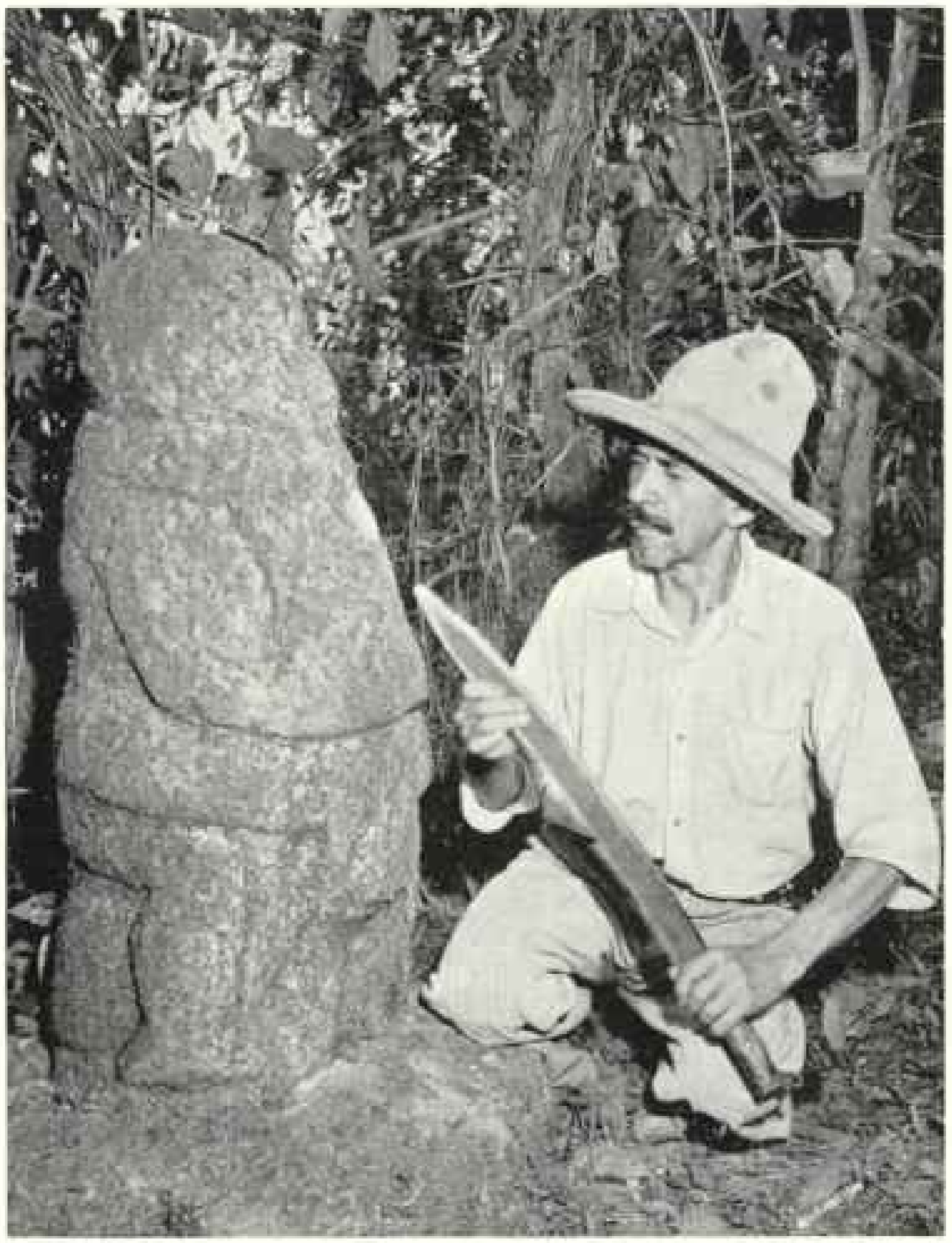
Florinda said she had been there once and that it was very nice if you had money. Nati said, "Yes, you see so many things there you want."

We told her it was like that in New York City, too. Nati replied, "Yes, any place is gay if you have money." Nati said she didn't take her children to market any more because they always wanted a mango or an orange or something.

One day Jorge remarked, "Too bad you don't have any corn in your country."

We replied, "Certainly, we have lots of corn."

"Then why don't you make tortillas?"



A Monkey Man? Time Has Disfigured the Portrait

This seated figure, carved from basalt, came to light on Tacaná Volcano, near the Mexican-Guatemalan border. Its creators are unknown, but the style is non-Maya. To expose it, the machete wielder has cleared the jungle (p. 141).

We explained that our women have their time taken up too much with other activities. "That's too bad," sympathized Jorge. "The women here are getting lazy, too. Perhaps some day we will have to do without tortillas."

Jorge's Philosophy of Work

Our men did not want to work during Holy Week. Jorge asked, "Do you celebrate Holy Week in the United States?"

We told him that during the war we worked straight through, with only Sundays and Christmas as holidays.

He observed, "Oh, yes, I guess the people are very poor there now with the war, and that is the reason they have to work all the time."

Nati asked if she could go home for Easter week to help her mother and sisters take care of the flower workers. She explained that her house was the depository for San Pedro.

At the time of the religious upheaval in Mexico, the priests distributed the images of church saints among various families in Ocozocoautla. It was considered a high honor to have a saint from the church in one's home.

Saints on Lend-Lease

The original idea was for the saint to be moved to another home on its own saint's day each year, the transfer being celebrated by an appropriate birthday party. Nati's family had had San Pedro for the last five years, since they could find no family willing to finance the birthday parties.

We asked her why they didn't return it to the church, which was again functioning, but her family did not want to lose prestige and have it thought they could not afford to take proper care of the saint (page 156).

We gave Nati the week off and took advantage of our friendship to ask permission to take pictures of the festivities.

Certain men in this region still make flower shields, probably a continuance of a pre-Columbian custom. At Eastertime these men go to the homes of people who have saints and altars. They are given food and drink and a small gratuity (Plate VIII).

The family goes out early in the morning to collect blossoms of the *flor de mayo* tree, a species of frangipani, the petals of which are waxy like gardenias. This tree blossoms in a variety of colors ranging from creamy white to deep yellow and pale pink to red. Purple for the shields is furnished by leaves of the *siempreviva*, green by mango leaves, and snow white by palm heart.

The shield makers are true artists. They discard any blemished petals. Several straw mats are spread out in the center of the house (the common man's house consists of only one room). The master and his helpers arrange the baskets of flowers and leaves within easy reach.

First a mango leaf is rolled into a slim pencil, with a flor de mayo blossom protruding like an eraser. Around this base is wrapped a single petal and then another and another, until the entire leaf cylinder is covered. Each petal laps over half the preceding one and so holds it in place.

The arrangement of the colors of the six or seven petals forms the design, just as in beadwork or weaving. The cylinder is then pierced near each end by a long needle. Now umbrella stays are used.

After ten or more cylinders have been made and stacked on stays, the eyes are threaded with heavy cord. Pulling the cord through the pencillike rolls of flower petals and keeping the cylinders flat so the shield does not buckle requires care and technique. The center of the shield is adorned with various flowers, such as orchids, bougainvillea, or roses.

These shields last for a week or more and are grouped together as altar decorations in homes or carried to the main church. Sometimes geometric designs represent the stars, moon, or sun. A key is made to honor San Ignacio. The rooster honors San Pedro. The rooster shield is also made at other times to be presented to a sweetheart, and its acceptance is regarded as an engagement.

One of our neighbors asked us how much we would charge to bring the radio down to their house to honor their saint on its birthday. It was hard to explain that we couldn't play a request program, as one would on a phonograph. We obliged, however, and they were well satisfied with hillbilly music from a San Antonio station.

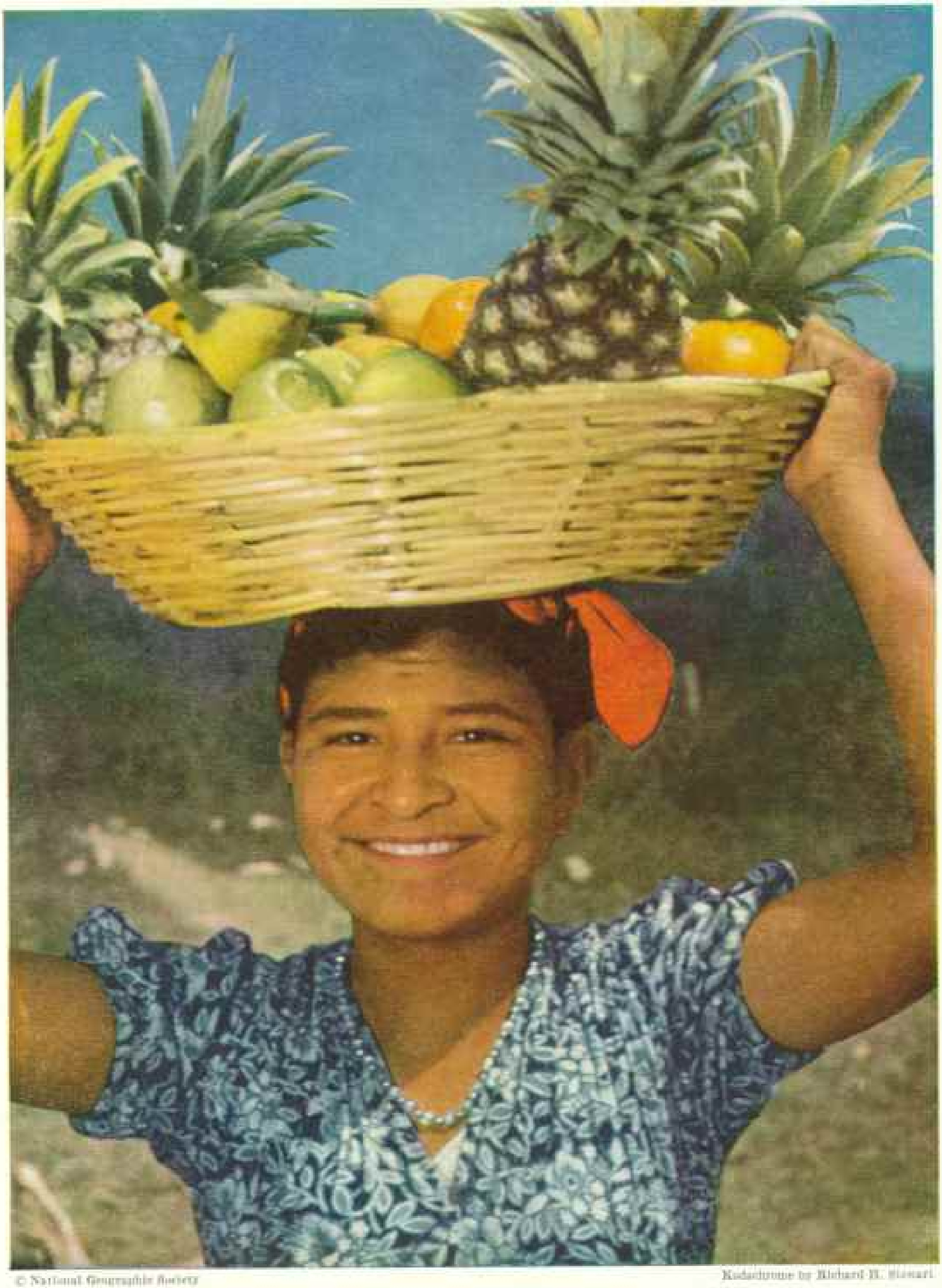
Two of our neighbors were Jorge and Agustín Cruz, brothers who had spent their lives in the vicinity. Agustín was the expert cowboy of the region, which was essentially a cattle range. He was in charge of the stock for the absentee owner. Jorge became a member of our work crew and was soon our right-hand man and guide for our week-end exploration trips in the region. He was the most enterprising local hunter and the proud owner of a muzzle-loading gun that might well grace the walls of a museum (Plate IV).

Orchids for the Picking

The region teemed with deer and quail, and Jorge frequently kept us supplied with venison. We made collections of reptiles, and Jorge was our most enterprising collector. Whenever he returned from his excursions into the bush he brought in some lizards, a live snake or two, and a big cluster of orchids for Mrs. Stirling, the latter practice being a bad precedent from my point of view!

We were surprised to find that on the scrubby trees of the semiarid limestone plateau around Piedra Parada the orchids were far more beautiful, abundant, and varied than in the lowland jungle areas where our previous camps had been located. The black orchid, one of the rarest and most beautiful of the many forms that grow in Chiapas, was one variety near our camp.

The archeological site of Piedra Parada consists of five principal mounds. Three are high pyramidal structures oriented in a



Kodachrome by Richard H. Stewart

Cook's Beaming Helper Wears a Sombrero of Mangoes and Pineapples

"Fruits abounded," says the author, "in Mexico's dry highlands, where we expected none. In jungles, where we anticipated fruits, we had to import them." These eight pages of Kodachromes picture the seventh National Geographic Society-Smithsonian Institution archeological expedition into southern Mexico.

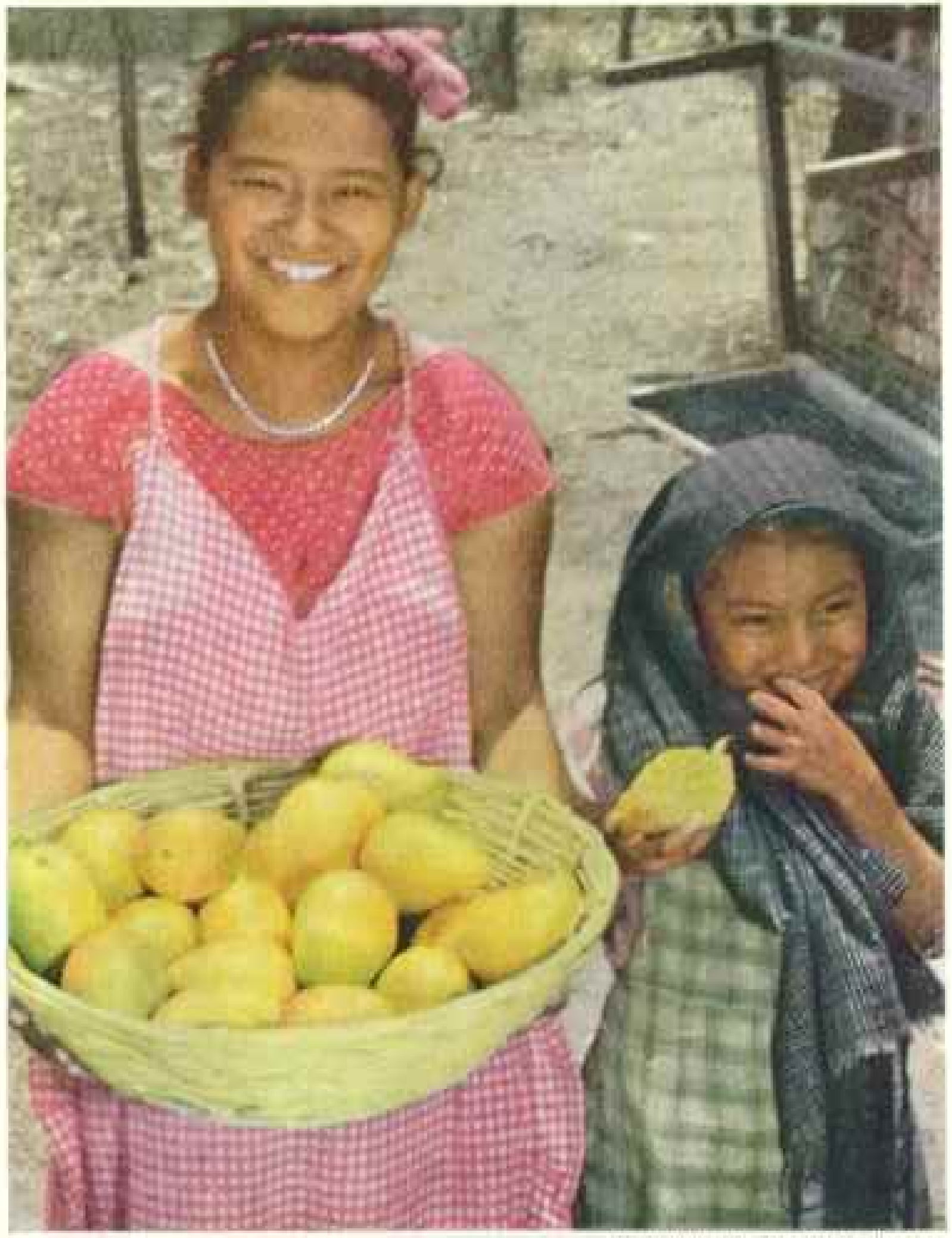
Kodachrome by Richard H. Stewart

School Children, Who Walked 12 Miles to See an Archeological Site, Stand on the 10-century-old Mound of Piedra Parada

Here the expedition uncovered a stone temple enclosed by five other structures, all fitting together like rings of onion skin. Their origin is uncertain. Pupils and teachers have trudged from Ocozocoautla, 12 miles distant. Dr. Matthew Stirling, leader of the expedition, stands hat in hand.

Bougainvillea Vine Forms a Wreath of Solid Pink

This child lives on the slope of a volcano in Chiapas. Archeologists searched her father's estate in vain for ruins. Instead, they found coffee and bougainvillea growing luxuriantly in the volcanic soil.



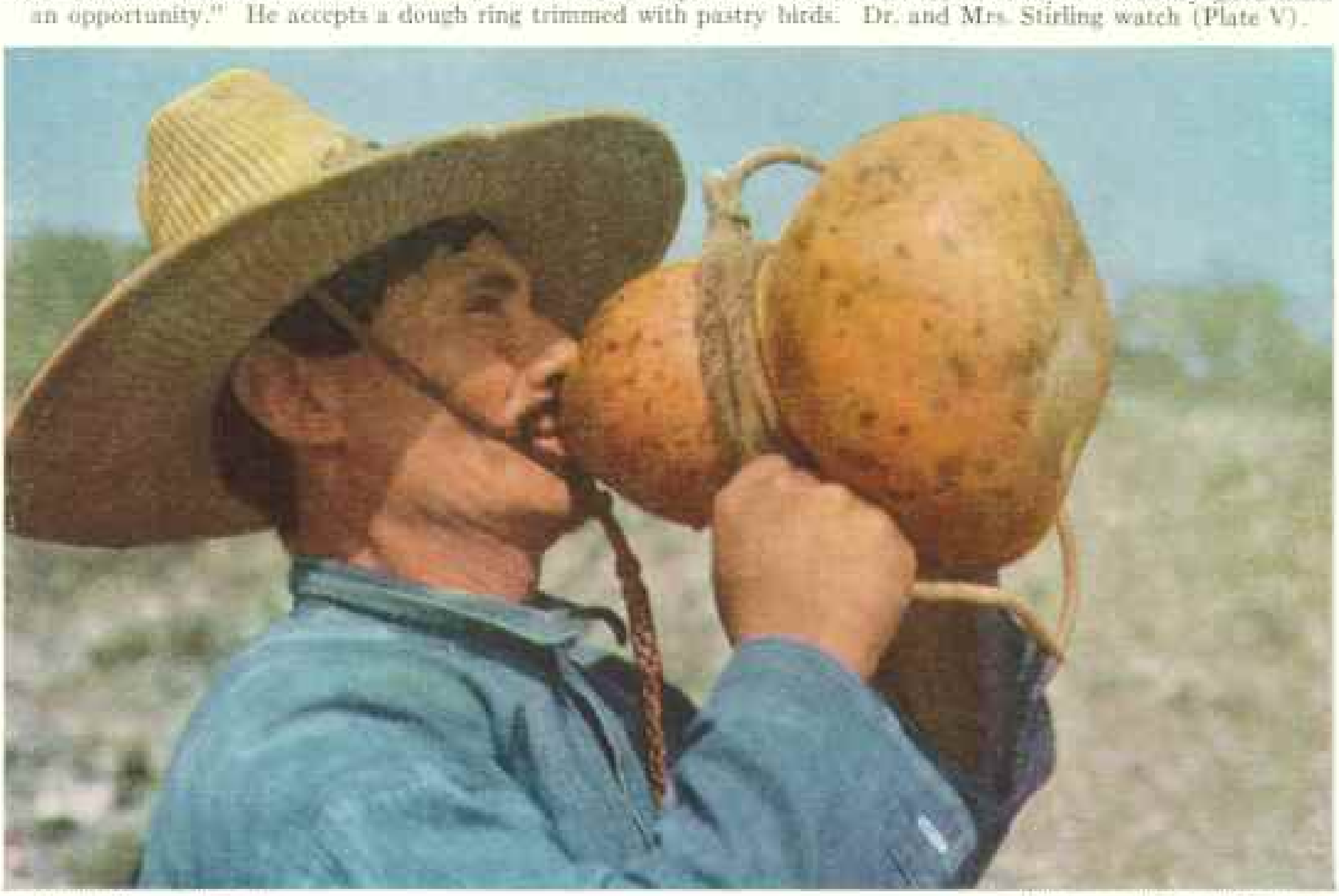
Kodachromes by Richard H. Stewart

"Try a Mango," Says Natividad, the Expedition's Cook

In a camp full of native workmen Natividad took precautions to preserve her reputation. For a chaperon she acquired the girl beside her. In Piedra Parada mango trees were laden. "Thick as persimmons," says the photographer.

His Birthday Secret Discovered, the Photographer Has a Surprise Party

"Our Mexican friends needed little excuse for a fiesta," says Dick Stewart (left), "and my anniversary gave them an opportunity." He accepts a dough ring trimmed with pastry birds. Dr. and Mrs. Stirling watch (Plate V).



Kodachromes by Richard H. Stewart

Jorge, the Expedition's Guide, Hoists a Gallon Gourd and Takes a Swig of Water

Jorge knew the caves where relics might be found. An indefatigable hunter, he roamed the countryside with a muzzle-loader. To Mrs. Stirling he carried wild orchids. For Dr. Stirling he collected snakes and lizards.

Piedra Parada Headquarters Stands on a Mound, Perhaps above Archeological Treasures

"I should like to have dug below the house," says Dr. Stirling, "except that our host, Don César, generously shared his quarters with us." Don César (below, left) preferred his adobe ranch home to his town house.

 Kodachromes by Richard H. Stewart

Photographer Stewart Wears a Birthday Crown of Corn

Don César (left) not only permitted the explorers to dig his land; he gave them tips on other archeological prospects and lent his horses for journeys. Cook, water boy, and two workmen complete the picture.

Kodachrome by Richard H. Stewart

Piedra Parada Workmen Bear Baskets of Pottery, the Broken Relics of a Forgotten Mexican Tribe

The valley is of limestone, which, being porous, holds no water; hence there is little population. Water-retaining sandstone forms the distant bluff. From its foot seeps a spring, the only water in a considerable distance. Therefore, both ancient and modern settlements were located on the site.

Kodachrome by Richard H. Stewart

Marimbas Make Music and Tiles Wear Decorations at a Zoque Indian Housewarming in Ocozocoautla

Before a Zoque home builder completes his roof he distributes the tiles in lieu of invitations. These the guests adorn with colored crepe. On housewarming day the tiles are handed in like calling cards, and, amid feasting, the roof goes into place. Chiapas State is celebrated for its marimba, ancestor of the xylophone.

Ocozocoautla Inherits Its Floral-shield Industry from a Primitive Indian Art
Green leaves are rolled into pencil shapes. Around them petals of various colors are wrapped until they overlap. Some shields are made to decorate saints' altars. One style is used by swains as a token of proposal.

 Kodachromes by Richard H. Stewart

Though She Molds Clay by Eye and Hand, the Potter's Vessels Vary Little

She has no wheel; only scraper and cowhide "bench." "Nonetheless," says Dr. Stirling, "you could measure her bowls with calipers and scarcely tell them apart." Her colleagues at Ocuilapa make censers for burning copal.

north-south line, with two rectangular flanking mounds just north of the central one. The northern and southern mounds are 800 yards apart (Plates II, V, and VI).

Between the north and the central mound is a small platform in front of which is a standing limestone stela, 10 feet high, which gives the site and the region its name of Piedra Parada (Standing Stone).

The north mound is an acropolis. It is built on a broad natural hill which had been artificially terraced, the terrace walls being built of slabs of limestone. Three terraces lead down the south front of this mound, which dominates the entire site. César's house was built on the first terrace directly in front of the mound proper.

In the vicinity of the principal mound group were a number of smaller mounds, and near the point where the trail to Ocozocoautla crossed the arroyo we found an ancient cemetery. Later we excavated it and discovered some of our finest specimens.

From the sandstone cliff back of our camp emerged a fine stream of clear water which, after flowing about a mile, disappeared in a sink in the valley. This stream, with the only water for many miles, was the reason for the location of the ancient site as well as the small modern settlement.

A New Species of Fish

Since the stream was about a quarter of a mile from our house, we hired a small boy to act as water carrier. It contained many small fish, a number of which we collected. As we suspected, they proved to be a new species.

Our principal excavations were on the north mound by our house, and the central mound.

The former was made up of superimposed stone masonry structures. The original building was in the form of a cross with well-built walls three feet thick. These walls had a core of stone rubble faced on each surface with well-shaped limestone blocks. On the outer surface were what appeared to be plugged-up windows with projecting awnings above them made of flat slabs of stone.

More detailed examination showed them to be pseudo-windows, which had been filled in when originally built. They were evidently intended to be purely ornamental.

After considerable time the rooms were filled with earth and stone and the entire structure buried. Covering the mound was a new and large stone-faced structure in the form of a terraced pyramid. As time went on, this process was repeated four more times, each succeeding structure serving to preserve those under it.

Under these structures and around the base was built an elaborate system of stone-lined and stone-covered drains. To excavate these and expose the inner ones without destroying those above presented a difficult problem.

Excursions to Caves and Ruins

Each week end while we were at Piedra Parada we made excursions to caves and ruins we heard about from the natives. Under the guidance of Umberto and Jorge we made a number of 10- and 12-hour horseback rides over fascinating trails in this heretofore completely unknown archeological area, and were richly rewarded.

Once, with Umberto and two guides, we rode to the Cueva de la Guayabal (Guava Place). The trail led across the valley and up the limestone ridge west of camp. From the foot of the ridge the country is limestone, making the trail rough and bad.

We crossed a rolling plateau, and after an hour and a half could see many small terraces and cleared squares where the *antiguos* (ancients) had lifted out the stones to aid cultivation.

It seems strange that this thin and sparse soil in shallow pockets in the limestone should have been utilized at all. Perhaps erosion has removed much of the soil since then.

Here and there were small rectangular platform mounds not more than 15 feet long and 3 feet high.

After descending a rather deep, bare valley and climbing the other side, we saw a number of stone walls three or four feet high and several small platform mounds placed rather closely together.

Each had a slab of limestone like a stela set up on the north side. The ground among the stones was littered with shards.

South of this site on the north rim is a remarkable limestone sink, or *cenote*, almost half a mile in diameter, with vertical walls and about 250 feet deep. There is a narrow entrance on the west where the roof of a former cave has fallen in.

Passing it a short distance over stony ground covered with pottery fragments, we dismounted, and our guides cut a trail down a slope about 200 yards. Suddenly we burst on the cenote that is the entrance to the enormous collapsed Cave of Guayabal.

Through trees we could see the big black entrance, framed by huge stalactites 100 feet long. A large flock of parrots stormed out noisily, vivid green in the bright sunlight, in strong contrast with the black cave opening. They circled about the cenote; many lighted near by on the top of a large tree.

On the east side the cenote is filled to within 40 or 50 feet of the overhanging rim, though the bottom of the cave entrance is 200 feet below.

A tall, slender tree, almost without branches to the top, could be reached from the rim. One of the men went down this tree, and with ropes we lowered our gasoline lantern, cameras, and other equipment.

Dick and I took off our boots and slid down the tree with the three men. We then climbed down the slope to the cave entrance, which is more than 100 feet high and 150 feet wide. Within the entrance one feels remarkably insignificant.

The cave is a mass of glittering white or light-amber stalactites. For 200 yards the floor is level and covered with soil. Near the entrance an enormous stalagmitic curtain running from ceiling to floor cuts off about four-fifths of the opening. The open portion has three or four great columns where stalactites and stalagmites have joined, and we could easily walk between them.

Almost at once we began to find pottery vessels lying around on the floor. We gathered them together in a heap.

With the gasoline lantern and flashlights we went into the cave about a half mile. As it progresses it branches off into many galleries, and I was afraid to go farther for fear of becoming lost.

All the way we found pottery, sometimes on the level floor, sometimes placed higher up on the formations. There was one *olla* (large jar) over two feet high of a fine thin buff ware, with constricted neck, flaring rim, and round bottom.

There were many flat-bottomed dishes of black incised ware, with straight, low sides and flat bottoms, and numerous shallow, saucerlike plates, from 3 inches to 10 inches in diameter, of a rather crude buff ware.

Near the entrance we found a shard with stamped inside bottom, Aztec style. Most of the ware was polished black, polished brown, and unpolished buff, though there were also some polished buff vessels. Some of the black incised pieces had traces of red paint on the bottom, and there were a few red painted pieces. Probably excavations in the earth floor would be productive.

Umberto said very few had been in the cave; he was sure no one had ever gone in as far as we had.

Parrots, Not Bats, Hover about Cave

The cave itself is the most beautiful and spectacular I have seen, as well as one of the largest. Curiously, there did not seem to be many bats, but near the entrance myriad parrots take their place.

After we had finished our explorations, Dick and I viewed with trepidation the feat of climbing the tall tree back to the rim.

Jorge went up first, with considerable effort, and rigged a rope along the tree as an aid. Umberto followed. We hoisted our equipment and boots and then, after much puffing and sweating, I finally broke through the big spray of yellow orchids growing on the tree just where it reached the rim and heaved myself thankfully on the top (page 139). Dick followed.

Another time we started on horseback at 6.30 a.m. to the Ranchito Aguacita.

The trail climbs the sandstone cliff east of camp and then heads north. After an hour's ride through hilly open country, we plunged into deep jungle over a raw, newly cut trail, very steep and rocky. We finally reached the isolated *ranchito*, merely a shelter in a picturesque little pocket at the foot of the Pico Carrizal, which rises straight above it like a jungle-covered Matterhorn.

About 200 yards up the steep north side of the peak, hidden in heavy jungle, is the cave entrance from a narrow limestone shelf. It is almost round, and drops directly into a vertical pit about ten feet deep. We descended by sliding down a pole.

A short distance inward a small room opens to the left. It is about 15 feet in diameter, with a level, earth-filled floor. This was littered with pottery vessels and ornate incense burners.

Later we lifted out about a hundred more that were buried in the loose earth of the floor. These were mainly flat-bottomed bowls nested closely together in groups of four to eight. The larger bowls were about 15 inches in diameter. We prospected only deep enough to see that there was another layer of vessels below the one just under the surface. It seems safe to assume there are more than a thousand complete vessels in this chamber.

Hidden Treasure of Jade

Shortly the cave turns to the left and becomes very high and narrow, being here about 50 feet high and 3 feet wide. In about 30 yards it widens again, with a floor space about 15 feet across and 20 feet long.

This floor was piled high with vessels and incense burners, heaped some two feet high. We cleared a passage through the middle and dug a little with the trowel. Hundreds of vessels were buried in the black earth just below the surface, and under this layer was a floor of flat limestone slabs. We lifted

a couple and found under them another mass of vessels. Often these were placed inverted, one inside the other.

In three we found jade beads: one a large spherical bead one inch in diameter with a brilliant luster, another smaller one of not such good quality, and a third long, rectangular bead, with small longitudinal perforation, of good-quality green jade.

Behind this room the floor level of the cave rises vertically about nine feet, but one can put a foot on each wall and climb up. At the top the cave again turns abruptly to the right. Just at the angle is a deep round pothole which drops into another room.

The mouth of this pothole had been covered with two heavy limestone slabs like a trapdoor. One of these we removed. The opening beside the other was so small that only Umberto could squeeze through to drop into the room below. This was also earth-filled and covered with incense burners and dishes.

Matthew W. Stirling

Target of Image Smashers—Battered but Indestructible

At San Lorenzo hundreds of years ago this statue stood complete, Dr. Stirling believes, with a recumbent, sphinxlike body. Conquerors, overrunning the village, tried to wipe out its monuments. The basalt head, broken off its body, was too large to obliterate, but small enough to carry a mile to a scrap heap.

The cave continues about 300 yards farther, and is narrow and exceedingly high. The floor level changes several times.

At places along the walls, especially at the turns, there had been carved out of the rock some round depressions, usually in groups of three, evidently for placing torches of pitch, since the limestone over these niches was blackened with soot.

At the far end the farmer had previously found a jade necklace of large beads with a centerpiece "like a turtle" of clear blue jade, which latter piece he said he sold in Coyta for 100 pesos.

During our three months at Piedra Parada we visited many similar caves and ruins near the gorge of the La Venta. The latter are an entirely new type of archeological site. Most of them had massive stone-masonry structures and big ball courts (page 158).

Our work along the La Venta has opened up an important new archeological area.

The "Hill of the Navel"

César had told us that the rainy season was due to begin May 22. This seemed a rather precise prophecy, but he sounded so convincing that we planned to break camp and leave on the morning of the 24th.

Early in the morning of the 22d we rode

An Altar Brightens Her Ocozocoautla Home Like a Christmas Tree

From the ceiling hangs corn, a favorite offering to Maya deities. Flowers are strung in festoons and rolled into circular shields (Plate VIII). One candelabrum is a tripod cut from a tree. The dish beside it is used for burning copal incense. Pride of the family is the carved wooden image of a saint immediately below the haloed infant. It is on loan from a church (page 144).

with him to Ocozocoautla to see a mound west of the town, known as Cerro del Ombligo (Hill of the Navel). It proved to be the central feature of a large and interesting group which we spent most of the day examining and mapping.

We returned to Ocozocoautla in the afternoon and went to César's house where his wife, in honor of her birthday, served us a meal with *mole*, a sauce containing about 30 ingredients, *tascalate*, a drink made from ground corn and other things (page 158), and several different kinds of sweetened aguardiente.

In the late afternoon we went to see a big tile-laying ceremony at the edge of town. One of the more prosperous Zoques had just completed a new house and there were more than 100 guests.

All Aboard the Oxcarts

Returning to camp, we completed our packing and paid off the crew. Finally, we got all of our equipment packed into oxcarts and made our last trip into Ocozocoautla, just one day too late to miss the rains.

When we reached Tuxtla by truck, we thought that our season's field work was officially over. Such was not the case.

Awaiting us was a letter from a Mexican friend in Coatzacoalcos telling of stone monuments on the Rio Chiquito, in a remote part of southern Veracruz. Juan del Alto, an acquaintance of ours, had heard that two of them were colossal heads.

Although we had plane reservations for Mexico City, we made a rapid-fire change of plans. Stewart, who had a photographic assignment in the capital, would go there, and Mrs. Stirling and I would get off the plane at Ixtepec and cross the Isthmus of Tehuantepec to Coatzacoalcos.

We left Tuxtla early the next morning and in an hour or so reached Ixtepec, where we said good-bye to Dick. The train left early the following morning, and after a 12-hour ride we found ourselves in Coatzacoalcos.

Having located Del Alto, we found no launch immediately available for going up the river; so we arranged to reach the Rio Chiquito the hard way. Accompanied by Del Alto, we climbed on the Isthmian train.

After a two-hour ride we left the train at a signpost marked "Texistepec." The village was two miles from the railway. Since there were no horses or men in sight, we shouldered our bedrolls and, carrying the net bags containing our other equipment, we set out on foot. Though still morning, it was hot, and after the recent rains the deep mud made heavy going on the hilly and slippery trail.

Dress Scanty; Head Loads Heavy

Texistepec is a Popoluca Indian village, with almost 3,000 people. Palm-thatched, mud-walled houses are scattered over a hilly clearing covered with vivid green turf.

Women wear hand-woven cotton skirts, most commonly red or blue with horizontal white or yellow stripes. Many women are uncovered above the waist.

The Popolucas are a fine-looking people. The women stand erect from carrying loads on their heads. Here we saw for the first time women balancing on their heads, one above the other, as many as three pottery jars filled with water.

No horses were available. All were hauling corn to the near-by town of Ojapa. We prevailed upon a tall, handsome young man called Máximo Millian to go with us as guide to Tenochtitlán, and he agreed to set out as soon as his animals returned from Ojapa.

In the meantime we went to the house of Domingo Ortiz, who took us in, served us breakfast, and, later in the afternoon, a good lunch "to fortify us for our trip."

Between meals we examined a number of prehistoric mounds on and around which the picturesque town is built. We saw also a number of archeological pottery vessels and figures which the natives had appropriated.

About 3 o'clock Máximo appeared with three horses and a mule and we set out on the trail. After an hour we crossed a deep, sluggish arroyo where our horses drank, and in an hour and a half more we reached a small group of houses.

At nightfall we came to the village of Ojo de Agua, on the Rio Tatagapa. In the darkness we swam our horses across the river, here about 50 yards wide and very deep and sluggish.

Lost! Then Marimba Music

It was cooler at night and we were wet; so we set out briskly toward the east across the wide savanna which separates the Tatagapa from the Chiquito. It was covered with tall *zacate (zacate)* grass which grew to the height of the horses' backs. There was no moon and it was very difficult to see the way.

Finally we got off the trail and became lost, wandering around but keeping our general direction for about an hour, until we intersected another trail which eventually led us to the bank of the Rio Chiquito.

We then followed up the edge of the river until Máximo called to us to listen. Faint in the distance we could hear the strains of marimba music. "Tenochtitlán," he said.

A little after 10 o'clock we rode into the village. A few men were still gathered around the bar in the palm-thatched village store.

Being well desiccated from our long, hot ride, we quenched our thirst and made known the purpose of our visit. Despite the late hour, our unexpected arrival, and our bedraggled appearance, we were received with much consideration.

Someone woke up the schoolteacher, and another routed out the Municipal President, who agreed to locate four workmen to accompany us, as well as two guides to show us the location of the monuments. We were conducted to the schoolhouse and invited to unroll our blankets and spend the night on the floor.

Early next morning we had our first view of Tenochtitlán by daylight. The town is on the left bank of the river, on two parallel ridges which run north and south.

The ridge nearest the river is covered with a series of small mounds built by the prehistoric occupants. The ridge 400 yards to the west has on it a series of very large mounds, including a rectangular court flanked on either side by a long, high embankment, and at each end by a tall pyramidal mound.

Cook Swizzles *Tascalate*, a Pre-Columbian Soft Drink

Into the beverage go water, ground corn, sugar, cocoa, and sometimes *achoite* (annatto), seed of a tree used to color the drink tomato red. Honey-sweetened tascalate was relished by the Conquistadores.

These mounds command a fine view over the spacious plain below. Eight miles to the southwest the lone, low Cerro Encantado (Enchanted Mountain) rose from the level plain. About four miles to the south we could see the heights of San Lorenzo where the monuments are located. This is a continuation of the same low, isolated ridge on which Tenochtitlán is located.

For the schoolhouse the teacher had gathered antiquities which whetted our archeological appetites. Among the specimens were two small, 4-legged rectangular stone vessels, each carved with a face in La Venta style, the two front legs being in the form of recumbent, bent elbows. There was also a fine realistic carving, about three feet in length, of a crouching and snarling jaguar.

Beside one of the town's houses, still in its original position, was a large stone figure consisting of an anthropomorphic jaguar seated on a human figure lying on its back with crossed legs.

Found—a Big Eye, Then a Head

Tenochtitlán is a relatively new community. Eight years ago all of this ridge was tall virgin jungle. The first houses were built on the mound site. Only a year ago was the first of the stone monuments located on the high land south of the village.

As the trail along the ridge wore deeper, a stone was encountered. Since this is a region where no stones should be, a native with more leisure and curiosity than the rest stopped his horse one day and with his machete scraped away the mud over a section of the stone. To his surprise he found a huge eye gazing up at him.

Shortly thereafter, another man, clearing the woods from the side of a steep arroyo, found lying face up an enormous half-buried head.

Gossip concerning these reached some woodcutters on the river, and from them the rumor came to Del Alto and others.

We had followed up many such rumors, usually to find the story a myth. This time we were soon to see that our efforts had not been in vain.

By the time we rode up the trail and reached the stone, our four workmen already were busily engaged in digging around it. Excavated, it proved to be a handsome colossal head, nine feet in length and considerably larger than the biggest at La Venta.

This was only the beginning of a strenuous

day and a half of exploration. One of our guides, an old man, led us more than a mile beyond this spot, where we plunged into the jungle of the plain below and found a beautifully carved stone head of unique form but in typical La Venta style. It was realistically done, and shown as wearing a peculiar flat, ornate headdress. It had been broken off at the neck from a larger complete figure.

In its present form it is 3 feet 4 inches high. Apparently it had been carried to its present location in ancient times from the site on the ridge (page 155).

Returning to the main site, we were next shown a big table-top altar, lying on its back at the edge of a deep depression about 30 yards across. This stone is under water most of the year because the depression becomes a lake in the wet season. Arriving at the close of the dry season, we were fortunately able to excavate it and take photographs.

The stone is of the same type of pitted basalt from which the two big altars at La Venta were made. This huge altar is very similar in appearance and almost exactly the same size as the largest La Venta example.

In front is a seated figure in an arched niche, holding what may be a baby in his lap. The figure is badly eroded from having fallen face up. Each end of the altar is carved in low relief.

On the south end is a single seated figure, elaborately ornamented, wearing a peculiar headdress which culminates in a clutching eagle's talon.

The north end, as in the large altar at La Venta, has only part of the decoration remaining. The rest was removed to make a number of deep rectangular recesses or niches. The San Lorenzo altar is 11 feet 4 inches long, 6 feet high, and 5 feet in width across the table top.

Masterpiece of All Heads

After this altar had been excavated, our guide said, "Now we will see *El Rey*." He led us east across the central mound group and we came abruptly on a small, steep ravine, the sides of which had been cleared of their jungle growth.

Lying on the steep slope of this ravine, face up, top of the head down, was the colossal head to end all colossal heads.

This stone, because of its fine state of preservation, size, and artistic merit, is the most impressive of all the San Lorenzo monuments and, for that matter, one of the finest monuments of the La Venta culture. About nine feet in length, it is wide and thick, and the heaviest of all the heads.

The moment we saw it, we knew we were gazing on a real masterpiece. The only damage it had suffered was the scaling off of a section above the right eye. The pieces were lying on the ground at the base of the head, and we later restored them in place with cement. The mouth is more than three feet wide and each eye is just less than two feet across! (Plates IX and XVI.)

The features are executed with great realism, the natural appearance of the lips enhanced by the convention of a narrow raised line which outlines them.

Our appreciation of the ancient inhabitants of La Venta was increased by the thought that more than 1,300 years ago this huge block of stone had been transported from the nearest source of basalt in the Tuxtla mountains, more than 60 miles distant in an air line, and had been carved entirely by stone tools.

The enterprise, patience, and skill required to perform this feat could be the product only of an unusual civilization.

Monuments and an Aqueduct

Our finds, however, were just beginning. Returning to the court in front of the central mound, we found the earthworks so densely overgrown that it was difficult with our limited time to discover their location and arrangement.

In this court were two monuments. One was the seated figure of a woman holding in her arms the chubby form of an infant. The head of the woman had been broken off in ancient times.

Near this was a stone sphere 115 inches in circumference, reminiscent of those recently discovered in Costa Rica. We had found two smaller examples at Cerro de las Mesas in Veracruz.

From the central mound group we went west through dense undergrowth where, at the bottom of a steep jungle-clad ravine, we were shown a flat projecting stone.

This, when excavated, proved to be the base of a seated figure. We righted it with difficulty and it turned out to be a handsome carving four feet in height, almost undamaged, of the Olmec jaguar god.

Just above this figure, in a gully on the side of the ravine, was a mass of hollowed-out tile-shaped stones, each about 32 inches long, 15 inches wide, and 10 inches high. With them were a number of flat stones of the same length and width.

These stones were apparently the remains of an ancient aqueduct, a most surprising new feature of La Venta culture. Such stones also appear in at least two other localities on

the site. If they were part of the same system, the aqueduct must have extended for perhaps half a mile (Plate XIII).

On a narrow, projecting point in a most unlikely-looking spot at the edge of a steep ravine we found another unique specimen. This was a stone fount, carved in the form of a swimming duck. The top was hollowed out like a basin. The sides were carved in the form of wings and between them was a series of water glyphs.

On the breast in low relief was a Disney-like cartoon of a duck, with open beak as if quacking, and with flapping, extended wings. Two webbed feet project from underneath the breast. In one side is carved a U-shaped opening, and a small round hole forms an exit for the water.

In the bottom of still another ravine we excavated another buried, inverted figure, a seated woman holding a cylindrical bar across her lap. It is beautifully carved, but the head is missing.

On the edge of yet another ravine we found a large rectangular slab. One side was carved with a shallow depression, leaving a raised margin like a frame around the sides. On this flat surface were carved six symmetrically placed depressions in the form of stone axes, or celts. Our guides, always ready with an explanation, called this the "stone pool table."

Our time was definitely limited. At noon on the second day we had to call a halt to this exciting but high-pressure period of discovery. Regretfully we mounted our horses and returned with Máximo to Texistepec in time to catch the night train to Coatzacoalcos.

