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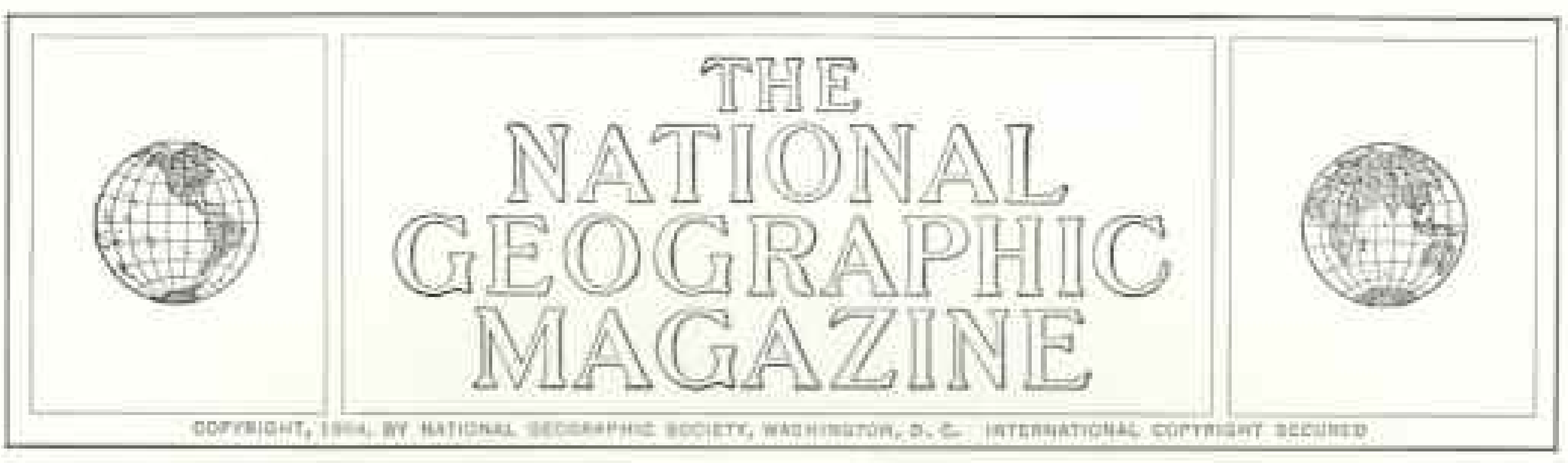

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Sicily the Three-Cornered

On the Mediterranean's Biggest Island, Crucible of Many Cultures, Men Grow Citrus, Mine Sulphur, and Patiently Fish the Sea

BY LUIS MARDEN

Foreign Editorial Staff, National Geographic Magazine

With Illustrations from Photographs by the Author

THE Greeks had a word for it. They called it Trinacria, the three-cornered. Yet the Greeks, who colonized Sicily 700 years before Christ and remained for five centuries, were only one wave in a sea of peoples that has surged over the mountainous island (map, page 7).*

The cultural heritage of Sicily is as many-layered as an onion. Peel away the Italian outer skin and you find the Normans; lift another layer and you see the Saracens; strip off another to disclose the Romans; under these lie the Carthaginians; then a stratum of Greeks; yet one more thickness reveals the Phoenicians; and so to the inner core of Sicans and Sicels, the shadowy early races.

Ancestry Shows in Sicilian Faces

One sees the faces of all these peoples in the crowds that throng the streets of Palermo, the capital. This handsome city facing the blue Tyrrhenian lies cupped in a mountain-girt plain, the Golden Shell (page 31). In the evening, crowds saunter along the capital's broad avenues and fill the cafes along the Via Ruggero Settimo. Customers crowd four deep at cafe counters. A cashier enthroned in a booth sells tickets to the standing customers, who exchange them for coffee, elaborate pastries, or bitter vermouth-base apéritifs.

Here, in the land of their invention, I saw the Italian coffee-making machines in all their chrome-plated glory. The gleaming instruments incorporate shining cylindrical urns hung about with water gauges, ebony-handled spigots, valves, and yards of tubing. White-coated operators clamp a metal cup under a faucet, then spin wheels and pull levers while steam hisses and agitated water leaps up and down in a glass tube. Then, after a lengthy wait, inky *caffè espresso* drips in a feeble trickle, a ludicrous contrast to the ritual of preparation.

Coffee of Many Colors

But what wonderful coffee! Strong, black, and fragrant, it is served in tiny cups half the size of a demitasse. There is a whole series of gradations in cafe coffee, from black to white. If you want a cup that is extremely strong, ask for a *restricted coffee;* for some less strong, say a *long coffee;* if you prefer coffee with a little milk, ask for a *Capuchin*, which is probably named for the color of the monks' habit.

Many of Sicily's regional dishes come from the sea, for, above all, Sicilians are fishermen. From ancient times they have followed

*See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Sicily, Island of Vivid Beauty and Crumbling Glory," with 22 illustrations in color, October, 1927, and "Zigzagging Across Sicily," by Melville Chater, September, 1924.

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Sicily at Ganzirri Beach Lacks 2½ Miles of Touching the Toe of Italy

Swordfish and tuna migrating through the strait give employment to Messina men. Some 140 kinds of fish are netted, speared, or hooked. These rowing swordfishermen tow the mast of a lookout boat (page 21).

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Kodachrome by Luis Marden, National Geographic Staff

The Strait of Messina at Slack Water Looks Deceptively Smooth and Calm

Whirlpools and strong currents regularly stir the narrow passage. Ancients attributed these perils to Scylla and Charybdis, mythical monsters. Actually, Scylla is the distant headland; Charybdis, a whirlpool off Sicily.

the old and honorable calling, and Sicily has sent her sons to man the fishing fleets of many nations. In the United States there are colonies of Sicilian fishermen in Boston, Gloucester, San Francisco, and other ports.

I liked to wander about in this city of imposing baroque buildings in search of interesting little *trattorie,* humbler and more typical eating places than the full-fledged restaurants. Down in the narrow streets near Palermo's waterfront one can eat a wonderful dish of spaghetti with squid sauce, or plates of red mullet or fried octopus. The red mullet were prized by the Romans; even today I found them to be expensive and scarce.

Squid and octopus swarm in Sicilian waters. Without these soft, big-eyed cephalopods Italian cookery would lose many savory dishes.

I went squid fishing one night with a man named Filippo. He kept his rowboat in a small basin protected by a breakwater and a disused lighthouse. The flame of an acetylene lamp hissed steadily and lighted Filippo's wise-monkey face as he rowed us into the darkness. With sly winks he told me of an unusual red-spotted squid he had caught.

"I took it to the scientifics at the museum," he said, "and they beat the pages of their big books looking for it, but they couldn't tell me what it was. It tasted good, though."

As we rowed over the oily black water, yellow lights like stars winked on and off. They were the little flames of other squid fishermen. As the boats rose and fell with the slow swell, the rising shoulder of the sea occulted the lights; then the black waters slid away and the yellow points blinked on again.

Squid Strike at Baitless Hooks

I could see nothing but the lights and a few pale stars when Filippo suddenly cried, "*Viva Maria!*" From the blackness a voice replied, "*Viva Gesù!*"

We pulled alongside another fisherman whose bent back had concealed his light from us. When Filippo asked, "What luck?" the man, piety forgotten, burst out with, "Ah, pig of a goddess, there are no blanked inhabitants in this blanked piece of sea!"

Squid are caught on an artificial lure that looks like a miniature mushroom anchor, armed with a circlet of needle-pointed barbless hooks. The squid strike at the lure as it is seesawed up and down about 50 feet below the boat (page 47). Our friend who was working the empty piece of sea fished two lines; one was tied to his ear and the other he jigged up and down in one hand.

The fisherman suddenly began to pull in his line, swiftly but smoothly, hand over hand, until at last with a heave he swung the lure with its clinging squid into the boat. As he jerked the catch out of the water, my exploding camera flash caught the string of water globules in mid-air; for an instant they hung, frozen in an arc, motionless and glistening like bubbles of crystal in suspension.

When we rowed back to Palermo, cold, tired, and hungry, about 3 o'clock in the morning, we had only a few small squid in the boat.

Sicilian Roads Climb and Plunge

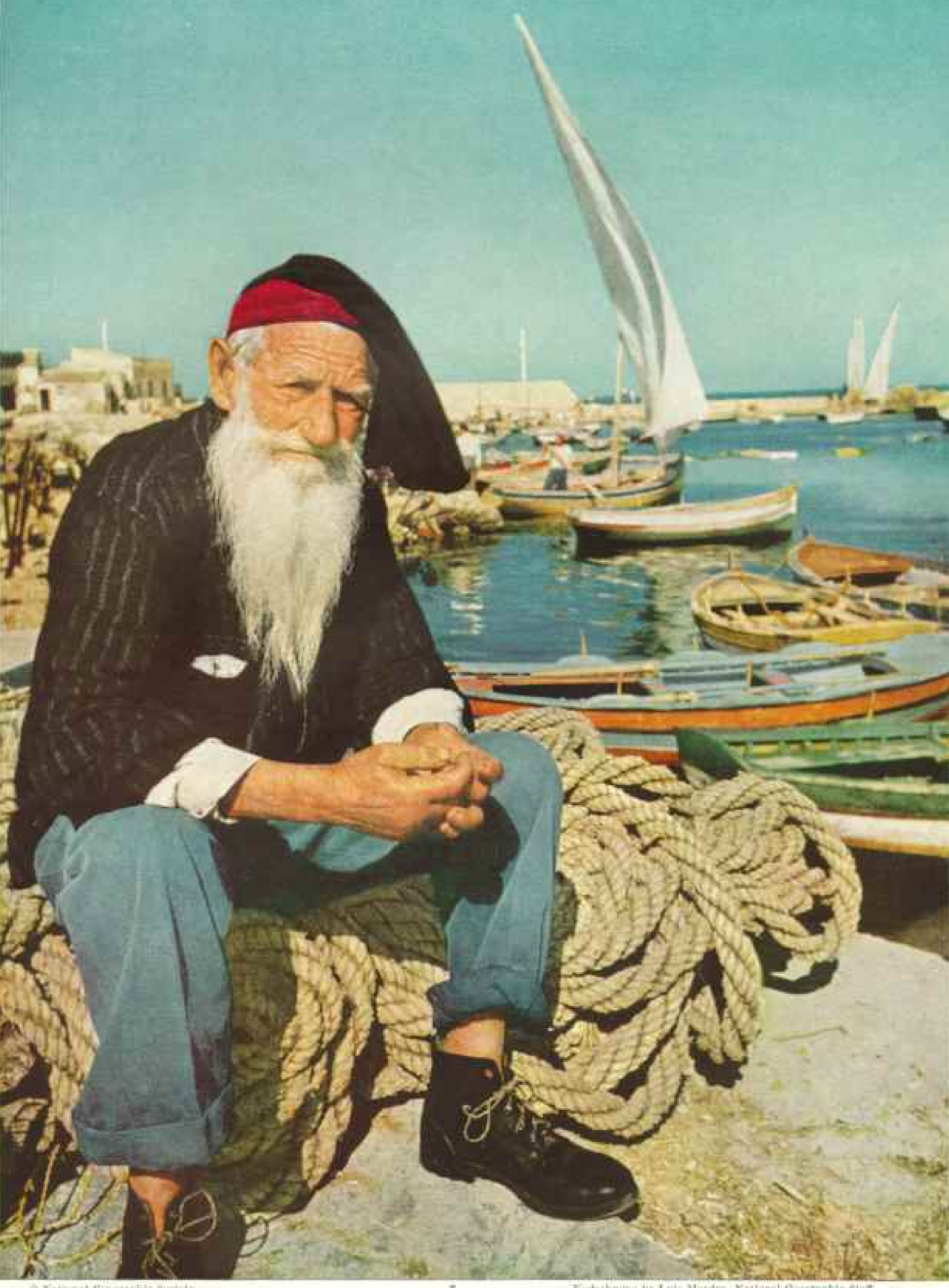
There are few straight and level stretches of road in Sicily. From Palermo I drove westward along the coast road, behind the jutting headland of Mount Pellegrino, and through the little town of Sferracavallo, with its blocks of old buildings huddled in the shadow of a fantastically shaped rock (page 9). The yellow sunlight lay like butter on the stone buttress above the town, and, a little distance beyond, the setting sun drew red streaks along the horizon, silhouetting the stone tower on a small island offshore.