Excavating in the Rain and Mud

Less than a year later we were again on the Chiquito, this time with Dick Stewart and Phil Drucker, the latter just back from the war. We cleared a section of the jungle and built our permanent camp on the edge of the plateau where the site of San Lorenzo was located, four miles south of the village of Tenochtitlán.

We soon discovered that our camp was erected on one of the ancient structures. Our view over the coastal plain was magnificent.

In a deep ravine beside our houses was a fine spring of clear water. From Tenochtitlán we recruited 30 workmen whose machetes soon felled the concealing growth that covered the ancient center.

For three weeks we were plagued with rain, which contributed to our discomfort and retarded the work. It is hard to excavate in wet and sticky clay, especially when we have to locate and recover specimens and note structural details in the pits. The lagoon, completely dry the year before, this season remained full of water to the close of our work.

From the village we secured as cook Domatila and her two-year-old nudist son, Nacho. Domatila turned out to be the best cook we found in eight seasons of work in Mexico (Plate XV).

It is not only the more complex civilizations that are thrown out of gear because social and economic adjustments lag far behind the rapid advance of education and the material arts. Domatila, who was a conservative, would frequently lament the passing of the good old days.

Only ten years ago a few pioneering farmers hewed the first clearing around the spring at the base of the big mound. Someone with a vague knowledge of the history of his ancestors named the little settlement Tenochtitlán after the great capital city of the Aztecs.

Life then was simple and elemental. Money was unnecessary, since each family raised all the food it required. Wild game was abundant and the rivers were full of fish. The women spun cotton and wove the striped *faldas* which they wrapped around the waist and wore as a skirt. This convenient dress was the only garment required. Other simple needs were acquired by barter.

Launches ascended the Chiquito infrequently and the little traveling that was done was by dugout canoe or on horseback.

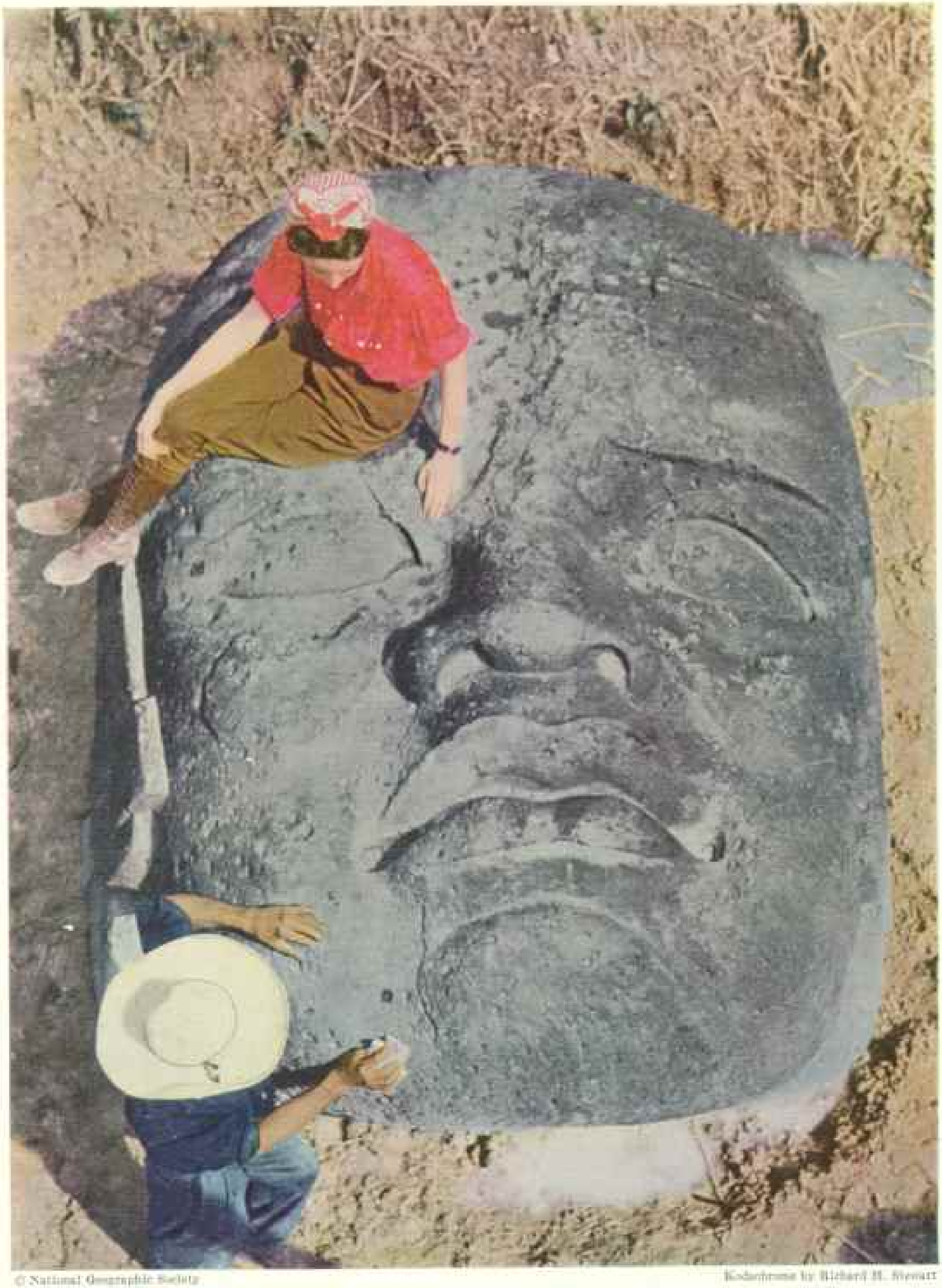
Each member of the family, including the small children, had his or her assigned tasks, prescribed by custom. All were busy, all were happy. The monotony of this routine was broken by the regular week-end fiesta which provided the excitement of music, dancing, amours, drinking, fights, and an occasional killing.

This state of affairs finally began to break down. The village grew and a town council was appointed. A trader began making regular weekly trips up the river in his launch and buying the surplus corn. A store was built in the village. Young people became interested in visiting the fleshpots of Minatitlán, as the launch made the trip easy. Urban ideas began to creep into the community.

The climax came with the arrival of our archeological expedition and its pay roll of 30 men.

A Teacher of Many Parts

In keeping with this progressive spirit and the educational program of the Mexican Government, a schoolhouse was built and a teacher imported from Jaltipan. This man, of pure



© National Geographic Society Kodachrome by Richard H. Stewart

El Rey, 30 Tons of Carved Lava, Gets His Colossal Face Scrubbed

Workmen called him *el Rey* because he was *the King* of 11 colossal heads found by the author. All, like a football eleven, wear helmets. This one undoubtedly resembles his flat-nosed creators, the vanished La Venta people. He was one of five heads discovered at San Lorenzo in 1946 by the eighth and final expedition to Mexico.

Kodachrome by Richard H. Stewart

Iztaccihuatl, the Aztecs' Sacred "White Woman," Holds Her Snowy Head High above the Pan American Highway

The view is exceptionally clear; clouds usually cover Iztaccihuatl's face. Once this 17,342-foot peak was an active volcano, but no trace of its crater remains. Popocatepetl, its 17,887-foot neighbor, towers out of sight to the right. The expedition's station wagon has just left Mexico City.

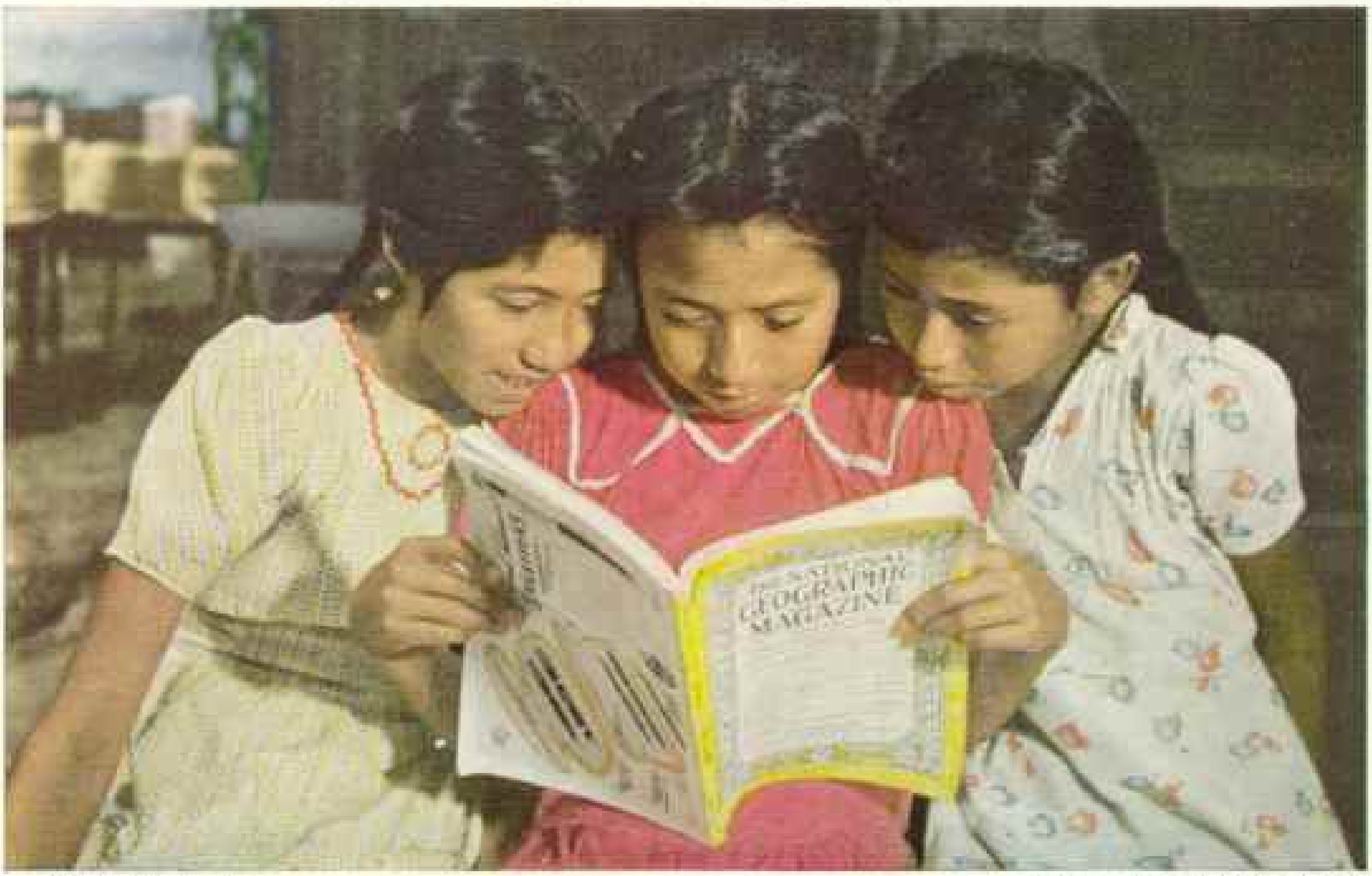
 Kodachrome by Richard H. Stewart

At San Lorenzo Headquarters the Society's Flag Flies above a Mound Erected by the Sculptors of Colossal Heads

From the porch Dr. and Mrs. Stirling enjoy a view of the coastal plain, where they often could see storms sweeping in. In this desolate region they had to build quarters because there was no house within five miles. Their insect-proof dining room was a $60 treasure; the screening cost that much.

Twin Atlases of the New World Support an Altar on Heads and Hands

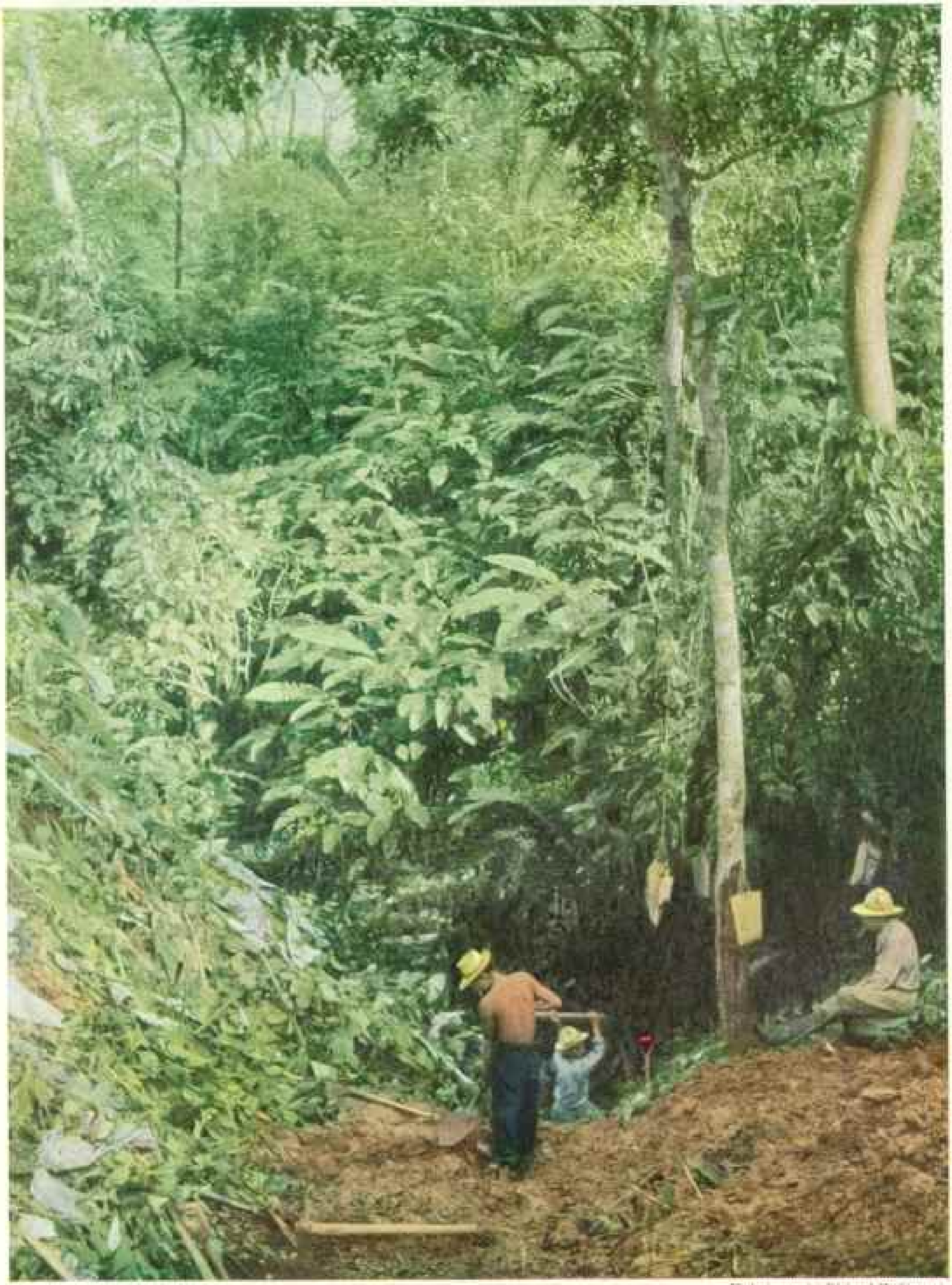
Stroke carved above each Atlantean figure represent the eyes of a jaguar, a beast sacred to La Ventana. The workmen did not appreciate their unique discovery; only gold or jade would have satisfied them.



 Kodachromes by Richard H. Stewart

Three Sisters, Visiting Camp, Neglect Their Father, the Foreman, for Your Magazine

Carrying supplies to Papa once a week, they never failed to stay out the day. They admired cookie tins and film packs. Above all, beautiful women and shiny automobiles shown in THE GEOGRAPHIC fascinated them.



 Kodachrome by Richard H. Stewart

A Jungle of Wild Banana Plants Conceals the Ruins of a Remarkable Elevated Line

Centuries ago La Venta craftsmen bridged this ravine with a series of trough-shaped stones covered with flat slabs. At enormous cost in labor each heavy piece of basalt had been carved by hand. Stretching perhaps half a mile, the fallen blocks probably represented an aqueduct, in the opinion of Dr. Stirling (right).

Rotochrome by Richard H. Stewart

Diggers Drive a Trench as an Exploratory Cross Section. This Disappointing Mound Contained Nothing of Special Interest

Ben Grauer (left), the radio announcer, visits camp on vacation time. He has made archeology his hobby ever since reading the August, 1939, NATIONAL GEOGRAPHIC MAGAZINE's account of Dr. Stirling's finding a colossal head at Tres Zapotes. An 8-foot growth represents the jungle's repossession of an abandoned farm.

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Weaver of Palm-leaf Hats Says, "Twenty Centavos, Please"

Doing double duty, he weaves as he drives his burros along the Pan American Highway between Oaxaca and Cuautla. Others weave as they walk.

Kodachromes by Richard H. Stewart

Donatila, San Lorenzo Cook, Prepares a Meat Turnover

To prepare the dish, she fills a cornmeal pancake with meat, folds it, fries in deep fat, and serves with a hot sauce. Her name for it: *empanada*.

Five Visitors, Two Astride a Bull, See Mrs. Stirling about an Exchange of Sweets

From the cane fields they have brought a bottle of *agua miel* (sugar syrup), knowing they'll get some hard store candy. Their mount, a family pet since calfhood, is as gentle as a pony.

Kodachrome by Richard H. Stewart

***El Rey* Undergoes a Face Lifting; He Wears a Concrete Patch on His Forehead**

In a muddy ravine he is forced to lie. Centuries ago a marauding tribe, conquering his creators, evidently tried to destroy their monuments. El Rey was too big and tough; the iconoclasts could only push him into the ditch.

Indian descent, is a remarkable and many-faceted individual. He recruited most of the numerous children of the village for his school and installed successfully the unaccustomed discipline necessary to the conduct of classes.

He instructed them in reading, writing, and arithmetic and in elemental natural history. Feeling the need of developing interests in something other than drinking, *huapangos* (folk dance of Veracruz), and fighting as recreation, he organized baseball, basketball, and soccer teams in the village.

Since few of the villages knew anything of these sports, he taught them all the details and made trips to neighboring villages to stimulate the organization of similar teams in these places. He then arranged a schedule of Sunday games between Tenochtitlán and these teams, up and down the river.

At the time of our visit, a healthy rivalry had been developed. Needless to say, our teacher was both coach and star player on each of the local teams.

He purchased a marimba and taught a group of young men of the village to play. When we were in Tenochtitlán we spent several evenings listening to pleasant concerts of which Carlos was the director and leading instrumentalist.

Being also an expert trumpeter, he gave variety to the concerts by alternately working his mallets on the marimba and playing the cornet. He was always able to oblige either on the mouth organ or the guitar. He was the leading soloist in the vocal portion of the programs.

Since the salary of a country schoolteacher is pitiably small (his salary was less than the wage paid our workmen on the excavation), Carlos augmented his income by operating his own farm as a side venture.

Here he departed from all local tradition by not growing maize, the universal crop, but beans and cabbages, hoping by example to encourage more variety in local agriculture and, incidentally, making more money by having a virtual monopoly in his own special produce.

A Painless Subsidy for Art and Athletics

Since the levying of municipal taxes is even more unpopular in Mexican rural communities than it is in our country, Carlos had devised a sure way of extracting funds from the citizenry through the exercise of another of his talents. Few backwoods Mexicans are able to resist the lure of a deck of cards or a pair of speckled cubes. Our schoolteacher, always provided with these commodities, was ready to take on anyone at any time for any amount. It is scarcely necessary to add that he seldom came out second best.

A good proportion of this income he expended for purchase of athletic and musical equipment and medicinal supplies for the good of the community. A fair share of our pay roll was undoubtedly funneled in this manner toward the development of education and community uplift.

The children are now well adjusted to school routines, but the benefits of such newfangled ideas as academic education are viewed with mixed emotions by some of the older natives.

One day Domatila was discussing with us the problems of the younger generation. Although her own marital experiences had been rather informal, she lamented the present trend toward lack of permanence in the marriage union.

"Nowadays," she said, "it is the usual thing for young people to live together only a year or two, and then split up and live with someone else.

"The effect of this," she philosophized, "is bad for the children, as it breaks up the home and makes for shiftlessness. Formerly a young man and woman who took up residence stayed together for life, or at least for a respectable length of time. There was public disapproval if they did not do so.

"The young women were well versed in all the domestic arts, such as corn grinding and cooking. They were good housekeepers and knew how to take care of children; consequently, the household flourished. Now this has all changed."

Too Much School; No Time to Learn!

Domatila had an explanation. "The trouble is," she went on, "nowadays all the girls spend the years while they are growing up in going to school: so they don't learn anything."

Another regrettable feature of this modern trend, according to Domatila, is the beginning of a social caste system in the neighborhood. Instead of the former economical method of marriage by mutual consent, some people are getting the fancy idea of going to Hidalgotitlán and being married by the civil authorities in order to enhance their social prestige by this display of reckless expenditure.

Domatila herself was always a practical person, as she coyly confided to us one day that Juan, her boy friend on our crew, was going to buy her a whole new set of false teeth if she would come to live with him after we broke camp.

Natives of tropical Mexico living in the vicinity of ancient ruins or monuments pay no attention to them until an outsider arrives

and exhibits interest. To the native the only possible reason for this must be that the stranger expects to profit from his excavations. The sensible explanation is that he is looking for treasure.

Although we always tried to explain the purpose of our work, I doubt that our workmen, and especially the other villagers, ever fully believed us. As a result, it was often difficult for us to persuade natives to reveal to us the locations of stone monuments. Often they would demand some ridiculous fee for doing so, since they assumed that we expected to locate a treasure.

We made it a rule never to pay more than a very small bonus over a regular day's pay for such services, for, if once the precedent were started, no one but a millionaire would be able to do archeological work in the region.

In this respect our schoolteacher was of great assistance to us. He explained clearly and intelligently the reasons for doing archeological research and that it was a nonprofit occupation (like schoolteaching).

He made these explanations not only to his pupils but to their parents, and he was believed, where we might not have been. As a result, we were never up against the obstacle of extortion at San Lorenzo; but five miles away it was a different story.

"They Are All My Wives"

One day when we were working at the small village of Potrero Nuevo where we conducted excavations for a week, one of the local men who had been very helpful to us asked Mrs. Stirling if she would take a picture of him with his family, as he had never been photographed. Going with him to his house, she found three women working around the place and a number of small children.

"Which is your wife and which are your children?" she asked, as she prepared to pose them in front of the house.

"They are all my wives," he replied, "and these are all my children."

After taking the picture, Mrs. Stirling inquired if he didn't find it difficult to take care of so large a household.

He shrugged. "What is there to do? There are more women in this village than men. Who would take care of them? Where would they live? Besides, in many ways it is advantageous. With their help I can grow more corn. With three, the household work is easier for all of them. If one is sick, the others are here to care for her and the work goes on.

"Every man in this village has more than one wife!"

At Potrero Nuevo the principal business is cattle raising, the stock feeding on the lush secate grass that covers the vast savanna which here stretches, level as a floor, for miles.

Jaguars still are abundant in this region, and at the time of our arrival the men were jubilant over having killed a particularly large animal that had taken a number of their calves.

Here we had one of the most enjoyable experiences of our trip, when we were invited to the big annual roundup and branding. Everyone in the region is invited, and they come with their horses and cowpunching equipment to help in driving in the cattle to the big corral, where they are segregated and branded. The whole scene is lively and is conducted much as were the big cattle roundups in our West.

The work with the cattle winds up in a huge fiesta. The women are busy for days preparing barbecues and food of all descriptions. The local orchestra furnishes music and there is dancing in the evenings. Dancing with a pair of spurs on, incidentally, adds considerably to the effectiveness of the huapango.

Dr. Drucker Rides Again

Some of the boys rode calves for the entertainment of the gathering, and Dr. Drucker, who at one stage of his career was a rodeo performer, turned out to be the hero of the occasion not only by participating in the corral roping and branding but by riding three wild bulls.

Our reputations greatly enhanced by this performance, we rode back to our camp late that night feeling as if we had been projected backward in time to California before the gold rush.

Our work at San Lorenzo continued to the end of April. During this time we completely cleared the central section of the site, mapping its mounds, courts, and plazas. We cut deep trenches through several of the mounds, revealing their growth and manner of construction.

We also mapped the big mound site at Tenochtitlán and conducted excavations in the principal court there. We dug stratigraphic trenches at various places at San Lorenzo and along the river bank below Tenochtitlán.

From the excavations we recovered large quantities of pottery, clay figures, and other artifacts of the ancient inhabitants and were able to trace the changes in style and form with the passage of time as revealed in our trenches.

In our big stratigraphic trenches by the river we found an early occupation site of the monument carvers, buried under 20 feet of soil. Above this and 10 feet beneath the surface was another occupation level with a different style of pottery and different clay figures, showing that after the site had been abandoned by its original builders another people had arrived and occupied it.

In our deepest level we were surprised to find two huge, cylindrical granite columns, each 14 feet in length and 2 feet in diameter.

But most spectacular of the finds were the stone monuments of San Lorenzo. Outstanding among these were five colossal heads, better made and better preserved than any we had discovered on our previous explorations of La Venta culture.

We found a beautifully preserved table-top altar with two chubby figures carved on the front, standing with upraised arms as if holding up the heavy table top (Plate XII).

A Streamlined Jaguar

There was a gracefully carved figure of a crouching jaguar, strangely elongated, with the tail shown as passing under one hind leg.

There was another figure of a jaguar seated on a recumbent human figure better made and larger than the one we had previously found in the village, but unfortunately badly broken.

At Potrero Nuevo we found a monument in the form of a heroic-sized seated human figure holding a large serpent gracefully draped over the lap. All of these and more, added to the monuments we had found on our earlier visit, make San Lorenzo one of the richest and most interesting monument sites in the New World.

Locating and clearing these stones was not easy. Many were almost completely buried. All were hidden in dense jungle and some were gripped in the roots of enormous trees. Most were on the sides or bottoms of the steep ravines which here and there cut through the site.

Our conclusion was that the later people revealed by our stratigraphic trenches had rolled the stones to their present locations, with great effort in an attempt to dispose of them, or at least get them out of sight. None was set up in relation to the mound structures, as in the other sites we had explored.

Our work at San Lorenzo concluded an eight-year program on the La Venta culture, a civilization which our investigations made known for the first time.

These interesting people were one of the first to emerge from the simple early agricultural level of Middle America and achieve civilizational stature. In the jungles of Veracruz and Tabasco they erected big ceremonial centers that presaged the theocratic cultures of the Maya, the Zapotecs, and the Toltecs.

The great earth mounds constructed to give eminence to their religious structures were precursors to the pyramids of the Maya and the Aztecs. The early dates that we found on their monuments suggest that they originated the marvelous calendar which subsequently gave the Maya their greatest claim to intellectual fame.

America's First Great Artists

La Venta people, too, were America's first great artists. They erected huge basaltic monuments in the form of stelae, altars, and colossal heads, marked by artistic realism and simple artistic restraint. Their art was pure in that they refrained from the gaudy embellishments that characterize most of the later sculptural art in Mexico and Central America.

La Venta artists were apparently the first in America to use jade, that beautiful and difficult medium that became the most precious and revered substance in pre-Columbian America. Whereas the later Middle American artists were considerably baffled by its hardness and difficulty of shaping, La Ventans treated jade as if it were a plastic substance.

At Tres Zapotes we were able to trace the earliest developmental period of this interesting people. At La Venta and San Lorenzo we found their culture at full flower.

About A. D. 600 the period suddenly terminates, and they were replaced by a people of different physical type and a different culture, a people who apparently attempted to destroy the monumental works of art and the idols of their predecessors when they occupied the centers which La Ventans had built.

The region where they reached their greatest development was in southern Veracruz and northern Tabasco. Although they were not a group of conquerors and did not extend their boundaries widely, nevertheless they gave to Ancient Mexico its first great cultural impetus, an effect which did not cease until the Conquistadores of Cortés brought to a sudden end 2,000 years of New World development.

In the course of this work we had penetrated the remotest parts of the jungles of Veracruz, Tabasco, Campeche, Oaxaca, and Chiapas. We had traversed mountains, plains, and swamps, on foot, by dugout canoes, on mules and horses. We had traveled many hundreds of miles in small planes and once had even crashed in the jungles of Tabasco.

We had voyaged on many of the southern rivers in launches, and there was no section of the railway system of southern Mexico we had not ridden. We had blazed trails in

Natividad, Accepting an Invitation, Decorates Her Heavy Calling Card, a Roof Tile

By delivering the bare tile, the host summoned her to a housewarming party. Here she returns it wrapped with paper streamers cut from a cooky box. Passengers in her toy boat are a paper-doll Carmen Miranda and other magazine figures (Plate VII and page 142).

our high-wheeled station wagon and in other cars on numerous trails where a car might travel in this virtually roadless area.

Thomas Gage, who wrote of his famous travels through this region in the 17th century, melodramatically described the dangers to the traveler where one is likely "to be lost in wildernesses where no tongue could give directions; to be devoured by wolves, lions, tigers, or crocodiles, which there so much abound; to fall from steepy rocks and mountains, which seem to dwell in the aerial region and threaten with fearful spectacles of deep and profound precipices . . ."

Although I am sure we penetrated deeper wildernesses than any essayed by Gage, and traveled rougher trails and crossed higher mountains, we were much less concerned with such major calamities as he describes than with rains and mud, heat and thirst, winds and dust—and, more often than one might expect, with penetrating cold.

There were usually ants, ticks, mosquitoes, and biting flies, and on long rides sometimes fatigue and hunger. These and scores of other discomforts, however, are but the spice that enhances the pleasure of exploration in a little-known region. There was beautiful scenery that was frequently magnificent, and the weather was often fine. There was beauty, too, in birds and flowers with the brilliant colors of the Tropics.

We acquired a high regard and affection for the people who live in these regions—those like ourselves who live in the cities, and the straightforward, simple, and friendly rural population whose help and knowledge of their country made our work possible.

Finally, there is the satisfaction of doing a job which far exceeds the pleasure of mere travel, and the hope that we have added a little bit to human knowledge in revealing for the first time an interesting chapter of New World prehistory.

Scintillating Siam

By W. Robert Moore

With Illustrations from Photographs by the Author

OUT of a black Calcutta night we flew into a flame-colored dawn. Below us through thinning ground haze a slender temple spire glittered as it caught the first rays of sunlight.

As visibility increased, we looked down upon a vast level plain patterned with rice fields and village-bordered canals.

Soon other spires rearing above expanses of multiple overlapping blue- and gold-tiled rooftops shone white or sparkled with spangled incandescence as they slipped beneath the winging plane. On a wide serpentine river rode scores of tiny boats.

In 57 hours of eastward flight, plus short pauses at landing fields in Bermuda, the Azores, North Africa, Iran, and India, the big plane had left Washington, D. C., half the world behind. Below us lay Siam.

As we glided down for a landing at Bangkok (Krung Thep), I recognized familiar landmarks. Years ago I had known the country well. For seven years this oriental land in the lower corner of Southeast Asia had been my home.

But I had not been back for 15 years. What was it like now?

Thailand Becomes Siam Again

In those 15 years Siam, I knew, had undergone several political changes. Absolute monarchical rule, benevolent though it was, had fallen by coup; a constitutional government was established. King Prajadhipok had abdicated; the ill-fated boy prince Ananda Mahidol, studying in Switzerland, had been elevated to the throne.

To the world Siam had also announced its change of name to Thailand (Freeland).

Thai, or "free," the Siamese have always called themselves.

Ironically, after the country assumed the name Thailand the people probably enjoyed less freedom than they had known for generations past.

Here, as in several other places in the world, totalitarian rule found transient rooting. For nearly five years, too, Japanese forces occupied the country, using it as a base for their conquest of Malaya and their thrust through Burma.

At Japanese insistence Thailand also issued a declaration of war against Britain and the United States. It was a declaration, however, which found little favor among the Siamese people, and one which the United States chose to ignore.

Before long the Japanese came to learn they were not the welcome guests they had wished to be, and in Siam they gained little but strategic position and supply.

The country has since repudiated its wartime leaders. Peace has been re-established with Britain; the documents were signed on January 1, 1946, in Singapore.

On maps again will reappear the long-established name of Siam (map, page 195).

At present the nation is faced with postwar problems perhaps as acute as any it has known since the Burmese sacked and burned the early capital of Ayutthaya in 1767. On June 9, 1946, it was further saddened by the tragic and mysterious shooting of King Ananda Mahidol.

Normally, Siam is the world's second largest rice-exporting nation. Rice, together with teak, tin, and rubber, furnished a solid financial structure for the country's prosperity.

For years, however, Siam was isolated from world markets, except Japan, and its economy was badly disrupted. Loans to Japan obviously became worthless paper. Siam's currency, the *baht* or tical, dropped to only about one-fourth its prewar value.

In such topsy-turvy conditions, the man who pedaled a *samlob* (literally "three wheels"), one of those combination bicycle-rickshaw vehicles which carry persons about town (Plate XVI), might earn as much in a week as a responsible government official received in salary in a month.

Prices Hit Fantastic Highs

Because of war-created scarcities, many commodity prices rose to fantastic levels. When I went to buy an ordinary tropical suit of white drill which only a few years ago cost 15 to 20 ticals, I found it more than 600 ticals!

Frequent bombing raids over the country caused extensive damage to railways and rolling stock. Many vital bridges were blown up. As a result, trains long were unable to make continuous trips from Bangkok to Chiang Mai, chief city in the north, or down the peninsula to Malaya.

To make such a journey one had to travel by local trains operating on tediously slow daytime schedules and walk or be ferried

AP from Press Ass'n

The King of Siam, Phumiphon Aduldet, Attends Rites for His Deceased Brother

Shaded by the royal umbrella, the new monarch walks to his waiting motorcar from one of the halls in the Grand Palace in Bangkok. High government officials follow. The late Ananda Mahidol, who ascended the throne in 1935, just before his tenth birthday, was mysteriously shot on June 9, 1946. Phumiphon Aduldet is 18 years old. Both brothers had spent much of their lives away from Siam studying in Switzerland, where the new ruler has now returned to continue his schooling.

across the gaps. Little heavy cargo moved for long distances.

The best that the railway system could offer to travelers was no better than its cheapest class a quarter of a century ago.

On highways, worn and rickety buses chugged along on such power as they could gain from burning charcoal.

Within Bangkok itself several areas were reduced by bombers to masses of broken walls and heaps of rubble. Wreckage lay about both the central railway station and one on the west bank of the Chao Phraya River.

Rama I Bridge, completed only a few years ago as a memorial to the 150th anniversary of the founding of Bangkok as capital and the accession of the Chakkri dynasty, also became a target. Its central span was neatly taken out, and the gap was patched by a Bailey bridge.

For months the city was without electricity after both its electrical plants were bombed, and for some time its water supply was cut off. One of the plants had been restored by the time of my visit, but power was short. When lights failed, as they frequently did, the people resorted to pressure lanterns and smoky little coconut-oil lamps.

Water was again being pumped through the city mains, but there was seldom sufficient pressure to raise it to the upper stories. Water for cooking and bathing above the ground floor level thus had to be carried by hand. A familiar sight in my hotel was the daily trooping of the water brigade!

Siam Favors "Open Mind Policy"

Compared with its neighboring countries, however, Siam is still one of the brightest spots in the Far East. The scintillating color of its temples, shrines, and pageants is undimmed. Few persons here have gone hungry. One meets friendliness on every hand. The nation may have its difficulties, but it has not forgotten how to smile.

"In the Orient one hears much talk about the Open Door Policy," said Mom Rajawongse Seni Pramoj, former Minister of Siam to Washington. "What we in Siam are most interested in maintaining is an Open Mind Policy.

"We have governed ourselves for a long time, and, I think, done quite a good job of it. We are a friendly, hospitable nation and have always welcomed persons of whatever nationality or race with complete impartiality. I hope our people may continue to retain that generous characteristic."

Wander about Bangkok and you soon learn the free, cosmopolitan nature of the city. Here are tens of thousands of Chinese. In fact, they comprise roughly a fourth of the population of the capital and conduct a sizable portion of its trade and business.

Three Lions

A Lady of Legend Carries a Modern Torch

Fanciful half-bird, half-human figures of Siamese mythology hold the electric lights that illuminate Rajadamnoen Avenue, Bangkok's most modern thoroughfare (page 170). Alternate figures on the lampposts are male.

The merchants range from the street hawker to the wealthy factory owner, rice-mill operator, or big importer.

Teeming markets are noisy with the traffic and babble of Chinese who bring in poultry, pork, and vegetables from their outlying farms and lush, intensively cultivated gardens.

Along other streets are persons from India sitting in the midst of soft silks, luxurious brocades, and other cloth goods. Husky, bewhiskered Indians also comprise a goodly number of the watchmen who guard offices and homes.

Here are European stores and importing concerns which normally carried on extensive enterprises in such manufactured articles as radios, refrigerators, typewriters, motorcars, scientific equipment, and engineering machinery. European firms handled much of the teak lumber industry and overseas shipping trade.

Only in recent years have the Siamese themselves begun to be attracted to larger trade interests. Formerly they maintained comparatively small shops and left much of the business in foreign hands. It was a country composed largely of two groups of people—the farmer and the government functionary.

Today there are far more well-educated Siamese than there are government jobs to fill.

The war provided some opportunity for new enterprises. Many imported products became unobtainable and numerous home and local industries sprang up to fill the need.

East and West Blend in Bangkok

Seeing Bangkok after a lapse of several years, I was struck by the many changes. Even when I lived here, the capital had already long outgrown the traditionally pictured oriental city with only narrow, crowded streets and perhaps a few luxurious palaces.

The narrow, busy lanes are here; so, too, are the palaces. But Bangkok has numerous broad avenues, fine public buildings, and many modern structures of Western design.

Particularly in years just before the war, new developments were born. New are the huge Ministry of Justice and Law Courts, an imposing central Post and Telegraph Office, a stadium, sports rings, parks and pleasure pavilions, and countless newly built offices.

In the section of the city lying between the walled enclosure of the old Grand Palace and the sumptuous Throne Hall (now used as the Assembly Hall) is a wide concrete thoroughfare, entirely new. Flanking it are modern—almost modernistic—three- and four-story buildings of reinforced brick and concrete which house spacious hotels, airy offices, department stores, restaurants, and a cinema.

At a circle midway along this new street rises the Monument of Democracy. A distinctive oriental touch is given the avenue by half-bird, half-human figures of legend which crown parallel rows of lamp poles (page 175).

At the central Post and Telegraph Office, near the opposite end of town, the motif for the upper corners of the thoroughly modern building consists of huge winged figures of the Garuda, mythological steed of Vishnu in ancient Indian legend (page 210).

What better figure than the Garuda's could be chosen for Siam's air-mail stamps? With the aid of such superhuman wings, surely the mail will go through!

Into suburban areas new avenues have been cut; new homes have been built; and whole sections are growing into fully populated residential districts where only a short time ago rice fields covered open countryside.

Gay Native Garb Is Disappearing

Among the people, too, there has been considerable change. Gone are most of the gaily colored *panungs* and *pasins* which the men and women once wore. European suits, slacks, and sports clothes abound.

When nationalism acquired a dictatorial trend, the government leaders decreed that such garb no longer suited a nation absorbed in acquiring modern growth. The distinctive and attractive panung, which gives a bloomer-like effect, was banned. Women began reshaping their saronglike pasins into skirts or adopted as workaday attire a white blouse and dark-blue or black short skirt.

Everyone was also required to wear a hat. And what hats some persons wore!

Fortunately, most of the odd headgear has vanished and the sun can shine again on heads of lustrous black hair. At present the sleek tresses of Miss Siam hang in a long bob with the ends smartly curled.

Before Siam went into black mourning for the King, some of the bright panungs and pasins had reappeared, particularly at festivals and holiday gatherings. But sports costumes and slacks make a far stronger bid for popularity.

Instead of being bare or flatly sandaled, feminine feet now are clad in high heels, wedgies, and what not!

Of late, dancing to music of Tin Pan Alley tunes has become popular. In many countries this would hardly be news, but here until recently dancing was confined to the classical stage or to a few folk dances where women and men performed separately. For a man to have touched a woman in public, even for a husband to assist his wife, would have been unseemly.

One of the dances first to be popularized, and still a favorite at many gatherings, is the *ram wong* (page 194). It is a circle folk dance which came originally from the northeast portion of the country. Both men and women dance round and round with a graceful movement of body and feet, at the same time moving their hands in rhythmical patterns similar to those seen in the classical dance of the theater.

In the first few months after Allied forces arrived, the cabaret and taxi dance hall flourished as a fad, in vivid contrast to the traditional Siamese customs of the dance.

Despite such contrasts, however, much of the city's life remains virtually unchanged from year to year.

Along winding New Road reel the old, open-sided yellow tramcars that have been doing duty for nearly half a century. Operators run them with an abandon based on implicit belief that a clanging foot bell is more effective in avoiding collisions than are their hand-levered brakes. Conductors swing aboard at fare junctions to tear or punch tickets with long sharp fingernails.

 Kodachrome by W. Robert Moore

Glaring Giants, in Heroic Stance, Guard the Entrance of Wat Arun, Bangkok

Inspiration for these odd many-headed temple guardians comes from characters in the ancient Indian epic, the *Ramayana*. Siamese drama and many motifs for its art derive from that source (Plates XVII-XXIV). Flower clusters on the gable and patterns on the giants' costumes are made from broken pottery.

Kodachrome by W. Robert Moore

"Temple of Dawn," Wat Arun Rajavararam, Towers Majestically above the Muddy Chao Phraya at Bangkok

This spectacular spire rears to a height of more than 240 feet (Plate IX). Steep stone steps lead up to a narrow balcony nearly as high as the surrounding *prangs*. Main temple buildings are at right. Though a modern bridge spans the waterway, small sampans carry many passengers across the river.

Kodachrome by W. Robert Moore

River Serves as Dooryard and Main Street for These Floating Houses at Ayutthaya

Built on large floats, such aquatic bungalows bob at anchorages along both sides of streams intersecting this onetime capital of Siam. Most are general merchandise shops as well as homes. For roofing, corrugated iron now replaces thatch. Two women propel the high-sterned boat.

 Kodachrome by W. Robert Moore

Glistening Spires and Serpentine-gabled Shrines Adjoin Royal Wat Phra Keo

The large multiroofed building is the Pantheon, in which are statues of Chakkri dynasty kings and urns containing their ashes. A roof corner of the Emerald Buddha (Phra Keo) Temple shows at left (Plates XIV, XV). Cattle symbolize the "year of the cow," one of the animals in a 12-year cycle.

Creaking Carts Bring Produce from Farm to Town

Humps on the cattle reveal partial zebu blood. Such animals, and water buffaloes, haul crude plows and tread grain.

Kodachromes by W. Robert Moore

"How Much Is This Rose Apple?" Asks Sister

Brother looks as if he'd already eaten too many! Two varieties of this fruit, locally called *chumpu*, are seen here. In the other basket are short lengths of bamboo in which a glutinous rice is cooked.

Kodachrome by W. Robert Moore

Superb Example of Multiple Overlapping Roof Construction Is Wat Benjamabopitr in Bangkok

Walls of this temple, built during the reign of King Chulalongkorn, Rama V (1868–1910), are of Carrara marble rather than the usual brick and plaster. It has also glass windows, not double doorlike shutters. Two large marble "lions" flank the entrance. Doors are heavy cast bronze.