It was dark when I headed inland at Castellammare del Golfo and drove up into the mountains to see my first Greek temple at Segesta. On the way to Trapani a winding road led into a dark valley, then upward as the moon rose to the shoulder of a hill.

As I stepped from the car, the moon emerged from a cloud and lighted the columns of the Doric temple that stands there in solitude. It was a somber and impressive scene in silver and black, the straight strokes of the temple columns alone denoting man's handiwork against the rounded crests and curves of the surrounding mountains.

Trapani, an old city of narrow crowded streets on a long peninsula that points its finger at the Egadi Islands offshore, panted in a pall of heat. My host at the hotel said, "If you want to cool off, go up there," and pointed to an isolated mountain that loomed in the moonlight beyond the city.

Rising 2,400 feet above Trapani's shimmering heat, one of Sicily's most fascinating towns stands on this lonely mountain. Erice, the ancient Eryx, has no exact founding date. Even in classical times its origins were lost in the dimness of antiquity and had assumed



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Dressed for Sunday, a Sicilian Bernard Shaw Meditates on Fish and Life

This patriarch, sitting on the waterfront at Mondello, reminded the author of the Irish playwright. His old-style cap is rare nowadays. Lateen sails (background) have moved Mediterranean craft for centuries.

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Modern Vulcans, Grimacing in Heat and Smoke, Fit an Iron Tire to a Carved Wheel

Heated to a red glow, the tire is forced over the rim with levers, clamps, and hammers. Slight inequalities in the wood are burned away by the hot metal. As the tire cools, it shrinks and clamps itself to the wheel. These men work on the outskirts of Palermo, the center of wagon art (pages 14, 15). Most Sicilian wagons are drawn by horses, though some are hauled by mules. Donkey wagons are made especially small.

the status of a myth. At that time it was the center of a cult of Venus, here considered the protecting goddess of seafarers.

When I drove through a gate in Erice's thick wall, I left behind the world of clangorous cities. All was silence; cold winds whistled down deserted cobblestone streets. Barred and shuttered houses everywhere seemed not so much hostile as reserved and peaceful.

Uncle Vito Offers Help

One castle has been restored and is used as a villa, a place of retirement from summer heat. It stands on the brink of nothing. Below it the thick mist swirled and blotted out the view of the coast below.

As I stood at the rail of a little park waiting for the mist to clear, an old man wearing a hooded cloak approached, announced that he was more than 80 years old, that his name was Uncle Vito, and that he would answer any questions about Erice.

The break in the fog came with surprising suddenness. At my feet I saw the headland of Trapani stretching into the hazy sea. Evaporating basins for sea salt surrounded the port with a geometric pattern.

Along the steep streets of Erice walk silent black-mantled women. Uncle Vito hailed one and introduced me. Her name was Aunt Bartola and she was 86, but, like Vito, spry, upright, and full of good humor. She accompanied us nimbly round the city wall, pointing out ogival church doorways and an occasional Norman inscription. Back in the little central piazza, I offered her a ride in my car.

"This is the second time in my life that I have been in a motorcar," she said. "The last time was in 1916."

She held tightly to her black silk mantle

7

Sicily, a Steppingstone to Europe, Has Served Invaders Since Phoenician Times

Some of Sicily's conquerors went on to the mainland. Others stayed to colonize and left beautiful monuments. During World War II the Allies, leaping from North Africa, made their principal landings on the island's southeastern and southwestern coasts. Sicilians reach the mainland by overnight steamers from Palermo to Naples and by railway trains ferried across the Strait of Messina to Reggio Calabria.

as we drove round outside the walls on the edge of the plateau. When we reached the giddy speed of 35 miles an hour, I heard her mutter under her breath, "Blessed devil, how did you come to mix me up in this situation?"

Like nearly all Sicilians, Aunt Bartola had relatives in America. "Perhaps you know my nephew in Brooklyn?" she asked. "Yes," added Uncle Vito, voicing a mistaken belief of many islanders, "there are more Sicilians in Brooklyn than in Palermo."

Big Families the Rule on Sicily

Overpopulation—families of 14 and 15 children are not uncommon among country people—and absentee ownership of large estates, with little arable land to go round among ordinary people, are largely responsible for the great outflow of migrants from what is, after all, an agriculturally rich island.

Uncle Vito led me along the railed walk that runs so close to the edge of the plateau that one seems to stand on the flying bridge of a ship. With the heavy white mist hiding everything below I had a sensation of weightlessness, of being suspended in space and time.

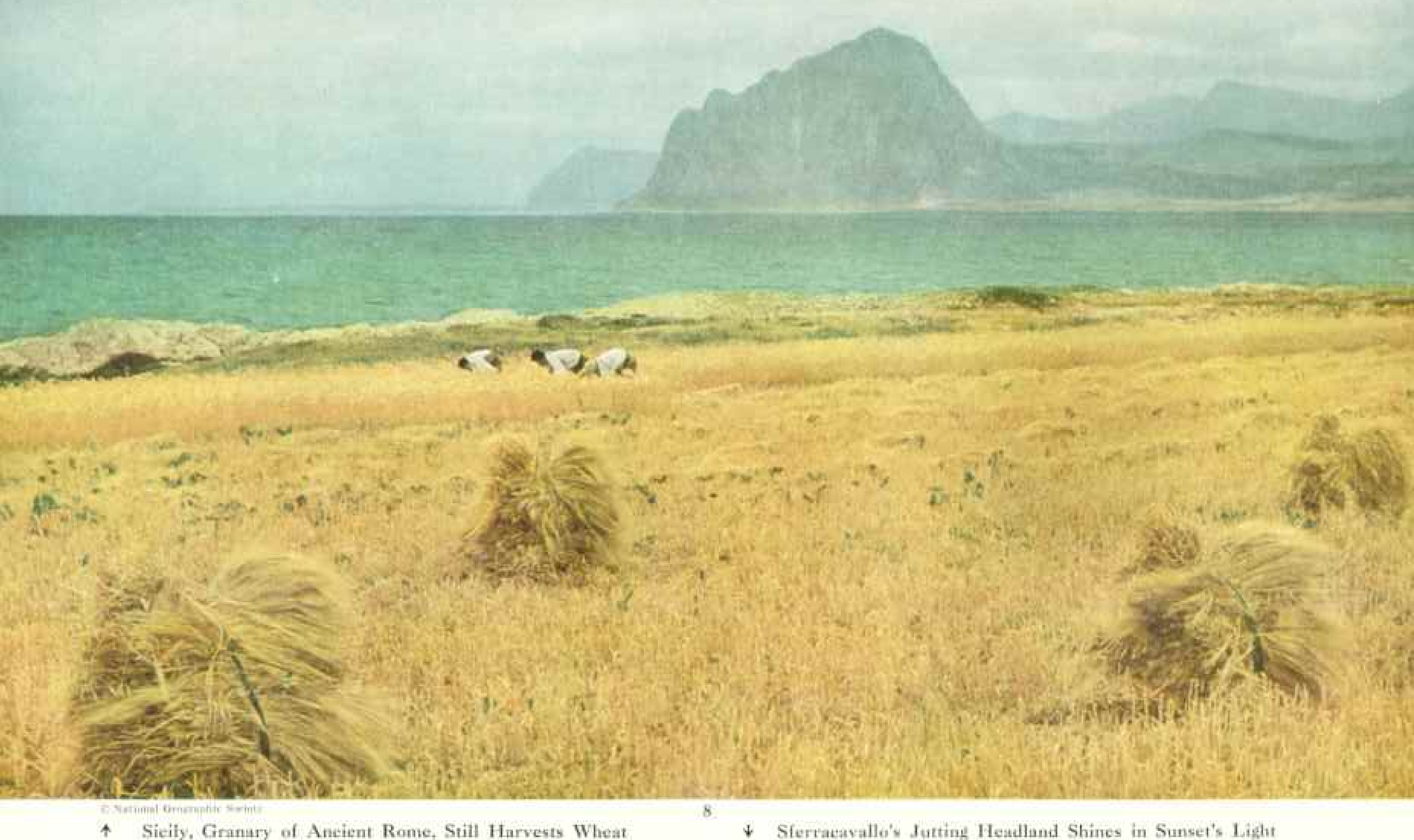
"And that," said Uncle Vito, "is the Temple of Venus."

I was a bit disappointed. The "temple" is a crumbling medieval ruin clinging to the edge of an outthrust spur that drops sheer to the rocky lower slopes.

Uncle Vito described how in classical times the handsomest girls gathered round the temple to do homage to the goddess by sacrificing themselves to returning mariners in their own fashion. The old boy nodded.

"*Belli tempi, quelli!*" he said. (Fascinating times, those!)

(Continued on page 13)



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↑ **Sicily, Granary of Ancient Rome, Still Harvests Wheat**

Much of the Roman Empire's grain came from its Sicilian colony. Today the island's most important crops are oranges, lemons, and tangerines. These fields near Trapani run down to the sea. The rocky headland is Mount Cofano.

↓ **Sferracavallo's Jutting Headland Shines in Sunset's Light**

The town's name means Unshoe Horse, possibly because horses often cast their shoes on the rocky slopes. Towering promontories are a common feature of the Sicilian coast. Edible sea urchins are gathered offshore.