Kodachrome by W. Robert Moore

Producer and Consumer Rub Gunwales, if Not Elbows, at This Floating Market an Hour's Launch Ride from Bangkok

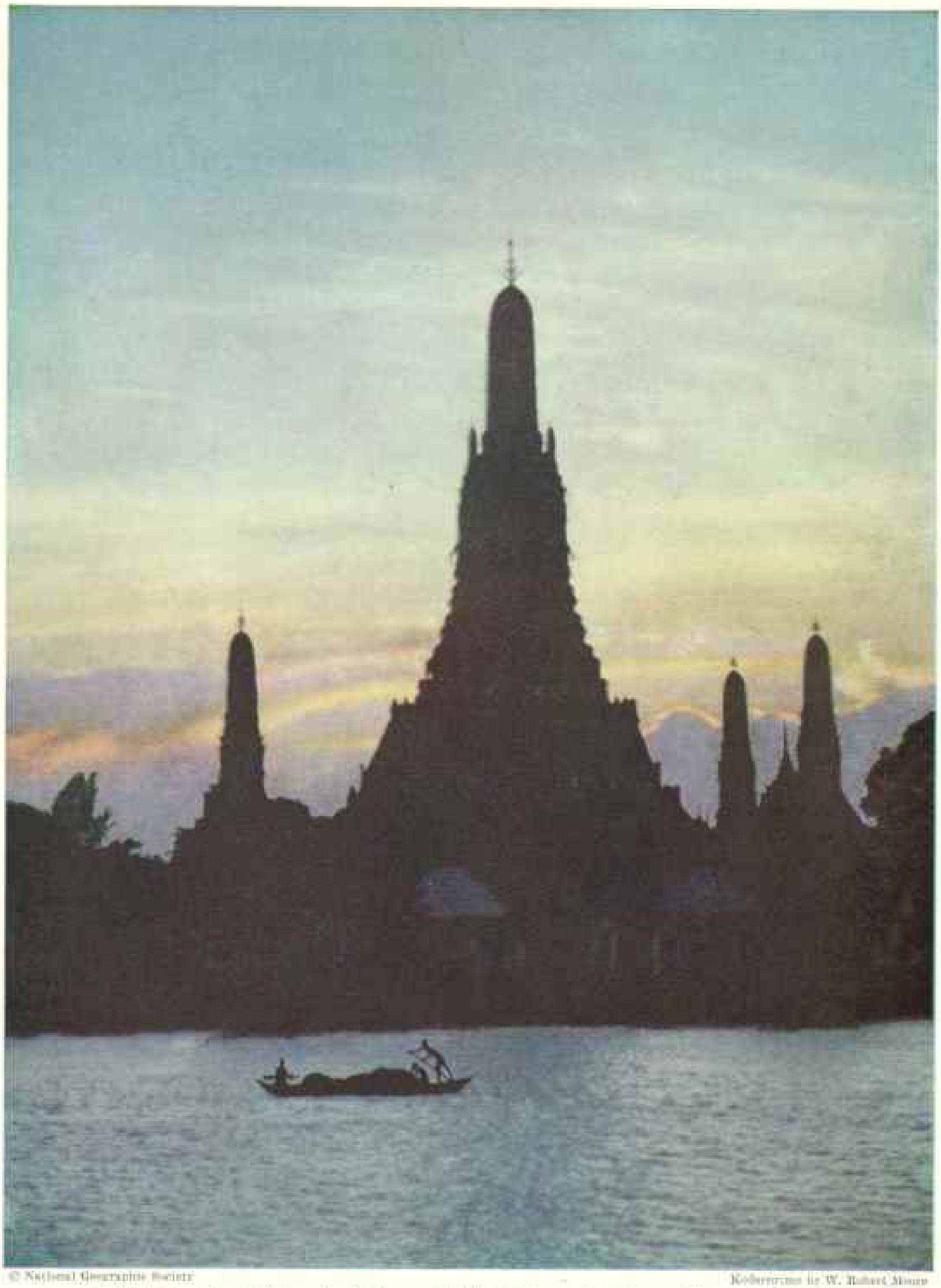
Early-morning market-goers, mostly women, paddle to this junction of two arterial canals. Some bring vegetables, fruits, fish, or prepared foods for sale to shoppers in boats and at canalside homes. Numerous small canals, branching off from these larger waterways, thread lush fruit and vegetable gardens.

No, They're Not Wearing Lampshades, but Hats of Palm Leaf

To shield wearers from rain or tropic heat, these wide hats are held on the head by a rattan framework. One woman cruises with a load of coconuts; another has rice cakes.

With a Fan She Keeps Coals Aglow and Broadcasts Tempting Odors of Cooking Bananas

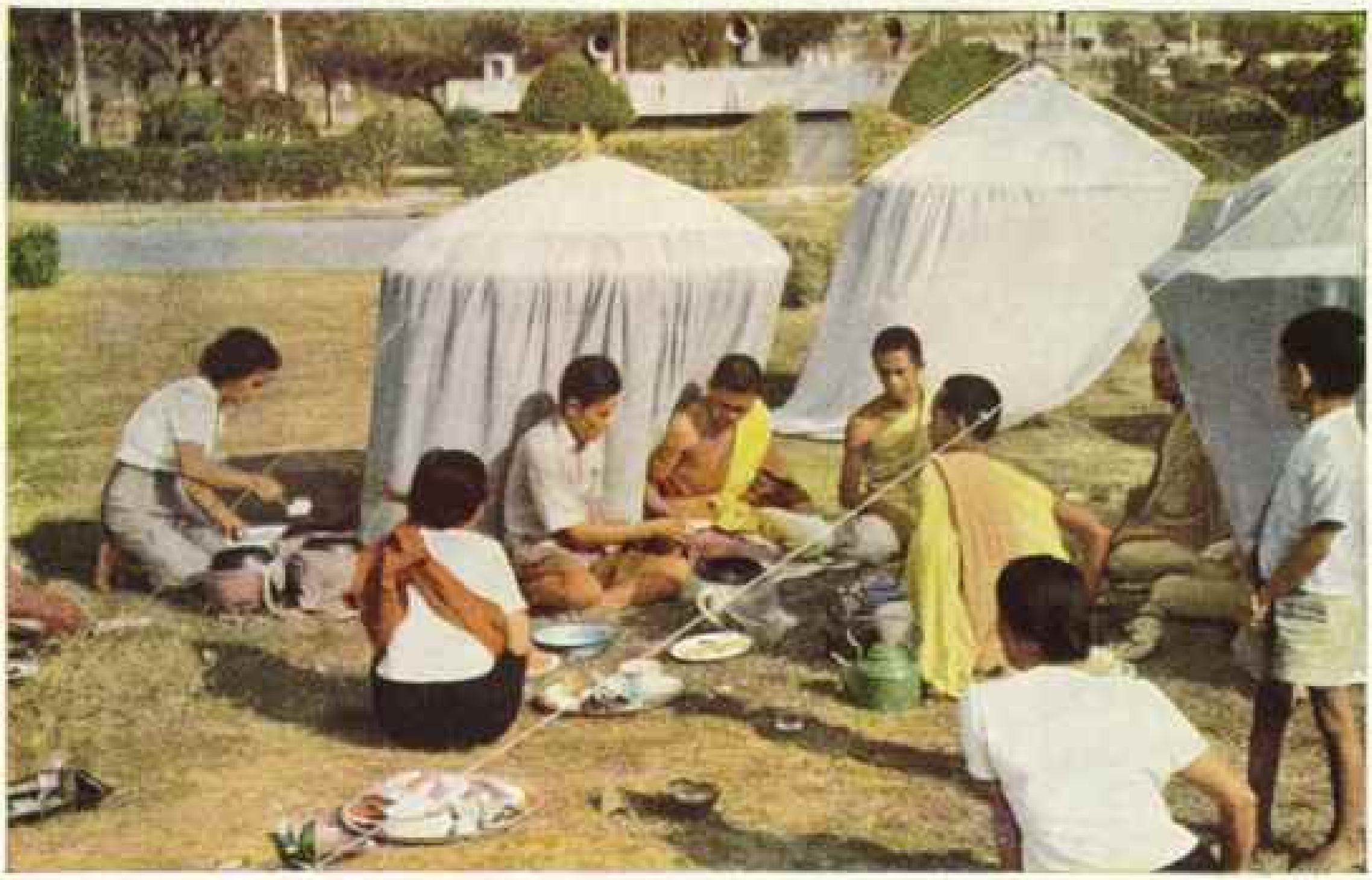
This thick, stubby plantain is not good to eat raw, but is delicious when baked or grilled. When the woman moves, she carries her "kitchen" balanced on a pole across her shoulder.



 Kobbervaag for W. Robert Moore

The "Temple of Dawn" Achieves Added Charm Against a Tropical Sunset

Dawn or twilight, day or night, this is one of Bangkok's most conspicuous landmarks (Plate II). From its sides, two thirds of the way to the top, project trunks of triple-headed elephants on which rides the god Indra. Towers are crowned with the trident of Siva.



Buddhist Devotees Bring Morning Offerings of Food to Priests on Pilgrimage

One girl puts rice into their begging bowls, while others present trays of condiments and fruit. When traveling, priests sleep under large umbrellas over which they hang mosquito nets.

Kodachromes by W. Robert Moore

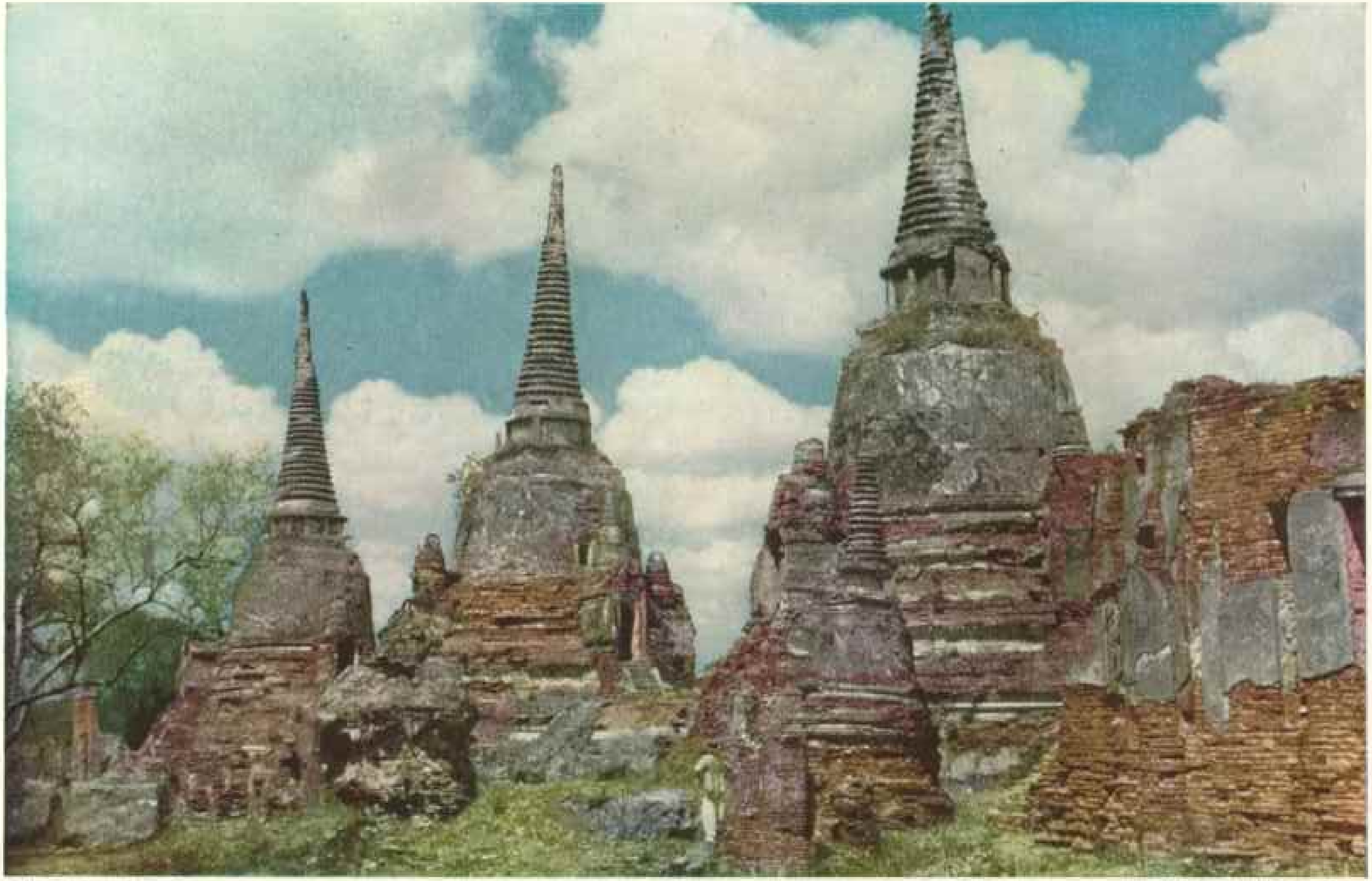
With Legs Braced and Hands Upturned, Leering Giants Support a Votive Spire

Many Buddhist structures in Siam have characters of ancient Hindu legend as decoration. Costumes are mosaics of colored glass set in a pitch base. Gold leaf covers this spire of Wat Phra Keo, Bangkok (Plates XIV, XV).

 Kodachrome by W. Robert Moore

Flowers Bloom in Broken Porcelain Against a Wall of Checkered Tile

A Buddhist priest in the humble yellow robe of his order stands on a stairway at the base of a *phrachedi* (sharp-pointed spire) at Wat Po, Bangkok. It is one of four dedicated to the first four rulers of the Chakkri dynasty. Stone figures and "lion dogs" are Chinese.



Kodachrome by W. Robert Moore

Three Massive Spires and Heaps of Crumbling Walls Are All That Remain of Ayutthaya's Wat Sri Sanpetch

When it was capital of Siam, from 1350 to 1767, the city had scores of magnificent Buddhist temples, as has Bangkok now. Captured, looted, and burned by the Burmese, Ayutthaya never regained its glory and position. Jungle covers many of its ruins.

Kodachrome by W. Robert Moore

Grandpa Spoils Baby by Buying Rice Cakes, but Mother Pays the Bill

They are getting "veranda" service from a vendor who paddles as well as peddles her wares along a rural waterway. A canal "commuter" is interested in the conversation and the youngster's expressive gesture. Homes are built on stilts to prevent rainy-season flooding.

 Kodachrome by W. Robert Moore

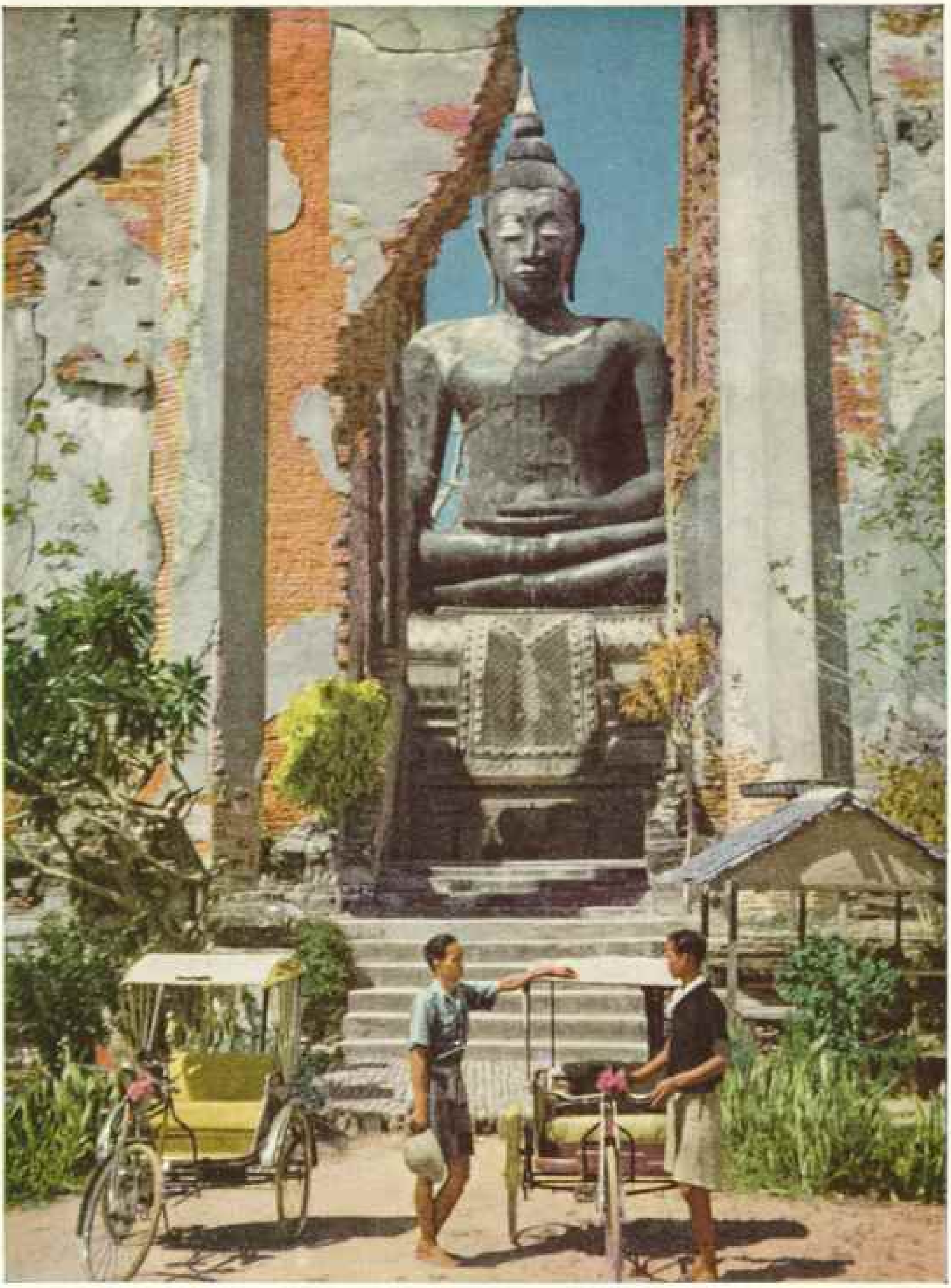
Their Shoes Removed, Worshipers Kneel and Bow Before Entering Wat Phra Keo

Some also place flowers and lighted candles on trays and rack. Once a week now this royal Emerald Buddha Temple within the Grand Palace walls is open to the public. Façade and doorways are heavily gilded; doors are inlay pearl. The alert "lions" are polished cast bronze.

© National Geographic Society — Kodachrome by W. Robert Moore

On a Lofty Altar Flanked by Praying Devas, the Emerald Buddha Sits Enthroned

This guardian deity of the capital is carved from a single piece of jasper. Golden gem-studded vestments are changed thrice yearly, for cold, hot, and rainy seasons. The image, attributed to Ceylon, reposed in northern Thai cities for several centuries before being brought to Bangkok by King Rama I.



 Kodachrome by W. Robert Moore

Serenely the Buddha Meditates, Unaware that Roof Has Gone and Walls Are Gaping

Wat Mongkol Bopitr was one of Ayutthaya's most elaborate temples before that city was destroyed in 1767. Conquering Burmese fired the capital and carried away many of the artisans as slaves. In foreground are two *samloks* ("three wheels"), a bicycle-ricksha vehicle for carrying passengers.

Truck and car drivers dart blithely in and out among the slow-pedaling samlohs, speeding trams, and jaywalking crowds, with blatant horns sounding. Weaving bicycles are legion. The same congestion can be duplicated on a dozen other thoroughfares.

Capital Crisscrossed by Canals

In Bangkok it has been almost axiomatic that to build a new street the city gained another canal. Since the river banks and the plain upon which the city has spread are only about four feet above sea level, earth from the canal excavation furnishes the embankment upon which the street is laid.

As a result, the capital is crossed and crisscrossed with waterways. In residential districts many are arched with shady trees and spanned by small bridges. Elsewhere they are busy avenues of traffic for hundreds of boats carrying persons and produce. Into them are poled, paddled, and rowed craft carrying vegetables, fruits, charcoal, wood, pottery, and a bewildering variety of other things the people need.

A number of these canals, or *klongs* as they are called, existed as thoroughfares long before a system of roads and streets was developed.

Small freighters, sailed lighters, barges, launches, and myriad sampans move up and down the Chao Phraya River and clutter its shores. Downstream from the north also drift large, ungainly rafts of valuable teak logs.

Engaging a motor launch, one can travel for miles through the network of waterways and see a phase of Siamese life that has existed for generations.

Homes perch on spindly piles above the banks like long-legged water spiders. The stream is their highway, their front yard. From their landing steps everyone bathes and does the family laundry.

Behind and beyond the houses lie the gardens of vegetables and coconuts, bananas, and other fruits, the gardens themselves laced by smaller irrigation channels.

At canal intersections many sizable waterside villages have been spawned and at each there is usually a tangled knot of small craft dealing in fish, flesh, fowl, and fruits of the garden (Plate VII).

Temples, too, face the waterways, and in early morning dozens of yellow-robed Buddhist priests paddle about in small canoes to wayside houses where they collect their daily gifts of food.

Most Buddhist youths in this Buddhist land are expected to spend at least a brief time in study at a monastery. Some devote years of their life to the priesthood, but many others remain in the cloth for only a few months.

All, while in service, must make their morning rounds with begging bowls to get their daily food, since the life is supposed to be one of humility and renunciation (Plates X and XI). Bangkok streets at daybreak consequently present a golden parade of these yellow-gowned monks, for the capital has hundreds of temples and monasteries.

300 Glittering Temples Adorn Bangkok

Set apart from the general confusion of the busy city by walled enclosures are these temples, or *wats*, whose façades, tiled roofs, and votive spires flash with brilliance in the tropic sun. They are a distinctive feature of the art and architecture of the country.

Temple roofs rise in an unusual overlapping manner. The gables terminate in hornlike points which represent the tails of serpents; at the eave corners rear their stylized heads. Many of the spires that pierce the sky are encrusted with flower designs made from broken porcelain or are surfaced with scintillant chromatic tiles.

Bangkok's more than 300 wats share many common architectural features, but among them is an infinite variety of design and detail.

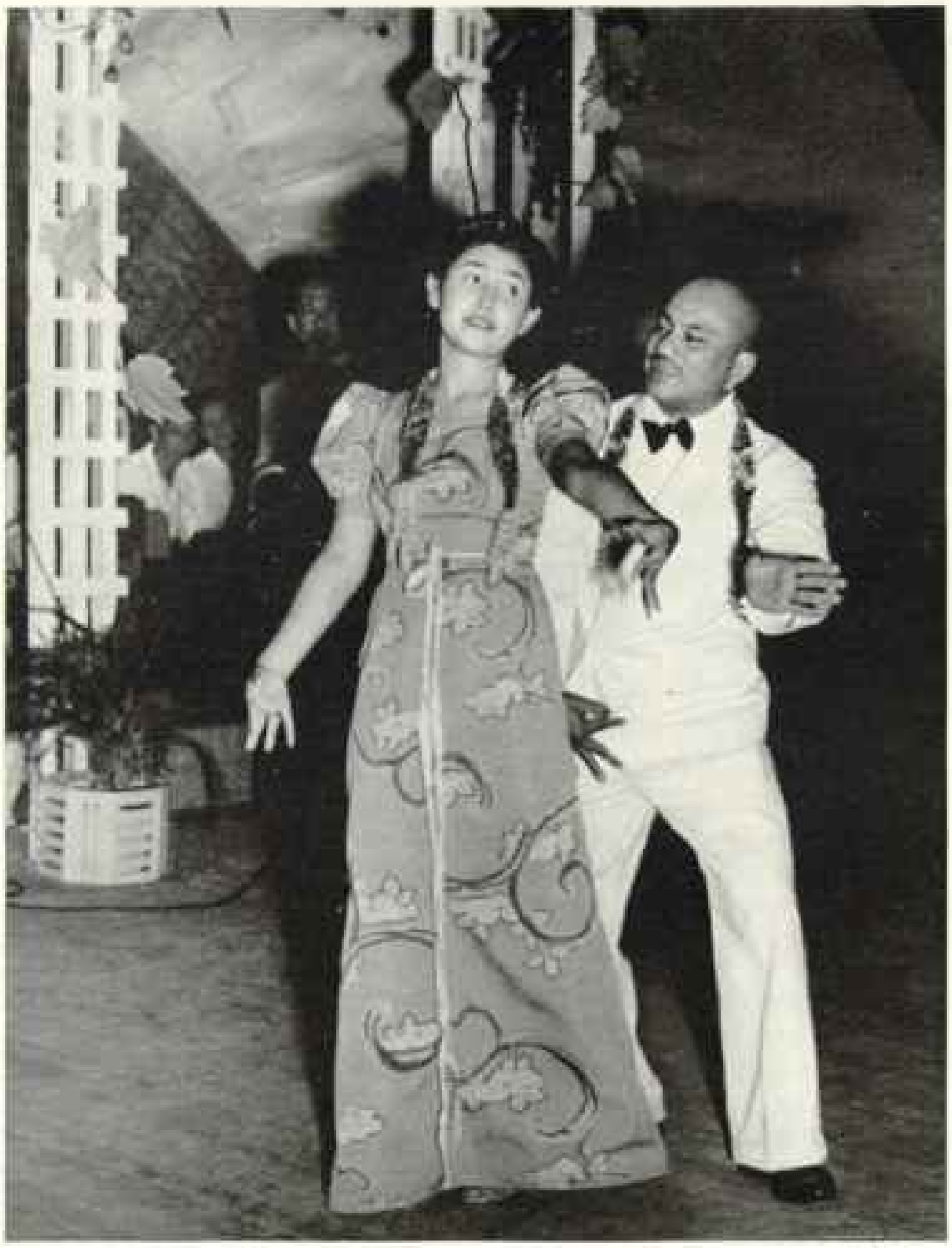
Climax of all architectural detail, wealth of color, and elaborate decoration, however, is at Phra Keo, the royal temple within the walls of the Grand Palace. Here, enshrined in the central temple building, is the precious Emerald Buddha, the palladium of Siam, before which religious rites for royalty have long been held (Plates XIV, XV).

On walls of an outer gallery surrounding the courtyard are scenes from the Indian epic, the *Ramayana* (Plates XVII-XXIV). Frowning giants of plaster and pottery stand guard at the gateways. *Phrachedis* and scintillant *phraprangs* (votive spires) soar above. Myriad tiny bells about the roofs tinkle as breezes swing their fan-shaped clappers.

Buddha's Clothes Changed Thrice a Year

The Emerald Buddha itself, in the main temple, is actually not emerald, but has been carved from a single large piece of jasper. Nearly two feet high, the image sits on a lofty, many-tiered gilt altar surrounded by golden figures, some of them life-size. Only a portion of the dark-green figure is visible, since it is clothed in golden robes. They are changed thrice annually with the change of seasons—the hot, rainy, and cold.

A popular annual event at many temples is a local fair through which funds are raised for necessary repairs. During war years none of these fairs was held, but in the spring of 1946



Col. Homer F. Kelloug

Rhythmical Hands Are Needed to Dance the *Ram Wong*

Participants move their arms and hands in graceful patterns as they glide around the floor. Men do not touch their partners (page 176). This popularized version of an old circle folk dance shares favor with Western ballroom dancing at the officers' club in Bangkok.

they were in full swing throughout the country.

Nightly several areas of Bangkok were noisy with the blare of loud-speakers, pulsating native orchestras and drums, and raucous barkers. Small stalls set up all about the temple area specialized in selling trinkets, cloth, or foods and in running freak shows, dart boards, hoop ringing of bottles, and other catchpenny attractions—even bingo.

In pavilions the Public Health Department administered free inoculations against cholera, and vaccinations to guard against further spread of prevalent smallpox.

Before the temple and within some of the adjacent buildings the fair assumed a more religious tone as thousands came to burn incense and lay flowers before the altars, and perhaps attach a bill to the temple gift "tree."

Many of the stalls moved from one fair to another, just as concessions follow American country celebrations.

Kites Capture Others in Springtime Sport

On the Phramane ground, an open, park-like area adjacent to the Grand Palace, kite flying got under way (page 197). March and April winds here bring out kites as a warm spring day at home brings out dandelions and baseballs. Every lad who is old enough to toddle has a kite of some size riding high at the end of a string.

But kite flying in Siam is also a game for grownups. The long Phramane is divided across the middle with a bamboo-pole barrier. On one side, downwind, scores of small kites are sent up; from the opposite side large star-shaped male kites are flown.

Riding on hundreds of feet of cord, the male kites invade the territory in which the smaller ones are flying. The idea of the competition is for the large male kite to fight and entangle the others and then try to haul a victim back over the dividing line.

Kite operators manipulate the kites with remarkable skill. The big stars soar and plunge, seeking to snare their smaller opponent. Equally skillful, the small kite flyers seek to avoid the big kite or to bring it down in their own territory. For such a catch the small kite handler gets as prize twice the sum that the male kite operator gets for any victory he may win.

Until a decade ago motorcar owners in Bangkok were confined to the city limits. Not a single road led out of town. At that time the

Ministry of Communications had followed a policy of constructing roads only as feeders to the railways.

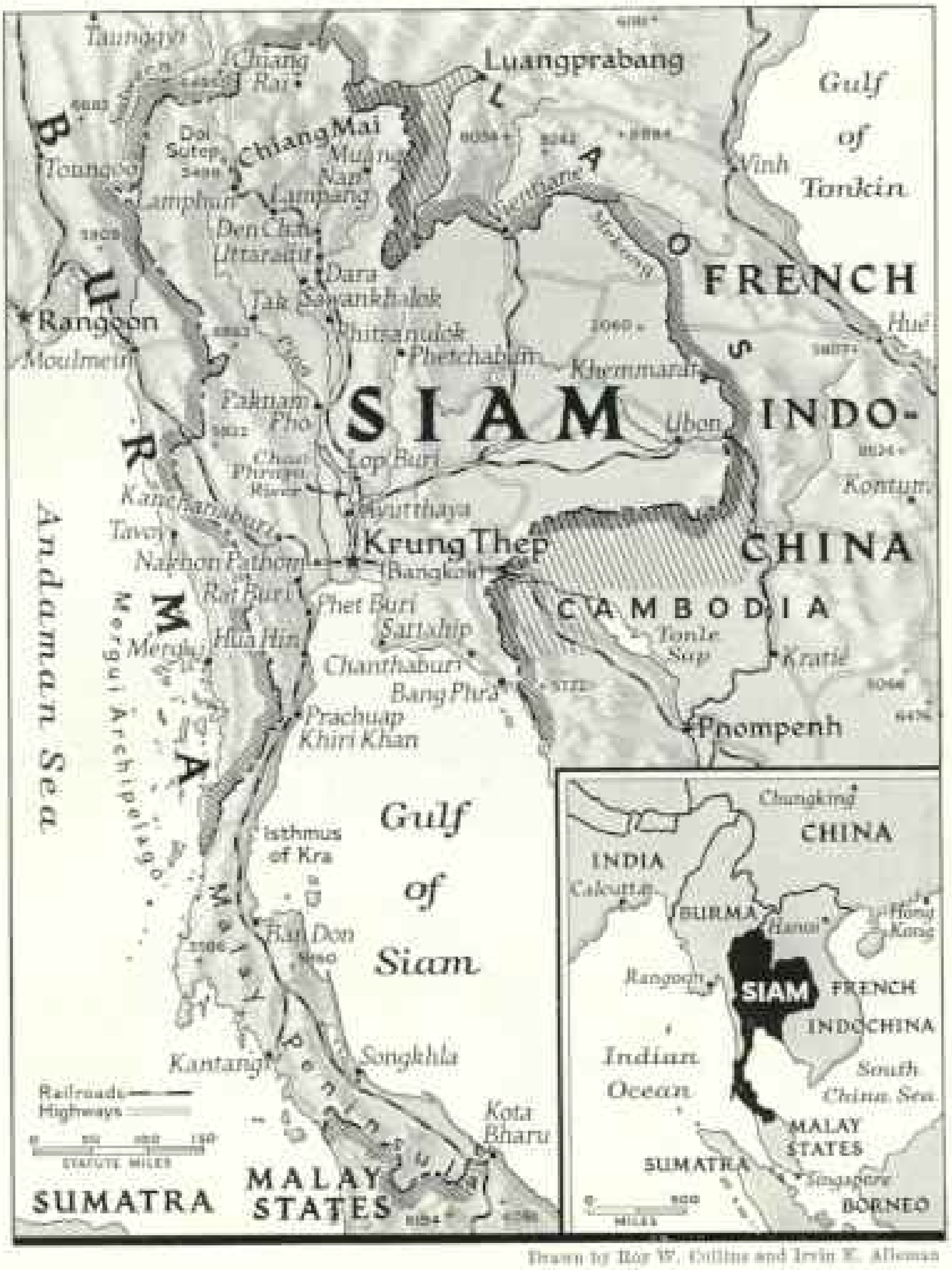
In 1933, however, a road-building program broadly covering the whole country was planned on an 18-year construction program.

Today several roads radiate from the capital, and many regions that formerly were isolated have been linked to important trade centers. Roughly half of the nearly 10,000 miles of projected roads have been completed since work began 10 years ago.

From Bangkok you can motor down the eastern coast of the Gulf of Siam, past a couple of seaside resorts, and travel on to Chanthaburi; or by another highway network the motorist can probe the eastern provinces which long had been largely cut off from the capital.

Still another road swings westward to traverse the rice plains. Passing Nakhon Pathom, where stands the largest pagoda in Siam, it turns southward, touching Rat Buri and Phet Buri, and extends on to the seaside resort of Hua Hin and beyond.

Highways also lead into central Siam, but connecting links have not yet been completed to join them to the road system that has been developed around Chiang Mai, Lampang, and Chiang Rai in the north.



Drawn by Roy W. Collins and Irvin E. Alleman

After Six Years as Thailand, Siam Resumes Its Older Name

During the war Japan occupied the country and used it as a base for operations against Malaya and Burma. In a boundary dispute, Siam gained the shaded areas along the eastern frontier from Vichy France in May, 1941. They were returned in November, 1946.

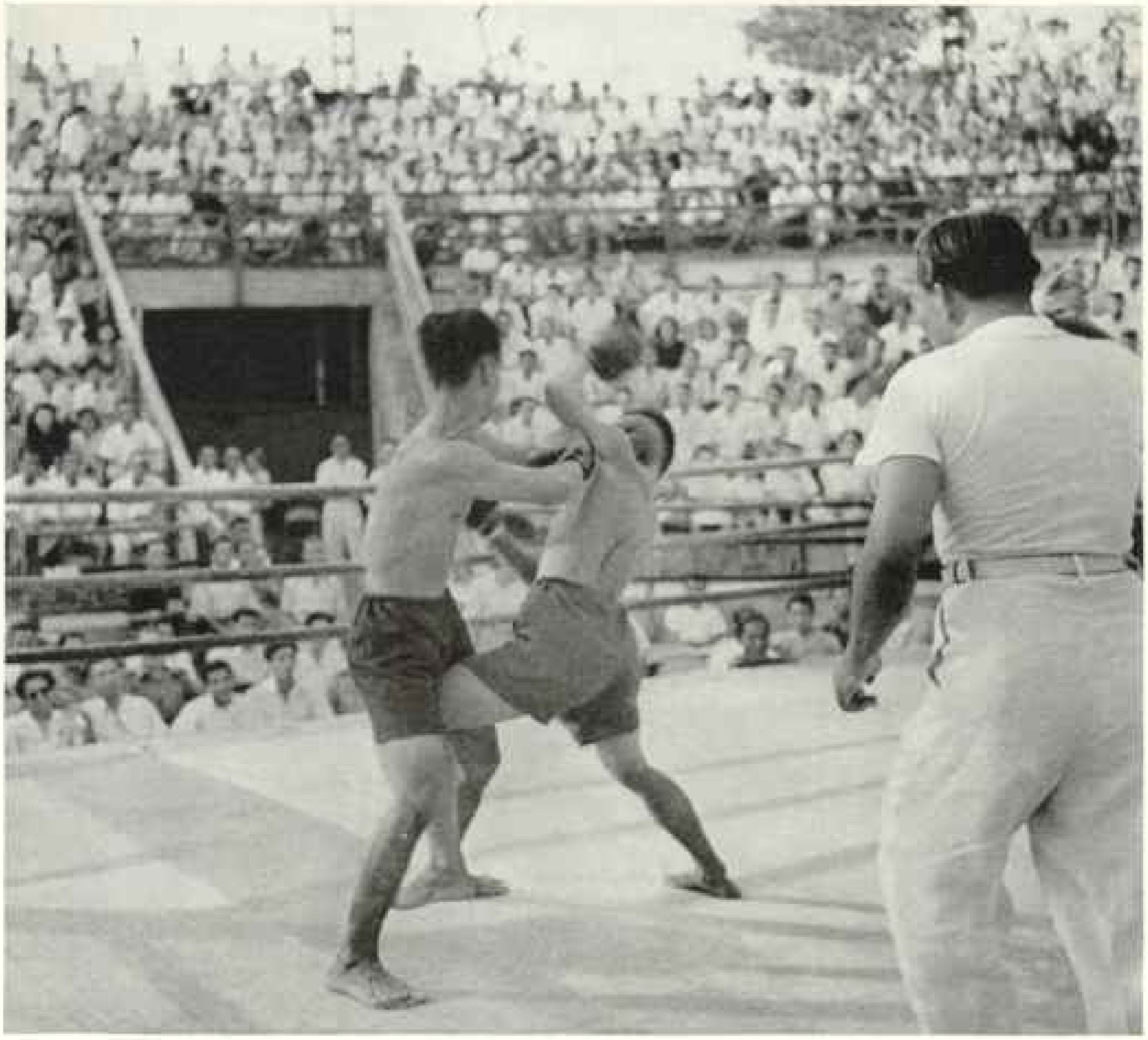
100,000 Died Building Jap Railroad

Other routes in both the north and south still remain to be finished, but already the country has seen visible changes since towns have been tied together. Areas which before were isolated have now begun shipping out surplus products, and new agricultural areas have been opened up.

Siam has one communication line, however, of which it can hardly be proud. It is the railway line into Burma which the Japanese built by forced prisoner-of-war labor. Tens of thousands of Britishers, Australians, Dutch, Javanese, and Indians, as well as some Americans, toiled in the malaria- and dysentery-ridden camps along the jungle route to Burma.

Week after week the men labored, many with few clothes and no medicines, through sun, rain, fatigue, and inhuman treatment.

It is truly a road of death, for it is estimated that 100,000 persons lost their lives in its building. Near Kanchanaburi, not far from where the route branches from the main Siamese railway, stands a monument—if it is



Knees, Feet, Elbows, or Fists—Almost Anything Goes in Native Siamese Boxing!

The use of gloves is a recent innovation; formerly boxers' hands were wrapped with soft rope. At the opening of the match contestants go through an odd ceremony of obeisance and dancing motions, accompanied by drums and wailing flutes. Western-style bouts also are popular.

still there—which the strange-minded Japanese built in commemoration of those thousands whose death they caused.

Travel east, west, or north from Bangkok, or fly over central Siam, and you see a vast expanse of sprawling rice fields. On these lands, some 6,000,000 acres in extent, and in other rice districts throughout the country, before the war, Siam normally grew enough of the cereal to export about a million and a half tons of whole and cracked grain annually.

War has affected rice production to some extent. Some farmers left their fields to seek jobs as laborers, and many carabaos and cattle used in tilling the soil were sold.

Gradually in recent years, too, there has been a shift from an almost exclusive one-crop enterprise to more varied production. Cotton is now being grown in increasing amounts in several eastern and central sections. Jute growing has attained considerable success along the flooding river district between Sawankhalok and Ayutthaya. And in the north increasing acreage is devoted to bright-leaf Virginia tobacco and to soybeans.

But Siam's rice crop is still its greatest asset; and when transportation problems are solved the grain can be of vital assistance in feeding areas of the postwar world now faced with hunger.

As you ride through the countryside in the dry season, the fields lie parched, dusty, and rent with wide cracks. During the wet season, between May and November, however, there is a panorama of vivid green. Rains, the rivers, and a network of irrigation canals provide abundant water.

On rare occasions there is too much. In

Back Comes the Victor Kite, with a Small Victim in Tow

Kite flying is a sport for adults as well as children in Siam. Large five-pointed "male" kites are flown beyond the dividing pole across the field. Operators manipulate them in "enemy" territory, seeking to snare other kites and drag one back over the barrier, without having their own brought down. On the cord are "spurs" to catch opponents' strings (page 194).

October and November, 1942, much of the low, flat, central plain was submerged in an unprecedented flood. All land communications in the region were halted. Bangkok stood in a sea of water.

Captive Snakes Released by Flood

Shops literally functioned off their top shelves, and persons could get to their places of work only by boat. Out at the snake farm the cobras and banded kraits used for collection of venoms in preparing antivenins all swam away!

The flood also caused much destruction of fruit and other trees. Practically all durian trees were killed and, since they are extremely slow to grow to the fruiting stage, the odoriferous though tasty fruit is still rare and expensive. Pomelos, though damaged, made quicker recovery.

The dry season was mounting toward its hottest April heights when I made a trip into northern Siam.

Before the war the journey to Chiang Mai by comfortable express took only 17 hours, and with replacement of bombed-out bridges by temporary structures a through route has again been established. In the spring of 1946, however, we still had to go by "local," and at the end of the first 17 hours we had reached only Phitsanulok, about halfway.

Heat waves danced as the crowded, war-wounded train moved slowly across the plain and stopped long at almost every station. One stop was ancient Ayutthaya, for some four centuries the capital of Siam. Out of

No Plush Cushions Here; Passengers Have Observation Seats Even on the Roof

During the war Allied flyers heavily bombed Siamese railway bridges and rolling stock to halt movement of Japanese troops and supplies. When war ended, only a few local trains ran. Through service to the north has since been re-established (page 197).

its bush and about the reviving riverside town rear scores of broken spires where once stood elaborate temples (Plate XII).

More than two hours later we chugged into Lop Buri, where ruins of 11th-century Cambodian temples, broken palaces of 17th-century King Narai, and memories of the Greek adventurer, Constantine Phaulcon, his adviser, seem incongruous in the midst of a new town-planning project.

Later came Paknam Pho, where several rivers mingle their waters to form the Chao Phraya. Here the Forestry Department maintains a duty station for checking on the teak logs floated down the streams from the northern forests. In the waterways we saw many rafts of the big logs roped to the banks.

At midnight we reached Phitsanulok in breathless heat. This interior town, perched on the high banks of the river, has a reputation of being one of the hottest in Siam. I was ready to agree.

We transferred our luggage to another train in the blackness of nearly morning and took off at dawn on the next stage of the journey.

The train traveled only as far as Dara because there the bombed railway bridge lay in a crumpled heap in the river bed. We had to carry our luggage across a temporary footbridge and entrain again on the opposite bank.

As the day wore on, the train finally reached Uttaradit, then Den Chai, and swung westward into the mountains to Lampang—another 17-hour journey.

Teak Logs Hauled by Elephants

At several places in the mountains, where the train spiraled around bold hills and followed deeply cut ravines, we saw quantities of teak logs lying in the stream beds, awaiting the next high water to carry them downriver. Several elephants, used to haul logs, stood in the shallow river hosing themselves off with long, curling trunks.

Made of Bamboo, This Creaking Water Wheel Irrigates a Family Garden

As the wheel turns in the current, tubes attached to its rim dip up water and spill it into the trough at the top. Thence it is piped through bamboo tubes to the vegetable patches. The bridge over the Ping River links the two sections of Chiang Mai.

They reminded me of the fact, familiar to all who have seen the movie *Anna and the King of Siam*, that King Mongkut (Rama IV) wrote President Lincoln offering to stock the United States with elephants to roam in its "jungles" and provide a source of beasts of burden. Mr. Lincoln replied that his government's jurisdiction did not "reach a latitude so low as to favor the multiplication of the elephant" and added that "steam . . . has been our best and most efficient agent of transportation . . ."

At way stations as we traveled on, local villagers rushed out to meet the train and sell fruits, drinks, rice dishes, and meats. Water from a young coconut is ambrosia indeed after hot, dusty hours on the train.

The food the people offered along the way afforded a good index to the prosperity of the rural districts. In some places we could buy only fresh, sweet sugar cane, while in others veritable banquets were available.

Through the interior as we chugged northward we also noted a change in the villagers' clothing. The farther we got from Bangkok the poorer was their dress. Garments in some villages were almost in tatters, for the people had been unable to buy cloth for a long time.

About Lampang, Lamphun, and Chiang Mai, at the upper end of the line, residents were better clad. In these towns a sizable home industry in weaving had been developed.

From Lampang to Chiang Mai our train groaned, chugged, stopped, started, and coasted for nearly seven hours. Along the route the railway climbs through forested mountains and at its highest point bores through a tunnel nearly a mile long before it drops to the Lamphun-Chiang Mai plain.

On the plain about Lamphun diked rice plots were flooded, and many men and their womenfolk were busy transplanting green rice seedlings into the muddy ooze. Others tended bean patches.

An elaborate irrigation system in this area permits watering of fields in the dry season so that the land may produce two crops a year.

Not everyone, however, was at work. Thousands of persons were gathered at Lamphun for a priestly cremation and a fair. Hundreds more descended from our train, where they had clung to every available space in cars, on platforms, and on rooftops.

Never after this ride into Lamphun can I feel that there was crowding in the famous old French cars of the "40 and 8." The luggage van in which I rode as the best accommodation available had less than half the space allotted to those World War I horses or men. But in it I counted 54 persons, plus bags, bundles, baskets of dried fish, and other fragrant items (page 198). We breathed relief—breathed—when the crowd got off.

Cremation of Priest Attracts Thousands

The priest whose cremation was taking place had gained wide fame throughout the north for his holiness and good works. He was so holy, many persons said, that when he walked his feet never touched the ground.

Through his efforts several new temples were built and others repaired. He had only to sit at a temple that needed repair and immediately old and young would start bringing materials and gifts or offering their labor.

He sponsored the building of a highway up Doi Sutep, a mountain five miles from Chiang Mai, to a temple on its slopes. Working with picks, shovels, knives, and bare hands, the volunteer laborers in three months almost literally clawed out the seven-mile path.

The priest died in 1939 before a bridge in which he was interested was built. His mummified body had been kept in a case where the devoted could view it. But now, in 1946, he was being cremated. The body was already in its gilded urn on the pyre built in a temple courtyard. Thousands came to pay homage, then moved on to enjoy the fair.

Beauty Contest and Five-legged Cow

Many stalls selling foods and local products were set up outside the courtyard. Others specialized in games of chance. A contest was under way to select the prettiest waitress in the several restaurants. Side-show barkers pleaded for attention to exhibits of live crocodiles and a five-legged cow.

Chiang Mai, too, was having a fair. The night vibrated with the hypnotic throb of drums; fireworks sprayed the sky. By day, however, this second largest town in Siam went leisurely about its business, afoot, on bicycle, and by samloh.

In early morning women filed to and from the markets carrying baskets of produce with striking grace. They appear taller and fairer than the southern Siamese. Called Lao, folk in the north remain closer to the basic Thai stock, for they migrated into the land more recently than did those down-country.

Within the past generation, since communications have increased and Siamese has been taught in the schools, differences in language and costume have become less marked.

Chiang Mai reminds one of a pleasant country town grown large only because it is a rural trade center. It sprawls generously on the plain. Homes are set amidst green coconut trees and flowering shrubs.

Bullock carts meander through the streets. When water is high in the Ping, which flows through the town, long slender river boats move on its waters. In fact, since railways were bombed, river traffic between Chiang Mai and Bangkok has revived considerably.

Home industries in beaten decorative silverware and lacquer bowls flourish, and it is difficult to look at the beautifully wrought products without buying. Homespun silks also catch the eye, but at the moment their cost discourages all except the looking.

Hill Folk Shun Outside World

During my springtime visit, the countryside about Chiang Mai was so smoky that only once did I glimpse 5,499-foot Doi Sutep, only five miles away. This was the season when stubble was being burned on the rice fields and many fires were kindled on the mountainsides. Some of the hill fires are set by plains people; others are caused by primitive tribesmen who inhabit the remote peaks.

These hill folk, who have slowly wandered southward from China into Burma, Siam, and Indochina, set their homes on the high mountain crests and clear small plots of jungle to raise corn, a few vegetables, and some opium poppies. When the first quick fertility is gone, they move to another site.

Years ago I climbed many of the mountains to visit these strange, secluded people. They belong to a variety of tribal strains, have differing customs, and wear distinctive costumes, often strikingly brilliant. Theirs, however, is a life apart from the rest of the country, and they wish only to be left to themselves.*

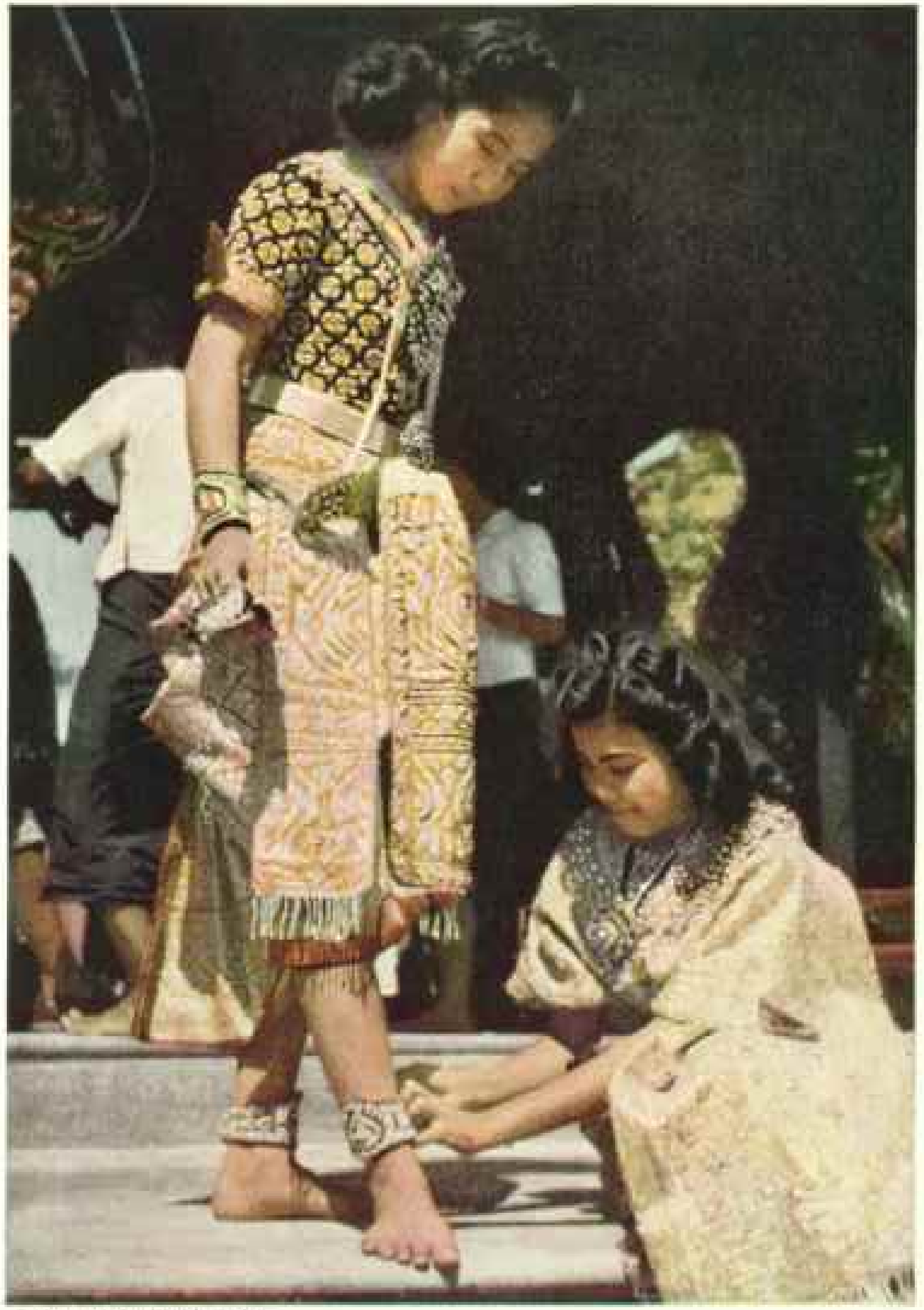
Siam, quite the opposite, eagerly seeks international contacts. Rapidly it has assimilated many modern ideas. And today it is trying its hand at democratic government.

* See "'Land of the Free' in Asia," by W. Robert Moore, National Geographic Magazine, May, 1934.

 Kodachrome by W. Robert Moore

Hero Rama Congratulates the Monkey God Hanuman on Slaying a Demon Enemy

Wars waged by Rama and his allies against Ravana, King of Lanka (Ceylon), to regain Sita, Rama's kidnaped bride, afford the main theme of the Siamese drama. Source of the story is the 22-century-old Indian epic, the *Ramayana*. Rama holds a bow, Hanuman a tridentlike weapon.



A Ballet Goddess Helps a "God" Don His (Her) Jeweled Anklets

Kodamacrome by W. Robert Moore

No Buttons Will Pop Off! Rama Is Sewn into His Costume

Kodachrome by W. Robert Moore

Purple-faced Magician Maiyarab Conjures Two Young Maidens from His Boiling Caldron

These, however, he slays and discards. Finally his incantations produce two live lions, whose hearts he extracts and grinds with a mixture of herbs and fungi. With this concoction he later puts an army to sleep and thus succeeds in abducting the powerful Rama.

Leering Ravana, Ten-headed Demon, Fails to Frighten a Goddess

She fits her jeweled headdress preparatory to joining the ballet on stage, while the King of Lanka, usually called Thosakanth by the Siamese, practices his part as ferocious warrior.

 Kodachromes by W. Robert Moore

Boat-shaped Xylophones, Drums, and Castanets Provide Orchestral Stage Direction

Gong sets and wind instruments are also included in a full theater production. Here a class of girl students of the Department of Fine Arts learns acting under skilled men and women directors.

 Kodachrome by W. Robert Moore

Gods and Goddesses Join in a Dance Before a Golden Pavilion in the Clouds

With rhythmical movement of hands, feet, and body they provide the dancing ballet, called *rabam*, which is interjected between scenes of a drama. Both male and female parts are played by girls. To attain supple grace in the stylized dances, actors train for years.

Kodachrome by W. Robert Moore

Like a Bejeweled Peacock, Ravana, King of Lanka, Displays His Manly Bearing Before Demure Female Attendants

By such means he hopes to win the favor of Sita, abducted wife of Rama. In a candle procession maids escort him through the darkness to the gardens where Sita languishes. The stage is backed simply by a dark curtain, its only "prop" the brilliant gilded bench.

With Gesture, Not Whistle, He Plays "Wolf" to Ladies

Masked players utter no words. Coyness, anger, haughtiness, and other emotions are expressed by stereotyped postures or gestures.

Kodachromes by W. Robert Moore

Motion of Hand Rather than Open Smile Expresses Pleasure

By passing thumb and forefinger across her upper lip as if to raise it, she indicates a smile. Note remarkable flexibility of fingers.

 Kodachrome by W. Robert Moore

Monkey God Hanuman Expands to Gigantic Size to Embrace Rama and His Army

Special guards are also posted against a night attack. Maiyarah, however, with the aid of his magic powder (Plate XIX) succeeds in entering camp. He blows a sleeping potion upon one after the other. Eventually even Hanuman's huge eyes close, and sleeping Rama within his gilded pavilion is carried away.

Pageantry of the Siamese Stage

By D. Sonakul*

FROM a boiling caldron supported by human skulls a demon giant conjured two fierce lions. Slaying them, he extracted their hearts. These he ground with herbs and fungi to produce a powder which would put an army to sleep.

Able also to render himself invisible by applying the powder to his own body, this warrior-magician later stole into his enemies' camp, though special guards had been posted for the night and one general had expanded himself to such size that he encompassed the entire headquarters. Shooting the powder from his blowgun, the shadowy figure then overcame the whole army and ran off with the High Command!

With equal ease those ancient warriors could hurl lightning bolts at each other, shoot quickened arrows to destroy whole battle units, ride chariots through the sky, transform themselves at will into gods or three-headed elephants, and utilize herbs to heal wounds with a magic swiftness that makes penicillin seem obsolete.

Drama Honors Rama, Hero of Old

Many of these lively battles of wit, magic, and force are recounted in the *Ramakien*, our version of the ancient Indian epic, the *Ramayana*. This time-honored story, the "Glory of Rama," forms the basis for the glittering pageantry of our classical drama.

Sometimes called the *Odyssey* of Asia, the *Ramayana* is one of the oldest and certainly the most widely known of Indian tales in Southeast Asia. Millions of Hindus in India look upon it with the same reverence that Christians hold for the Bible. Its prestige likewise has spread into non-Hindu lands to win it more millions of devotees.

Legends of Rama the hero date far back into the history of the Aryans in India, for mention of him occurs in the *Upanishads* (circa 600 B. C.), prose supplements to the *Rig-Veda*.

Older sections of Buddhist literature (circa 5th century B. C.) recite a folk tale of Rama's adventures, and doubtless other such stories, oral or written, existed.

Finally, perhaps toward the end of the 3d century B. C., the legend took definite form in the Sanskrit epic called the *Ramayana*, ascribed to the seer Valmiki.

The gist of the Valmiki story is essentially that of the old folk tale. Rama, heir to the throne of one of the kingdoms of ancient India, is exiled by his father in consequence of a boon which the aged king, in a weak moment, has granted to his second queen.

The latter, taking advantage of the king's promise of a favor, extracts the pledge that her own son, not Rama, shall succeed to the throne. The hero is followed into exile by his beautiful bride, Sita, and his younger brother, Lakshmana.

While they dwell in the forest, Sita is abducted by the demon king Ravana, ruler of the Rakshasa tribe of Lanka (Ceylon). Rama, acquiring the monkey state of Kishkhinda as ally, wages war upon his wife's abductor. In this undertaking he is helped greatly by the distinguished monkey warrior Hanuman, an incarnation of the wind god.

After many battles and adventures, Rama vanquishes his adversary and Sita is restored to him.

The story has been taken by some scholars to signify the Aryan conquest of South India as far as Ceylon with the help of an aboriginal tribe described here as a monkey race. The "demon" Rakshasa of Ceylon were actually the fairly civilized Dravidian people from whom the Aryans wrested their state step by step.

Legend Came to Siam from India

It would be a long tale to trace the course of the legend of Rama into Siam. Through successive waves of migration India exerted great political and cultural influence upon the races of Indochina and Indonesia. Hindu, or at least Hinduized, states flourished at one time or another in the Malay Peninsula, the East Indies islands, Cambodia, and in our land.

Probably our Siamese version came via Java and Cambodia in successive stages. At all events, the Ayutthayan period of Siamese history (1350-1767) is rich in evidence of the popularity of the Rama legend in literature, sculpture, architecture, and decorative art.

No written compilation of the whole story seems to have existed, but fragmentary metrical recitatives for the puppet shadow play, known as *K'amp'ak*, are believed to date from the period. Needless to say, in Buddhist countries such as Siam and modern Cambodia the story is shorn of its divine character.

It was not until 1798 that the founder of

* The author is Prince Dhani Nivat, outstanding Siamese scholar and former Councilor of the Royal Academy of Letters of Siam and President of the Siam Society.

Staff Photographer W. Robert Moore

Figures and Billboards Advertise Historical Drama and Fictional Play Instead of a Movie

Dates on circles announce that one play (left) is being presented from the 7th to 12th of the month, the other from the 13th to 17th. The drama recites the story of Phan Tai Norasingh, a captain of the royal barge for Rama III. Ka-ki, a king's favorite, is heroine of the second play. She is held in the arms of a royal aide, transformed into the figure of the winged Garuda (page 176). Such stage plays were given in this Bangkok movie house when war shut off the film supply.

the Chakkri dynasty of Bangkok (Krung Thep) took the initiative of writing in epic form the Siamese version of the *Ramakien*. It is possible that the King was inspired either by a Siamese version such as the *K'amp'ak* or by the Cambodian *Ramker*.

The *Ramakien* was, however, designed on a different pattern from either of those works. Instead of consisting of recitatives for the shadow play, it was written in lyrical verse to be sung to the accompaniment of dancing. It was, moreover, a long and complete story of some 200,000 words. The Rama legend was considerably embellished, and to the war in Lanka the author added another almost identical long war and two minor campaigns.

In Siam the story has had wide representation in dramatic stage form, known as the *khon*, and on a screen as the *nang*, or shadow play. In my opinion, the khon, a masked stage presentation, developed from the shadow play, for even now one of its forms of staging requires as background a screen of white cloth like that on which the shadows of the puppets are thrown in the nang.

In the khon, the orchestra sits on one side of the stage behind a gilt bench, or now sometimes in an orchestral pit. It consists of half a dozen to some twenty musicians playing various kinds of xylophones, gongs, drums, wind instruments, and castanets (Plate XX).

With the orchestra is the chorus of several

singers, and a man to prompt—often much too conspicuously! The dancers, obviously mute because of masks, must listen to the chorus and prompter for guidance to their action, and also to the orchestra for the rhythm.

Every Motion Has a Meaning

Dancing consists of postures and gestures expressing not only action but also thought and feeling.

Anger is shown by stamping a foot and by gestures of the hands. A gesture as if to raise the upper lip with a pinch of the fingers conveys a smile; hence pleasure. Stiffening of the body with a certain arm motion indicates ambition. Supporting the bent brow with the hand expresses sorrow.

Music also directs the dancer's action, such as running, fighting, or weeping. Gigantic demons have characteristics of haughtiness, ambition, ferocity, and often dignity. The monkey allies of Rama frequently adopt most realistic simian mannerisms accomplishable only by agile acrobats.

One must master traditions of the mask to be able to follow the story and distinguish the characters. Thus, Rama, if a mask is worn, would be recognizable by his tall, pointed royal crown and a green face. However, the hero and his brother frequently enact their roles without masks (XVII, XVIII).

The villain Ravana has a green-faced mask and a peculiar crown on which small faces are painted to indicate that the demon is 10-headed. We Siamese usually call him Thosakanth, or "Ten-necked" (Plate XX).

The simian monarch, the two brothers of Thosakanth, and his eldest son, Indrajit, also wear green masks, but are distinguishable from one another by the facial shapes and the types of their crowns. Green masks seem to denote high rank, though not invariably so.

Hanuman, ideal warrior and confidant of Rama, has a white simian mask. Other characters wear yellow, purple, or red masks. The Occidental colors of purple and blue are usually allotted to comparatively minor roles.

Feminine performers wear a skirtlike lower garment, and a heavy shawl covers the upper part of the body, leaving only the arms bare.

Male human characters wear the *panung*, a bloomerlike lower garment over a tighter pant affair which shows ornamented brims just below the knees. The upper body is encased in a tight tunic with pointed, upturned epaulets. Demons wear much the same dress as human figures; the monkeys dispense with epaulets but wear tails.

Colorful indeed are the costumes, for the rich fabrics are heavily embroidered and crowns and decorative neckpieces are set with flashing stones.

Akin to the khon is our *lakon*, a music drama accompanied by a singing chorus. In this, however, the characters are seldom masked. Although the khon was once reserved for men actors and the lakon for women, the reservations are not strictly adhered to now. Despite the absence of masks, stereotyped gestures instead of facial expressions are used in the lakon, too (Plate XXIII).

The classic repertoire of the lakon is drawn chiefly from the *Fifty Stories* of local folklore and from the Javanese historical romance of Panji, known to us as *Inao*. More recently, legends surrounding the colorful Phra Ruang, who supposedly devised the Siamese alphabet and accomplished much for the nation, has provided subject matter for many plays.

Still another stage presentation is the *rabam*, or ballet, danced to the accompaniment of music and often sung verses. As a rule, it is interpolated in other theatrical presentations and occupies a place analogous to that of the ballet in Occidental opera.

Kings, Gods, Demons on Royal Program

A concrete illustration of these various types of entertainment was the program given by His late Majesty King Ananda Mahidol after the dinner for Lord Louis Mountbatten. From its scenes Mr. W. Robert Moore, of the Foreign Editorial Staff of the NATIONAL GEOGRAPHIC MAGAZINE, secured the accompanying color plates.

The first item presented was a lakon. Its theme was an adaptation from an archaic poetical romance of the north in which the hero, Phra Lò, a young king of a Thai kingdom in the north, sacrificed his life to win the love of the daughters of a rival Thai ruler.

In the performance we see the forest wizard, splendidly attired as a divine being, directing a flock of wild fowl of the jungle. Feminine wild fowl flutter about in rhythmical dance, led by an unusually charming leader. After a series of dances they disappear into the forest (off stage) in quest of Phra Lò. He eventually appears and is at once attracted by the lead fowl, who conducts him away. All parts are played by girls.

The second item, a khon drawn from the *Ramakien*, is impressive in its setting. A plain dark curtain shuts off the back of the stage, on which simplicity reigns (Plate XXII).

Amid dim lighting to denote the night, demure female attendants enter in pairs, each bearing a candle to light the way by which Ravana, or Thosakanth, the 10-headed king of Lanka, proceeds to the garden retreat

where he has been keeping, against her will, Sita, the abducted wife of Rama.

The demon king now enters in gay mood, followed by more female attendants. On a gilt bench he struts, poses, and performs like a gay peacock before vanishing.

We are now switched, in the third scene, to the heavens where, in a rabam, or ballet, gods and goddesses are assembled to perform a graceful dance accompanied by music and song (Plate XXI). After a series of lively rhythmical movements before a promontory in the heavens, the curtain falls.

Powdered Lion Hearts Overcome Foe

The final item, three scenes from the *Ramakien*, is the feature of the program. In the initial scene, Maiyarab the magician (purple mask with fire crown) is busy with the magical rite of concocting a powder which will put anyone to sleep (Plate XIX).

On a dais sits the magician with eyes closed and hands clasped in concentration. Before him is a caldron supported on bones and skulls. Sentries guard the sacrificial area.

As the caldron boils, he blows into it with a long pipe and lo! two young maidens rise from the boiling mass. The young magician is thereby tempted to pay them cavalier attention, but suddenly recollects his task and strikes them dead.

Further incantations and a blow of the pipe produce a pair of fighting *gajasiha* (lions with elephantine trunks), which, not being conformable to his requirements, are also killed. A third incantation produces a pair of regular lions, very much alive and pugnacious.

He claps his hands for joy, kills them, and extracts their hearts. Returning to the dais, he prepares his magic powder. Then the curtain falls.

As it again rises, Rama is revealed sitting on a rocky hill surrounded by the leaders of his armies. While he consults with his brother Lakshmana, the monkey god Hanuman, and other generals, a sudden gust of wind attracts general attention. One member interprets the natural phenomenon as presaging a disaster involving Rama himself, but predicts that the danger will be past when the morning star rises on the eastern horizon.

Hanuman volunteers to keep watch by swallowing Rama and embracing the whole camp.

When the curtain again rises, we see Hanuman's gigantic mouth enclosing the pavilion in which is Rama (Plate XXIV). Within his protective embrace, Lakshmana and the generals guard the entrance to the pavilion while sentinels patrol about the higher officers.

As time wears on, a bright star rises in the east; everyone expresses relief at the expiry of the time limit of the magic spell. As a matter of fact, it was the magician himself who, climbing to the mountain heights, twirled his gem-encrusted blowpipe to create the semblance of the morning star.

Descending quickly, Maiyarab approaches the camp to find the soldiers preparing for sleep. The higher officers, however, seem less in a hurry, so he makes use of his magic powder and blowpipe.

One by one they succumb, until finally even the vigilant Hanuman droops his gigantic eyelids. All being ready, the demon jumps into the breach and enters the pavilion. A few moments later he returns, carrying the unconscious Rama. The performance ends.

Modern Siam Streamlines Ancient Play

The caldron and trappings of Maiyarab's sacrificial court and a gigantic papier-mâché head of Hanuman are examples of the new and more elaborate staging of the drama which is now being carried out by the Department of Fine Arts. The directors are also streamlining some of the episodes of the play by shortening long individual actions.

Older patrons, once used to sitting for hours to watch with critical appreciation how certain actors bent their knees or arms and postured in prolonged combat, feared that the drama would be spoiled if any action was cut. They find, however, that the theme unfolds more rapidly and the play is unharmed.

Although Western dialogue drama derived from the Greek model existed in classical Sanskrit in medieval India, it failed to migrate to our shores. All our early dramatic presentations of shadow play, stage acting, and dance were either accompanied by recitations of the theme or the story was sung in verse to the accompaniment of an orchestra.

The dialogue drama that we find so abundantly nowadays in this country owes its origin to Occidental, chiefly English, patterns. Among the pioneer adapters of the drama of the West was the late King Rama VI (1910-1925), who was an ardent admirer of Shakespeare's work and adapted a number of plays from that master playwright. He also introduced works from Sheridan, Molière, and Pinero and wrote many original productions.

In passing, it is interesting to note that, when motion pictures were introduced into Siam, they were called *nang* by our people because they required a screen for projection. The name is derived from the word for skin, or hide, from which the elaborate shadow puppets, forebears of both the motion picture and the Siamese drama, once were made.

Blizzard of Birds: The Tortugas Terns

By Alexander Sprunt, Jr.

Southern Representative, National Audubon Society

WHEN in 1513 Ponce de León discovered the low-lying Dry Tortugas in the Gulf of Mexico, the seeker of eternal youth must have been puzzled as his galleon neared the islands. Over one of them hung a peculiar dark-hued haze, a shifting curtain which grew larger, then smaller, expanding and contracting endlessly.

As the ship held to her course the mystery was dissipated, for that moving curtain finally was seen to be composed of—birds!

Approaching the Dry Tortugas today, one sees the same haze, the same curtain which rises and falls, swells and shrinks, hovering over the sands like a vast, shapeless coronet. Now, as then, it is made up of birds.

Fort, Prison, Naturalist's Paradise

Still unfamiliar to many Americans are these seven low islands of shell and coral sand which bask in the warm Gulf waters some 70 miles west of Key West, Florida.* Mention of them frequently elicits a blank stare and the query, "What and where are the Dry Tortugas?"

Yet on one of the islands, Garden Key, sprawls historic old Fort Jefferson, now a National Monument. This fortress which never fired a shot in war has known its share of death and drama. It once served as the Nation's loneliest prison, and here Dr. Samuel A. Mudd, of Maryland, imprisoned for setting the broken leg of Lincoln's assassin, rose from chains to lead the heroic fight against the 1867 yellow fever epidemic which sowed these sands with graves (pages 216, 217, 222-225).

Aside from those familiar with Fort Jefferson and its story, there are two groups whose eyes light up at mention of the Dry Tortugas. They are marine biologists and ornithologists —the fish and bird men (and women).**

Thus, despite the dominating influence of that ghost fortress, the Dry Tortugas have another claim to prominence. They are a naturalist's paradise, a treasure house of bewildering beauty, both above and below the colorful waters which all but engulf their coral sands.

Islands Named for Sea Turtles

That this was apparent even to their earliest explorers is attested by written records. Though evidently not naturalists, some of these men took enough trouble to set down figures. What they referred to simply as "birds" were doubtless the same two predominant species of terns which live there today.

The first allusion to Tortugas wildlife goes back to the very beginning, in the historian Antonio de Herrera's account of the discovery of the islands by Ponce de León. He tells why the Spanish explorer named them *Islas de las Tortugas*, or Islands of the Turtles.†

"In one short time in the night," he wrote, "they took . . . . one hundred and sixty tortoises, and might have taken many more if they had wanted them. They also took fourteen seals and there were killed many pelicans and other birds. . . ."

It is these "other birds" to which particular interest clings.

Another early account tells of the numerous birds found by John Hawkins, an English sea captain trading in slaves, when he landed at the Tortugas in 1565: "The captain went in with his pinesse, and found such a number of birds, that in halfe an houre he loaded her with them; and if they had beene ten boats more, they might have done the like."

But not until the 19th century did an ornithologist come to this teeming wonderland of birds and leave a record of his visit. More than 250 years had elapsed since Captain Hawkins landed his "pinesse" when, in May, 1832, the United States Revenue Service cutter *Marion* came to the Turtle Islands, bearing John James Audubon. In his graphic style he gave an account of what he saw.

A Storm of Wings

"On landing," wrote that tireless seeker of birds, "I felt for a moment as if the birds would raise me from the ground, so thick were they all round, and so quick the motion of their wings. Their cries were indeed deafening, yet not more than half of them took to wing on our arrival. . . .

"We ran across the naked beach, and as we entered the thick cover before us, and spread in different directions, we might at every step have caught a sitting bird, or one scrambling through the bushes to escape us.

"Some of the sailors, who had more than once been there before, had provided them-

* See Map of the Southeastern United States, supplement with this issue of the National Geographic Magazine.

** See "Life on a Coral Reef (Dry Tortugas)," by W. H. Longley, National Geographic Magazine, January, 1927.

† The lack of springs and abundance of sea turtles account for the present name, Dry Tortugas.

U. S. Navy Official

Where Wreckers Once Lured Ships to Ruin, a Lighthouse Blinks Friendly Warnings

Loggerhead Key, named for its loggerhead turtles, maintains southern Florida's most westerly lighthouse. Since the 1850's the 150-foot tower has endured hurricanes "with hair on their chests." Loggerhead, like other keys, abounds in pirate legends. Firm believers insist on "millions in Spanish gold buried right here." In the 1920's rumrunners succeeded wreckers and pirates, using the Dry Tortugas as transfer depots.

selves with sticks, with which they knocked down the birds as they flew thick around and over them.

"In less than half an hour, more than a hundred terns lay dead in a heap, and a number of baskets were filled to the brim with eggs. We then returned on board and declined disturbing the rest any more that night.

"My assistant, Mr. H. Ward of London, skinned upwards of fifty specimens. . . . The sailors told me that the birds were excellent eating, but on this point I cannot say much in corroboration of their opinion, although I can safely recommend the eggs, for I considered them delicious, in whatever way cooked, and during our stay at the Tortugas we never passed a day without providing ourselves with a good quantity of them."

Here we have the first direct reference to the birds as terns, and Audubon goes on to speak of the habits of the two species which have made the Tortugas famous—the sooty and noddy terns of the Tropics.

Although the two are closely similar in size, the sooty being 17 inches long and the noddy less than an inch shorter, they differ markedly in color. The sooty is soot black above and white below; the noddy is dark brown with a white forehead. His uncomplimentary name, meaning "simpleton" or "fool," was bestowed by early sailors who accounted the bird stupid because it showed so little fear of man. This impression was heightened by the noddy's habit of incessantly nodding or bowing.

At the Tortugas both of these terns reach the very northern limit of their range,* nesting at times under the very walls of Fort Jefferson itself. Nowhere else in the United States

* See the National Geographic Society's *Book of Birds*, Vol. 1, which points out the single known exception—a sooty tern's nest found on an island off the Louisiana coast in 1933.

do they breed, though after tropical storms specimens have been seen and taken along the Atlantic and Gulf coasts far from their accustomed haunts, blown thither by winds.

Audubon thrilled to the Tortugas terns as only an ornithologist can, and as many have done since his time. Louis Agassiz, one of the distinguished naturalists of his day, followed Audubon in the 1850's and spread further the fame of the remote islands.

Now the great bird city of the Dry Tortugas has come to rank as an outstanding avian wonder of North America and a veritable mecca for bird students. Those fortunate ones who have made the journey there, or observed the incredible concentration of sea birds in the Aleutians and the swarming gannets of Bird Rocks in the Gulf of St. Lawrence, have seen sights they will carry in their memories forever.

Great Bird City Contains 100,000 Terns

Probably the first question at the sight of any bird species in mass is, "How many of them are there?" Certainly, on seeing the Tortugas terns, one cannot but ask it.

To those not accustomed to such a sight the natural answer would be, "Millions." But, much as we have become hardened to the use of that word in recent years, it is still a figure of enormous magnitude, and we cannot use it as a unit in bird counts even if the sky does appear to be black with birds.

Recent systematic work there has centered on this subject and indicates a present-day total of about 100,000 terns.

Apparently Audubon made no attempt to estimate the tern population. This may seem strange, but it must be recalled that in his day large numbers of birds were not unusual; all kinds of wildlife were abundant then. It is different today, and the only way to know whether a species is increasing or decreasing is to make population counts.

We know that the Tortugas colonies were large in early times. The fact that Captain Hawkins could have loaded "ten boats more" is indicative of their abundance, even if no figures are given. Also, Audubon's statements are clear enough on this point. Unfortunately we have no early estimates. They would be tremendously interesting for comparison with the figures of today.

Sooties Outnumber Noddies

It was not until the early years of this century that definite counts were made. In 1903 Herbert K. Job, an early photographer of bird life, estimated that the colony contained some 3,600 sooty and 400 noddy terns.

This must have been a very low ebb for the former, though we have no previous figures for comparison. Perhaps during each of the war flurries, when Fort Jefferson was active, the birds suffered inroads, because the soldiers and sailors stationed there, having little to occupy their spare time, used the colonies as a meat and egg supply to augment military menus. If so, Job's low 1903 figure may have been the result of persecution during the Spanish-American War.

At any rate, the terns increased from 1903 on. In 1907 Dr. John B. Watson, who later became professor of experimental and comparative psychology at Johns Hopkins University, began his now famous studies of these birds (page 228). He found 18,000 sooties in 1907 and 20,000 the next year. The noddy population took an unexplained drop from 4,000 in 1907 to 1,400 in 1908.

There was a gap in the counts for several years and another war intervened. In 1917 Dr. Paul Bartsch, then Curator of the Division of Marine Invertebrates, U. S. National Museum, estimated 25,000 terns on the islands. Afterward, Fort Jefferson and the Tortugas were too busy in World War I to permit the counting of birds.

Whether numbers declined after that war is not clear, but if so the drop could not have been serious. By that time the wild bird protective laws were fairly well known. Bird protection had gained tremendous ground since early in the century when little, if any, existed.

Bird Key Wiped Out by Hurricane

The year 1935 saw some radical developments at the Tortugas.

First, the very topography of the islands was changed. Bird Key, time-honored nesting grounds where the terns had "always" bred, was eliminated completely by a hurricane! The low-lying sandy islet simply disappeared beneath the waves and has not reappeared since, though in recent years there has been some indication that it will yet do so.

Coincident with this change was the inauguration of annual expeditions to the Tortugas by the Florida Audubon Society. Several members made the trip each season to estimate the tern population.

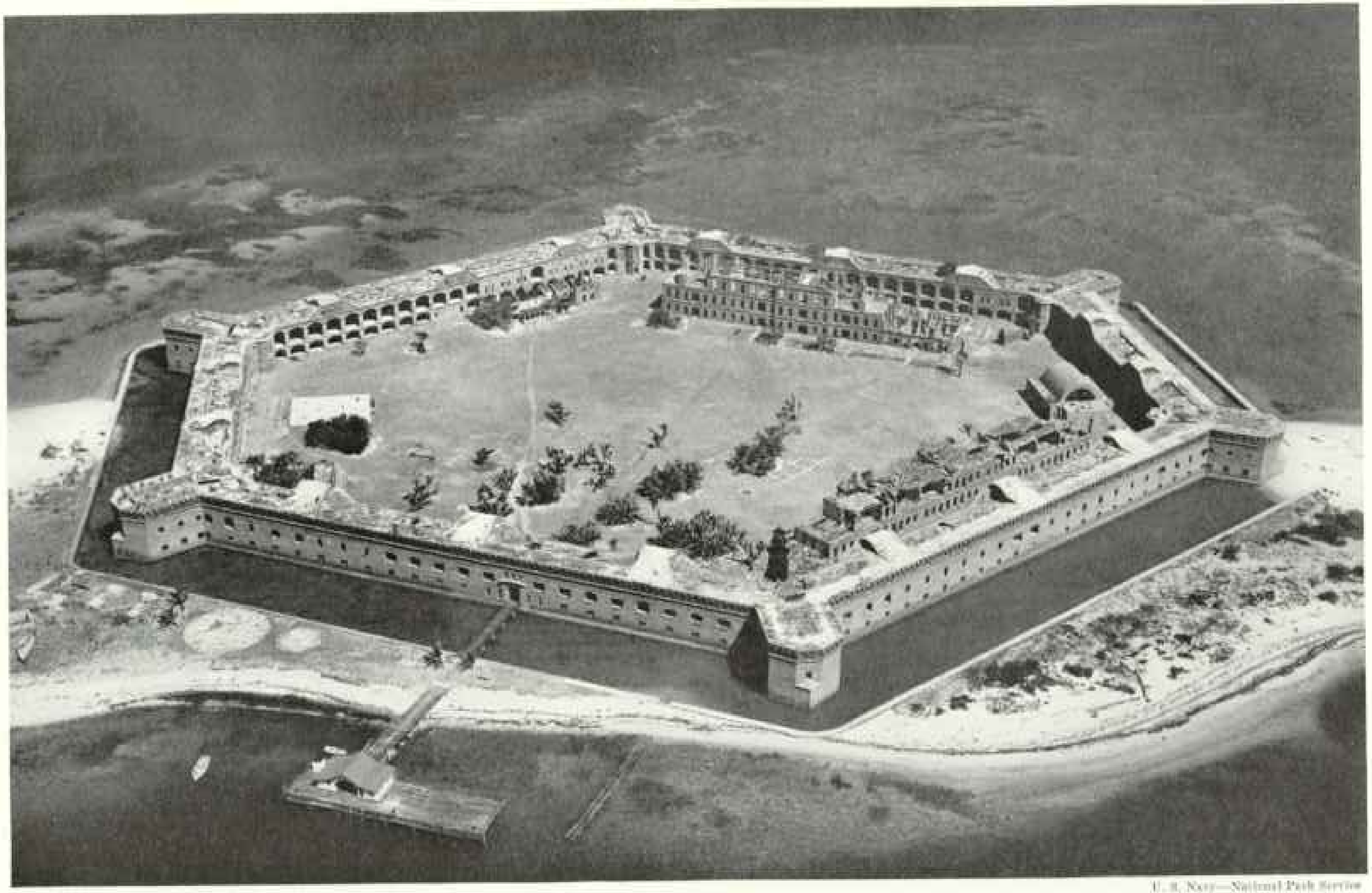
Also, in 1935 Fort Jefferson, as well as the Tortugas generally, became a national monument by proclamation of President Roosevelt. The first group of workers of the Florida Audubon Society was welcomed and ably assisted by National Park Service personnel stationed at the fort.

On that survey it was found that the terns

U. S. Navy—National Park Service

Ghost in the Gulf of Mexico, Six-sided Fort Jefferson Presents the Illusion of a Monster Ship Aground in Shoal Water

An estimated 42 million bricks stretch around 3,030 feet of Garden Key. The fort's walls are 8 feet thick and 45 feet high. Three gun tiers could hold 450 cannon. Rusting coal piers (left and right) were abandoned by the Navy after hurricanes wrecked them. From these waters the battleship *Maine* sailed to her death at Havana. Bush Key lies within shouting distance. Beyond: Long Key.



U. S. Navy—National Park Service

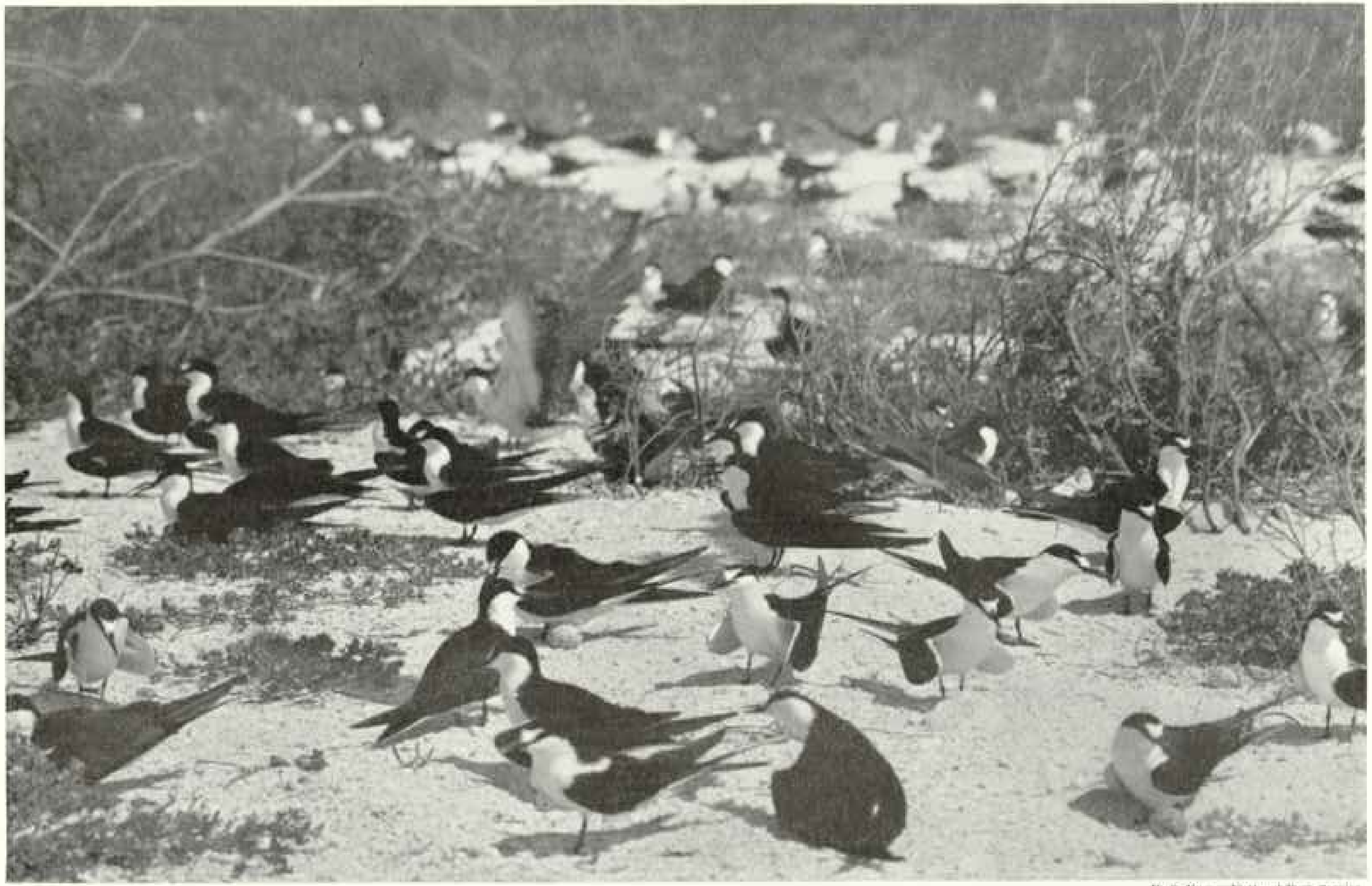
In the Midst of the Gulf Stretches a Wet Moat, an American Fortress's Medieval Defense Against Raids and Jail Breaks

Fort Jefferson's only entrance, the bridge and sally port (front), once had a drawbridge. Legend says sharks were enticed into the moat to deter escaping prisoners. Six huge corner bastions could sweep the ditch with fire. On the parade ground are the caretaker's house (left), officers' ruined quarters (center), and soldiers' barracks (right).

U. S. Navy—National Park Service

A Canopy of Wings Flutters over Bush Key. From Afar the Sooty Terns Resemble an Expanding, Contracting Cloud of Smoke

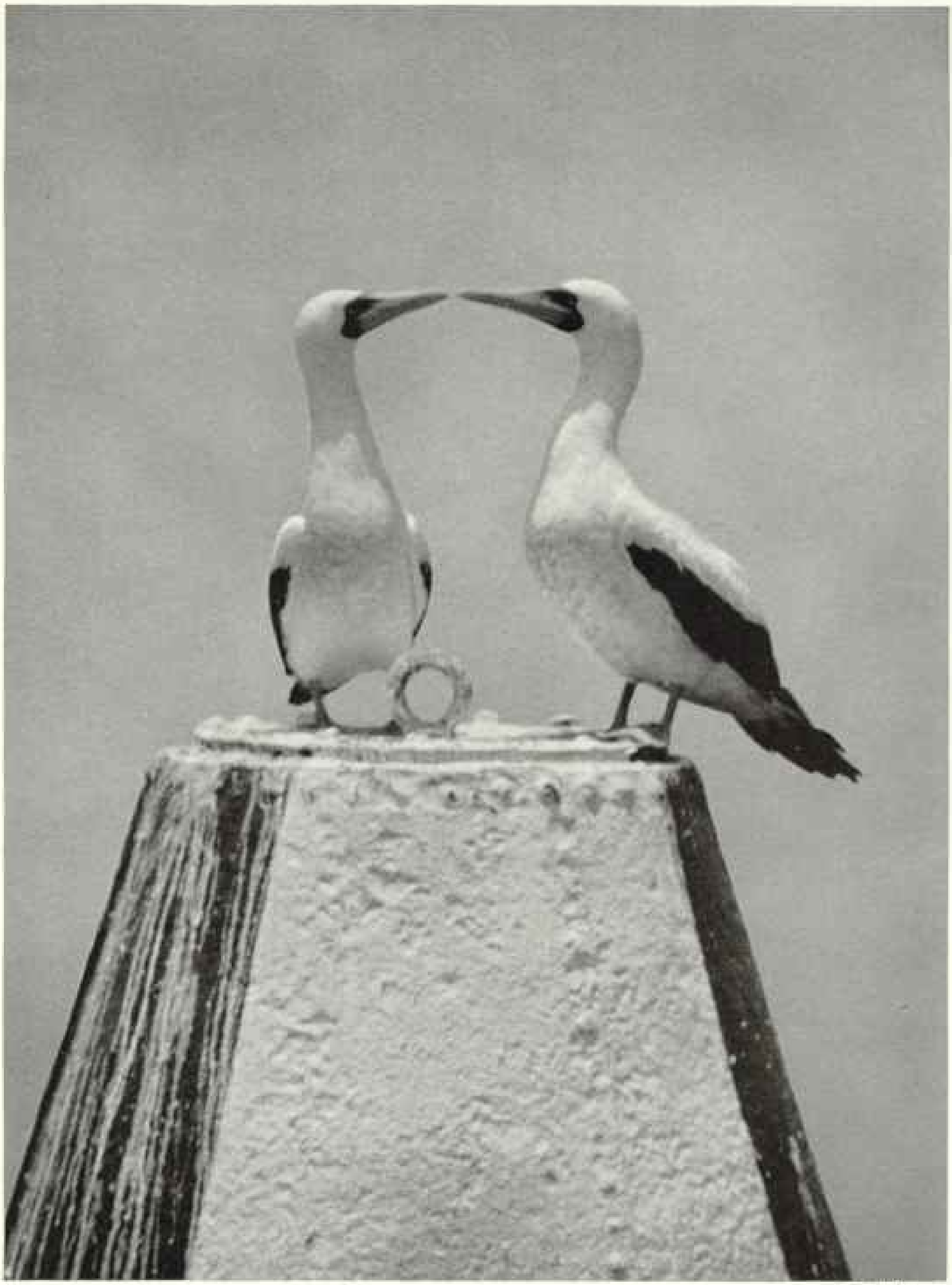
This illusion is created by only half the colony, the others minding the eggs. For recreation the sooties love aerial maneuvers, soaring almost out of sight. Audubon found their staccato cries "indeed deafening." These terns nest under the shadow of Fort Jefferson.



U. S. Navy—National Park Service

On a Furnace of Sand Stand the Sooty Terns, Shading Their Eggs from the Blazing Sun

In a multitude of nests each bird finds its own unerringly. A mated pair's homestead is little more than two feet in diameter. Any claim jumper is punished ruthlessly. These early birds arrived on Bush Key in May. In September they vacate the island. Where they go remains a baffling mystery of the sea.