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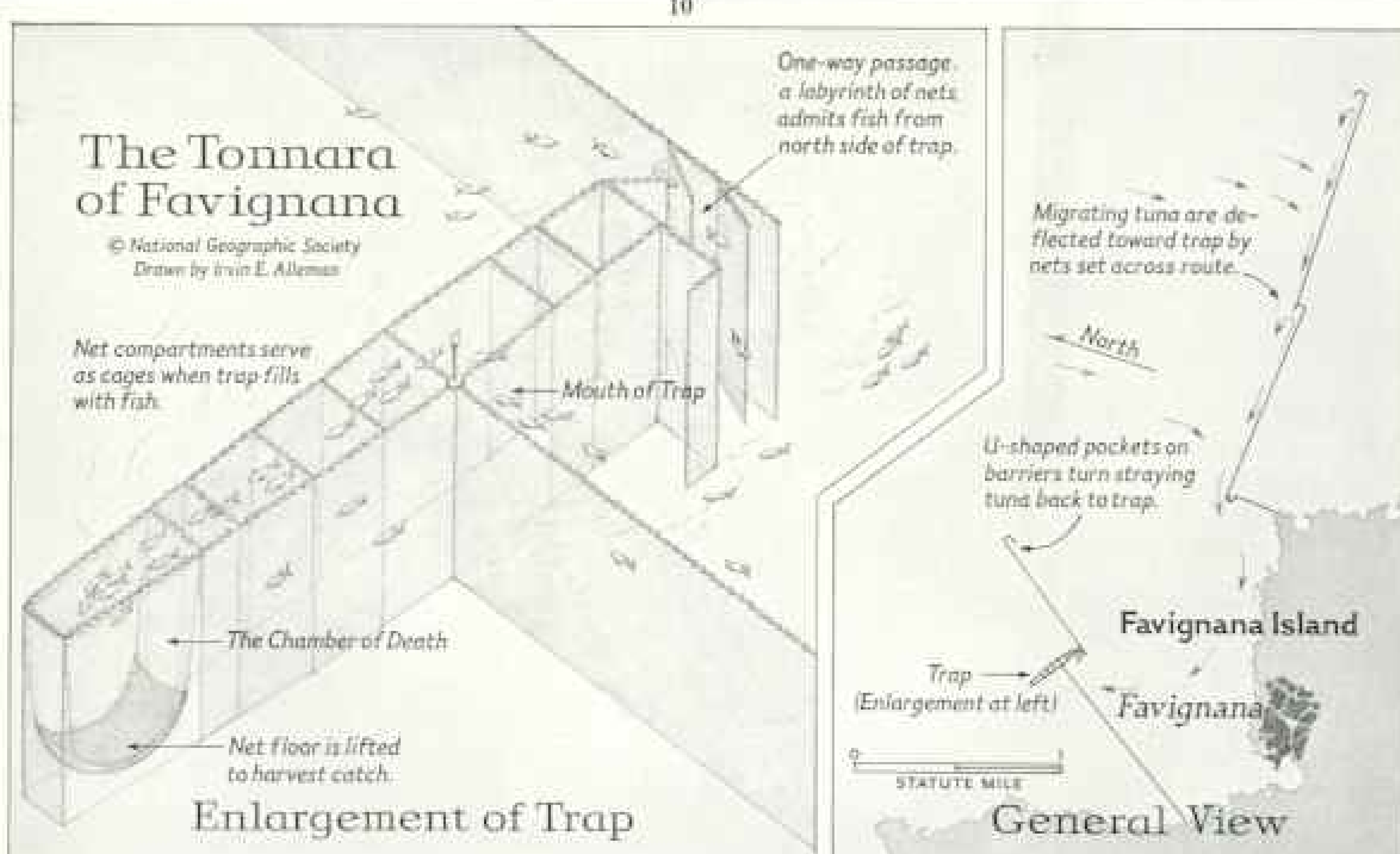
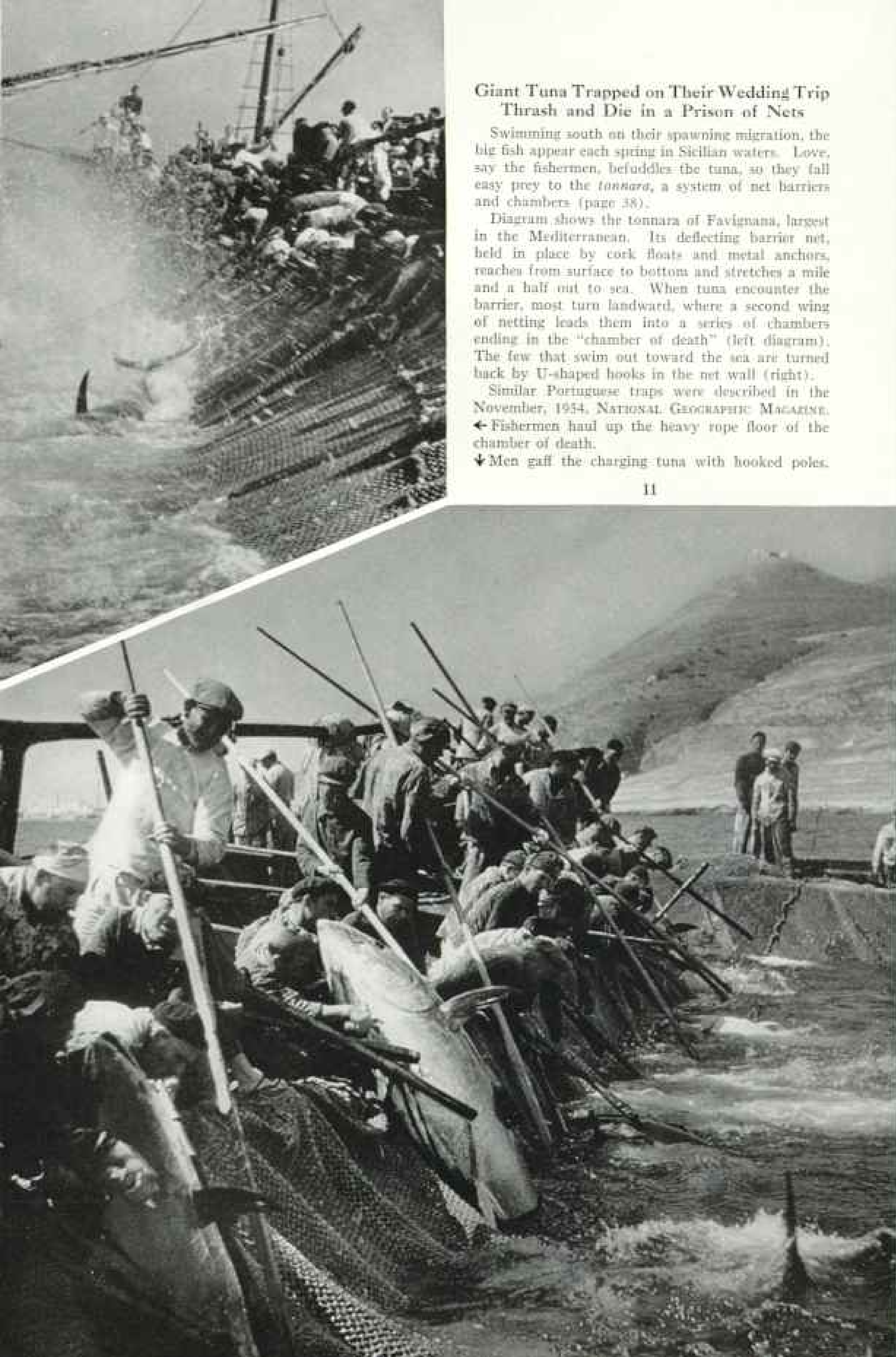

The Tonnara of Favignana
© National Geographic Society
Drawn by Irvin E. Alleman
One-way passage, a labyrinth of nets admits fish from north side of trap.
Net compartments serve as cages when trap fills with fish.
Mouth of Trap
The Chamber of Death
Net floor is lifted to harvest catch.
Enlargement of Trap
Migrating tuna are deflected toward trap by nets set across route.
North
U-shaped pockets on barriers turn straying tuna back to trap.
Favignana Island
Trap (Enlargement at left)
Favignana
STATUTE MILE
General View



Giant Tuna Trapped on Their Wedding Trip Thrash and Die in a Prison of Nets

Swimming south on their spawning migration, the big fish appear each spring in Sicilian waters. Love, say the fishermen, befuddles the tuna, so they fall easy prey to the *tonnara*, a system of net barriers and chambers (page 38).

Diagram shows the tonnara of Favignana, largest in the Mediterranean. Its deflecting barrier net, held in place by cork floats and metal anchors, reaches from surface to bottom and stretches a mile and a half out to sea. When tuna encounter the barrier, most turn landward, where a second wing of netting leads them into a series of chambers ending in the "chamber of death" (left diagram). The few that swim out toward the sea are turned back by U-shaped hooks in the net wall (right).

Similar Portuguese traps were described in the November, 1954, NATIONAL GEOGRAPHIC MAGAZINE.

← Fishermen haul up the heavy rope floor of the chamber of death.

↓ Men gaff the charging tuna with hooked poles.

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Tarantella Dancers Whirl in Taormina's Old Greek Theater Beneath Etna's Cone

The name of this dance is popularly ascribed to the tarantula, the big hairy spider whose bite was thought to induce melancholy and a dancing frenzy. Old-time Italians regarded the tarantella's strenuous exercise as an antidote. Some authorities say the dance originated in Taranto, on the mainland.

A small museum houses objects dug up on the temple site: amulets, figurines, bits of sculptured heads. Notable is a small marble head of Venus no bigger than a plum. The severe classic beauty of the head with its straight bridgeless nose was enhanced by the light which suffused the translucent stone and caused the features to glow as if warm with life.

Among the Greek and Roman objects some Egyptian bronze figurines seemed surprising, until I recollected that these were probably brought as votive offerings to the shrine of Venus by returning mariners who came to give thanks for a safe voyage. I saw a green-patinaed Hathor, the cow goddess who carries the sun's disk between her horns, and the small figure of a child, his youth symbolized by the Egyptian artistic convention of a lock of hair curling over one ear. This was doubtless Horus, son of Osiris and Isis. The sailors had also left scarabs from the Nile.

Of all this faith that brought worshipers and tribute from the whole Mediterranean world, nothing is left but a few crumbling stones, the whistling wind, and solitude.

Wine Ages in Room-size Casks

The road running south along the coast from Trapani winds between wheatfields, olive groves, and orderly rows of grapevines. At crossroads and strategic curves, like harsh notes of discord in the warm and pastoral air, loom the ominous turtlebacks of German concrete redoubts, their eye slits masked by growing things, silent now, but shocking as sudden death on the edge of the green fields.

The town of Marsala stands at the water's edge, on the westernmost tip of Sicily. Apart from its wine, it is chiefly remembered by Italians as being the place where the liberator Garibaldi landed with his Thousand in 1860 to free Sicily from the Bourbons.

In long white buildings on the waterfront are the Florio establishments, largest nowadays of the wineries of Marsala. There a white-smocked oenologist showed me through the cool warehouses with their rows of tremendous casks, where in darkness and quiet the deep gold Marsala ages.

"You may have heard that Marsala, as we know it, is not Sicilian in origin," the expert said. "Actually, it was developed by an Englishman, John Woodhouse, who settled here and in 1773 set about compounding a wine that resembles both sherry and port."

In 1800 Woodhouse contracted with Lord Nelson to supply 500 pipes, or casks, of Marsala to the British fleet at Malta.

Marsala starts as the common white wine of the neighborhood. Grape brandy is added, then, after preliminary aging, *vino cotto*, cooked wine, which fortifies the crude wine further and darkens it.

"In 1943 Allied bombers raided Marsala, and more than 100 bombs fell on our works," said my friend. "Many of those big casks—the ones as big as a small room—burst, and wine literally ran in the gutters. The real wine lovers forgot their fear and came running with pans and bottles. People around here still talk about that day."

Ruins Like a Spilled Jigsaw Puzzle

The main road turns southeastward after leaving Marsala, following Sicily's southern shore, then veers inland to Castelvetrano. Near by, on the edge of the sea and in the full blaze of the southern sun, stands the jumble of ruins called Selinunte, once a great city but now so thoroughly razed and shaken by earthquake as to suggest spilled pieces of a jigsaw puzzle.

Selinunte was the westernmost Greek colony in Sicily. Though the city, founded in the seventh century B. C., at first maintained good relations with Carthage, the Carthaginians sacked it in 409 B. C. and razed it in 250 B. C.

Selinunte is impressive because of its sheer size and somber isolation. But to see Greek temples in a nearly pristine state one must go on to Agrigento.

The acropolis of Agrigento rises on its sharp-spined hill above a sea of almond trees, which in spring surround the ruins with a white cloud of blossom. One temple, which archeologists list starkly as Temple F, is the best preserved example of Greek architecture in existence, after the Theseum at Athens. Yet no one knows to what deity this masterpiece was dedicated. Guidebooks call it the Temple of Concord, after a Latin inscription unearthed near by (page 22).