Robert T. Peterson

Symmetrical Question Marks on a Tortugas Mooring Pile Are Blue-faced Boobies

On the bare skin of its face the booby wears a blue mask. It earned the name booby (Spanish *bobo*, dunce) by permitting itself to be shoved off its nest. Stupid or not, the bird is a spectacular fisher, making 60-foot dives through the air for prey in the sea. These boobies are casual visitors to the Dry Tortugas.

had taken to nesting on Bush Key, just across a narrow channel from Garden Key. They have utilized it ever since.

The count revealed 30,000 sooties and 3,000 noddies. In 1936 they increased to 40,000 and 4,000, respectively, while in 1937 the sooties reached an all-time high of 100,000 and the noddies dropped to 2,000.

Some scattering of the birds occurred in 1937 and 1938. Large numbers continued to use Bush Key, but many crossed the channel and nested on Garden Key beneath the walls of Fort Jefferson, or even, in some cases, on the fort itself. Others bred in the wreck of the old coal docks.

Alexander Sprunt, Jr.

Noddy Screams Insults at the Camera Invader of Its Nest Bush

By what right does man invade the Dry Tortugas? Terns had colonized the islands, possibly for millenniums, by the time Ponce de León made the discovery in 1513. Now Bush Key's 100,000 tern residents multiply under Uncle Sam's protective wing.

Many Young Noddies Killed by Rats

In 1938 the birds received the attention of an able field scientist of the National Park Service, Dan Beard, Jr., who worked with the Florida Audubon Society group. The count that season was 64,000 sooties and only 400 noddies.

One factor in lowering the noddy population was the appearance of rats on Bush Key. These vermin, probably from Cuban fishing boats, wreaked havoc on the young birds.

Control of the pests was instituted, but the noddies descended to an alarming record low of 180 in 1940. Eventually, however, the campaign against the rats was successful and the noddies have increased steadily, if slowly, since.

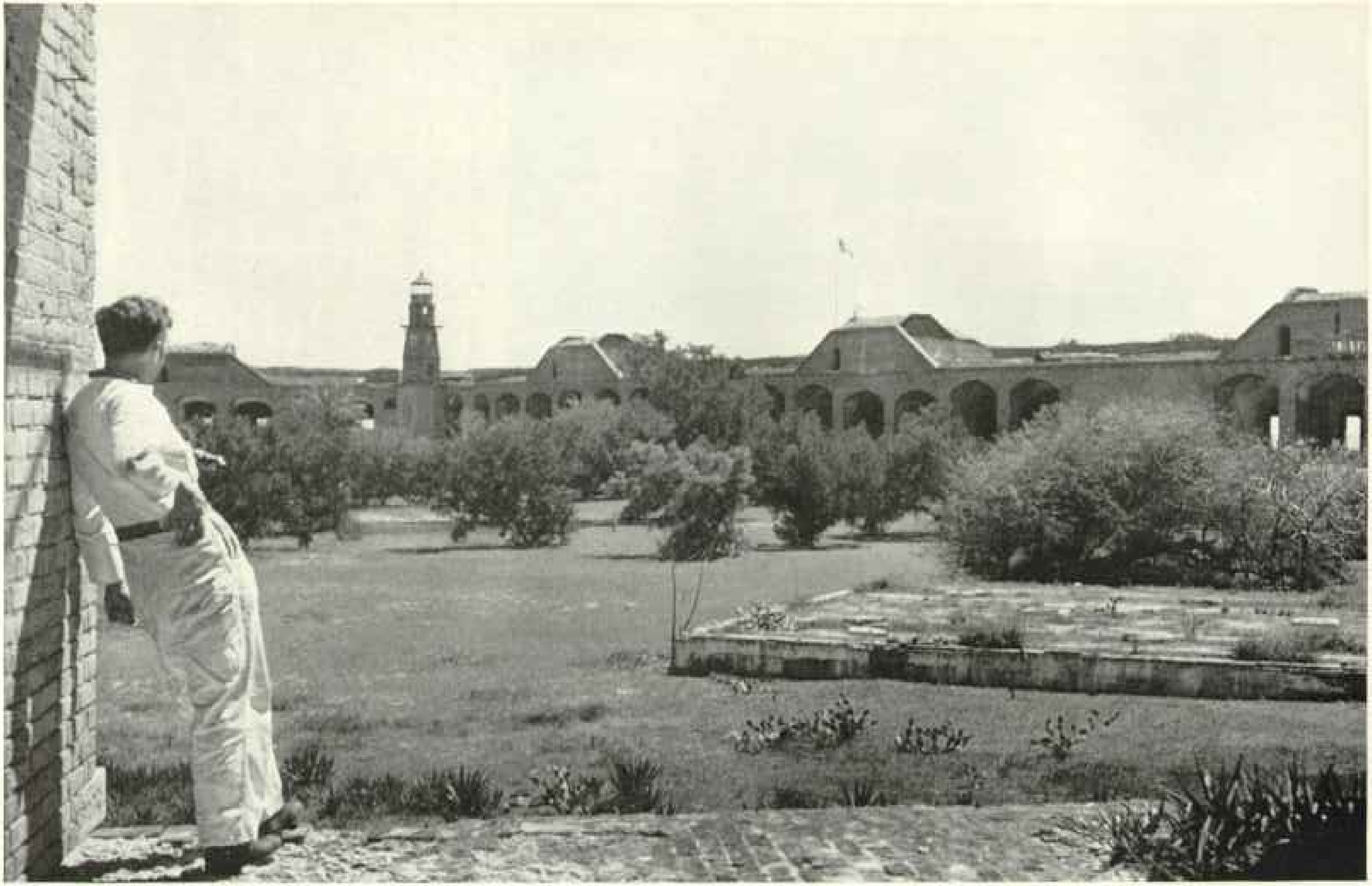
Before World War II stopped the Florida Audubon Society's work in the islands for the duration, a count of 100,000 terns was made in 1940. In 1941 the colonies were visited by Roger T. Peterson, of the National Audubon Society, who also estimated the bird population at 100,000. The custodian of Fort Jefferson carried on in 1942, and his count was 65,000 sooties plus 450 noddies.

No bird counts were made in 1943 and 1944, for the Tortugas had become an important base for antisubmarine activities in the Gulf.

Air Is Thick with Birds

In the 1945 season, in my capacity as Southern Representative of the National Audubon Society, I accompanied C. R. Vinten, Coordinating Superintendent of Southeastern National Monuments, to the Tortugas and made the count. On my last visit there in 1939 our census had indicated 70,000 sooties.

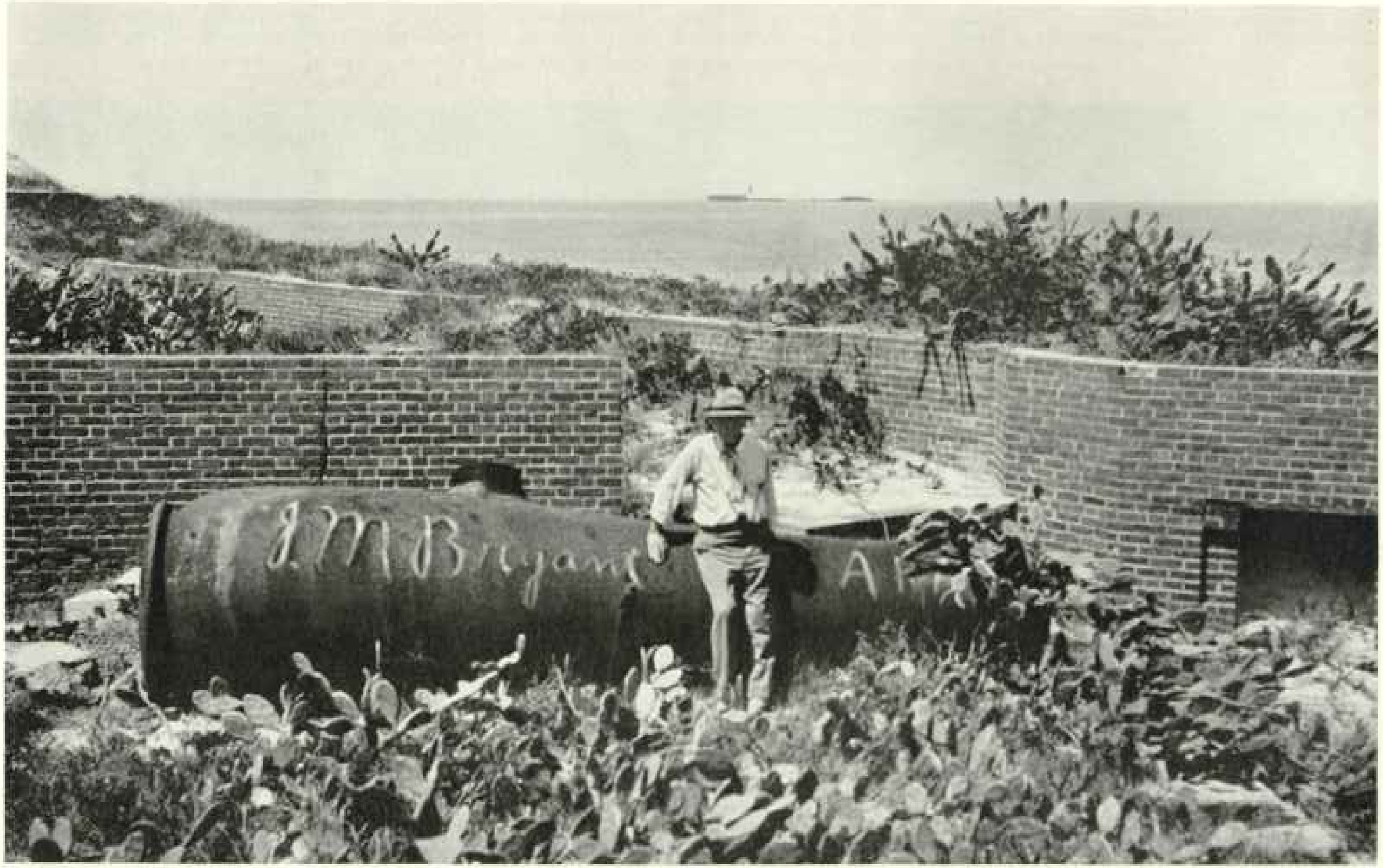
In making these counts, or estimates, one



Gilbert Grosvenor

Solitude Reigns over Fort Jefferson's Parade Ground; the Thud of Army Boots Is But a Memory

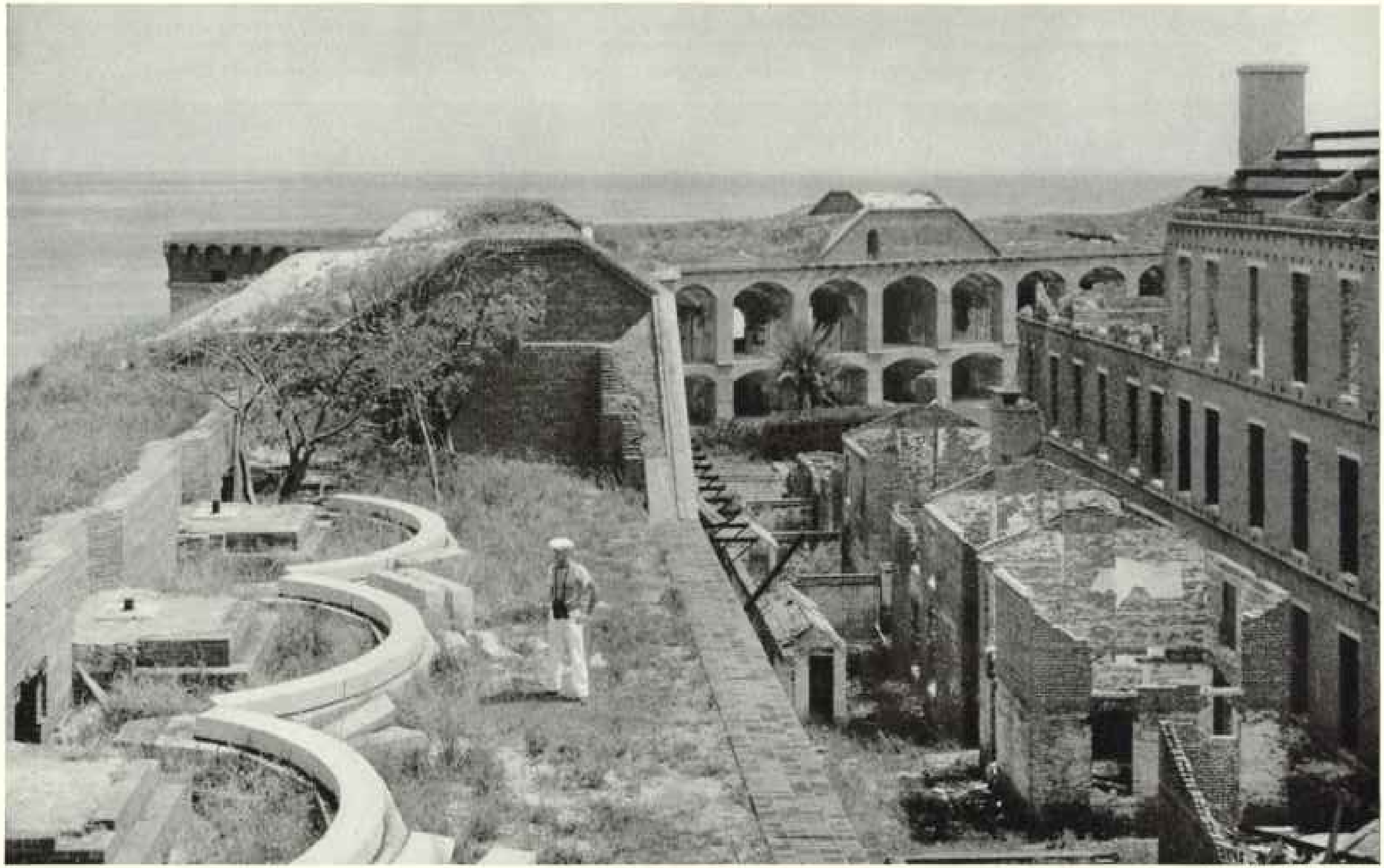
Garden Key became American upon Florida's purchase from Spain. Fort Jefferson, begun in 1846, was left incomplete because rifled guns made its brick defenses obsolete. Yesterday's "Key to the Gulf" has become a national monument. Visitors are welcome, but boat service is lacking. The lighthouse shines no more.



Gilbert Grosvenor

Fort Jefferson's Cannon, Which Never Fired a Ball in Anger, Lie Like Fallen Trees, Pointing Nowhere

In the Civil War four unready cannon saved the fort. When a Confederate warship demanded surrender, the commander of the useless guns replied, "I'll blow you out of the water." His bluff succeeded. Too heavy for looters, this old cannon sleeps among cactus. J. M. Bryant's name is one of thousands "registered" by visitors. Loggerhead Key's lighthouse rises in the distance (page 214).



U. S. National Park Service

Walls Crumble, Roofless Rooms Stare at the Sky. Looters Mined Fort Jefferson for Metals and Firewood

Vandals chopped mantels and hacked plaster. Time and hurricanes heaped up the confusion. Wrought-iron girders in the officers' quarters are almost a century old. Empty casemates (center) could house the people of a good-sized town. Beside a palm stands the small, tomblike hot-shot oven, built to heat cannon balls cherry red for firing at wooden ships. Guns which once commanded the Gulf are gone, but their brick mounts remain (left).

Gilbert Grosvenor

A Tragic Monument Bears Fading Testimony about Yellow Fever, Which Scourged Fort Jefferson in 1867

Most celebrated prisoner at Fort Jefferson, once a Federal penitentiary, was Dr. Samuel Mudd, who innocently set the broken leg of Lincoln's assassin. When fever felled Bvt. Maj. Joseph Sim Smith, the post surgeon (see tablet), Dr. Mudd volunteered. Released from his chains, he toiled among 270 cases; there were 38 deaths. Then Dr. Mudd returned to his cell. Two years later he won a belated pardon. Capt. C. C. von Paulsen, U. S. Coast Guard (on right).

Roger T. Peterson

Sooty Tern, a Victim of Insomnia, Has Earned the Nickname "Wide-awake"

By night the sooties do not settle down like respectable fowl on a roost. Alternately napping and flying, they go gadding about Bush Key. With the noddies, they share a marvelous fishing technique. On beating wings they follow schools of fish, picking off small fry leaping above the surface.

is beset by a bewildering problem. Both the swarming numbers of birds on the sands and in the air and the never-ceasing cacophony of avian voices which beats in one's ears combine to set the mind whirling as wildly as the terns themselves.

As the disturbed owners of the multitude of eggs and young circle and wheel virtually at arm's length, Audubon's description seems very apt: "I felt for a moment as if the birds would raise me from the ground, so thick were they all round."

Thick is the word! It is a curious sensation, this being in the midst of a swirling vortex of winged life. It produces impressions difficult to describe, or even to relive in retrospect.

Obviously, there is no such thing as one-two-three counting. The best that can be hoped for is a reasonable approximation of so great a multitude. If one happens to strike a time before the eggs are hatched, a count of them in some such unit as a square yard can be averaged, and the total nesting area multiplied by that unit.

After some of the young have appeared and there are still thousands of eggs, the difficulties are apparent. One can then only count the sitting adults (incubating or brooding) and multiply that number by two for the absent member of the pair.

Taking the square yard, which is the unit usually employed in the Tortugas estimates, one must determine how many birds occupy that space. This varies from 2.5 to 6 birds, though an average of 3.5 is a fairly safe one.

Once the census takers have determined how many nesting birds there are to a square yard, it remains only to ascertain the total nesting yardage and double the number for the pair.

Noddies Nest above Ground

On Bush Key however, this is no simple matter. Much of it is covered by low vegetation—grasses, cactus, and bushes—and there are two brackish ponds. The terns do not use the strip of beach immediately at, or just beyond, high-water mark; so this must be discounted.

On all the rest of the open, sandy areas, in nooks and corners between the bushes, and even in the mats of salicornia grasses, the terns nest thickly. The egg of the sooty is usually on the ground, but the noddies place their nests in bushes or low trees. Incidentally, they are the only terns in North America

U. S. Navy—National Park Service

Noddy Terns, Nest Architects, Give Building Materials A-1 Priority; They Hoard Sticks

If chance allows, they loot twigs from neighbors' homes. Toss up a handful of sticks and all the noddies in sight will battle for them in mid-air. Polite birds, they nod and bow and scrape to one another. They love to perch on stakes and buoys. Once in a while one roosts on the head of a swimming pelican.

Alexander Sprunt, Jr.

To Make Her Nest, Mrs. Sooty Tern Merely Scratches a Hollow in the Sand

Others brood on the flat earth (observe the four neighbors' unattended eggs). Normally shy of man, the sooty undergoes a psychic change once her egg is laid. She defends it with tricks and bold maneuvers.

which nest above ground (pages 218, 219, 221, 227, 229).

Exclusive of a long, rather narrow sand spit at its eastern end, Bush Key has an area of 105,000 square yards. Of this, approximately 34,000 square yards were being used by the birds that season, including practically all of the sandy areas and some of the grass flats. Allowing for varying density of birds per square yard, the average was three per unit. Therefore, there were somewhat more than 100,000 sooties present. The noddies numbered about 500. The 1946 count, which I conducted, was about the same.

To form an idea of such a concentration without actually seeing it is difficult. Figures are dry and cannot begin to tell the whole story. The scene can be fully grasped only by standing on the wind-swept beach, under a tropic sun, with unbelievable color on all sides. It can come only through almost physical contact with the teeming thousands of birds.

Indeed, physical contact is perfectly possible, for the noddy often allows itself to be picked up from the nest. To obtain a picture of the egg it is frequently necessary to remove the sitting bird bodily and set it aside! The expression "tame as chickens" loses much of its significance at the Tortugas, for here the birds are much tamer than many chickens.

One hundred thousand is a good, substantial figure; at least, it conveys the idea of abundance. To think of so many of anything in so restricted a space as this tiny key is to make one wonder.

Although Audubon stated definitely that both the sooty and noddy terns lay three eggs, such is not the case. It is strange that he should have said so, unless the birds have changed their breeding habits since his time, which is most unlikely.

Both species lay one egg. Now and then the sooty will lay two, and there may possibly be records of a setting of three, but if so they are exceedingly rare. The noddy consistently lays but one.

Schooner Took Eight Tons of Eggs

"Egging" was once carried on extensively at the Tortugas. Harking back to Audubon again, we find the following illuminating statement regarding its scope:

"At Bird Key we found a party of Spanish eggers from Havana. They had already laid in a cargo of about eight tons. . . . On asking them how many they supposed they had, they answered that they never counted them, even while selling them, but disposed of them at 75 cents per gallon; and that one turn to market sometimes produced upwards of $200, while it took only a week to sail backwards and forwards to collect their cargo. Some eggers who now and then come from Key West sell their eggs at 12½ cents the dozen . . ."

The fact that schooners laid in eight tons of eggs, and were evidently not fully loaded then, will give some idea of the vast numbers of the birds represented when we consider that each egg (or practically so) meant a pair of birds present!

The usual practice on arrival at the colonies was for the eggers to go ashore and systematically stamp upon all eggs they could find, then await the re-laying, which takes place almost at once. In this way they could be assured that their collections were fresh. Some Florida bakeries used the tern eggs in their bread and other products.

Conservation laws, of course, have put a stop to such a practice, but even yet there are those who would carry it on if they could. Now and then boatmen from the Florida Keys approach the custodian at Fort Jefferson and ask if they cannot take only "a few hundred dozen." The negative quality of his reply leaves no room for doubt on the subject!

Whether such requests are made in ignorance of the prevailing laws, or in the hope that their actions would be winked at, is problematical, but the end is always the same. The Tortugas terns and their eggs are in safe hands.

The Mystery of Migration

Another inevitable question when watching the activities on Bush Key is how the birds find their way back to it so infallibly each year. From September to April no sooties or noddies are about the Tortugas. They have scattered through the seas to the southward.

Whether or not they know much about birds, most people are interested in the marvel of migration. They cannot fail to wonder at the amazing power which guides these feathered creatures over land and sea, year after year, to a given place. We shall never understand it completely, perhaps, but we have to admit it.

The "first robin" and the wedges of northward- or southward-flying geese give annual notice that the homing instinct of birds is one of their greatest characteristics, about which romance and mystery will ever cling.*

It was Dr. Watson who did more than wonder about the Tortugas terns (page 215). This indefatigable student worked in the colonies for several seasons in the early 1900's and,

*See "Our Greatest Travelers," by Frederick C. Lincoln, in *The Book of Birds*, published by the National Geographic Society.

Hugo H. Salander from National Audubon Society

Rusty Iron Chips Form a Hard Bed in a Strange Maternity Ward

Tradition tells the noddy tern to construct a bush nest on fashionable Bush Key. Unable to find a home there, she has become a squatter on neighboring Garden Key. Her single egg rests on an abandoned coal pier. Lacking better supports, noddies nest even on cactus plants.

among other projects, decided to find out definitely how long it took the birds to cover known distances back to the nesting grounds.

He secured some of the terns at their nests, marked them with brightly colored paints, established the exact location of each nest, and shipped the birds by steamer to various parts of the Atlantic and Gulf coasts, where they were liberated. He was notified of the time of their being set free. Taking his station by the nests, he awaited developments. One example of the results will suffice.

Back to Their Nests—1,080 Miles Away

Three noddies and two sooties were liberated from a ship 12 miles off Cape Hatteras, North Carolina, on June 16. Five days later the two sooties appeared at Bird Key and settled on their eggs!

Dr. Watson estimated their flight at 1,080 miles, as he was sure, from the usual habit of the species, that they followed the coastline.

Of the three noddies, only one returned. Its experience was, to say the least, discouraging. When it did arrive, some days after the sooties, its mate had taken on another consort and the two of them set upon and drove the homing unfortunate from the nest! It was not seen again.

How did the terns make these flights? No one can say, but the fact remains that they did.

One more characteristic of the Tortugas bird city is its antiquity. Consider that it was seen by Europeans 434 years ago—just 21 years after Columbus landed on San Salvador (Watling) Island, and 107 years before the Pilgrims came!

True, consecutive records are not extant, but the record began in 1513 and there was another in 1565 (page 213).

Despite the great lapse of years until Audubon's visit in 1832, there is no reason to believe that the terns ceased to use the Tortugas keys. Why should they? They "al-

ways" had been there, long before Ponce de León found them, or so it may be assumed. Who knows but that the logbook of many a galleon, frigate, and schooner held references to these "other birds" between the 17th and 18th centuries?

And there they remain today, unchanged, unchanging, voicing their age-old tumult across the sands. No wonder they are known as "wide-awakes"!

It is clear enough that this last war has not militated against them, whatever may have happened in like conditions in the past. The colonies have never been in better condition, at least in recent times, though much larger populations of the noddy are on record. It is still not clear why the birds fluctuate in number as they do.

The present custodian of Fort Jefferson, Russell A. Gibbs, may be depended upon to watch his avian charges vigilantly. He has their welfare very much at heart. No human interference will be tolerated; no eggers will take a "few hundred dozen"!

Hurricanes may come, as they have in the past; man-o'-war-birds which roost on Bush Key may take some toll of the youngsters; but there are few, if any, avian sanctuaries anywhere which are more free of bird life's greatest enemy—mankind.

Tortugas Nocturne

It was on my last trip there amid the terns that I saw one of the most weirdly beautiful sights in my experience. We were down on the dock in front of the old fort one night, enjoying the sweeping coolness of the breeze.

Across the channel to the left, the great bird city hummed and shrilled with activity as if it were midday instead of nearly midnight. Noise never stops there, the incessant cries of the sooties beating like a breaking surf every hour of the twenty-four.

Suddenly, above that clamor came another sound, a deep-toned, ever-growing drumming of motors in the sky. Looking to the southward, we saw the approaching red and green wing lights of a Liberator up among the stars. It came on steadily, passed directly over us, and swung gradually behind the ramparts of the fort beyond, the sound of the motors fading.

For a few seconds all was as it had been; then, in an instant, a brilliant orange light blossomed in the night sky. Glowing balls of fiery luminance, trailing twisting plumes of white vapor, drifted slowly toward the sea as two parachute flares spread their intense illumination amid the darkness.

We stood spellbound, gazing at that eerie brilliance almost in unbelief. The orange glow shed its searching light across coral sand and dark water. Bush Key stood out in sharp relief and, erupting from it, white as snow against the luminance, hosts of birds streamed seaward.

As the flares descended, the brilliance grew, the whole scene being permeated with an unearthly beauty. The massive walls of the fort seemed outlined brick by brick, and all the while across the waters and the sky those living clouds of birds whirled and circled in an unending, ever-shifting backdrop of ghostly movement.

It was as if the spirits of those unfortunates of long ago, whose bones lie buried beneath the submerged sands of vanished Bird Key, had suddenly arisen in gleaming shrouds and were streaming upward from their coral resting places in protest at this invasion of their peace.

The fiery bodies touched the water at last, burned with a final burst of orange as the smoke plumes towered higher; then darkness closed once more.

We stood there for a while in wonder at that sight, each carrying in his mind a picture of something unforgettable in its strange, unnatural beauty. It is another mental kodachrome of that place of many memories, ever associated with that great bird city, its myriad wings flashing ceaselessly in the wind which ripples the crystal waters over the beauties of the coral builders beneath the waves.

The Society's Southeastern United States Map

AS MUCH of America as a man could see from a rocket forty miles above Macon, Georgia, is unfolded before the 1,600,000 members of the National Geographic Society in the ten-color map supplement with this issue of their Magazine.

But instead of the vague, blurred image that a V-2 voyager would behold, The Society's new map of the Southeastern United States shows these nine States and parts of ten more in a clear cartographic picture.

Every town of any size is named; all principal railways and canals as well as natural features are shown. State and national highways are numbered and battlefields are named and dated.

From just south of the Mason-Dixon Line (the Maryland-Pennsylvania boundary) to the mouth of the Mississippi and the Florida Keys, from stormy Cape Hatteras and the Kitty Hawk sands which cradled the airplane to quaintly named Water Proof, Louisiana, and Evening Shade, Arkansas, the busy Dixieland of today is revealed on a scale of 39.46 miles to the inch. Special insets show the southern Atlantic coast and the lower Mississippi area at double the scale of the main map.

This supplement is the fourth in the National Geographic Society's series of detailed and decorative maps covering the United States by sections on scales much larger than would be possible in a single map. Similar maps of the Southwestern, Northwestern, and Northeastern United States were distributed to members in June, 1940; June, 1941; and September, 1945, respectively.*

Swift Changes in the Historic South

For thousands of Americans this map will chart the way to winter warmth.

Within the new map's cotton-boll borders is the oldest city in the United States, St. Augustine, Florida, founded by the Spanish in 1565, as well as the site of the first permanent English colony, established in 1607 at Jamestown, Virginia, under the leadership of Capt. John Smith.

Both George Washington and Abraham Lincoln were born within the compass of this map, the one at Wakefield, on the Potomac River in Virginia, and the other in a one-room log cabin on Sinking Spring Farm, near present-day Hodgenville, Kentucky. At Yorktown and Appomattox, Virginia, concluded the momentous wars that "made and preserved us a nation."

The map is sown with historic shrines, and national parks of scenic, recreational, and natural history value are also plainly marked.

In Tennessee, Alabama, Mississippi, and Kentucky the beautiful lakes of the Tennessee Valley Authority stand out in clear detail on this large scale. In this region of abundant power the Government developed the atomic city of Oak Ridge, Tennessee.

All through the South significant changes are taking place. During World War II Dixie gained nearly five and a half billion dollars in industrial facilities.

Cotton is still the South's big crop. The acres growing it would cover all of Scotland. Thirteen million Americans are dependent upon it for their livelihood. But this dependence is changing as many erstwhile subjects of capricious King Cotton turn to other crops, and thousands of acres from which the cotton plant has mined all strength are brought back as pasture or forest land.

In the Mississippi Delta States, 48 percent of the tilled land was planted to cotton in 1930. Today this has dropped to 19 percent, with oats, barley, alfalfa, and the growing livestock industry which they support increasing every year. Alabama, Florida, and Georgia in 1945 received a cash income of $50,213,000 from a $200,000,000 cattle industry which did not exist until a few years ago.

Cotton is a two-way crop. Besides the fluffy fiber which is now baled high, there is the important oilseed, the country's main source of edible vegetable oil. Not long ago the cottonseed was trash which piled up around the gins, making an expensive disposal problem. Now it is the basis of a $200,000,000 industry giving us cattle feed, margarine, salad oil, soap, and a host of other products.

Experiments are being conducted to develop a "cottonless" cotton plant in which the strength will go into production of seeds, and even to put the cotton burs into industrial use for lacquers, dyes, wallboard, tannin, tannic acid, and potash fertilizer.

Another great Southern industry is undergoing revolutionary changes. In the early days of the Jamestown Colony, Capt. John Smith founded the naval stores industry. From the gum of the pine tree the colonists distilled turpentine and extracted rosin.

Now pine sap has become a chemical bonanza. Supplementing the gum from living

* Members may obtain additional copies of the new map of the Southeastern United States (and of all standard maps published by The Society) by writing to the National Geographic Society, Washington 6, D. C. Prices, in United States and Possessions, 50¢ each, on paper; $1 on linen; Index, 25¢. Outside United States and Possessions, 75¢ on paper; $1.25 on linen; Index, 50¢. All remittances payable in U. S. funds. Postage prepaid.

pine trees, the countless stumps left by lumbering and pulping operations are retrieved and processed by big chemical plants to produce not only rosin, turpentine, and camphor but a host of chemicals for plastics, perfumes, insecticides, rubber, and many other products.

One output of this industry finds a fascinating use in meat packing. The freshly killed pig is dipped into a vat of melted rosin plastic. This hardens and is then peeled off, bringing every bristle with it from snout to tail.

By education and necessity, the South is coming to consider its forests as a crop. The southern pine grows rapidly, in some cases adding an inch each year to its diameter. In only ten or twelve years young woodland is ready for careful harvest. Thirty-six percent of all Southern land is in commercial forests. More than 216,000,000 acres supply 44 percent of the national timber yield.

This great forest reserve has brought many manufacturing industries into the South. The pulp and paper industry here has grown from nothing into a $200,000,000 giant employing some 43,000 men. Much of the pulp goes into rayon, gunpowder, and other cellulose products. From lignin, a by-product of the pulp mills, comes such odd progeny as building board, synthetic rubber, and artificial vanilla.

Tung and Ramie, Oriental Newcomers

Two oriental newcomers to the South are making a name for themselves. One of them owes its success in the United States largely to a trustee of the National Geographic Society, Dr. David Fairchild.

In China 45 years ago, Dr. Fairchild, agricultural explorer for the United States Department of Agriculture, studied the Chinese use of tung oil. Two years later, in Washington, he received about a thousand tung tree seeds from L. S. Wilcox, Consul General at Hankow, who had early recognized their possibilities.

With this shipment Dr. Fairchild started the development of tung-oil culture in the United States. In Florida, Georgia, Alabama, Mississippi, and Louisiana there are now some 4,000 tung groves aggregating more than 150,000 acres.

From the big poisonous nuts comes the miraculous tung oil. For far more than 5,000 years the Chinese have been using this quick-drying tung oil. It is the secret of their waterproof paper umbrellas and of their wonderful heatproof, waterproof lacquers. In America it goes into linoleums, oilcloth, brake bands, electric insulation, printing ink, paint, and varnish.

Another newcomer to the South is ramie, a miracle plant which produces a ton of fiber to the acre. The top of the plant makes an excellent cattle feed. From the stalk comes the fiber which processes to strands of 12 to 18 inches in length. This fiber is eight times as strong as cotton, three times as strong as hemp. It has a sheen like silk and will not shrink. It is perennial; one planting lasts about ten years.

Experimental plantings have been made in the Everglades and other points in Florida, Alabama, Mississippi, and Louisiana. Industrial research has perfected ways to process and handle the fiber; so ramie, like its oriental neighbor, the tung tree, may easily become a leading resource of the South.

In Florida's Everglades ramie plantations are off to a head start. But farming in the Everglades is a tremendous undertaking. Water control alone is a major operation, requiring pumps, canals, and subsurface drains to maintain a delicate water balance, since the Everglades muck will burn by natural oxidation if it becomes too dry.

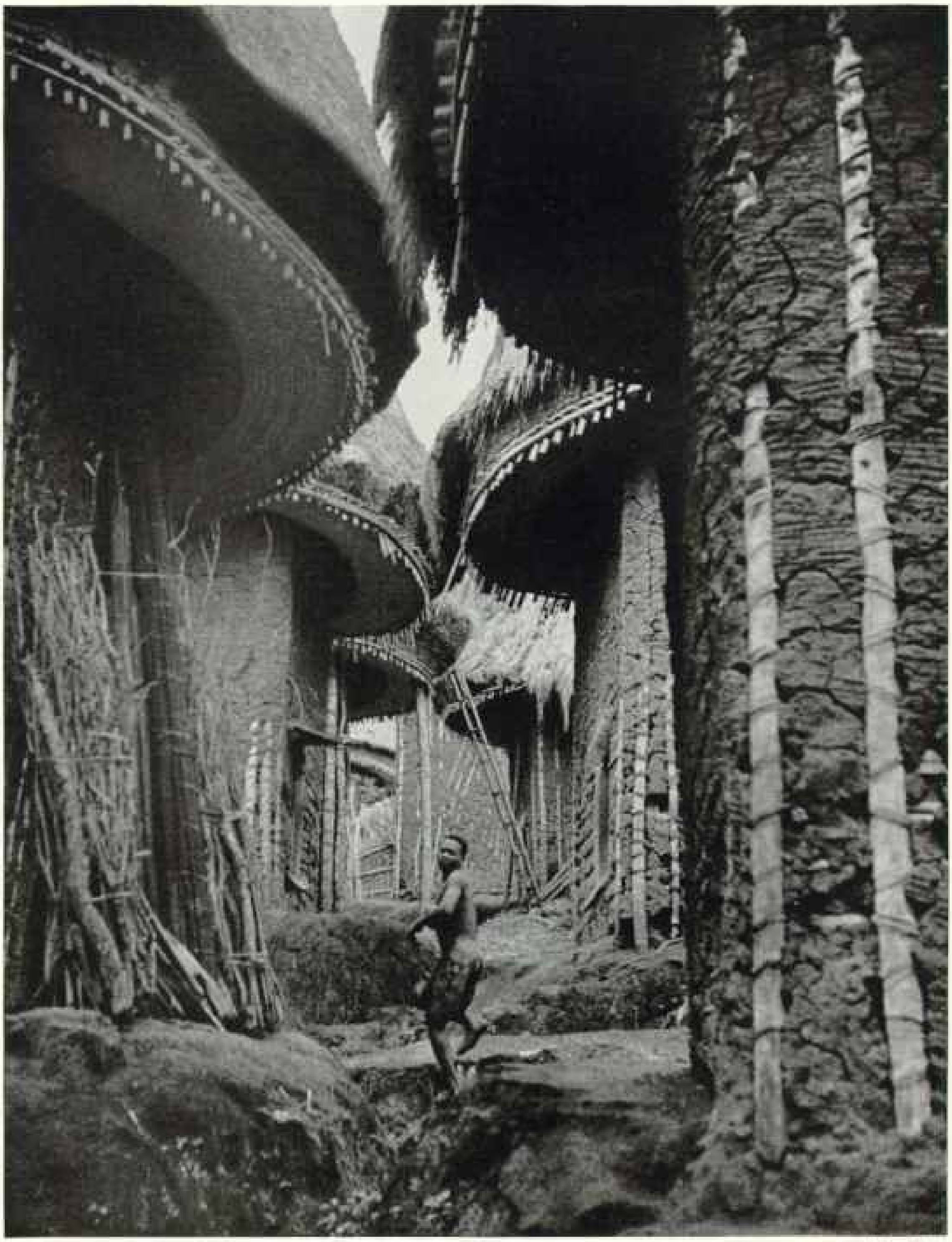
The principal "farmer" of the Everglades is the United States Sugar Corporation, with headquarters at Clewiston. More than 6,000 employees live in the Corporation's plantation villages, and huge processing plants which can handle 10,000 tons of sugar cane and other crops a day form the end of a systematic chain. Cattle are raised as a by-product to consume the abundant feed.

From tobacco to bauxite, the South's products bulk large in the Nation's economy. Increasingly its goods are being processed there instead of being shipped to other sections as raw materials.

Dixie's climate made it a vast drillground during the war, and on this map myriads of ex-servicemen will find the camps or flying fields where they "sweated out" their training, the towns where they sipped milk shakes, Cokes, or beer, and danced to juke-box tunes.

Of special interest to yachtsmen, fishermen, hunters, and other vacationers are the large-scale insets showing the detail of the Intracoastal Waterway, delineating the complex Atlantic coast, with its myriad islands, channels, and beaches, and detailing the Delta at the mouth of the Mississippi.

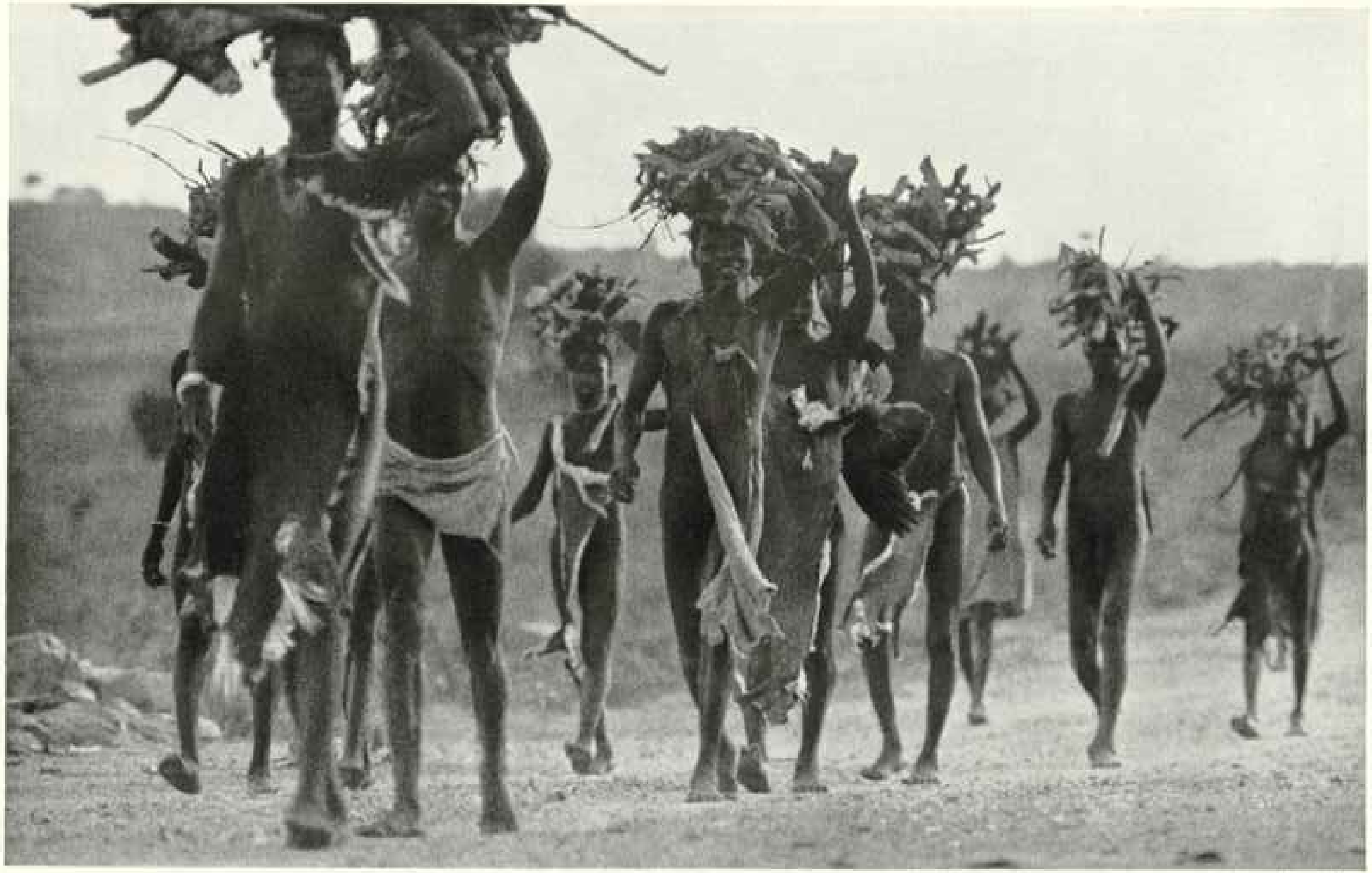
For map and insets the National Geographic Society chose the Albers Conical Equal-Area Projection, which results in maximum accuracy. Areas throughout the map are exactly proportional to their true areas on the earth and there is virtually no variation in scale. The picture presented by the map is thus far more nearly accurate and usable than the foreshortened view which the eye would obtain from a rocket forty miles up.



Pierre Ichac

A King's Wives, Who Refuse to Share a Palace, Live in Identical Mud Apartments

In tropic Africa lie the Cameroons, a name derived from the shrimp (*camarões*) caught in coastal waters by the Portuguese discoverers. A former German colony, the Cameroons are divided into British and French mandates. Some 2,500,000 natives live under the French. In general, those in the north are Moslems; those in the south, Christians. A stubborn few, called Kirdis by the Mohammedans, cling to paganism. The Bamileke, who own this village in the southwest, worship idols. They call this compound the "King Place."

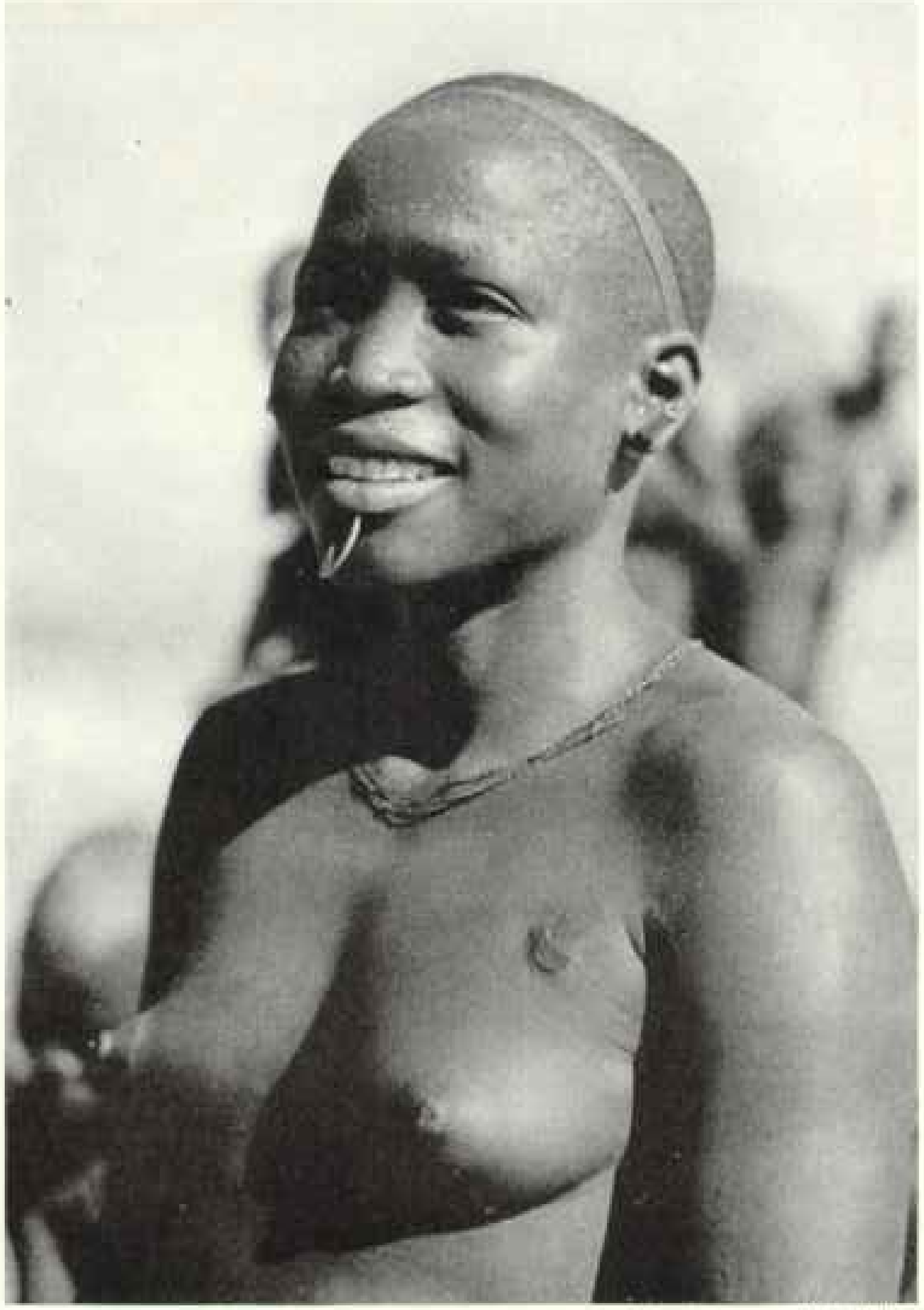


Pierre Ichac

Six-foot Matakam Tribesmen March to Market under Firewood Parasols. Some Lack Goatskin Vests, but No One Worries

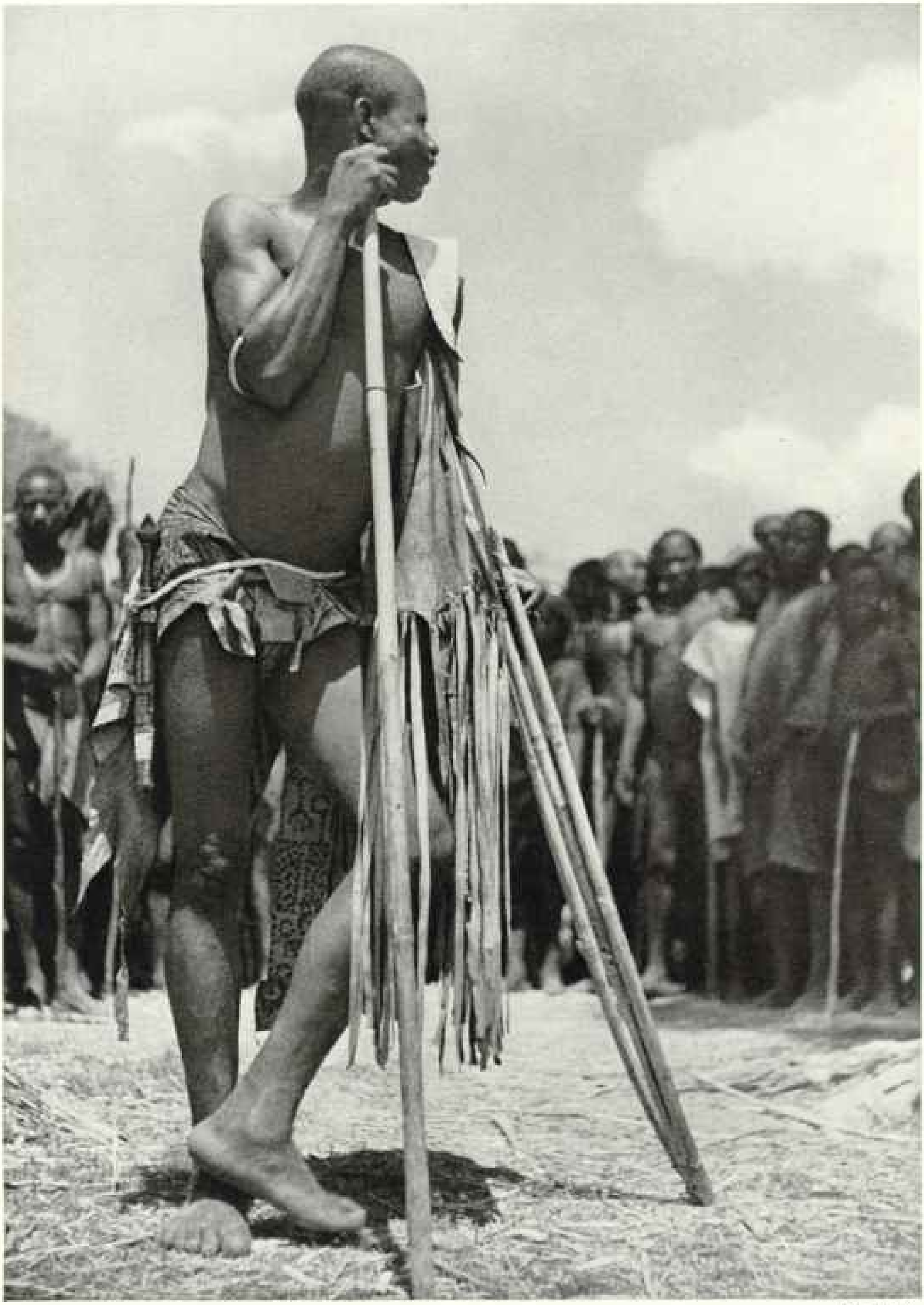
On the eroded Mandara Mountains, where their ancestors sought refuge from Moslem slave raiders, these people make their home under a benevolent French administration. Civilization's formal education and changing fashions are not their problems. A little road work fulfills their duty to the State. Farming and fishing provide a livelihood. In the highlands of the north Cameroons the Matakam enjoy a comfortable climate.

A Man of the Kapsiki Tribe Enjoys His Brass-rim Pipe



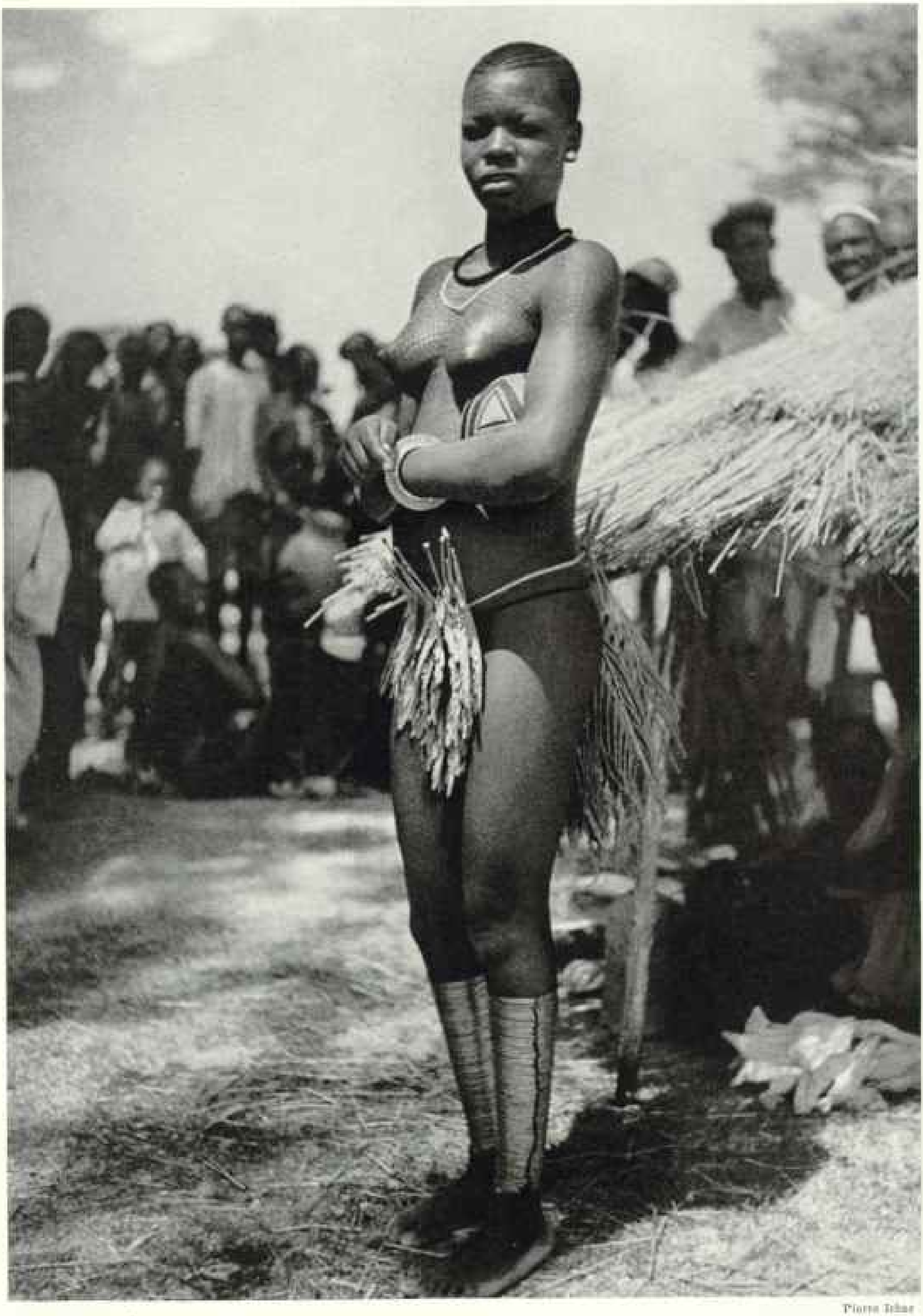
Pierre Ichac

Says His Wife: "I Should Wear Hot, Sticky Clothes!"



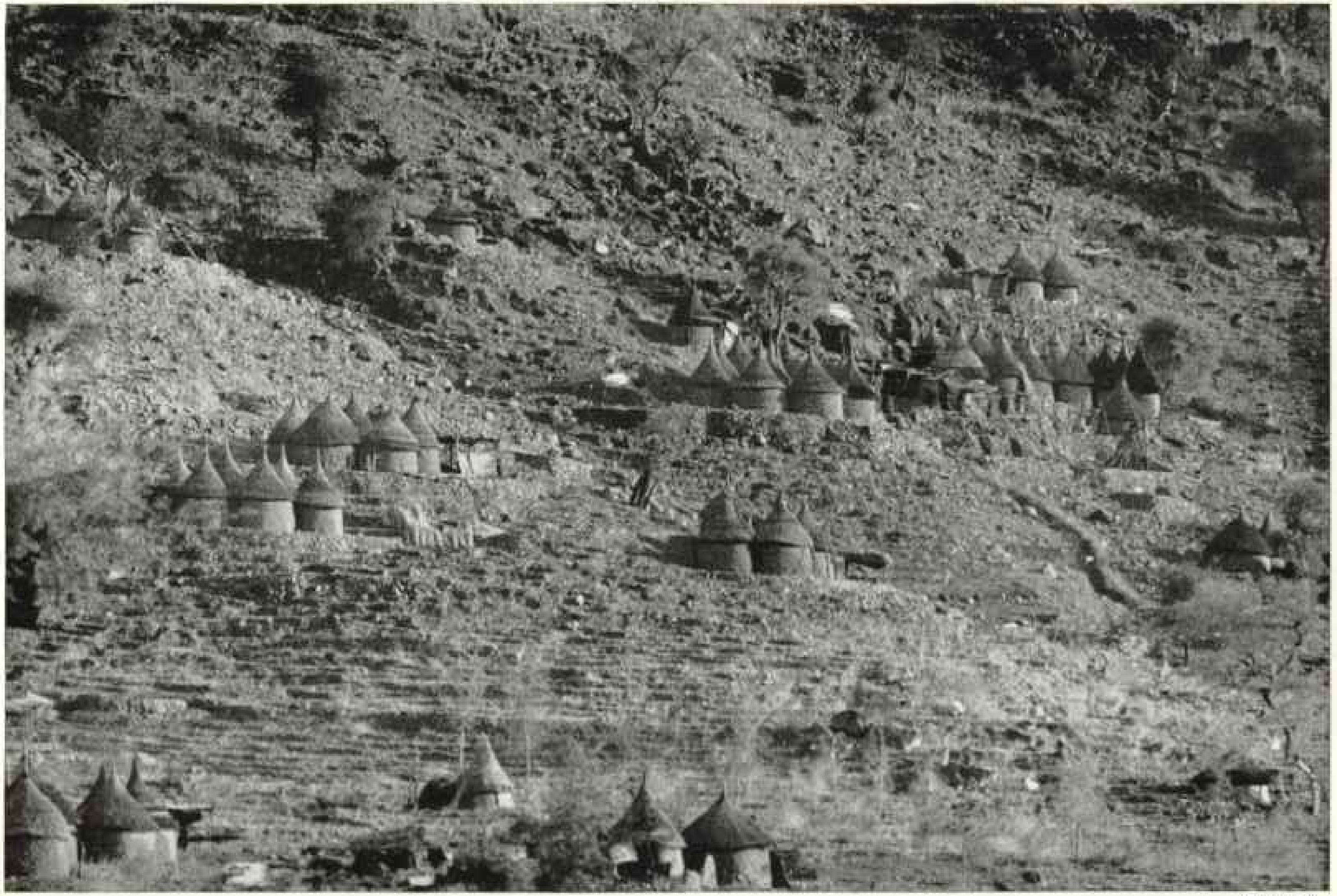
Pierre Ichac

Dagger on Hip, a Tall Kapsiki Leans on His Staff in the Village of Bourha



Pierre Ichac

Gowned in Leaves, Ornamented with Scars, Stands a Girl on Brass-bound Legs



Pierre Ichac

Beehive Huts in Koza Pass Wear an Abandoned Air, as Though Matakam Tribesmen Were Hiding from the Photographer

Pierre Ichac

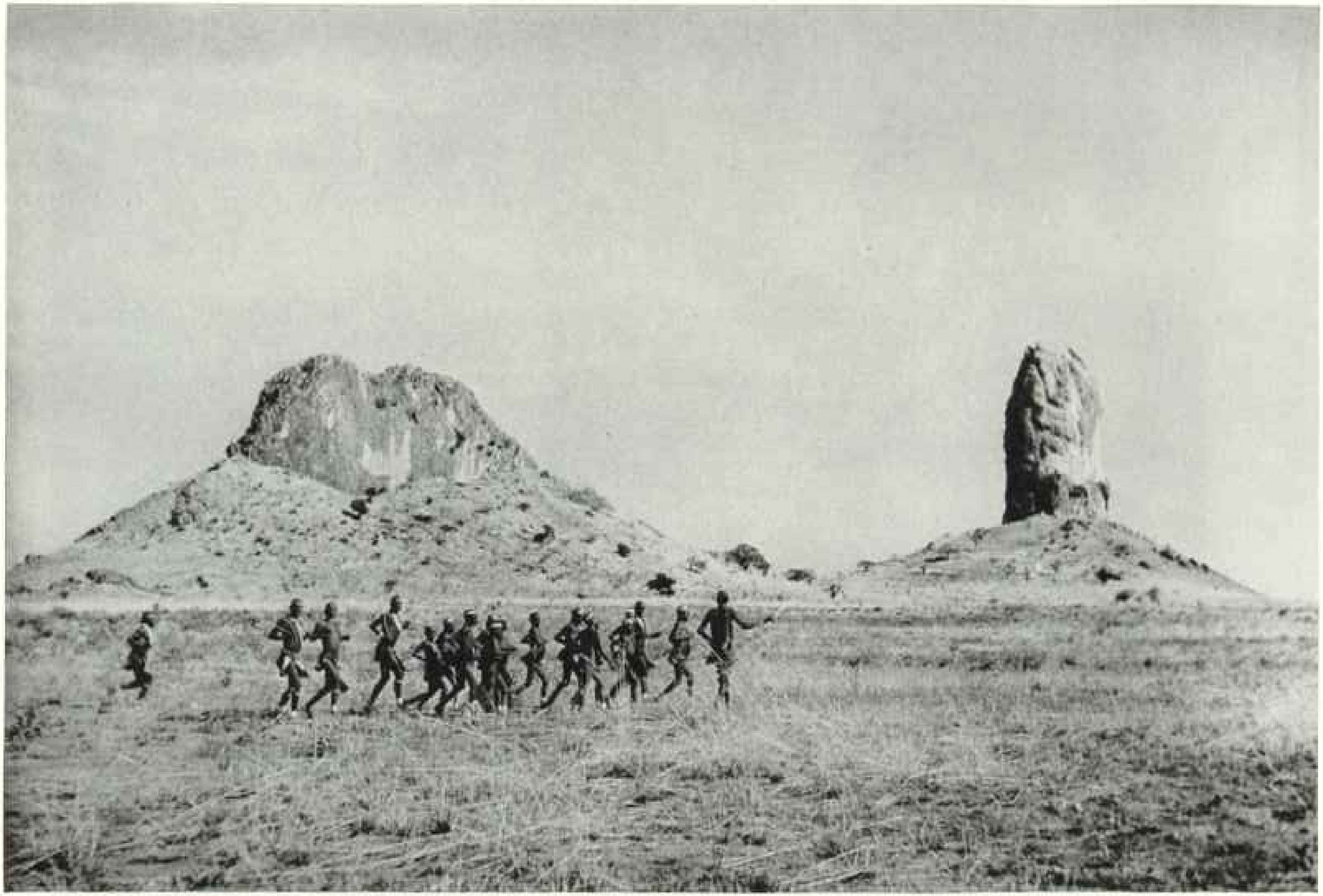
"We Are Men," Chant Kapsiki Youths Initiated into Manhood by Tribal Rites. Younger Brothers (left) Remain Novices

Pierre Ichac

Shell Necklaces and Brass Bells Make Fine Raiment at a Kapsiki Confirmation Party

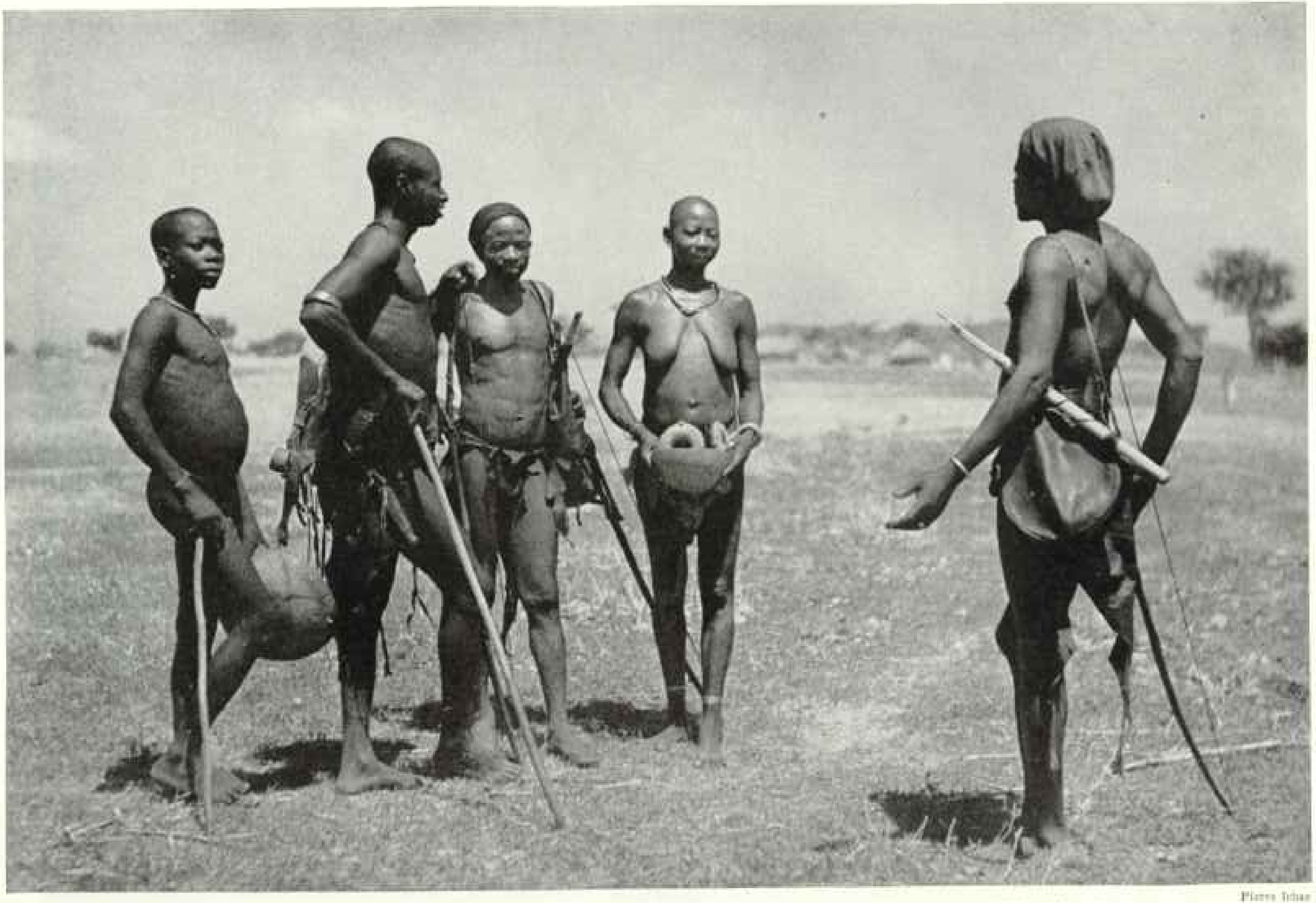
Pierre Ichac

In a Freshly Harvested Dress, She Gleans Firewood and Wears It as a Hat



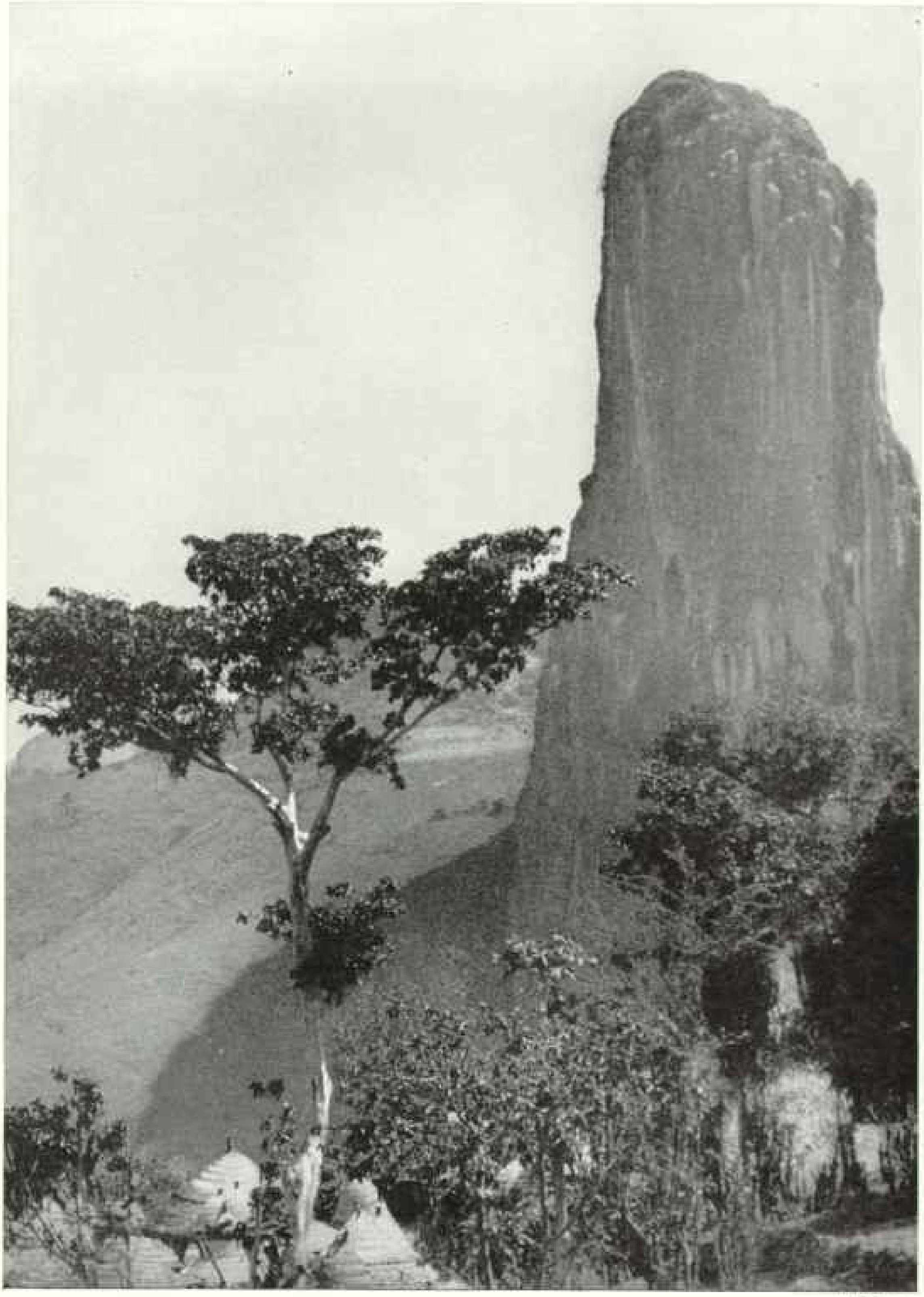
Pierre Ichac

Kapsiki Boys Race Across a Plateau Indented with the Frozen Lava Cores of Two Dead and Weathered Volcanoes



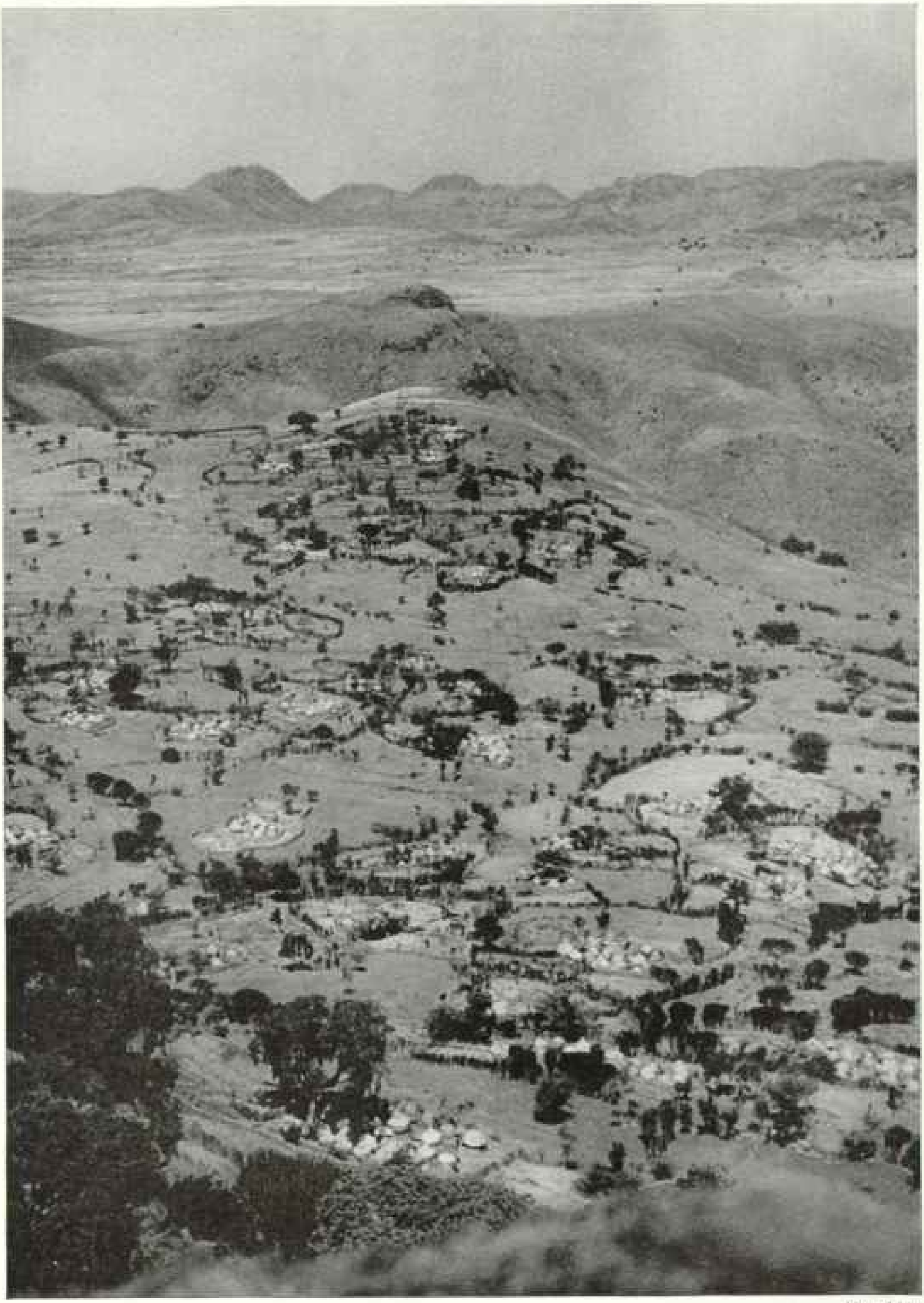
Pierre Tchar

On Market Day in Bourha a Kapsiki Archer Holds a Palaver with Warriors and Bowl-bearing Buyers



Pierre Jehan

Houmseki Peak, a Volcano's Neck Exposed by Erosion, Is a Kapsiki Village's Watchtower



Pierre Ichac

View from Houmseki Peak: Each Walled, Tree-bound Circle Encloses a Family Compound

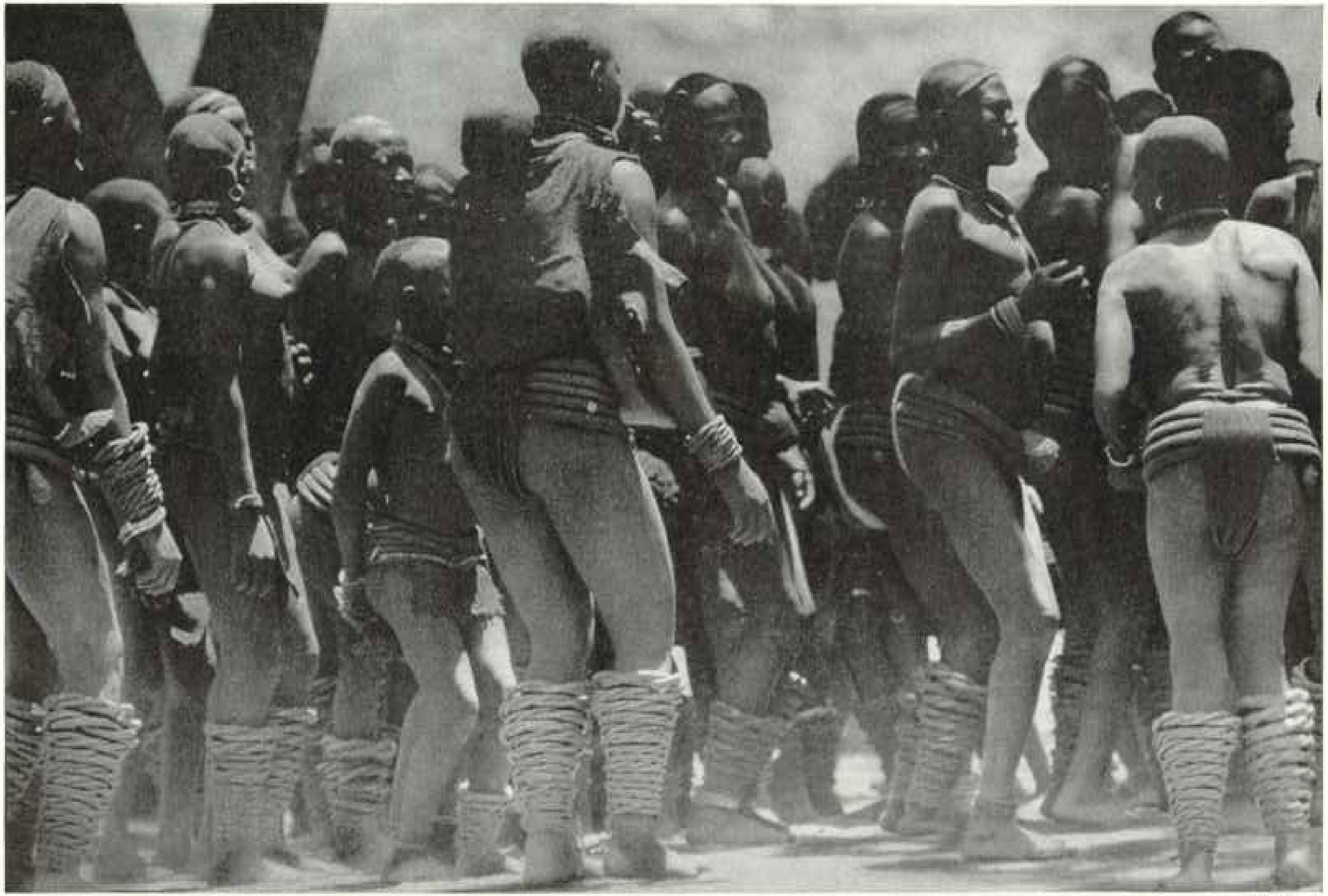
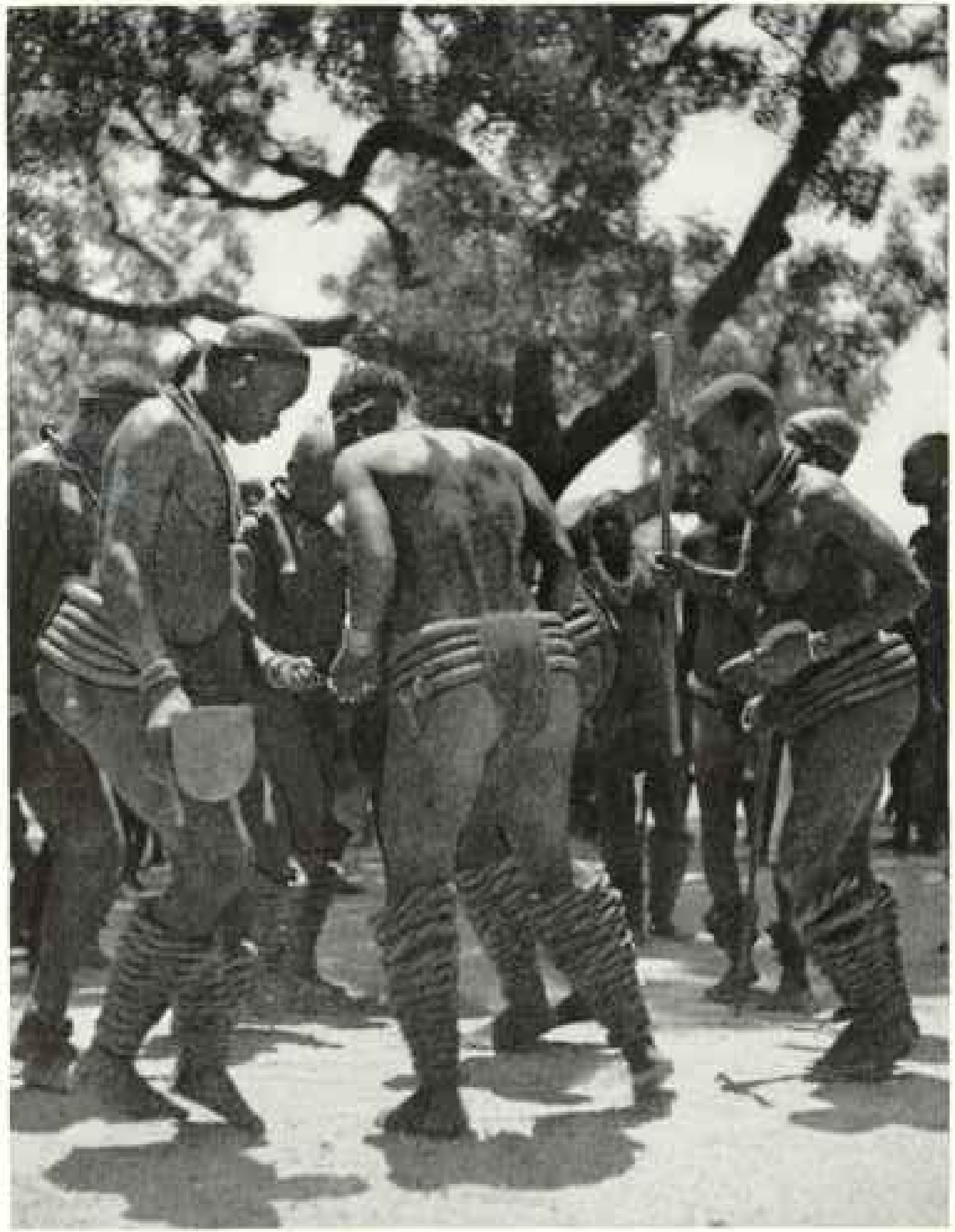


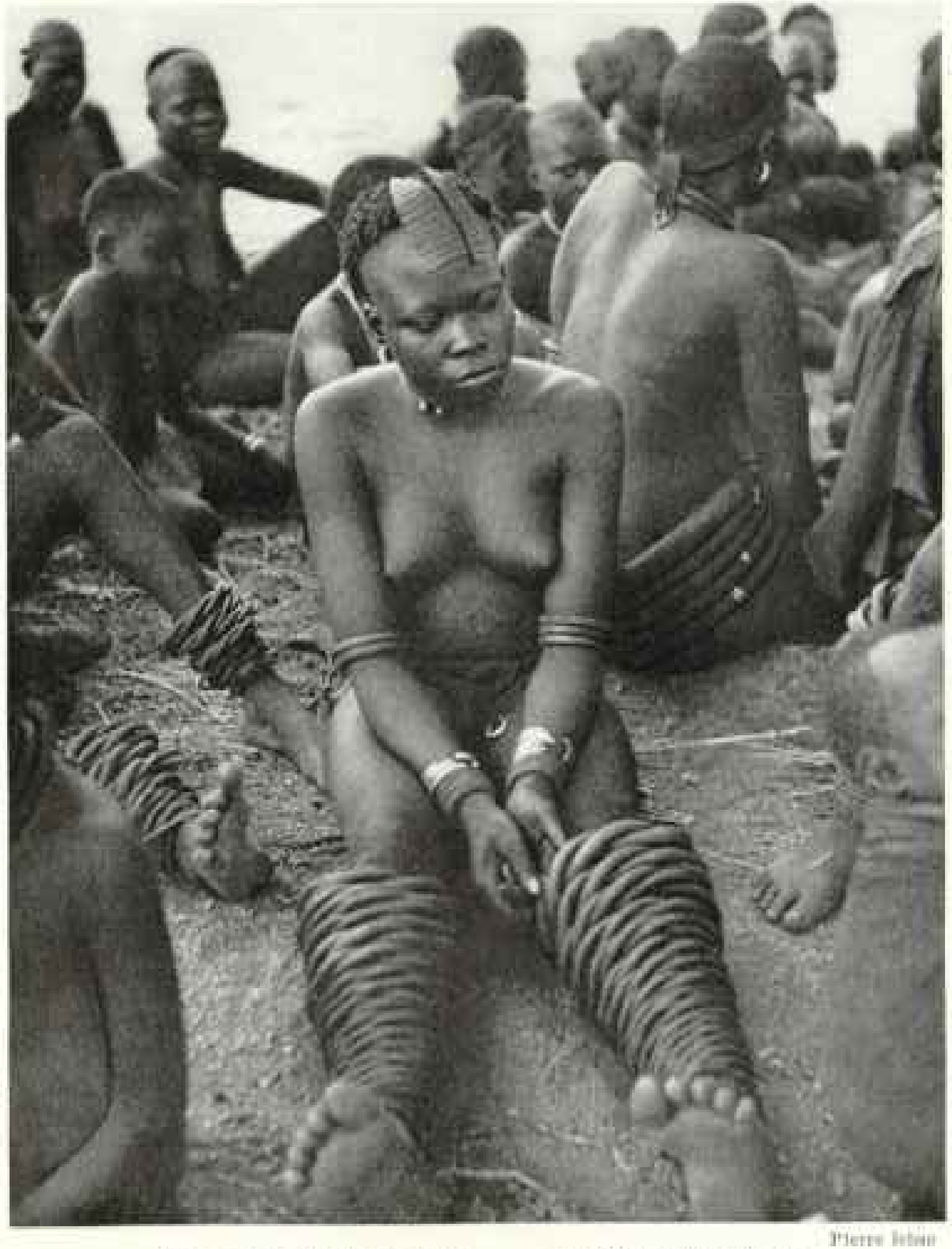
Photo Ichac

Twisted Roots Spiral Like Puttees Around the Legs of the Fali Women Dancing in Bassoum



Fali Women Trip the Light Fantastic on Heavy Legs

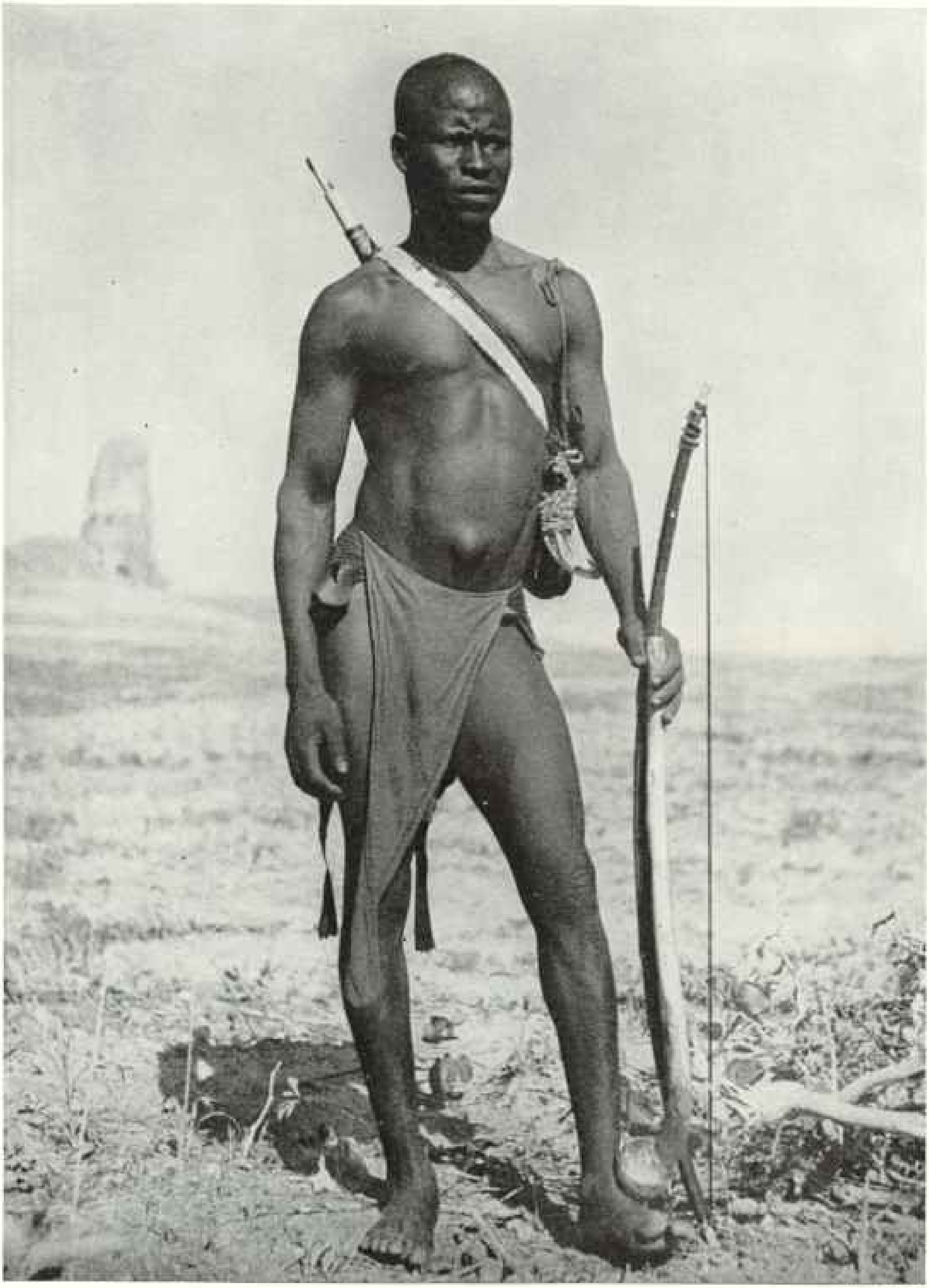
These ceremonial dancers perform, in their way, the village ballet of Bassoum. Some of their steps resemble those of the quadrille, an obsolete square dance, the photographer reports.