The tufa of Temple F, like that of other Agrigento ruins, is of a warm yellow-brown. In early morning sunlight the lovely building glows like a topaz in a setting of dark-green almond foliage.

From Agrigento the highroad runs southeast through the port of Gela, center of the

(Continued on page 25)

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Kodachromes by Luis Marden, National Geographic Staff

Painted Wagons Portray Sicily's Fight Against the Moors and Normans

Folk art reaches a high point in the island's wagons. Each new cart costs weeks of painstaking work with wood and wrought iron. In Bagheria, near Palermo, the five Ducato brothers specialize in cart painting. Working in relays, they finish a job in a few days. One brother (opposite) applies striping to wheel spokes that carry costumed figures in high relief. Another (below) paints scenes of chivalry from the time of Charlemagne.

Above: A completed cart rolls through Catania on a feast day. The horse wears harness as elaborate as the wagon.

© Kodachromes by Luis Marden, National Geographic Staff →

Stromboli, World's Most Active Volcano, Spits Slag by Day, Fire by Night

During daylight (above) the flying fragments look unimpressive, but at night (opposite) the incandescent lava describes glowing hyperbolas amid clouds of gas. After the first startling *crump* of an explosion, fragments continue to fall on the crater's slopes with a staccato patter. Outbursts of fragmental viscous lava give vulcanologists the word "strombolian" to describe similar phenomena around the world. Eruptions usually occur every 10 to 12 minutes.

19

↑ **Medieval Gangi Perches on Its Hilltop**

Sicily's stone houses blend so well with rock foundations that they are hard to distinguish from a distance. Many towns founded in feudal times were built on heights for easy defense.

← In late spring *sulla*, a legume, forms bright rectangles in the fields. These women harvest the blossoming plants as feed for cattle.

→ Donkey's reward: a taste of sulla from his own burden. The animal's owner greeted the author in Italian mixed with Greek, Spanish, and French, a dialect reflecting the passage of Sicily's many conquerors.

Italy's official and literary speech is the Tuscan of the north. Sicily's country dialects bear little resemblance to the tongue of Dante.

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Standing at the Oars, Fishermen Send Their Craft Streaking After a Swordfish

Boss of the fishery, the harpooner stands ready to drive the dart into his prey, which swims just below the surface. Aft rowers, who steer the boat, take their orders from the lookout perched above them.

Kodachrome by Luis Marden, National Geographic Staff

High Above Messina Strait, a Lookout Watches for the Shadowy Forms of Migrating Fish

The tall-masted vessel serves as an observation platform at Ganzirri. The lookout cries a warning when fish approach. Inset: A harpooner removes his dart from a 90-pound swordfish, a small specimen.

© National Geographic Society

↑ **Agrigento Preserves a Splendid Greek Temple**

Long use as a Christian church saved this Doric structure from collapse. Scholars have dated its style as that of about 450 B. C.

↓ **Tiger, Lion, and Mythical Griffin Glow in Stone**

Archeologists can only guess the meaning of parts of this animated mosaic in a Roman ruin at Piazza Armerina. An oil swab brings out the coloring.

© Kodachromes by Luis Marden, National Geographic Staff

Aphrodite of Syracuse: Sicily's Masterpiece of Greek Sculpture

Discovered in 1804, the marble figure is attributed to the school of Praxiteles. It shows the Aphrodite Anadyomene rising from her bath. Supports for the missing right arm, which was folded across the breast, mark the torso. Syracuse, once the most powerful of Greek cities, preserves Aphrodite in a museum. Romans knew the goddess as Venus.

↓ Three Roman Sailors Endure in Mosaic

Floors of Piazza Armerina's Roman villa are so lavish that some investigators think the residence was built for an emperor. Female gymnasts, hunters, and warriors parade across the floors. These sailors hold a gangplank for a horse that seems too large for the boat.

Wild animals depicted in the mosaics are African. Here a leopard stalks an antelope.

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Kodachromes by Luis Marden, National Geographic Staff

Americans' landings in 1943, and across to Syracuse (Siracusa), on the east coast. Here was the greatest of all the Greek colonies in Sicily, a city that rose to heights of magnificence in the arts, letters, and sciences, and defeated Athens herself (opposite page).

Founded by the Corinthians about 734 B. C., Syracuse became the most powerful city in Europe after routing the Athenians in 413 B. C. Thucydides describes how some 200 ships fought for the supremacy of the Greek world. Athens suffered a terrible defeat; of her 40,000 armed men only 7,000 survived to be taken into slavery.

Drama in a 2,400-year-old Theater

The 7,000 traditionally were imprisoned in the Quarry of the Capuchins, cut from the living rock of a hillside. As I walked about in its oppressive silence, I saw, growing from crevices in the rock, striking-looking white-and-purple flowers. The waxy, delicately scented blossoms resembled passionflowers, and I protested when my guide nipped off several of the green buds. "But we do this to thousands every summer. Don't you recognize them?" he said. "They're capers."

Now I can never eat capers without thinking of the sweet-smelling flowers that will never blossom.

The semicircular Greek theater is in a remarkable state of preservation. Classic Greek dramas are often presented in it by a group sponsored by Sicily's regional government. When I was there, two tragedies, *Oedipus at Colonus* of Sophocles and *The Trojan Women* of Euripides, were played to an audience that came from all Italy and many other European countries.

A man who sat next to me told me that in an earlier season a historical play had been performed here that had had its Sicilian premiere in this same theater more than 400 years before Christ.

Northward along the coast from Syracuse lies Catania, second city of Sicily and the industrial and commercial center of the island. The city is built on nine layers of ancient lava, three prehistoric and the last as recent as 1669. Fortunately, these unwelcome outpourings of the volcano Etna, which broods over Catania, have not reached the city in modern times, though several flows have nearly touched it. They are there still: black, fantastic areas of tortured rock.

The proximity of a volcano frequently brings one blessing: that of fertile soil. The lavas, vomited from deep within the earth, contain enormous stores of minerals, which can support an intensive agriculture after long weathering.

I went to the top of Etna, 10,636 feet above sea level, to see the sun rise. There is a motor road to a small alpine refuge, which one leaves at midnight to ride muleback for a short distance, then to climb on foot to the crater. The road runs at first through rich vegetable gardens, vineyards, and groves of the citrus fruits that are Sicily's chief agricultural export.

We reached the top while it was still dark and exceedingly cold. One of the members of our party, a girl, was so sleepy (we had all been awakened at midnight by the guides) that she fell asleep at the tip of Mount Etna, with her head on her knees and, to keep warm, her seat on a fumarole.

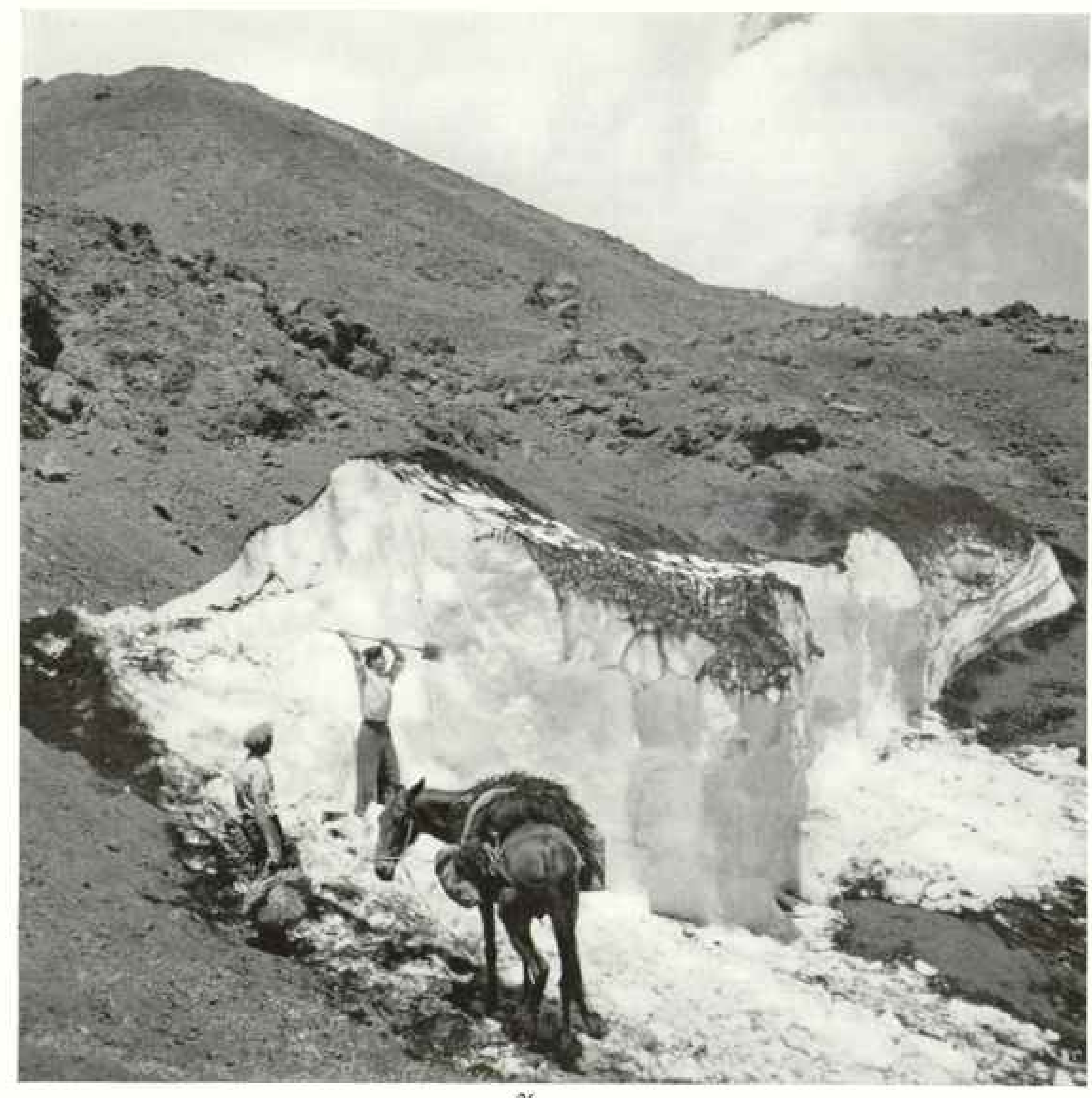
As we looked out to sea through the clouds of steam, the sky reddened and then, as suddenly as if it had popped over the edge of a flat world, the red disk of the sun appeared, coloring the rising steam with refulgent red-gold and flashing cross-shaped beams through the refracting air (page 48).

Sicily's Most Famous View

Halfway between Catania and Messina stands the town with the most famous view in Sicily (page 44). Taormina is so squeezed on its lofty natural terrace that everything there seems miniature—the extremely narrow streets, the tiny squares, the minuscule cafes. But the world drops away at the edge of the mountain, and one can sit sipping coffee and look southward across Sicily—almost, it seems, to Africa.

Northward I drove to Messina, the city closest to the Italian mainland, a scant five miles from the peninsula of Italy. Ever since the terrible earthquake of 1908, in which 60,000 died and more than 90 percent of the city's buildings were razed, Messina has erected only low structures of reinforced concrete along its wide streets and avenues. It has the most modern look of Sicily's cities (page 33).

"Your American aviators during the war called it the 'ghost city,'" a Messinese told me, "because they would come over and smother it with bombs; then, when the smoke had cleared away, there the buildings were, apparently intact, with no visible damage."