Pierre Ichac

After the Ball Is over . . . a Girl Must Rest

Married women wear ropy cotton girdles. This girl has one of leather, indicating she is a maiden. Teeth of rats are worn as earrings. A color photograph would show bodies painted red.



Pierre Ichac

Bow and War Club in Hand and Quiver on Back Arm a Kapsiki Fighting Man

A lumpy protuberance is evidence of umbilical hernia, an ailment common to his people.

Hunting Folk Songs in the Hebrides

By Margaret Shaw Campbell

With Illustrations from Photographs by the Author

ONE morning I sailed northwest from Scotland to the long line of blue islands known as the Outer Hebrides (map, page 252).

As we entered the narrow neck of the bay at Barra, we passed herring boats sailing out eastward in single file to the fishing grounds. The crews could be seen on board readying the nets for the night's work.

Lying at anchor were Swedish mackerel boats that had come to buy and cure the mackerel caught by the Scottish herring drifters. The isleman has a prejudice against eating this fish, believing that it feeds upon the bodies of drowned men.

Ahead of us, at the foot of a hill, lay Castlebay, chief port of Barra, with its cottages, shops, and church with clock and steeple. Beyond, the land was a dark-green shadow.

In the bay itself the ruined castle of Kismull, ancient stronghold of the Macneils of Barra, seemed to float upon the water, the full tide submerging the little island on which it stands (pages 254, 260).

A Refuge of Gaelic in Scotland

The pier was crowded with people welcoming the boat. As we tied up, I heard a great rush of Gaelic and realized that I was in a Scotland unknown to me—strange and foreign and really individual in a way the English-speaking Lowlands could never be. Here were the Outer Isles—a refuge of the Gaelic tongue and customs.

I had come to collect folk songs. At a concert in Scotland I had heard these old songs, and their strangely moving beauty had lured me to their home.

As headquarters I chose South Uist, since it seemed one of the least visited islands and probably less under outside influence. Old songs should flourish there if anywhere.

But to collect them I must learn the spoken Gaelic first. For that reason I stopped for a time at Lochboisdale, acquainting myself with the language.

On New Year's Day I had dinner with the chief merchant of this island of loch, moorland, and sandy beach, and, as was customary, neighbors came in afterward to talk and to sing Gaelic songs. One of the singers had a strange clear voice, and her songs enchanted me. On the first calm day I sailed across the loch to ask her to sing to me again.

Mary MacRae was her name, and Mairi Andra her Gaelic patronymic. Her cottage was whitewashed and thatched; her door, not five feet high, was painted virgin blue. I knew that this was where I should be, for here were numerous genuine, traditional songs, many unrecorded. I soon arranged to live here, and Mary's house became my home for nearly six years (pages 253 and 257).

At first sight, South Uist appears to the stranger as a somber and desolate waste, but its melancholy beauty casts a strange enchantment. Long fjords cut between a noble range of magnificent hills. On the skyline lies the dark isthmus, with thatched houses standing like haystacks on the rim of the world. Beyond them the lonely Atlantic stretches all the way to Labrador.

Screaming sea gulls overhead sail the constant wind. It is difficult not to put one's house in the path of every storm that rages.

"Fast moves the husband of the thriftless wife on the machair of Uist."*

Fair enough in summer, in winter it is open to the Atlantic, bleak, windswept, cold, without a wall for shelter.

Thatched Cottages Now Disappearing

Mary MacRae's cottage was in a small village of thatched houses. Four new cottages were so-called "white houses," built partly by grants obtained from the Department of Agriculture for Scotland. These are now replacing the thatched cottages.

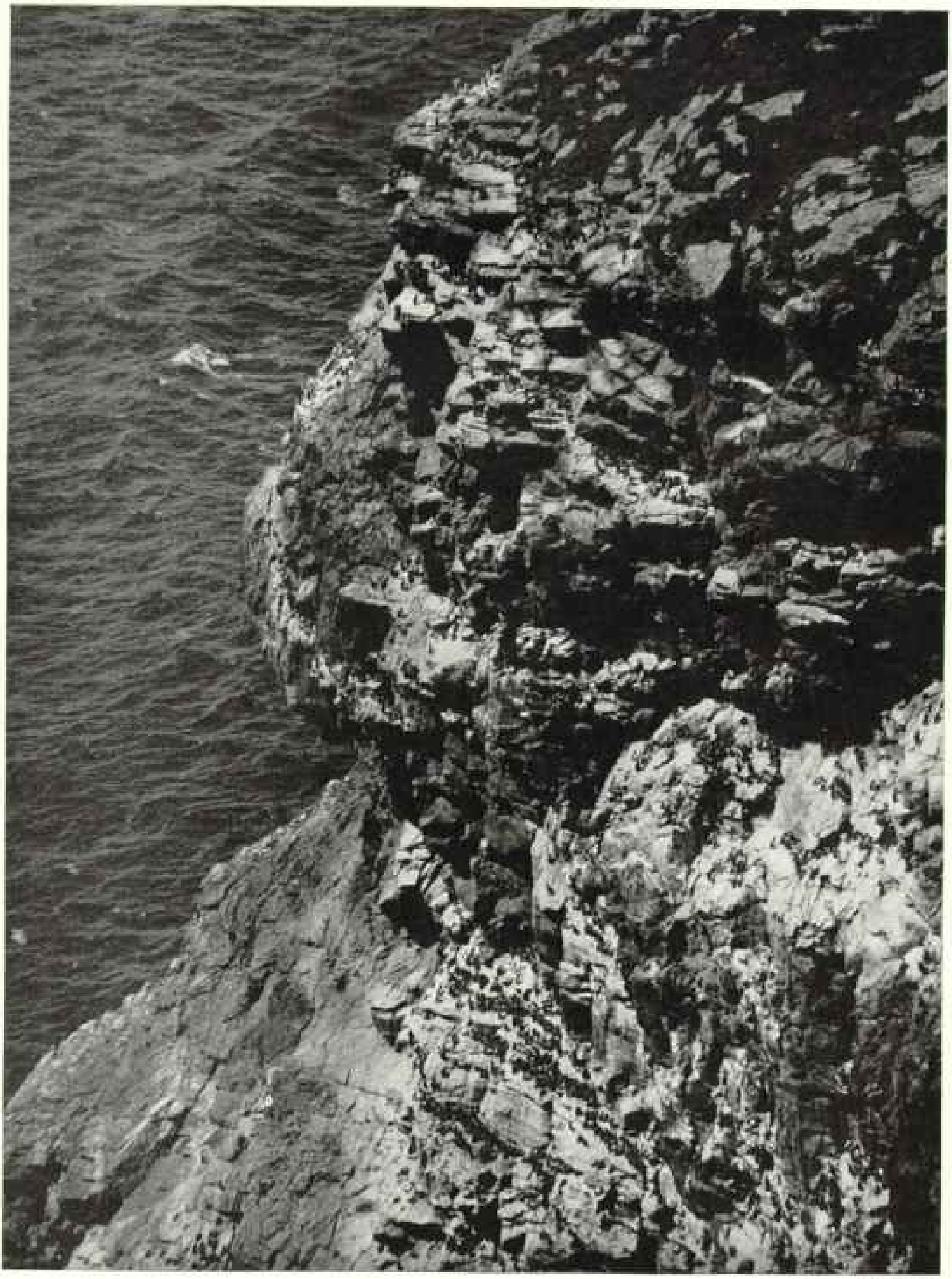
The thatched house differs in each island of the Hebrides. On one, the houses are very long with rounded ends, having the cattle under the same roof but with a separate door and partition for them.

Not very long ago many of the houses had the fire in the center of the floor, the smoke eventually finding its way out through a hole in the roof. Such a house has one advantage, for "to gather round the fire" can be taken literally, and there is room for all.

Moreover, the vent is usually so constructed that rain seldom puts the fire out. The smoke hangs in the rafters until it finds the hole. It is more comfortable to sit on a low stool so as not to be in the cloud.

My landlady's cottage had been such a house, but she had had the initiative to put chimneys at both ends and erect partitions,

**Machar,* or *machair,* a plain by the sea.



Robert Gordon

Guillemots Breed by Thousands on the Cliffs of Mingulay

Despite the dangerous footing, men gather many eggs on this isle, no longer inhabited (page 268). High in rock crevices are the guillemot nests, usually containing two eggs each. Descending by ropes from the top of the cliffs, daring Hebrideans fill baskets with the eggs and lower them to small boats hugging the rocky shore.

Never Missing a Puff, He Turns Out Heather Rope

Twisting the strands just right is an art. The result looks rough, but this South Uist islander says no other rope will outlast a well-made one of heather. It serves many purposes, notably to hold down the thatch on the little stone houses which seem to belong to the landscape (page 255).

which made a room at either end and a small one in the middle.

My first winter there convinced me that the thatched house with open fires is preferable to the modern "white house." It is better ventilated, with open chimneys, and the earthen floor is absorbent and warmer than cement. The double walls are four feet thick with a filling of small stones or earth for insulation. Stones are better than earth, which may house rats.

To make the roof, turf is laid on the wooden rafters and covered with the thatch of reed, bracken, bent grass, or, best of all, heather (page 255). A fishing net or chicken wire is spread over the thatch and anchored with ropes weighted by stones. To James Boswell it all gave the appearance of "a lady's hair in papers."

The great feat is to thatch without damaging the turfs underneath, for that causes leaks which are hard to mend. Trim, dry, and snug, such a dwelling belongs to the landscape and is reverenced by the tempest.

Rats Relish the Wallpaper Paste

Mary had lined the inside of the cottage with tea boxes and sacking. Over this she applied wallpaper with a paste of flour and water. Unfortunately the rats, for which Uist is notorious, got behind the lining and ate the paste off the paper. Peepholes appeared, through which the rats watched us with cool interest.

Mary's son plunged his knife through the paper where he heard them scraping, and an old neighbor who saw this warned him that the rats would take revenge if injured.

"If a fisherman throws a stone at one without killing it, that rat will find that man's nets, though with twenty others, and eat them," he declared.

Soon after, in broad daylight, the rats ate a big hole through Donald's bed of heavy

Drawn by Theodora Peter

Like Shields Against the North Atlantic Stand Scotland's Outer Hebrides, a Wind-swept Island World

Gaelic folk songs still survive here. To record them the author lived for nearly six years in a thatched cottage on South Uist, where hardy Hebrideans wring a living from soil and sea. From the wool of their flocks the island people weave their world-famed tweeds. The Outer Hebrides have 10 inhabited islands, five with only one family each.

homespun blankets and also gnawed away a large part of my fur coat as it hung on the back of the door.

"They will be making nests for the wee ones," said Mary to comfort me.

With the spring the year's work begins, and it is the same throughout the islands. Cutting the seaweed which is used for fertilizer is a cold business in February, when sleet and snow ride with the wind (page 258).

On a bitter morning I watched the men cut the weed with a saw-toothed sickle. Then they bound it together in big bundles and towed it home by small boats. The able-bodied carried the bundles up from the shore in creels on their backs, spread them on the ground, and left the weed to rot. At this point I hurried back to the hearth, to drink a scalding cup of tea to drive away the chill.

As the weather moderated, I took long walks, passing green fields bright with wild flowers. All about, the hills were afire to burn the heather.

An old woman knitting by the roadside one day asked me if, coming from America, I might know her sons who had gone to farm in Alberta.

"Ah," she said, "the frost is in their bones and they miss the sea."

Small tenant farms, or crofts, dot the sandy plain on the west side of the island. Every crofter has from one to three cows, a few sheep, chickens, ducks, cats, and a wise dog to govern all.

There was only one pony in the glen. He belonged to the crofter with land flat enough to plow. The others had to cultivate land on the steep hillside or where boulders and peat bog permitted.

Such ground is turned by a foot plow called *cas-chrom*, which means "crooked foot." This tool was once in general use in the Highlands but is now found only in most remote districts. Made at the local smithy, it has an iron blade two and a half feet long set at an angle to the five-foot wooden handle.

Working backward, the crofter pushes the blade into the ground by planting one foot on a side pin, then lifts the earth by drawing the handle back and rolling it to the left. The implement is balanced so that it is easy to wield, turning more earth than a spade without the backbreaking effort (page 267).

The lumps of earth are then broken by the

heavy wooden five-toothed rake called *racan*, or by a harrow dragged by hand.

All arable ground, mostly the sandy *machar* (page 249), is used in rotation for the two most important foods, oats for the cattle and potatoes for the crofter. The soil, though peaty, is sour and lacks calcium, which some say is why there are few trees and why many crofters have poor teeth.

Crofters Exchange Labor on Big Tasks

In the glen much of the work is done on a communal system, taken turn about. If our Donald cut peat for Angus, Angus would cut for us. The number of men needed depends on the cottage; for our two fires, six men cut for two days.

First, they all cut away the turf on top. Then three men cut the black peat, while the other three caught the clods that fell and put them neatly on the side (page 263).

The cutters were treated to an especially good dinner of salt herring and potatoes, with the customary bucket of oatmeal and cold water to quench their thirst. The womenfolk were asked for the afternoon for a particularly nice tea.

Fine weather is needed to dry the peat. After the cutting it was stacked by degrees until, in August, it was made into a great peat pile for the winter's fuel.

Land work done, the men in the village began the fishing. Lobster creels were readied and the children made nets (page 270).

Meanwhile, there is always work for the housewife. Every kitchen has its spinning wheel, where yarn for the blankets and tweeds is made. The women knit not only socks, stockings, and handsome blue jerseys but heavy underwear as well. The yarn is dyed with roots of flowers and with peat and soot.

Landlady and Cats Admire a Fisby Gift

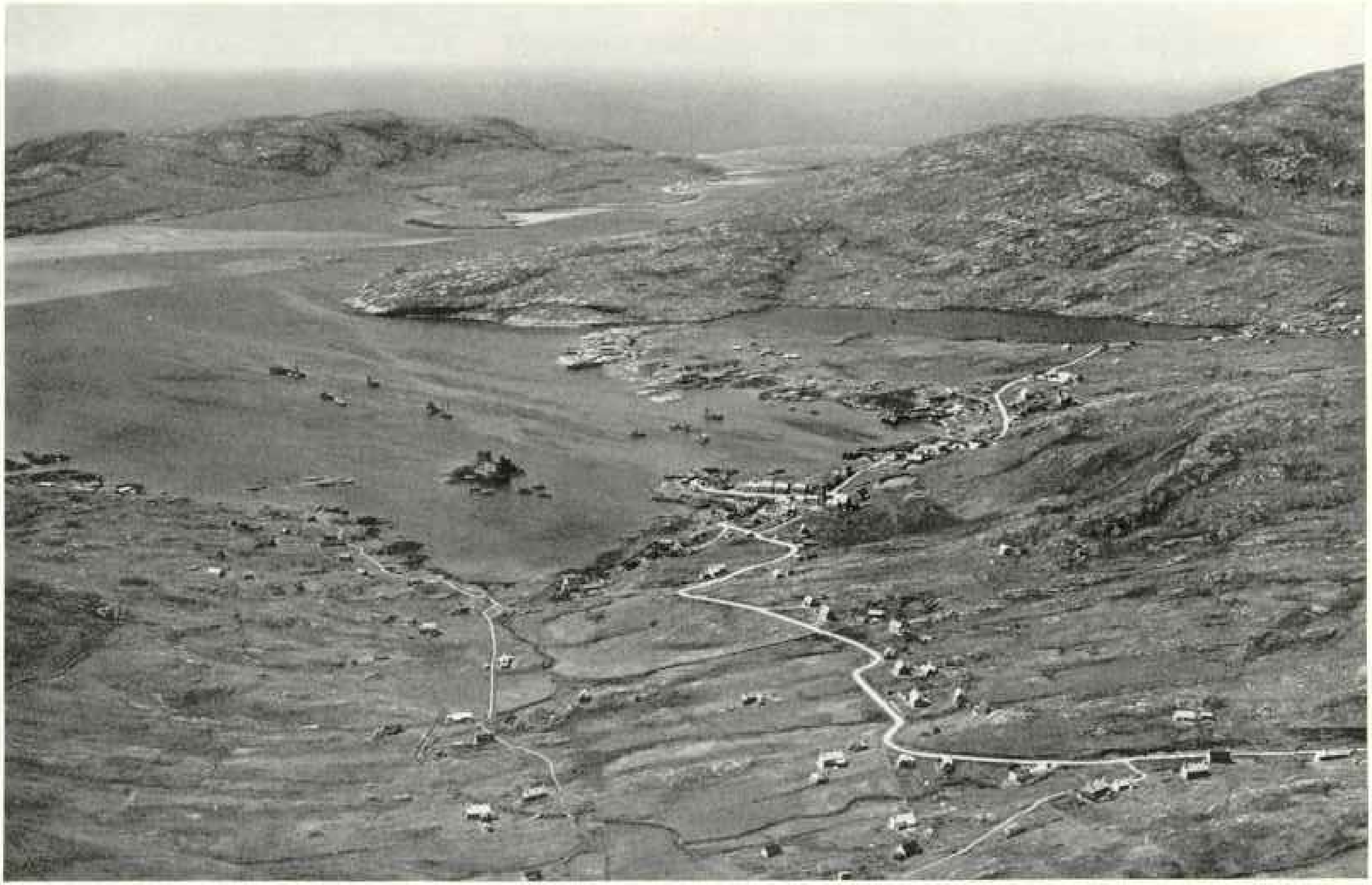
As a change from the regular fare of mutton and oaten bread, the codfish was a welcome present. The author lived in the house of this South Uist woman, Mary MacRae, who sang old Gaelic ballads (page 249).

Lichen from the rocks supplies a dye of rusty brown, but the fishermen do not wear this color while in their boats. There is a belief that "what is taken from the rocks will return to the rocks."

The root of the yellow iris yields a bluish gray, the nettle makes a light blue, and the roots of the water lily, black. Red comes from madder imported from France, and yellow from the heather tops.

"Waulking" Tweed to Shrink It

A neighbor wove me a fine piece of blue tweed on her loom and gave a "waulking" to shrink and thicken it. We made a long low table by borrowing two planks from the



Scottish Airways, Ltd.

Rocky Hills Protect the Harbor at Castlebay, Barra, Thronged with Fishing Boats and Dominated by Old Kismull Castle

Coming to the island by air, the traveler wonders where a landing can be made on the rugged terrain. A crescent beach at North Bay solves the problem, though water covers it at high tide. Flying schedules are attuned to the ebb and flow. In addition to being an airport, the beach is Barra's best cockle bed.

Stone Houses Snuggle Close to Earth and Fishing Nets Hold Down the Thatch

The base of the roof is turf, cut and pinned together like shingles on the wooden rafters, grass side up. Over this is placed the thatch, secured by a net, or sometimes chicken wire, which is anchored with ropes and stone weights. Such a dwelling, says the author, "is reverenced by the tempest" (page 251).

Judges Drink in Each Shrill Note as a Bagpiper Plays in Competition at the South Uist Games (Page 267)

Here Bonnie Prince Charlie Made His First Landing in Scotland

On Eriskay Island the little bay where he landed still bears his name. Convolvulus flowers which he planted with seed brought from France still flourish as living reminders of the luckless but beloved Stuart of 200 years ago (page 264).

Milking This Highland Cow Calls for Precaution and Music

Despite their somber environment, Hebrideans sing as they work or play. The author's ballad-singing landlady had a cow that refused to give milk unless the milker sang. This animal's hind legs are tied to keep her from kicking over the pail.

South Uist Crofters Gather Seaweed for Fertilizer

Each farmer is allotted part of the shore or a tidal island, where he cuts the weed with a saw-toothed sickle (page 252). The principal crops are oats for cattle and potatoes for the family.

On Halloween, the "Night of Tricks," Strange Beings Roam the Village

Householders take in all movable property, make plenty of good treacle scones and oatcakes, and have the kettle boiling for tea to entertain the apparitions. Some celebrants make masks of sheep heads (page 270).

bridge and setting them up in the byre (barn).

Ten or twelve of the women from the village gathered to help us waulk, or full, the cloth. They sat in rows on each side of the table, facing one another. The cloth was thrown on the table, wet with stale urine to set the color and tighten the threads. No substitute will do as well, the islanders say.

There are different ways of waulking in the islands, but in Uist the cloth is sewn to make a circle and then passed around the table sunwise to be beaten with a rhythm of four beats to the motions of each person.

The waulkers began in unison and in silence, the light from the storm lantern shining on their faces. As the motion became rhythmic with strong beats, one woman began a song, the verse more chanted than sung, and the others joined in the chorus.

© British Museum

A Cow Rubbed Against a Sand Hill and Unearthed These Curios

They are part of a cache of 78 walrus-ivory chessmen, 14 draughtsmen (checkers), and a buckle found near Uig in Lewis in 1831. The figures, now in possession of the British Museum, were made by Norsemen, probably in the 11th or 12th century.

Some of the songs are very old, dating from the 17th century. They often narrate a story, in many cases a tragedy. For instance, "Allein Duin," by Annie Campbell, was composed as a lament for her lover, Allan Morrison, whose boat was lost in a storm on the way to the betrothal ceremony in 1768:

Brown-haired Allan, I am in torment,
No mirth is in my mind,
But the roar of the storm and the greatness of the gale.
I would drink a drink against the wishes of my friends.
It would not be the red wine of Spain,
But the blood of thy body I would prefer.

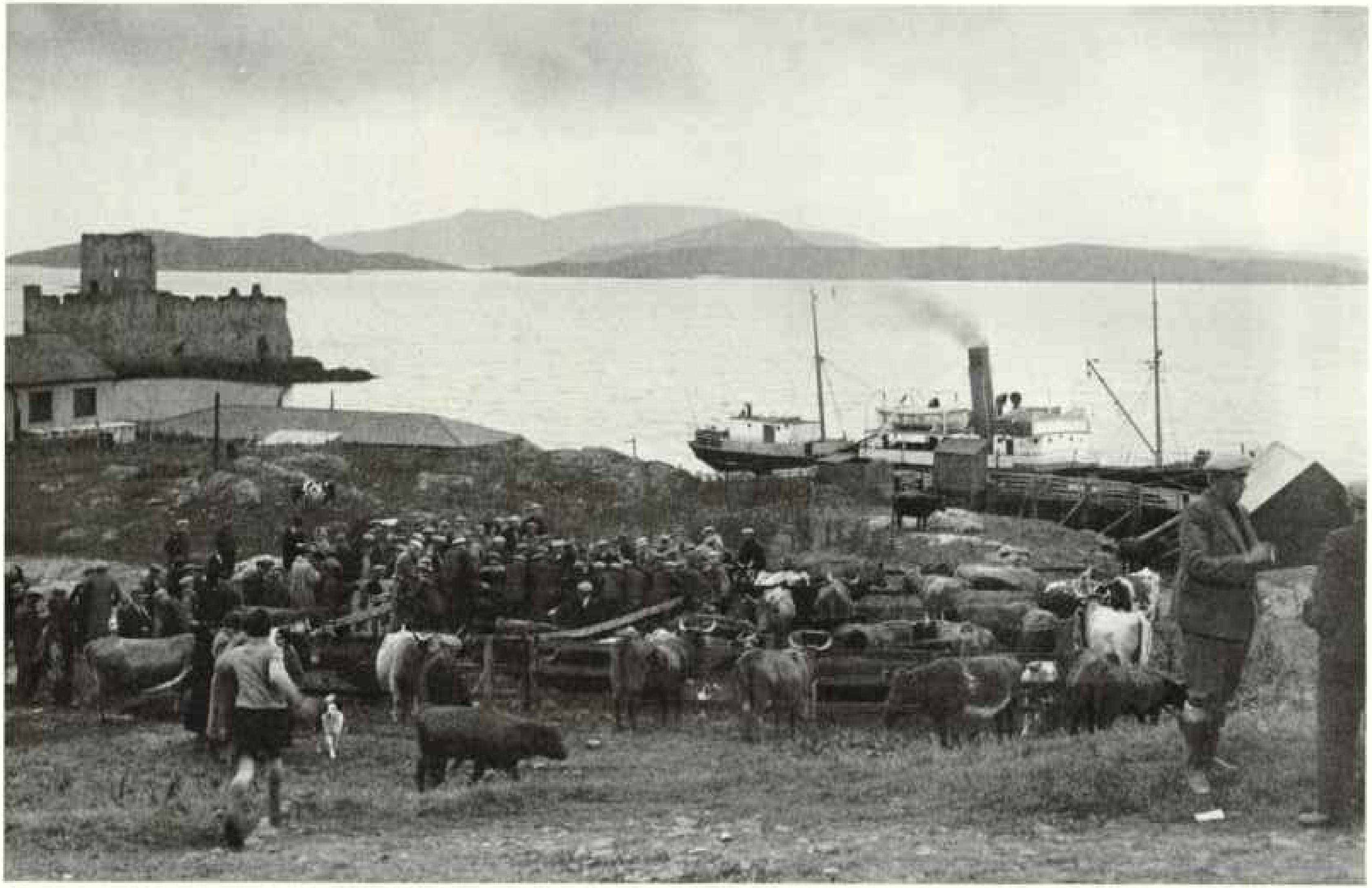
The Hebrideans are full of music, and they sing at work and play. My landlady's cow would not give milk without the accompaniment of a song (page 257). Songs are still being made about any striking incident, and certain families have a song-making gift which is inherited for generations.

The tunes, like the Irish-Gaelic airs, are more closely related to Mediterranean music than to the Scottish or English folk tunes. A knowledge of Gaelic is essential for anyone attempting to record the ballads, for to the people the words are all-important and the tune is merely the vehicle for the words. They have an extraordinary memory for songs, and one of 24 to 30 eight-lined verses is not unusual.

Gathering Together about the Fire

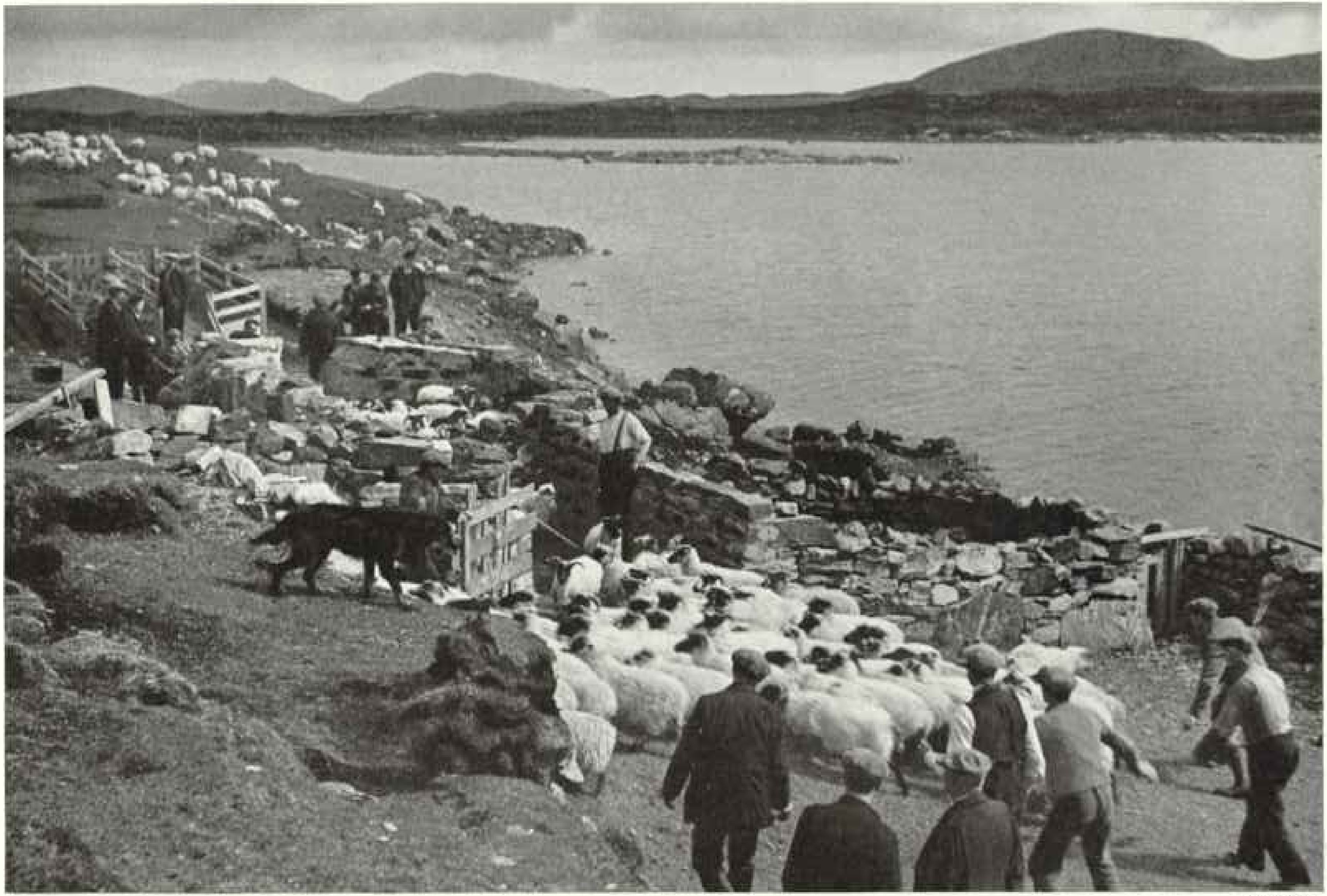
When the harvest work is done, the women wash and card the wool and start the spinning wheel and distaff.

It is the time of short days and rough weather, the season for the fireside and the gathering together. There are few radios, and newspapers are scarce.



After the Annual Market, Cattle Are Loaded on Boats at Castlebay, Barra

Buyers come from the mainland to purchase the beasts. Their sale is one of the chief sources of the island crofter's income. In background may be seen ruined Kismull Castle and, farther away, the hills of Sandray. Castlebay is a center for the island herring fleet in early summer.



Vivian Rattle

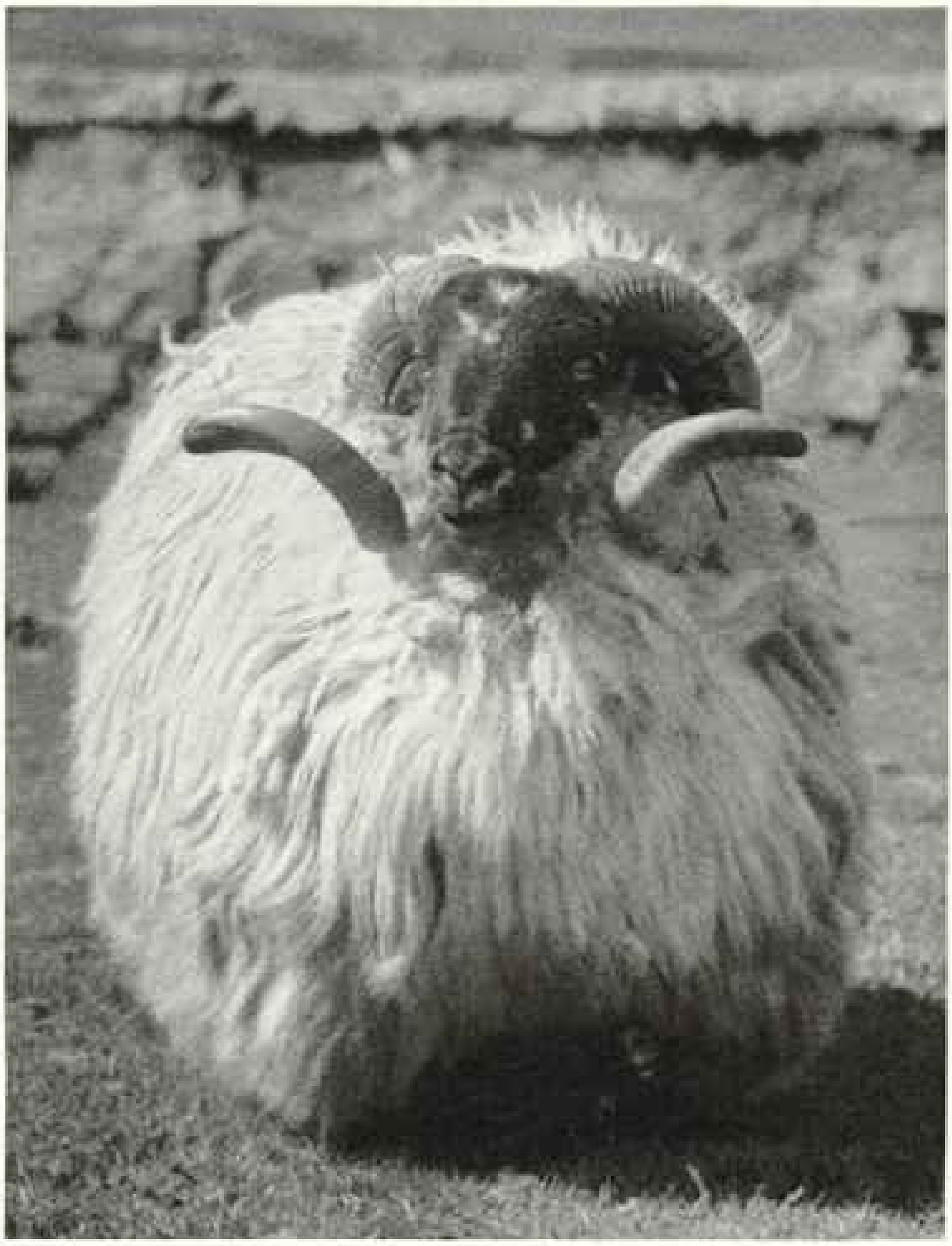
Hardy Blackfaces of South Uist Get a Purifying Bath; Law Requires that Sheep Be Dipped Twice in Summer and Once in Winter

By Sailboat Ferry, Mail and Passengers from the Croft Country Cross to Lochboisdale in South Uist

Snow in the foreground marks an area where potatoes are planted in "lazy beds," as they are known in Scotland. They consist of long mounds about six feet wide alternating with trenches formed by removing earth to cover the potatoes. Parallel lines nearer the shore are drains in an oat field.

Joining Forces in a Peat-cutting Bee, They Sweat in June Lest They Shiver in December

South Uist neighbors help one another, sharing the peat according to the number of days put in at digging (page 253). The Outer Hebrides are rich in this earthy fuel. Enough is dug in June to last all year.



From Lonely Mingulay Comes This Fine Ram

Fleeces sheared from this island's herds are sent to Glasgow to market, but in South Uist most of the wool is kept for local use. From yarn spun on kitchen spinning wheels come blankets, underwear, socks, jerseys, and handsome tweeds.

Around the fire in the evening, the island folk talk and sing. The men who have been deep-sea sailing have traveled in all corners of the earth. We hear in Gaelic about the grand climate of Valparaiso, and the cousin from Kilbride whom Roderick saw in Vancouver.

As evening grows late, the talk is of old days—the potato famine when people ate the nettle and the root of the silverweed cinquefoil.

Then steals in the supernatural tale. Second sight is still known, and the evil eye is not long hidden. There is still the seventh son with the gift to cure the king's evil (scrofula).

There is the tale of the Brahan Seer in the 17th century, whose mother got him the gift of prophecy one night while herding cows near the graveyard. At midnight the graves opened and the ghosts came up and flew away. One was a lovely woman and, when she had gone, the mother put her spindle across the opening of her empty grave.

When the creature came back, she could not get in for the spindle's being there. She was a princess of Norway and had visited her homeland that night. As a reward for removing the spindle, the mother was given a snake stone which her son should have and through it see all things to come.

Alas for the gift! It led him to a death by burning in a barrel of tar, for such was the command of a furious mistress for whom he foretold ill fortune.

Flora Macdonald and Bonnie Prince Charlie

Stories are heard, too, of Prince Charles Edward Stuart, who made his first landing on Scottish soil in the Hebrides (page 256).

The little bay where he came ashore in 1745 on the island of Eriskay bears his name, and there grows the *Convolvulus sepium* that he planted with seed brought from France.

After the tragic Battle of Culloden, April 16, 1746, Prince Charles returned to the islands, to wander from South Uist to Stornoway, on Lewis Island, and back, cold and wet, plagued with midges and lack of money, a price of 30,000 pounds on his head. It was in South Uist that his followers found the valiant Flora Macdonald, who was returning to Skye.

Dressed as Flora's maid, he eventually reached Skye, whence he made his escape to the mainland and to France.

In late September and October the sun

leans more and more to the south, and an extraordinary pink light from the afternoon sun floods land and water. The colors are most vivid at this time if the weather is fair. Often the equinoctial gales bring from the southwest deluges of rain and tides that flood the fields. The wind sometimes drives the spindrift four miles across the island to whiten the faces of men trying to tie down the remains of a haystack.

The walls of my room would billow in and out like an accordion; the roof would shake and flaming peat would blow out into the room. At such times there can be no opening the door, or the roof might depart. But there is more safety in a thatched house on such a night than under the fearful noise of a tin roof which is being lifted slightly with each terrible blast.

Except for the winter fishing, which is often interrupted by bad weather, there is little for the people to do at this time of the year. But a wedding is certain.

Proudly She Hugs Her Handiwork, a Roll of Tweed

From the wool of South Uist's sheep this island woman spun yarn on her spinning wheel, then wove the cloth on a hand loom. The white yarn for blankets is also homespun but will be sent to a mill in the Lowlands to be woven, since most hand looms can weave a strip only 32 to 38 inches wide.

True to custom, the suitor, with a friend of some position in the vicinity, goes armed with a bottle to the house of the chosen young lady, where her parents and perhaps a few close friends are gathered at the fireside.

The Business of Wooing

The friend, after small talk of the weather and similar topics, passes the bottle around. Then he begins to praise the character of his young companion, his ability and his handsome appearance, his heritage and his goodness of heart, the fine, well-kept croft he has. Finally he asks for the hand of the daughter.

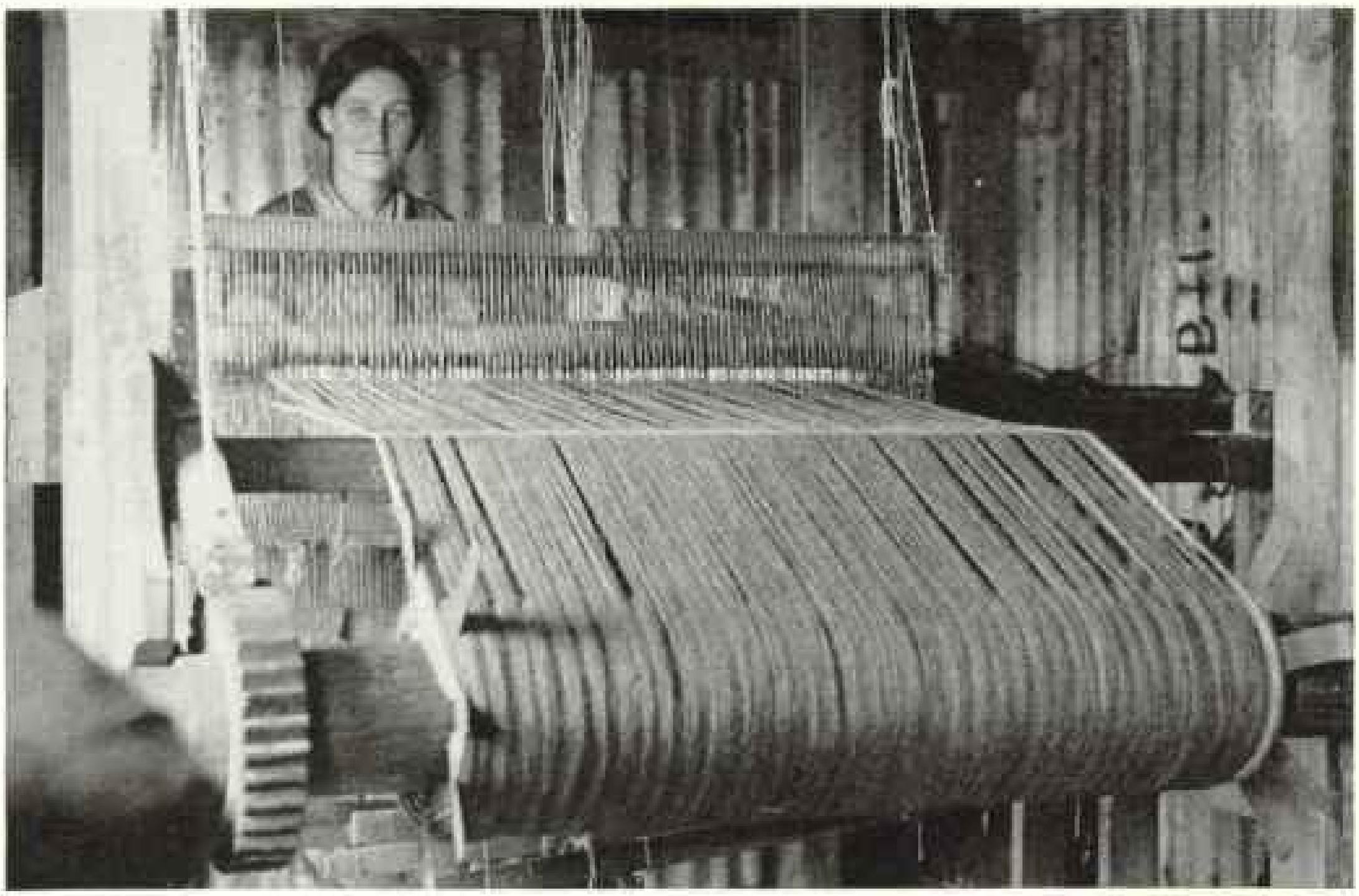
Sometimes father and daughter are unprepared for the answer, and at other times the daughter, sensing the business, retires in confusion and implies no. But when a match is to everyone's liking, the bargain is sealed, and the bottle goes round and round with all good wishes and true.

Banns are called three Sundays in the church, and on the Tuesday after the last calling the wedding takes place. The gift to bring in advance is a hen, and many women are busy in the byre plucking them.

Mary and I walked miles to one wedding, on a winter morning when the island was white with hoarfrost. The ceremony was in Gaelic, and at the church door the emerging couple was pelted with rice and barley.

Fleeced Again, Two Ewes Yield Warmth for Winter Clothes

While South Uist shepherds shear their charges, the lad waits with paintbrush to apply tar to any cuts or sores.



© Tudor Bartlett

A South Harris Woman Weaves the Famous Harris Tweed

The term "Harris tweed" is applied to the cloth made in all the Outer Islands. The word "tweed" originated from accidental misreading of "tweel," Scottish form of "twill." Tweed is a twilled woolen cloth. Highland Home Industries, Ltd., in Edinburgh, handles the sale of tweed from the Hebrides and Highlands.

On Bleak South Uist a Gaelic Poet Wields a Foot Plow (Page 252)

Though he signed the pension form as John Campbell, this bard was known to the islands as Seonaidh mac Dhomhnaill ic Iain Bhuin. Requests for copies of his Gaelic verse have come from exiled Gaels in Burma, New Zealand, South Africa, and Saskatchewan. With the poet is his wife.

Guns were fired, and with bagpipes playing we all marched away to the bride's house for the feast.

That night we danced, the pipes beginning with a Scottish reel executed by the bride and bridegroom and their two attendants. With joyful hilarity the guests took the floor, and music and shouting continued until morning. Footsore, we limped home at daybreak.

Highland games* are held on Uist's sandy beaches every summer. Bright and early, Mary and I left to see them.

On the short grass near the seashore, a big rope ring was set up. In the center of the circle a low wooden platform with a judges' bench was placed. The roar of the surf on the beach, the lowing of the cows, and the neighing of ponies grazing near by were the accompaniment to the sound of a dozen bagpipes.