Protected by Ash, a Natural Icebox Survives the Sun on Etna's Volcanic Flank

In winter snows lie in a deep mantle on Etna's cone; they linger even on the lips of steaming vents. This cool bank stands not far below the main crater, which is hidden by the rise at upper left. Villagers climb to its face to hack out donkeyloads of snow, which they sell to makers of Sicily's ices. Before the days of mechanical refrigeration, certain Sicilian nobles inherited the right to exploit Etna's snows and sulphur.

From Messina in 1943 British and Canadian troops, after driving the Germans from the city, were the first of the Allies to set foot on the mainland of Italy. Some crossed over, prosaically, by ferry.*

I wanted to see the peculiar form of swordfishing practiced in the Strait of Messina, so I drove northward along the beach, passing through towns with wonderful names like Paradise and Peace to Ganzirri.

From April through August the black-hulled swordfishing boats are strung like sentinels along the shores of Messina (pages 2 and 20). They anchor close to shore at 20 stations, which are allocated by the Captain of the Port at the beginning of each season. The stations have such names as Prince, Fountain, Breast, Beautiful, Dirty, Saint Agatha, and Grotto, and are rotated among the fleet.

On the station a big boat, the *feluca*, with a disproportionately tall mast, serves as a

* See "Sicily Again in the Path of War," by Maynard Owen Williams, NATIONAL GEOGRAPHIC MAGAZINE, September, 1943.

floating observation platform. Two small craft, the *ontri*, tie up to the parent vessel. Atop the high mast a lookout stands for a 4-hour trick, scanning through narrowed eyelids the blue sunlit strait.

The lookout usually faces upstream, as fish swimming with the current are swept by rapidly; occasionally he turns and searches the sea around him.

Current Reverses Every Six Hours

"Downstream" and "upstream" are not fixed terms in the strait, because the 6-mile-an-hour current normally changes direction every six hours. The Ionian Sea to the south and the Tyrrhenian at the north end of the narrow strait have different tidal levels, and, when the tide changes, this difference causes violent currents and whirlpools.*

I sat in one of the small boats several hours a day for three days, waiting for the appearance of a fish.

Six men man these little craft: the boss, who is also the harpooner; four oarsmen; and the lookout, who directs the actual pursuit of a swordfish. I was eager to film this mode of fishing, but I had been told that it would be impossible for me to get into the small boat that did the harpooning because I would be in the way during the speed and excitement of the chase. But it was typical of the generosity of the Sicilian fishermen that they immediately invited me to join them. While we sat in the rocking boat under the blazing sun, the men tossed me bits of swordfishing lore.

"What brings the swordfish here? Oh, they're like tourists," said Francesco.

"Tourists nothing!" scoffed another. "They're here on more serious business; it's their breeding season. Haven't you seen them swimming in pairs?"

"If the female of a pair is harpooned," the captain said, "the male hangs about, and often we can get him too."

As we talked, the boats streamed at the ends of their painters. The current that gurgled and slapped at their sides flowed south through the strait.

When opposing currents meet, or encounter a sudden change in depth, whirlpools form. In their early stages, before they become a smooth-sided whirling funnel, the currents meet with a clash of whitecaps, a peculiar soundless agitation of waters that resembles a school of fish breaking on the surface. With their sense of metaphor the Italians call these whirlpools *garòfali*, carnations; the agitated waters certainly resemble that flower with its tight whorl of notched petals.

Classical sailors dreaded the passage through the strait, particularly through the narrow part close to where we were anchored. Here a rock called Scylla on the Italian mainland nearly touches the point of Sicily, three-and-a-half miles away. Off the Sicilian shore the ancients placed Charybdis, a monster lying in wait for luckless mariners. Actually it is a whirlpool. They also feared a monster that lived in a cave in the rock of Scylla.

The hours dragged on, the lookout clung to his high platform, and some of the men fell asleep.

We had been three days without sighting a fish, though our position moved up one station each day. The men, whose daily bread—literally—depended on their success, talked ruefully, but without real bitterness.

To while away the time, Nino, one of the crew, stood up and began to sing in a Sicilian imitation of the Neapolitan dialect.

A shout from the lookout came with such suddenness that Nino tumbled into the stern sheets as the captain leaped for the painter and cast off. Everyone automatically took his place, the men at the oars standing facing forward, the captain on his harpooner's platform forward, and Nino on his short lookout mast amidships.

I jumped on the midships thwart, my left arm and leg round the stubby mast, my right leg spread wide with the foot close to the gunwale, so that the oarsman immediately behind me could sweep forward without striking me with the loom of his oar.

Harpooning a Swordfish

Hugging the mast with my left arm and with Nino's feet just touching my head, I held the camera to my eye. As eager as I was to make the picture, my chief fear was of hindering my kind friends in the capture of their first fish in three days.

All this had taken about five seconds. Now we were scudding over the water, guided by the shouted directions of the lookout high above the big vessel. The swordfish first circled out to sea, then doubled on his track.

When Nino caught sight of him, he jumped

* See "Fishing in the Whirlpool of Charybdis," by Paul A. Zahl, National Geographic Magazine, November, 1953.

up and down in frenzied eagerness, the soles of his feet slapping my head as he shouted, "*Forte, Nicolo! Forte, Francesco!*"

The fish straightened and swam just beneath the surface as we closed to five yards, when suddenly the lookout cried, "Stop all!" Silent now, the boat shot a length ahead, pushing a suddenly audible bow wave, and at the same instant the boss cried, "Blessed St. Mark!" and let fly his 14-foot harpoon. It struck solidly, the line snaked out from the basket where it lay in coils, and the swordfish, held fast by the barbed spearhead, towed the boat out to sea.

The fishermen calculate half an hour to each 100 pounds when bringing a fish to boat. This time ours came in quickly, as he weighed only 90 pounds. Small as he was, the men were overjoyed at catching something after so long a wait. With a formal air the captain cut out the choice saddle just back of the shoulder and presented it to me. I protested, but the crew would not hear of my not accepting.

My good friends put me ashore at Ganzirri beach, pointing out a restaurant where, they said, the swordfish would be cooked in proper Messina style.

An hour later I sat on the terrace, facing the strait, which at the change of tides, the "balanced waters" of the fishermen, reflected a mauve afterglow on its glassy surface. I had eaten a couple of dozen fresh mussels, which had been cultivated in the lagoon at my back. Now my host placed his masterpiece before me: roast swordfish steak, with pungent Sicilian lemon and a delicate caper sauce. A dry and heady white wine from the slopes of Etna completed one of the repasts that I shall always remember, both for itself and for the generosity of the humble men who furnished its centerpiece.

Wind and Fire Gods Dwelt on Vulcano

One day I sailed from Messina through the strait to the Aeolian Islands (Isole Eolie). We nosed out of the harbor at dawn, over leadenly glistening water, past the cape of Scylla, and out into the suddenly blue Tyrrhenian Sea.

The first island of the Aeolian, or Volcanic, group that we raised was the largest, Lipari. A white gleam, low on the horizon, slowly rose to become the island's pumice mountainsides.

A boatman, who rowed standing and facing forward, like nearly all men of the Mediterranean, ferried me from Lipari to the island of Vulcano. On the way we passed towering *faraglioni*, volcanic needles rising black and sheer from the sea (page 48).

Vulcano has more than its share of legend, even for the Mediterranean. For here were supposed to live not only Vulcan, god of fire, but also Aeolus, god of the winds. Aeolus's dwelling turned out to be a disappointing series of shallow caves.

Alum Forms a Bitter "Snow"

But Vulcano's crater, though innocent of violent eruptions for more than half a century, looked like a fire god's dwelling. Fumaroles hissed and puffed on the slopes of the wide and deep crater, their evil-smelling fumes staining the lava debris with bright-yellow sulphur (pages 41, 42-43). With the sun beating down and the earth's heat underfoot, it was suffocatingly hot in the crater of this mother volcano, the archetype, so to speak, from which they all take their name. For in Italy vulcanology got its earliest start, and many of the terms used in the science are Italian in origin.

Round the steam vents on Vulcano's slopes sulphur had condensed in vivid yellow needle-shaped crystals. Alum formed crystals of glistening white "snow." I made the mistake of tasting a bit of this on the end of my finger. The nauseating bitterness stayed with me for the rest of the day.

Toiling back up the loose rubble of the slope to the crater's rim, we slipped back constantly, and I was reminded of the underworld tortures of Sisyphus, son of Aeolus, who rolled a rock up an incline only to have it slip and come thundering down again, over and over, endlessly, as in a nightmare.

That evening I stood on the beach watching a blood-red sun, distorted to oblateness by the atmosphere till it seemed to bulge at the equator like Jupiter, sink into the sea. Against the orange afterglow a triangular lateen sail moved in black silhouette like the backward-curving dorsal fin of some super shark, leaving a coppery track on the sea.

Italians are a nation of divers. From earliest times the inhabitants of the peninsula and its islands have gone down into their limpid seas. Frogmen and goggle fishermen first saw bottom here. During the days of the Empire the Romans employed men with the curious

(Continued on page 37)

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Ektachrome by Duncan Edwards

Taormina's Festival Dress Shows Against the Mediterranean's Blue and Etna's Snow

Clinging to its seaside hills, Taormina offers such incomparable views that it has become a favorite resort of painters and writers. The girl sits amid the ruins of the town's ancient Greek theater (page 12).

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↑ **Fishing Nets Drying on Boats and Boulevard Symbolize Palermo's Oneness with the Sea** ↓

Above: Mount Pellegrino, looming across the bay, was to the poet Goethe so beautiful as to defy description. Below: Nets used to trap anchovies by night are spread each morning to catch the sun on a waterfront avenue. The nets take their color from a preservative.

Yard-high Marionettes Enact Chivalry's Dramas in Acireale

Animated with clashing swordplay, the puppet theater is beloved by Sicilians. Scripts handed down for generations tell stories in serial form. Most deal with the Sicilian Vespers, the 13th-century fight for independence from the Normans.

The marionettes have removable heads, so that a few basic bodies can play scores of roles. Once a character has been killed, his head may not be used for weeks lest the audience jeer.

These characters wear brass armor beaten from shell cases used by the British in bombarding German positions during World War II.

← Long iron rods to body and arms and lines to shields control the marionettes from the operator's platform above the stage.

→ Messina Cathedral suffered from a 1908 earthquake, which wrecked the original structure, and World War II bombs, which damaged the restoration slightly.

The modern bell tower houses the world's largest astronomical clock, a product of Strasbourg, France. Midday's display of robot figures always attracts a crowd. First, feminine effigies strike the hour with hammers. Then the rampant lion beneath the dial switches his tail, waves his banner, throws back his head, and roars. The four ages of man pass before Death, who waves his scythe over each. The cock (inset) flaps his wings and crows. Christ rises from His tomb as Roman guards look up in amazement. Six figures file past and bow before the Virgin.

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Kodachromes by Luis Marden, National Geographic Staff

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Tomatoes, Italian Cookery's Most Important Ingredient, Fill a Piazza in Agrigento

Though Sicilians like fresh tomatoes in salads, they use them chiefly to make a sauce for spaghetti and other *pasta* dishes. The New World discovered by Columbus gave tomatoes to his native Italy.

© Kodachromes by Luis Marden, National Geographic Staff

↑ **Mediterranean Gourmets Love Octopus, 8-armed Delicacy of the Sea**

Vendors in Mondello, near Palermo, set up booths along the waterfront each Sunday to sell boiled octopus and squid for eating on the spot. Most succulent are the smaller octopuses (on plate). Big fellows, like the 4-armed cut shown here, may be rubbery and tough.

↓ **Tomato Paste Dries and Thickens in Hot Syracusan Sunlight**

Tomatoes are pressed through sieves to form the paste for Italian sauces. Tomato conserve, prepared under summer sun, keeps well through the winter. Fresh slices drying on the board at left will be used in winter salads and garnishes.

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Papyrus, Which Keeps Its Feet in Water, Gave the World a Word: Paper

Ancient Egyptians made paper from slices of succulent papyrus stalk. A Sicilian savant rediscovered the art two centuries ago. These men gather the reed, an old import from Egypt, in the Ciane River near Syracuse.

Latin name of *urinatores*—divers—to swim just under the surface, breathing from goatskins or through reed tubes, and approach enemy ships to scuttle them or set them afire.

And the modern sport of underwater hunting of fish first became formalized in Italy. Today there are no more enthusiastic gogglers than the Italians, and history records what the frogmen, riding astride 2-man torpedoes of Italian invention, did to the British naval units in Gibraltar and Alexandria.

Never have I seen seas so clear as in the Volcanic Islands. When I floated in the waters off Vulcano and Stromboli, I seemed to be suspended over a soundless landscape that suggested the dead vistas of the moon.

Silvery Bubbles Rise from the Sea

Like the moon, too, the bottom round these islands shows evidence of some colossal cataclysm. Cyclopean blocks of stone and contorted masses of congealed lava looming up from the sea bed recall the elemental forces of vulcanism and record a cataclysm of such magnitude as to stagger the imagination. Over this bottom the goggler floats, silent and awed, watching the black slopes slide down into the luminous blue haze of depth.

Off the island of Panarea, submarine gas jets release strings of silvery bubbles in deep water. The columns of bubbles rise slowly in wavering lines, loose ropes of silver globes, expanding as they near the surface.

Some bottoms wear a thick carpet of grass-like yellow weed that bends first one way, then back, with the surge of the sea, like a boy's close-cropped hair ruffled by a breeze.

At Strombolicchio—Little Stromboli—I watched goggle fishermen jackknife, then surface dive vertically downward, swimming with the aid of rubber fins. Staying under for more than a minute, they peered into crevices in the face of the rock looking for the *cernia*, a fat grouper. I saw one goggler thrust his gun into a crack, heard a dull *chung*, and watched the fisherman haul in a struggling 15-pound fish.

Italians, though they pioneered in the use of oxygen-breathing apparatus, are especially adept at diving without breathing equipment. In 1952 Lt. Raimondo Bucher of the Italian Air Force achieved the world's record depth. Wearing only a goggle and rubber fins, he dived to an amazing 128 feet off Capri.

Stromboli is nothing more than a volcanic cone rising from the sea. There is barely room for the island's little towns to cling to the edges of the mountain, which rises from a 3,000-foot depth.

The padre at the main village of San Vincenzo told me of the large numbers of emigrants who had left the island for the United States, Australia, and Argentina.

"Before the war we had 3,500 inhabitants on the island," he said. "Now there are barely 700. Many of our houses stand empty, and those destroyed by eruptions of our mountain are seldom rebuilt."

If the undersea landscapes round the Volcanic Islands are lunar, with their eerie blue-green luminosity, the topside of Stromboli is Martian, a desolate scene in red and black.

One day I climbed to the top, 3,038 feet above the sea, well before dark, and clambered down a ridge to look into the active mouth of the volcano. It was steaming quietly when I reached a spur that overlooked the depths, but suddenly there was a rushing sound, like an explosive exhalation on a gigantic scale, and black fragments of slag flew into the air and pattered on the slopes (page 16).

Within the gaping interior of the mountain there were several holes. The guide pointed to the biggest crater and said, "It is not that mouth which makes the fire; that one has already spilled lava and finds itself satisfied; its belly is empty. The fire comes from down there under the steam clouds."

Descent Like a Dream Treadmill

After dark we stood on the highest part of the main crater's edge, watching the sporadically erupting inner mouth spew red tracer into the air (page 17). When the cold wind blew inland from the sea, particles of glass-like lava stung our faces.

To descend more quickly, we started down the far side of the mountain, skidding on a 50-degree slope of soft volcanic ash. In nearly absolute blackness we stumbled down the yielding stuff as if on the endless soft treadmill of a dream. It was a relief to come to straggling groves of olive trees, to the vineyards, and so at last to the town.

When I sailed away from Stromboli one morning, the little ship skirted the edge of the great cone and passed close under the Sciara del Fuoco, the long black slide down which the lava fragments and streams of liquid rock come flowing, striking the sea with explosions, hissings, and clouds of steam.

The ship put in at Milazzo, on a thin finger

of land that stretches toward the Aeolians from Sicily's mainland. From here I took an inland route to Palermo.

Sicily's hinterland is a jumble of mountains and hills. The road wound down into valleys that in spring were brilliant with carpets of poppies, purple lupines, and yellow broom, but in midsummer are a uniform yellow-brown of wheatfields and sun-seared grass. Stone towns loomed from the crests of mountains.

Beyond Enna, near the geographical center of the island, I passed the yawning mouths of sulphur mines, strangely enough far removed from any active volcanoes. Miners bring up dull-colored rock that is heated in furnaces to draw off the liquefied sulphur.

Tuna Trap Brought by Moors

One day in Palermo I received a telegram from the director of the Favignana fishery: the tuna had appeared in force and it was time for a *mattanza*—a killing.

Late each spring, as they have since the dawn of time, the tuna reappear in the waters of Sicily, swimming south on their annual breeding migration.

No one knows with certainty where they come from. One school used to maintain that they entered the Mediterranean from the open Atlantic; another describes a vertical migration, the tuna staying in deep water most of the year and coming to the surface to swim southward in the spring.

The huge fish reappear early in May, and the migration lasts until the end of June. This is the happy time, when the tuna, "traveling on the left eye"—that is, keeping the coast on their left—swim toward Africa. During July the fish, having mated and spawned, return northward, but this time in smaller groups, thinner, hungrier, and wiser, and the net fishing is not so good.

I took ship at Trapani to go over to the Egadi Islands to see the great *tonnara* of Favignana, largest in the Mediterranean. The tonnara is the system of nets stretched across the migration path of the giant fish.

There are stone quarries on Favignana, and the people grow some grapes, but tuna fishing is the chief business of the island. In a wineshop that night the secretary of the fishery introduced me to some of the fishermen who would man the nets at dawn next morning.

I met the *rais*, captain of the fishery, a mustached old man with kindly eyes and a sharp jutting chin. The Arabic word "rais" is one of many Moorish terms used in the tonnara. The rais told me that the tonnara had been brought to Sicily from North Africa and that the records of the Favignana nets went back unbroken to the 17th century.

"We have a man constantly on watch," said the rais. "He looks down through a glass-bottomed bucket and counts the fish as they come in. Then he opens the netting doors to let the fish pass from one chamber to another. When he thinks there are enough to warrant a killing, he sends word to me."

At dawn I stood on the pier beneath a high bare hill and watched the black boats assemble in the yellow morning light. The heavy work boats were towed out in a long string to the nets about a mile offshore. I went in the last small boat with the rais.

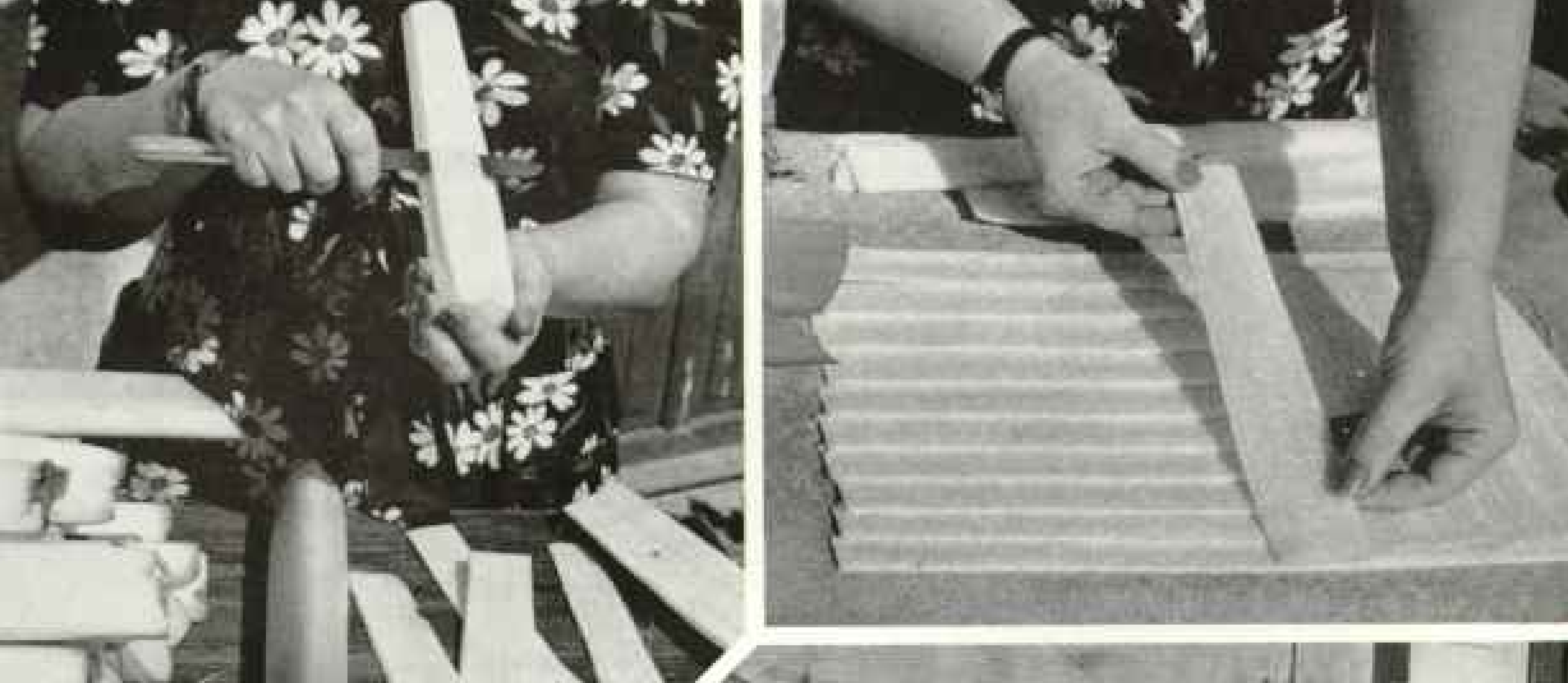
The tonnara is a net system stretching from the surface to the ocean floor in two main parts (page 10). The foot, a barrier a mile and a half long, stretches from the shore across the migration path of the tuna. This net deflects the fish, which turn shoreward and then encounter another, shorter barrier that conducts them to the door leading into a series of enclosed traps or chambers. The last of these, the "chamber of death," is the only one that has a netting floor. When the tuna are at last gathered in this trap, the men haul the floor almost to the surface, then pull out the wildly charging fish with hooks on the ends of long poles. This is the mattanza.

Our towboat cast us off close to a bobbing buoy. The men took off their caps and chorused, "Good morning, St. Peter!" The saint's picture on the buoy seemed to nod.

Fish Swim into Chamber of Death

The other boats continued on to the lines of floats marking the end of the series of chambers and formed a U round three sides of the chamber of death.