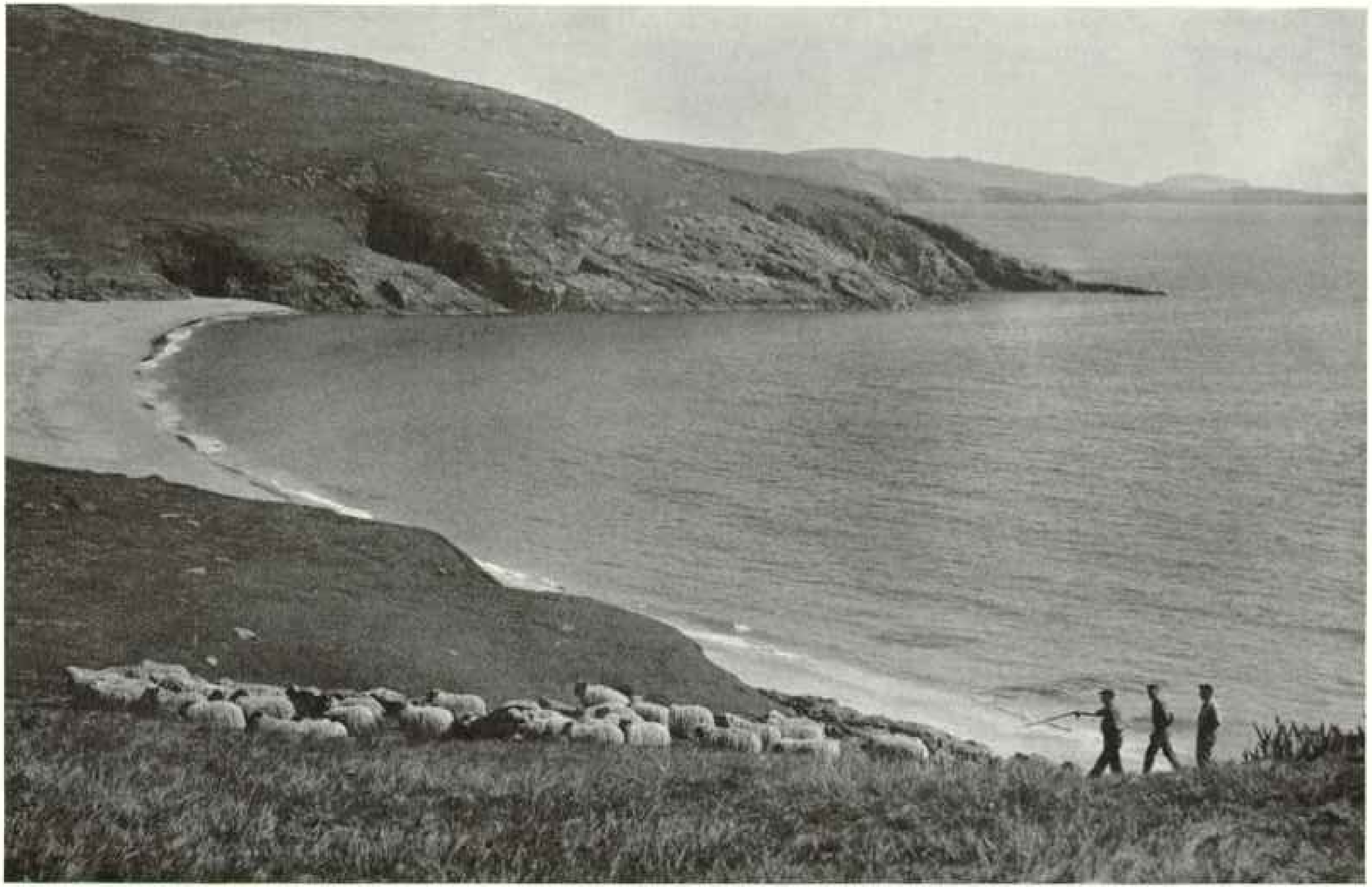
Among the sand dunes outside the ring the pipers were at work filling their bags and tuning their drones to the proper pitch. South Uist has some of the finest playing of the classical music of the pipes to be heard in Scotland—playing that comes from generations of pipers who pride themselves on correct and inspired interpretation of this ancient and difficult music (page 256).

The best judges were there to decide the contests. Besides the piping there were races, jumping, tossing the caber, and Highland dancing. We sustained ourselves with an occasional cup of tea or ginger beer and exchanged bags of "sweeties." After the games were over, we congratulated the winners and commiserated with the unsuccessful—"better luck next year."

Halloween a Time of Frolic

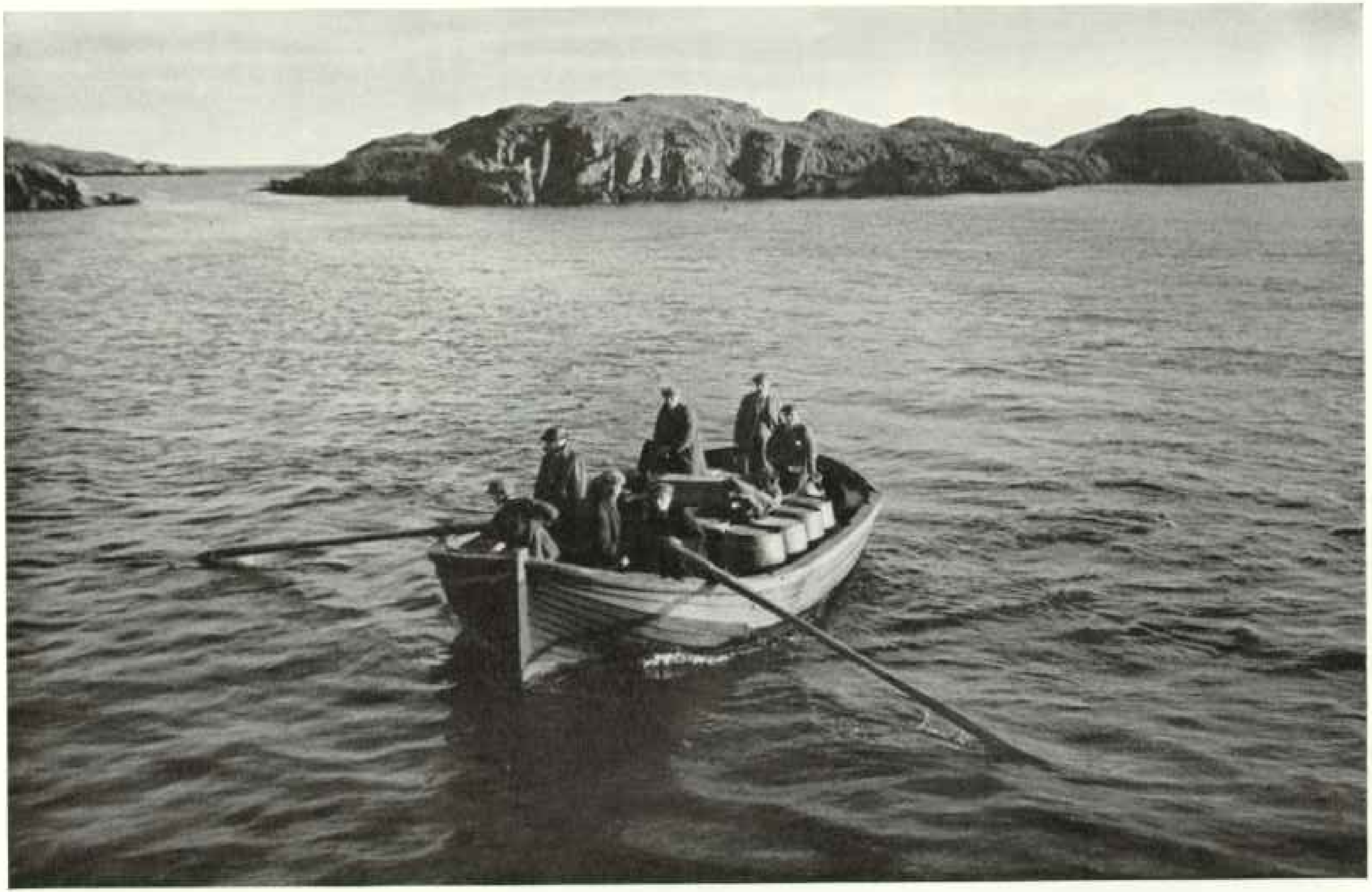
On the evening of the last day of October I was sitting by the fire reading when I heard

* See "Clans in Kilt and Plaidie Gather at Braemar," 11 ills. in color by Maynard Owen Williams, National Geographic Magazine, August, 1935.



Mingulay, Once Inhabited, Has Been Turned Over to Sheep

Not only here but on Sandray, Pabbay, and Barra Head former populations have departed, leaving only a few shepherds and the Barra Head lighthouse keepers. Mingulay's grass is rated among the best in the Hebrides for sheep, and its mutton and lamb are famed in mainland markets.



Kerosene for Rodel's Lamps Goes Ashore by Rowboat

The tiny village is on Harris. In its churchyard rests the body of Donald Macleod of Berneray. This doughty Scot fought for Bonnie Prince Charlie at Falkirk.

A Small Boy Makes a Net for His Lobster-fishing Father

With a large hand shuttle he weaves the netting which will be fitted over a frame of willow or pine to form the trap. Lobsters of the Hebrides are much in demand in London, whither they travel packed in heather.

a knock at the door, and looked up to see a horrible face. Mary laughed at me, and I remembered it was Halloween, in Gaelic known as "the night of tricks." Young people dressed up as ghosts, witches, and other terrible creatures wander from house to house to frighten folk and play practical jokes.

Mary had taken in all the movable property, made plenty of good treacle scones and oatcakes, and had the kettle boiling to make tea. The disguises of our guests were all homemade. Masks were of bits of oilskin, or sheepskin shaved except for some wool left for whiskers (page 258).

One neighbor, on lighting the fire that morning, found her little boy already busy with a knife on a sheep's head. He took off the skin like a bag, stiff gray ears, black nose and all, and his little sister wore it that night.

The feat of the evening is eating the *juarag*. A large bowl of uncooked oatmeal and thick cream are well mixed, and into it are put a ring, thimble, button, and three-penny bit. All sit in a circle, and with a spoon eat from the one bowl until all the rewards are found. It must be down with it, and no searching.

At Christmas, Mary MacRae and I gathered with all the glen folk to walk the five miles by the light of storm lanterns to midnight Mass. As we reached the top of the glen, we saw before us tiny lights moving across the moors. The whole population of Uist was on its way to church, the men in dark blue, the women with great white shawls about their heads.

The church was full of the scent of pine boughs which decorated the walls. In addition to the Latin Christmas hymns, we sang an old Gaelic folk song and listened to the Christmas story read in Gaelic.

We squelched home in wet shoes to find a big meal on the table. A piece of mutton is always cooked on Christmas Eve, to be eaten after the family returns from church.

New Year's Eve is celebrated with a strange mixture of pagan and Christian rites. We were sitting at the kitchen fire when we suddenly heard a shout; then voices outside chanted a Gaelic poem so old that some of the words have lost their meaning. It was to give the blessing of the New Year, provided that we would let them inside and give something in return.

The door opened and in came a number of young boys in great seriousness. One carried

Deft Girls Sort and Gut the Herring at Castlebay on Barra

Women quickly clean the fish, then salt them and pack them into barrels for export. The fishing is nearly all done between the Outer Isles and Tiree.

Hard Winters Leave Many a Woolly Orphan to Feed

When fierce storms sweep the islands, sheep on the open, wind-raked fields often suffer losses. This lamb was rescued after its mother perished. Like a black velvet silhouette stands the shepherd's cat.

Central News from P. & A.

Storm-swept St. Kilda Is the Outer Isles' Loneliest Outpost

Lying far to the west, the rocky islet is sometimes cut off from the world for months by North Atlantic storms. In 1930, when the population had fallen to about thirty, the inhabitants were evacuated to Morven, on the mainland, under government supervision, but the island was later bought by the Earl of Dumfries and with him some of the exiles returned. The wartlike objects are storehouses for peat and salted sea birds.

a smoldering torch of wool and tallow tied to a stick. This he swung around the head of the housewife three times. Unfortunate is the woman if the light goes out.

We gave them sweets, fruit, and bannocks, and they departed. Outside they went sunwise around the house with the torch, shouting in Gaelic, "The blessing of God and of the New Year on you."

"First footers" arrived at midnight, each with his bottle of whisky, of which we must drink. To make it lucky, a dark-haired man must call on a fair-haired woman, and a fair-haired man on a dark-haired woman.

The first of February is remembered as St. Bride's Day, for St. Bride (St. Bridget) was the foster mother of Christ. Her servant is a blessed bird, the oyster-catcher. When Christ was fleeing from his enemies, the oyster-catcher hid Him by covering Him with seaweed, and from that time, they explained, he has worn the cross upon his back.

A charitable bird, he lent his webbed feet to the sea gull so the gull could visit his sick aunt, and the gull has never returned them. Black and white, with bright-red legs and beak, he flies and runs at the edge of the waves, begging the gull for his shoes.

An old man told me not to start a journey, or any work, on the third of May, or I would be a lifetime finishing it. He told me that if I were to rise at dawn on Easter morning and go to the rim of the eastern sea, I would see the sun dance as it rose. But I yet have this to do.

Such were the customs of South Uist, in many ways like the primitive life of our ancestors. They are not typical of all the Hebrides, because there are many ways of life to be found there and some of them are changing rapidly, but they are typical of what was general not so very long ago.

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ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

To carry out the purposes for which it was founded fifty-nine 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 southwestern 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 26, 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, 291 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 72,395 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.

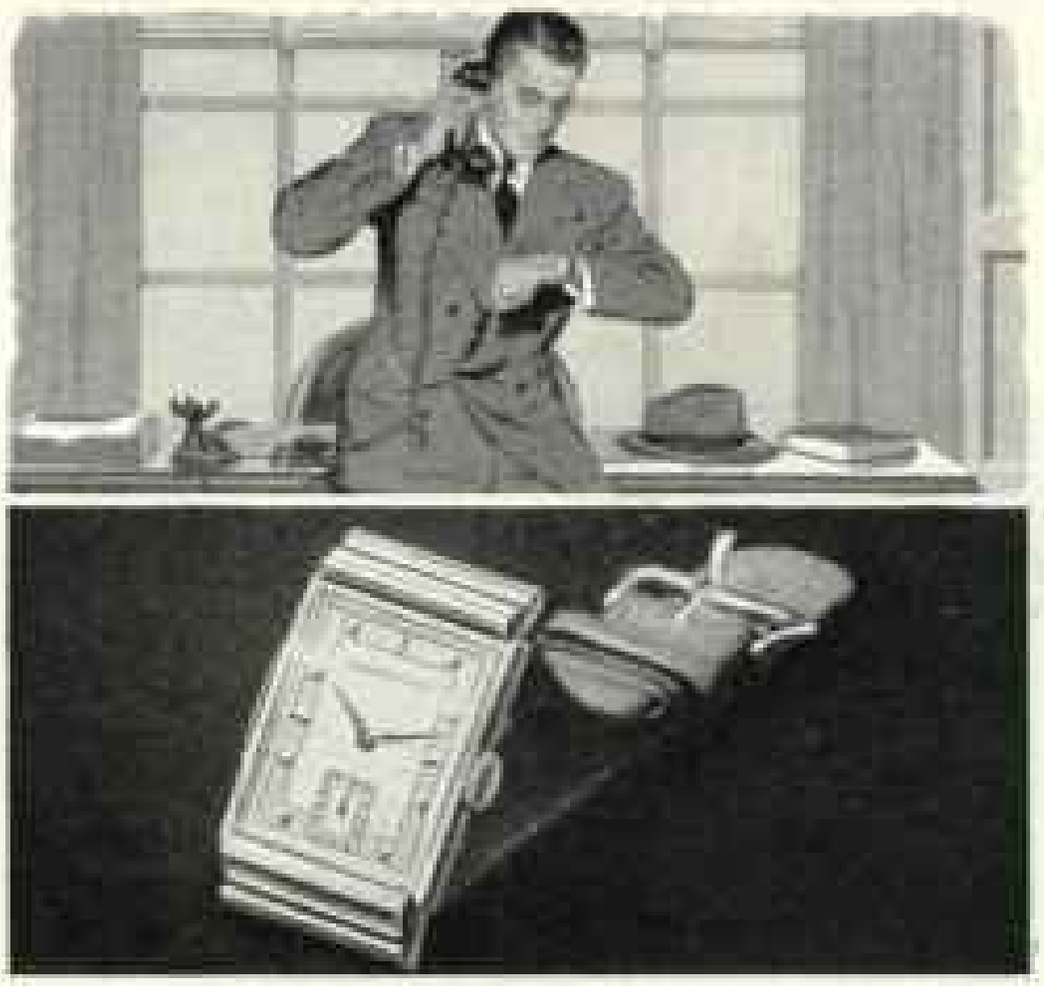
The Society granted $25,000, and in addition $75,000 was given by individual members, to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California were thereby saved for the 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.

WHAT IS YOUR HUSBAND'S CAREER?

(Whatever he does, remember him on his birthday with a Hamilton—
The Fine American Watch)

DOCTOR. If his time isn't his own, he needs a Hamilton. This really fine American watch is as steady and precise as a surgeon's hand. (Shown above: SECOMETER—17 jewels, 10K natural gold-filled case, exclusive sweep-second setting feature . $57.75.)



BUSINESSMAN. Does he work on a tight, high-pressure schedule all day long? Then he'll want a watch that's as businesslike as he is—a trim and handsome Hamilton. (Shown above: GORDON—19 jewels, 18K natural gold case . . . . . $210.00.)

EXPLORER. If he travels to far-off places, he deserves a hardy, reliable Hamilton—the watch that such famous explorers as Admiral Byrd have carried on their expeditions. (Shown above: MYRON—17 jewels, 10K natural gold-filled case . . . . . $55.00.)

RAILROAD MAN. If his job is keeping America's trains on time, he undoubtedly owns a Hamilton Railroad watch already. Give him a fine Hamilton *dress* watch for his birthday! (Shown above: MARTIN—17 jewels, 10K natural gold-filled case. . . . . $52.25.)

WIVES HAVE CAREERS, TOO! And whether your wife runs an office or a home, she'll bless you for giving her a stunning, graceful lady's Hamilton. (Shown at right, JESSICA—17 jewels, 14K natural or white gold case and domed crystal . . . . . $66.00.)

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Prediction: The new wives of 1947 are going to have more fun in the kitchen.

Previous cooking experience is desirable, perhaps, but not essential. There are so many new easy-to-use foods, so many new ways to prepare foods, cooking will be a novel and exciting adventure.

Further prediction: Cheese dishes will be featured more often on their menus. They'll know that cheese gives variety to meals. And cheese, like milk (nature's most nearly perfect food), is rich in protein, calcium, phosphorus, in vitamins A and G.

Yes, we have a personal interest in cheese. For Kraft, pioneer in cheese, is a unit of National Dairy. And what we've said about housewives using more cheese is true.

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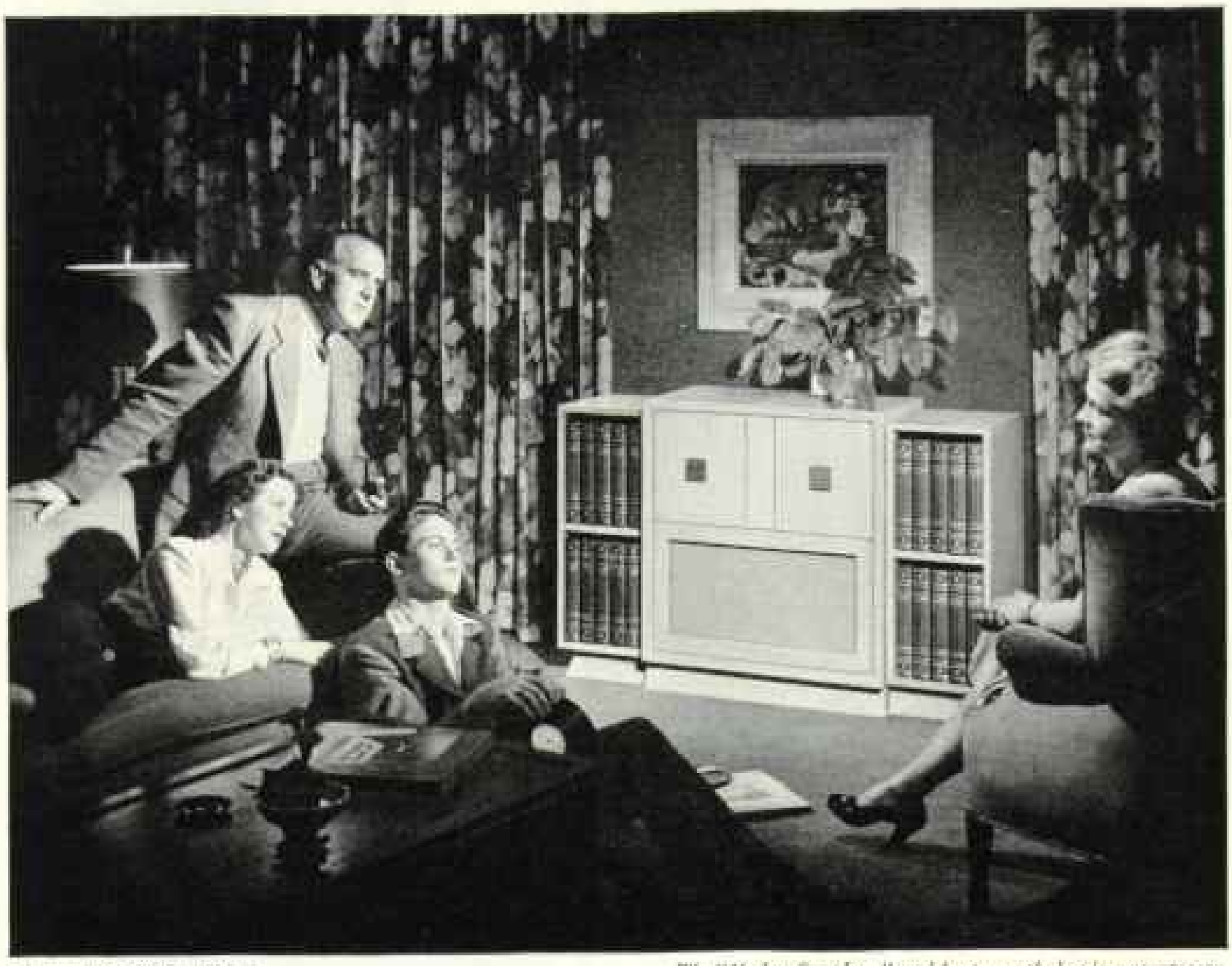

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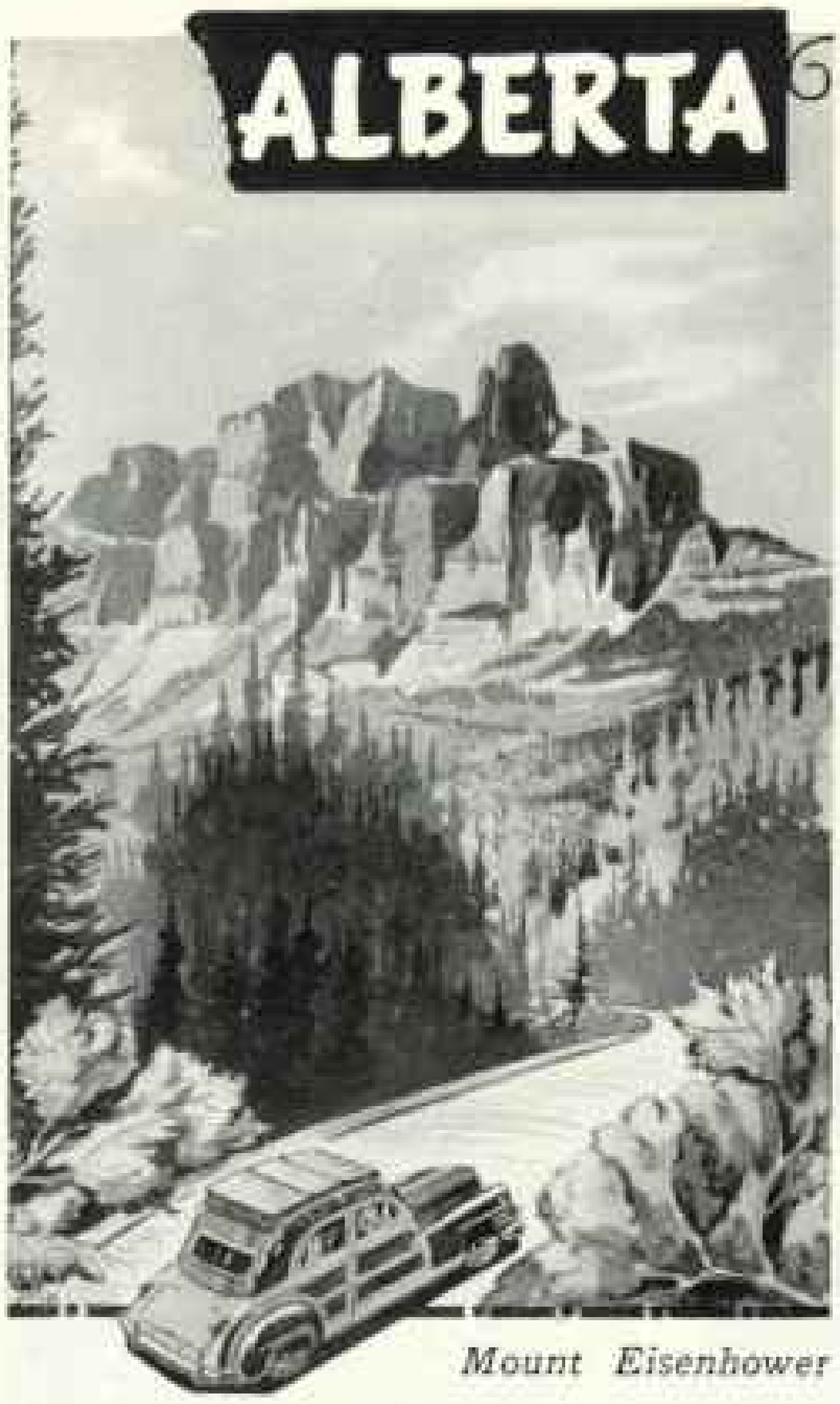

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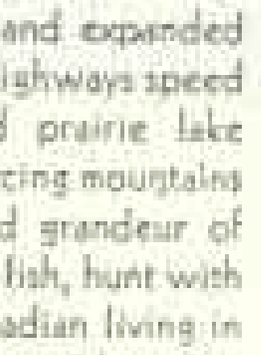

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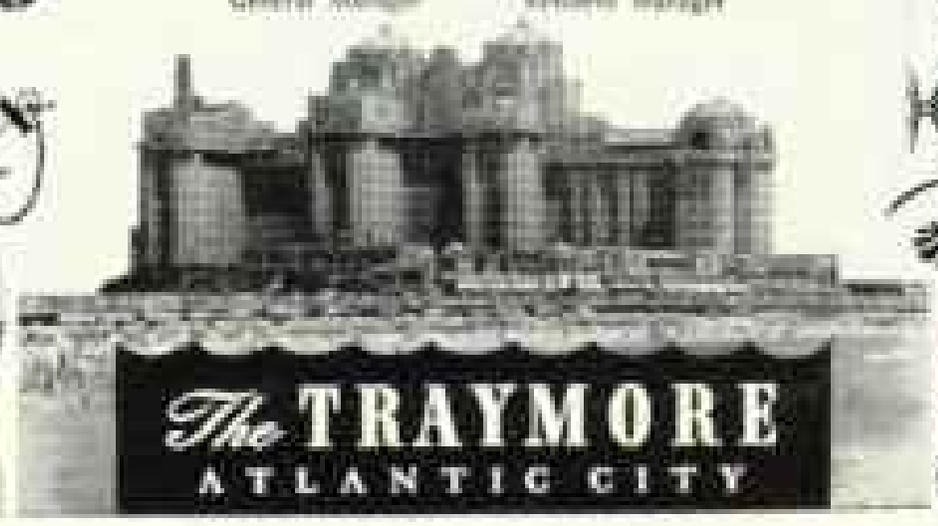

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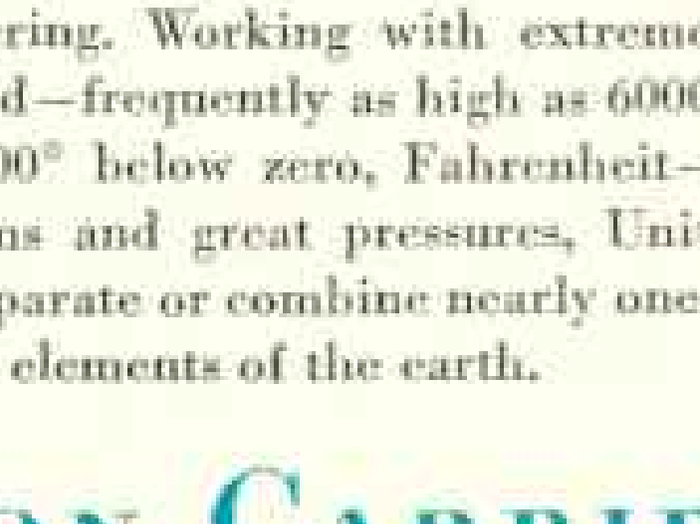

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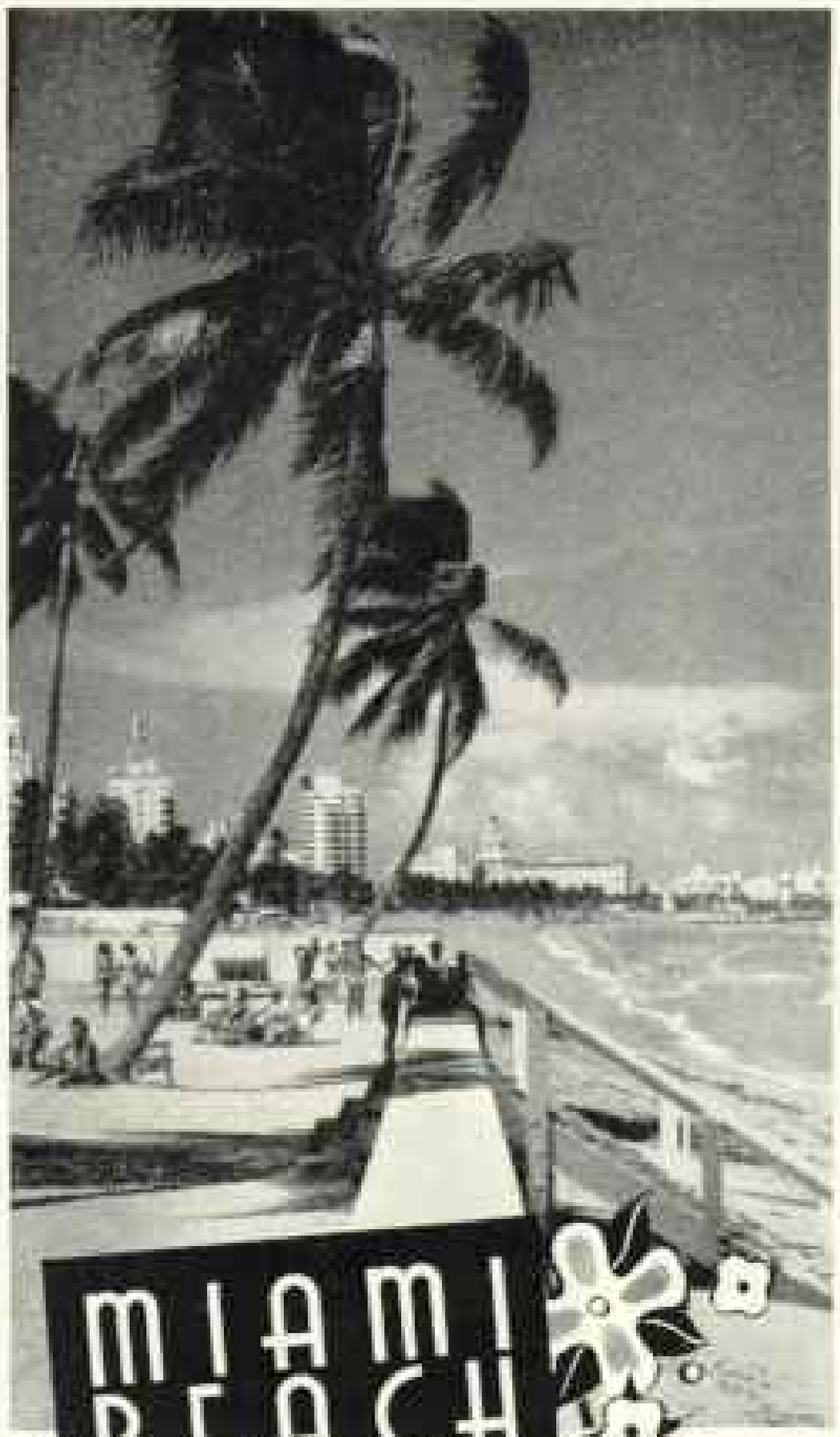

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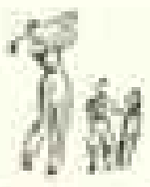

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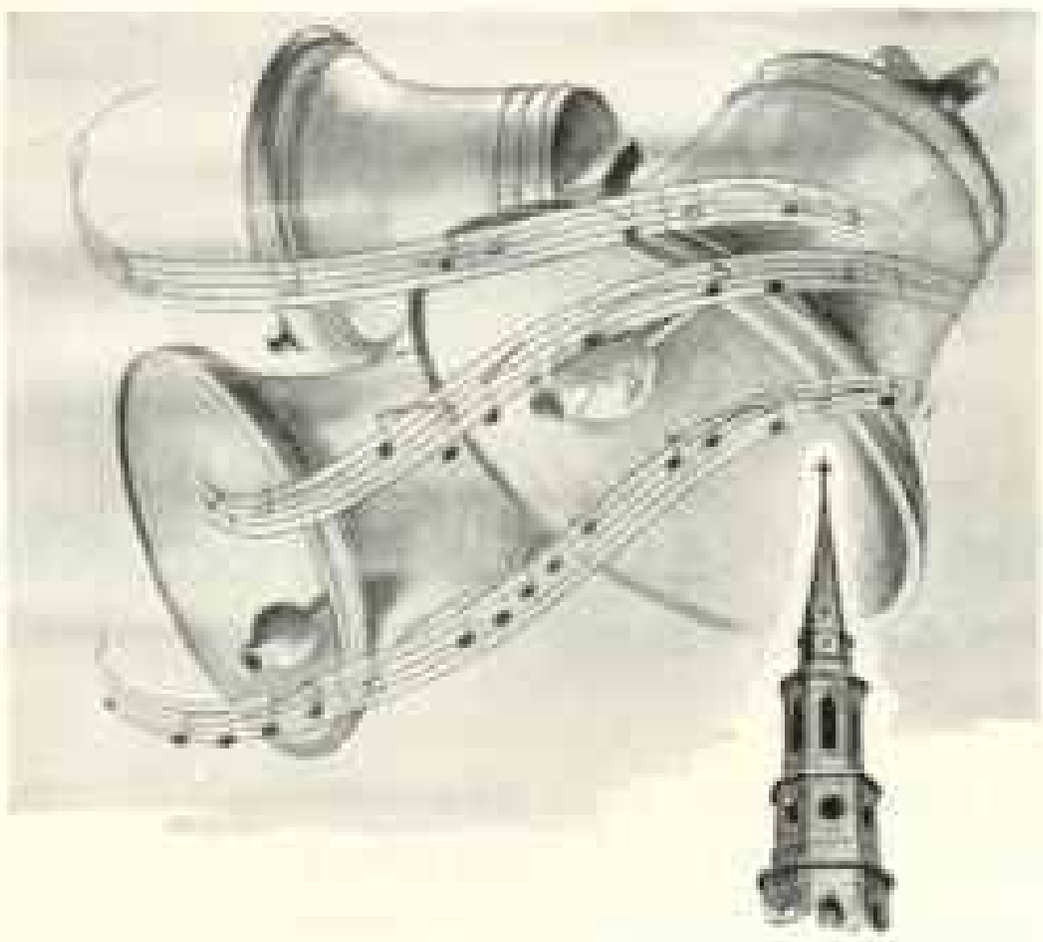

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As a memorial for those who gave their lives in service, inscribe their names, not in perishable substances, but in the skyward tones of music—in Carillonic Bells, whose glorious song will rise day after day in praise and homage.

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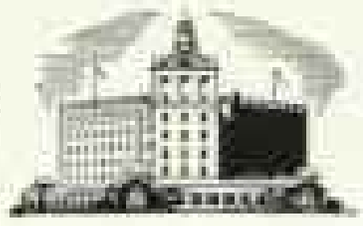

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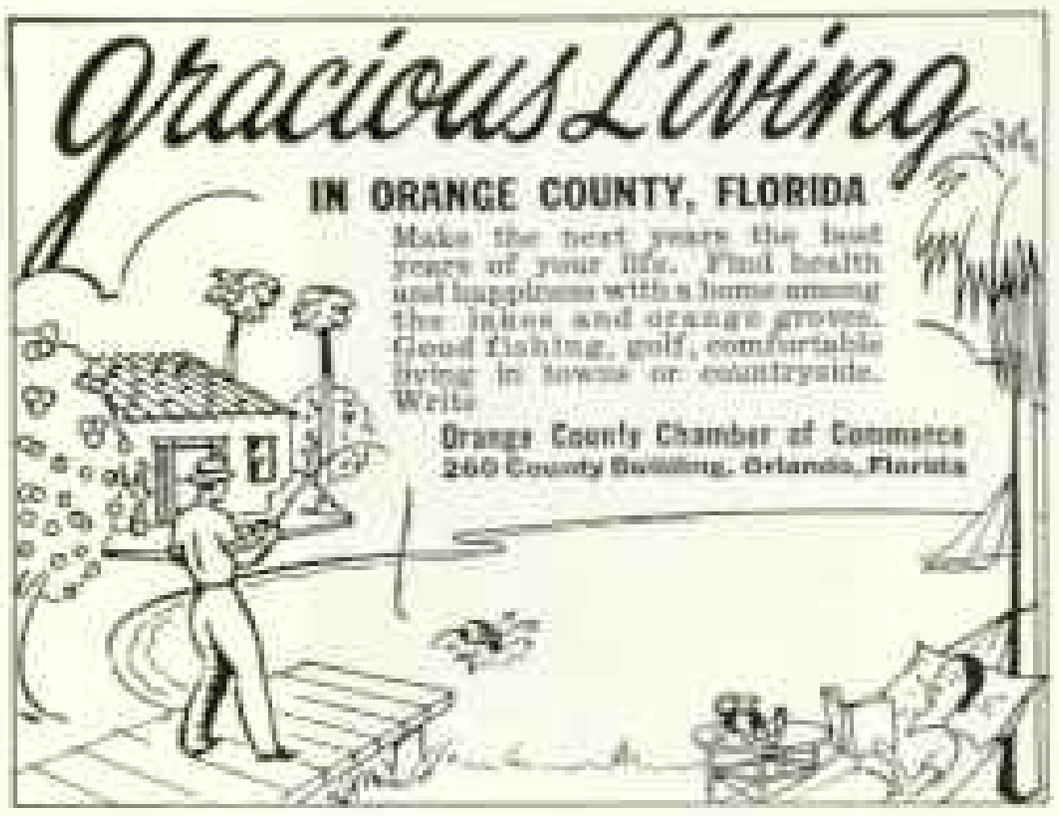

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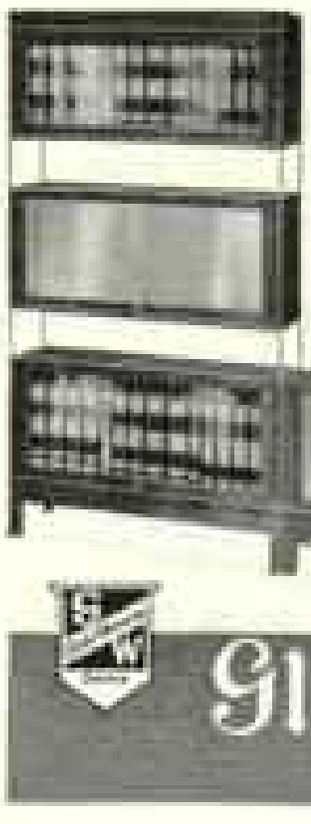

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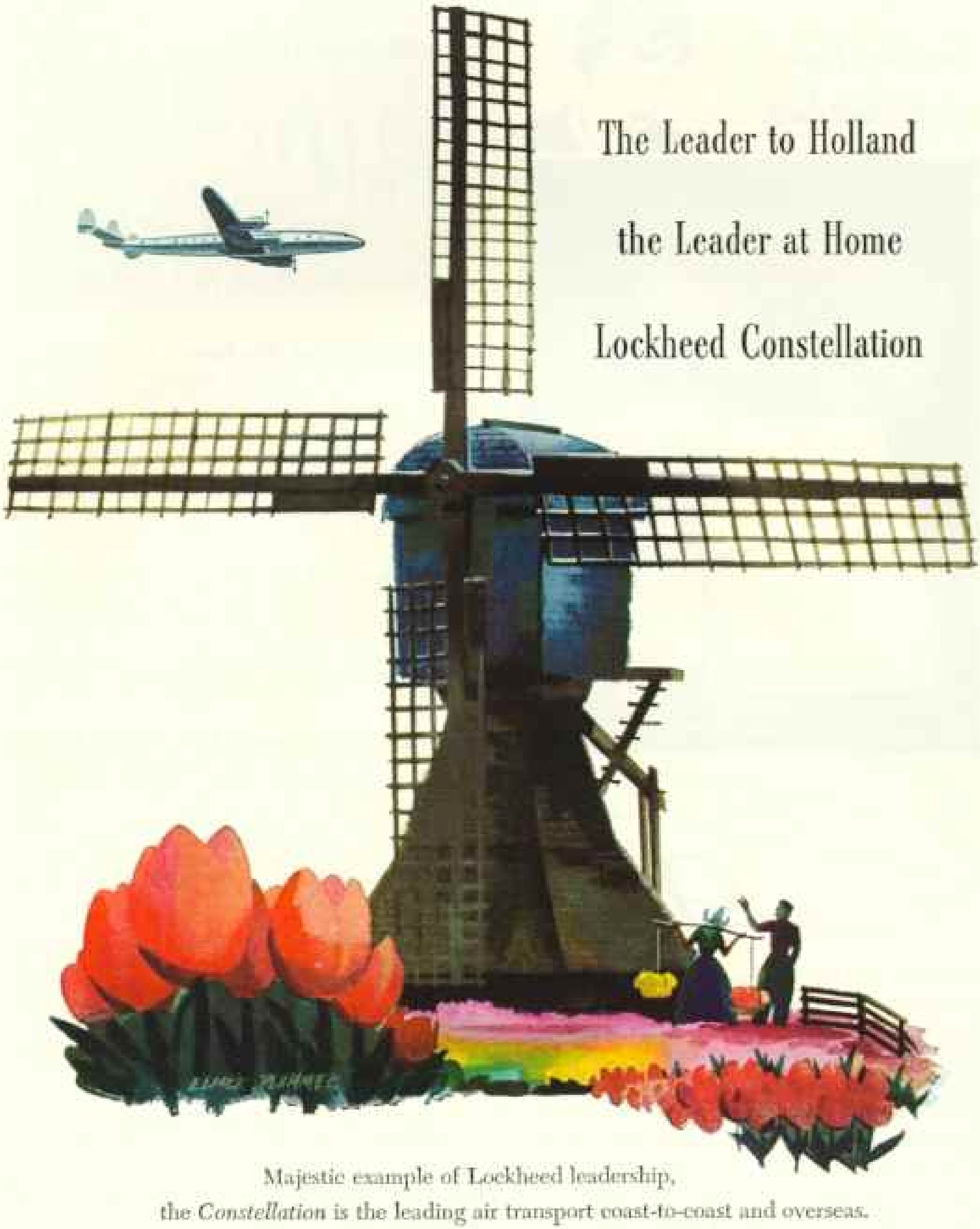

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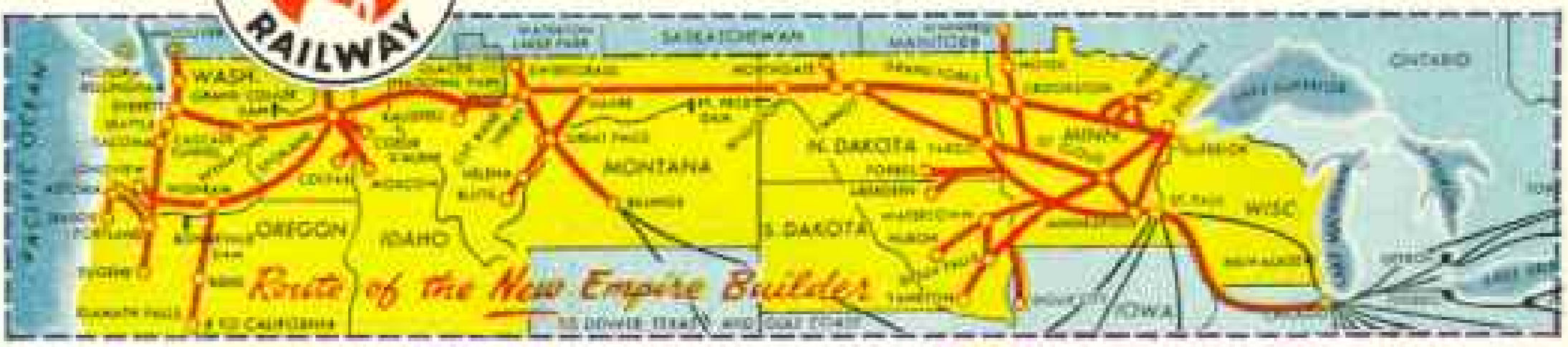

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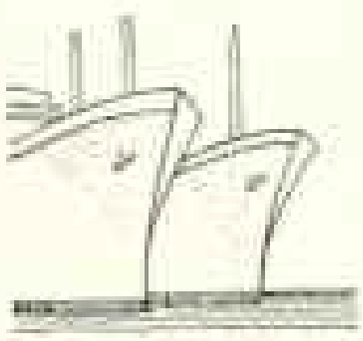

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