Our little boat moved in over the gate and down to the second of the eight chambers. The boat had a small glass-bottomed well amidships, and I sat over this, huddled under an old sail. I pressed my face to the luminous blue-green window, and when my eyes grew accustomed to the dim light, I saw them. Enormous shadowy fish, fusiform and compact as submarines, slowly swimming about 20 feet down, endlessly going round in counterclockwise circles. Their sickle tails flicked from side to side, and flecks of yellow light gleamed from caudal finlets.



↑ Paper from Papyrus: Syracuse Practices a "Lost" Art

Two sisters carry on the making of paper from papyrus, an ancient Egyptian invention rediscovered by a Syracusan in the 18th century (page 36). Only the bleached parts of the stalk that grow below water are used. Here Signorina Naro slices a stalk and lays thin strips in overlapping rows (upper right). A second layer crosses at right angles.

→ Folded in a cloth, the strips pass through rollers.

↓ A damp finished sheet shows the crisscross pattern.

Moors Introduced Papyrus into Sicily from Egypt

Paper made from papyrus stalks was invented about 4,000 years before Christ. It was partly superseded by vellum and parchment, which gave way in the 10th century to paper as we know it today.

Papyrus replaced the clumsy clay tablets on which the Babylonians and others impressed their cuneiform writing. Literary specimens preserved in museums are written mostly in Egyptian, Greek, and Latin.

Ancient Egyptians literally absorbed knowledge by washing off the ink of papyrus texts in beer, then drinking the mixture.

As I watched, a head and a powerful whiff of tobacco entered my sail tent.

"Pretty, eh?" said the head. "That big one'll go better than 700 pounds. Why don't they break out? Ha, they could if they tried: the netting's only thin coconut fiber! But—" the fisherman chuckled—"right now the tuna are foolish, because they are in love. It doesn't occur to a lovesick tuna to try to break out of a net; no, he swims patiently round and round, like a sheep."

The sea is 100 feet deep at this point, and the tuna would sometimes sink so deep as they circled that they became ghostly yellow-green outlines in the cobalt depths.

Another boat had moved up to the entrance to the next chamber. With a boat hook a man lifted the netting door.

Broken Crockery Lures Tuna

A fisherman at the open gate threw bits of broken white crockery in the water. As they sank, the shards fluttered like falling leaves, and their surfaces sent moons of white light glancing through the water. Eventually a curious tuna would go to investigate, then swim through the gate.

When the great fish came close to my window, I could see marks of bites they had given each other, the fishermen said, in amorous excitement. Suddenly I saw them stream toward the gate, head to tail, in one swift movement. Like sheep, they had all followed the leader. The netting was pulled up behind them, and we settled to wait patiently for them to move into the next chamber and then, finally, into the fatal last chamber.

When they were all in and the gate had been closed, the black *vascello*, biggest boat of all, moved in. Only the rais's boat remained inside the closed rectangle.

The net on three sides of the rectangle had already been hauled to take up slack from the "body," or net floor. Now the vascello men, standing on broad gunwales, began to pull the flooring up from its 100-foot depth.

They pulled anyhow at first; then, as the heaviest netting neared the top, they began a chantey, swaying and hauling in unison like a corps de ballet. They chanted in Sicilian mixed with Arabic:

E' San Petru piscaturi
Aia mola! Aia mola!

The rectangle of sea, sheltered by the black hulls and the crowded fishermen, remained green and calm at first. As the net floor came closer to the surface, black shapes darted about in panic, tail fins cut the water, and a shout rose from the men. Then pandemonium broke loose.

The beating tails of charging fish sent fountains of spray into the air, and the water boiled as they hurled themselves at the netting walls. But this part of the net was made of heavy rope, and their effort was useless. The fish churned madly as the men fastened off the net and picked up hooked poles. With shouts and imprecations they stabbed at the mass of churning fish, two or three hooking into the same torpedo body.

As many as six men would take hold of one 600-pound tuna to pull the monster over the gunwale. There would come a point when the water no longer buoyed up the great weight and the giant fish was poised halfway, when the group seemed frozen as in a tableau. Suddenly the men would give one more concerted heave, and the fish would tip and slide headfirst into the boat as the men bent like sheaves of wheat on each side, away from the thrashing tail that was capable of crushing a skull with one blow (pages 10-11).

As the heavy vascello filled with the thrashing fish, it trembled with the vibration of the monsters. The sea reddened with blood. Spray spouted into the air, and the men, maddened by the primitive struggle, yelled, shouted, and cursed.

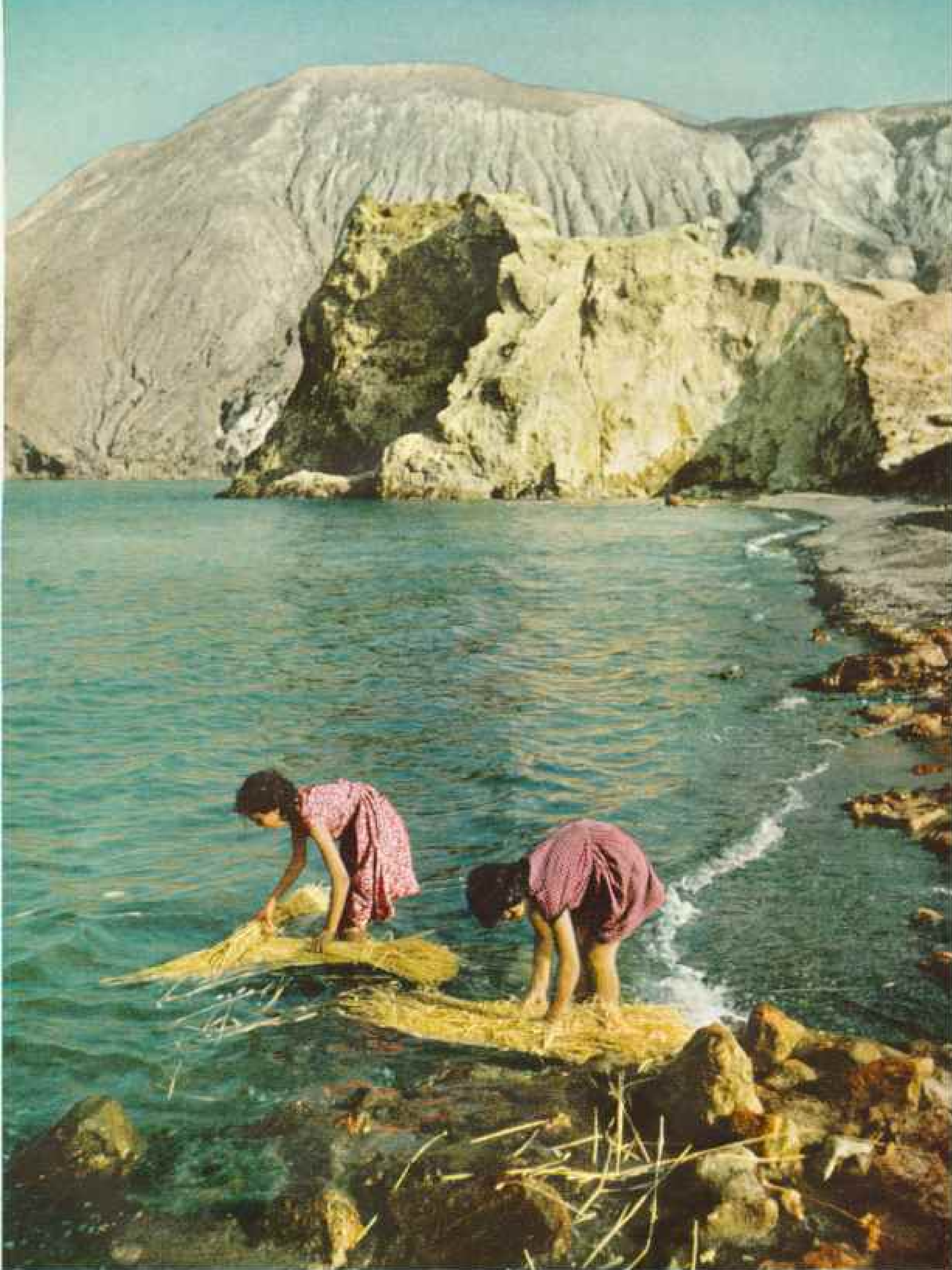
One by one the fish came into the boat and the tumult died down, until a small lone tuna, which had been ceaselessly circling his prison, was harpooned and boated.

Fishermen Give Thanks for Catch

Then, as suddenly as the uproar had begun, there fell a dead silence. The fishermen, standing on the gunwales in their wet and bloodstained clothes, removed their caps and bowed their heads, thanking God for sending them once more the harvest of the sea.

The net floor was unfastened and allowed to sink slowly to the bottom; the boats formed once more in line and were taken in tow. I rode in the vascello with the 88 tuna. The sea was strangely quiet and peaceful after the noise and excitement of the last half hour.

As we came into harbor, three fishing vessels hoisted rust-red sails and moved slowly out to sea to take up their positions for the night's work. The cycle of fishing, like that of life itself, goes endlessly on in Sicily.



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Vulcano Island Girls Wash Wheat Straw in a Sea Heated by Submarine Gas

Old Vulcano, which rises in the background, gave its name to volcanoes everywhere (pages 42, 43). Swimmers enjoy warm baths merely by floating above bubbles gurgling up from vents in the ocean floor.

← Vulcan, God of Fire, Dwelt in Vulcano

The ancients believed the god's forge kept smoke and fire issuing from the crater. Vulcano, namesake of the world's volcanoes, has not had a violent eruption in years, but its heat and sulphur fumes still make its slopes uncomfortable.

→ Condensing steam deposits crystals of sulphur within the crater. The yellowed boulder is a volcanic bomb, a mass of lava once violently ejected from Vulcano's depths. Passing rapidly through cold upper air, the molten globule cooled more quickly outside than in, causing the skin to crack and giving the bomb its characteristic bread-crust appearance.

↓ Sulphur Flowers Grow Around a Steam Jet

This delicate formation would crumble if roughly touched. An invisible flow of steam hot enough to scald issues from the vent. The man's hand is safe beneath the opening.

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Kodachromes by Luis Marden, National Geographic Staff

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Sicily's Most Famous View: Mount Etna from Taormina's Ancient Greek Theater

The theater was rebuilt so thoroughly in Roman times that the ruin is more Roman than Greek. Performances are sometimes given on the old stage. Columns taken from the structure flank the door of a house in Taormina.

Kodachrome by Luis Marden, National Geographic Staff

Etna's Steam Plume, Hot Breath of a Sleeping Giant, Rides a Wind to Sea

History records more than 50 major eruptions of Mount Etna, Europe's highest active volcano. Its last violent outbreak occurred in 1950. Lack of snow at the crest identifies this as a summer scene (page 29).

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As Dusk Spreads Its Purple Haze, Palermo Fishermen Light Lamps for Their Night's Work

Seen from a distance, fleets of these boats look like a lighted town. The radiance of their gas lamps attracts schools of small fish to the nets. The powered vessel (left) waits to tow the small boats out of Palermo harbor to stations at sea.

Pop-eyed Squid Fall Prey to a Bobbing Jig. Fishermen Use No Lamps to Lure the 10-armed Mollusks

Squid often go into spaghetti sauce; sometimes they stew in a brown sauce made from their own ink. Specimens at right are larger than the common squid (left). The Palermo fisherman jerks a jig, a spindle-shaped lead lure armed with barbless hooks.

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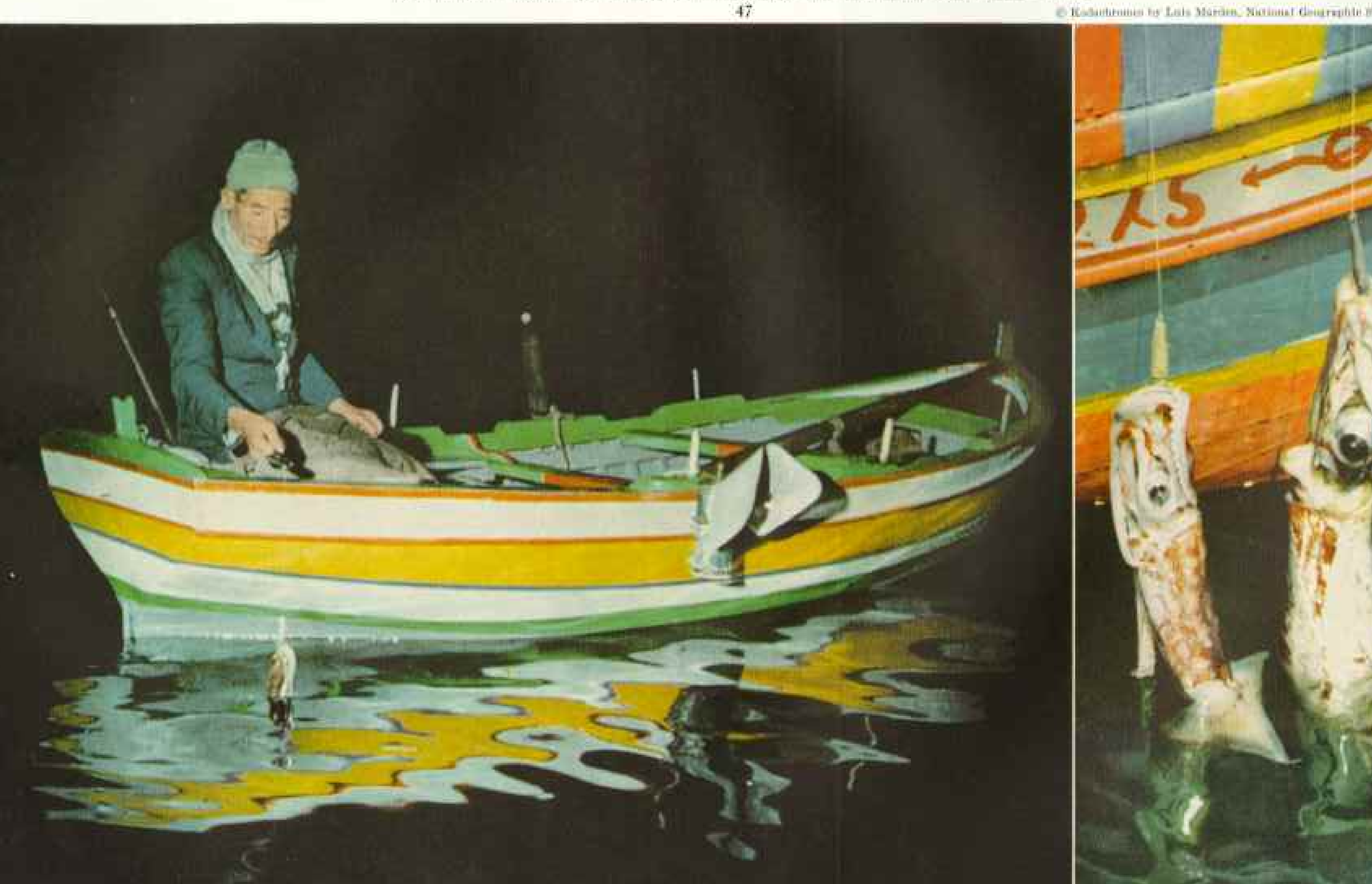

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↑ The Rising Sun Shows a Fiery Disk Through Etna's Steam Clouds

To be at the top by sunrise, climbers start the final leg of the ascent at midnight. A spectacular reward is the sight of Etna's triangular shadow stretching across the Catania plain. Clouds of gas issue, not from the main crater, but from a smaller and lower vent.

↓ Reddened by an Atmospheric Effect, the Sun Sinks into the Sea

A jagged extrusion of lava rising from the coast gives evidence of an eruption off Vulcano Island long ago. Common through the Aeolian Islands, such rocky pinnacles are called *faraglioni*. Waters here are so clear that they attract goggle fishermen from all parts of Italy.

Cruising Florida's Western Waterways

Four Men in a Houseboat Explore a Labyrinth of Jungle-girt, Spring-fed Streams Emptying into the Gulf of Mexico

By Rube Allyn

Illustrations by National Geographic Photographer Bates Littlehales

IT was a glorious morning on Tampa Bay. An hour-old sun gilded the wave tips and bathed St. Petersburg's sky line in a golden glow. A northeast breeze raised rolling swells as we rounded Point Pinellas, passed the tall supports of the 15-mile overwater Sunshine Skyway, and headed north.

White pelicans, flying in formation, wheeled from near-by Summer Resort Key. In the mangrove tangle of Indian Key, brown pelicans sat unafraid as we passed.

We were sailing on a cruise of Florida west-coast waterways in one of the most unorthodox craft the Sunshine State has ever seen. *Water Wagon* is a 26-foot, square-hulled houseboat designed specifically for shoal-draft navigation —and for comfort.

Our ultimate goal was the middle reaches of the storied Suwannee River; from its principal source in Georgia's Okefinokee Swamp, the stream follows a serpentine 240-mile course to the Gulf of Mexico. En route to the Suwannee we were to explore other beautiful streams emptying into the Gulf (map, page 55).*

Where Rivers Gush from the Earth

This coastal labyrinth is among the wonders of the United States. Many of its rivers seem to emerge full blown from the earth. Actually, some are born in swampy areas, but all are fed in part from subterranean reservoirs filled by infiltration through the limestone core underlying Florida's upland watersheds.

Rock formations under the riverbeds serve as filters; the water bubbles up crystal clear.

The largest of these rivers, the Withlacoochee, carries water enough to supply a city of 3,000,000 people; each of the next three pours out enough for a population of half a million.

Most of the rivers bear musical Indian names and course through dense jungle growth, a green barrier that has resisted shore-line development since De Soto's day.

Off for a holiday in this fabulous region, we were what west-coast newspapermen described as an "intrepid crew": Channing Cope, Atlanta journalist and radio commentator; Dorsey Newson, world traveler and resident of St. Petersburg; Bates Littlehales, a staff photographer for the National Geographic Magazine, and I, Rube Allyn, outdoor editor of the *St. Petersburg Times*. Four happier and more expectant mariners would be hard to find.

Craft Conceived on Midway Islands

Our unusual craft was the fruit of daydreams that had filled my head during long months of wartime duty in the Pacific. When I finally got back to Florida, plans I had traced on Midway Islands' sands were transferred to a naval architect's blueprints.

Water Wagon's flat bottom is reinforced by nine stout keels that act as guards and runners, permitting passage over rocks and fallen trees. Two 25-horsepower outboard motors move the boat at a lively clip.

Another feature is the vessel's sharply upswept bow. With block and tackle for pulling, motors for pushing, and the keels for sliding, we hoped to bull our way over such obstacles as tree trunks projecting above the water level. Barriers like these would defeat any other kind of boat.

Internally our craft is as efficient as a modern house trailer; comforts include bottled gas for cooking, a 110-volt electric system for lights and refrigeration, and hot and cold showers. The four of us slept on beds with innerspring mattresses; these converted into comfortable chairs for daytime hours.

At the start of our cruise friendly escort vessels from St. Pete and Clearwater accompanied *Water Wagon* as far as St. Joseph Sound and then turned back. We set a course for Anclote Keys Light, which was sighted at sunset. Beyond its flashing white lamp we dropped anchor in a cove off Anclote Keys (page 54).

At daybreak *Water Wagon*'s crew was up to

* See "Florida—The Fountain of Youth," by John Oliver La Gorce, National Geographic Magazine, January, 1930.

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↑ Yachts Assemble at Municipal Pier for a St. Petersburg Regatta

The Sunshine City at the mouth of Tampa Bay ranks as one of Florida's foremost yachting centers.

← *Water Wagon* receives a warm send-off at St. Petersburg. Wives and friends join crew members in dockside ceremonies.

↓ En Route to Hidden Coves, *Water Wagon* Ripples Tampa Bay

Two 25-horsepower outboard motors mounted at the stern propel the 26-foot houseboat. A steering wheel rises from the bow. Two decks provide space equivalent to that of a 40-foot boat. When lifted onto a wheeled cradle, the craft serves as an automobile trailer.

watch Nature's endless eat-or-be-eaten drama in the clear water of the Gulf. Grotesque octopuses edged warily out of their lairs; chunky groupers, hovering motionless near by, waited to gulp them down if they came within reach.

Sinister-looking sting rays flapped in from the channel, moving their fins rhythmically as they inspected the bottom for hermit crabs in search of their own breakfast of minute barnacles clinging to sea grass. A dusky shark glided silently behind a sting ray, awaiting the opportune moment to dash in and slice off a fin, then devour the cripple.

Hoisting anchor, we cruised up the Anclote River and snuggled into a berth at the Tarpon Springs dock beside the sponge-fishing vessel *Evdokia*. Capt. George Billiris, her owner, boasted that the 30-year-old ship is still one of the sturdiest members of the famous sponge fleet. Dozens like her bobbed side by side, bows to the quay.*

Evdokia, regarded as a "lucky" ship, holds an enviable record for her hauls of sponges. Her basic design—and that of her sister vessels—has been used by Greek fishermen for centuries. No major changes, except addition of engines, have ever been made.

Fried Octopus for Breakfast

The old-world atmosphere of Tarpon Springs is much the same as in a seaside Greek village. *Water Wagon*'s crew sauntered about the cobbled waterfront; on Athens Street we joined sponge divers and deckhands at a coffee shop (page 66). In near-by restaurants the preferred breakfast is fried squid and octopus, sweet pastry, and tiny cups of strong Greek coffee.

Later in the day we threaded our way up the Anclote in *Water Wagon*, moving from deserted marshland into virgin forest. Beneath a bluff two Negro fishermen squatted on a bit of sandy shore.

"Catching anything?" I asked.

"Sheepshead," one of them shouted. "They're the smartest fish! You can't catch a sheepshead till you learn to pull before he bites. It's the feelin' of the water that you yank on! If you wait for a sheepshead to bite, it's too late. He's done got your bait nipped off neat."

Thirty miles north of the Anclote we approached the Weekiwachee. Indians gave the stream its name, which means "little water." At its mouth a strong, sparkling flow greeted us. Clear as air, the river is alive with fish.

Red bay trees, bright with shiny berries, grow tall on each side of the Weekiwachee and intertwine overhead. When crushed, the leaves give off a delightful aroma. Edging the river banks, cypresses and giant oaks fight for space with magnolias, swamp maples, and sweet gums. Vines twine wherever there is space, and towering sabal palms push their fronds above the forest roof to reach the outer air.

Occasionally a stand of jack pines and spruce pines takes over, entwined with wild grapes and often festooned with the three-leafed gangster of the forest—poison ivy.

Water Wagon Climbs over Barriers

As we made our way up the mirrorlike river's verdant tunnel, we felt as Alice must have felt when she stepped through the looking glass (page 56).

Few boats of any size have attempted the passage up the Weekiwachee. Even in *Water Wagon* it was no trip for the timid.

Some of the dead trees in our path we lifted; others we pressed down and then vaulted over in a burst of full power. Precise timing was required in cutting the motors at the right moment to avoid piling into other obstructions. At some places the river was completely blocked; at others it was so narrow we had to cut away the banks and pull the boat through with block and tackle (page 63).

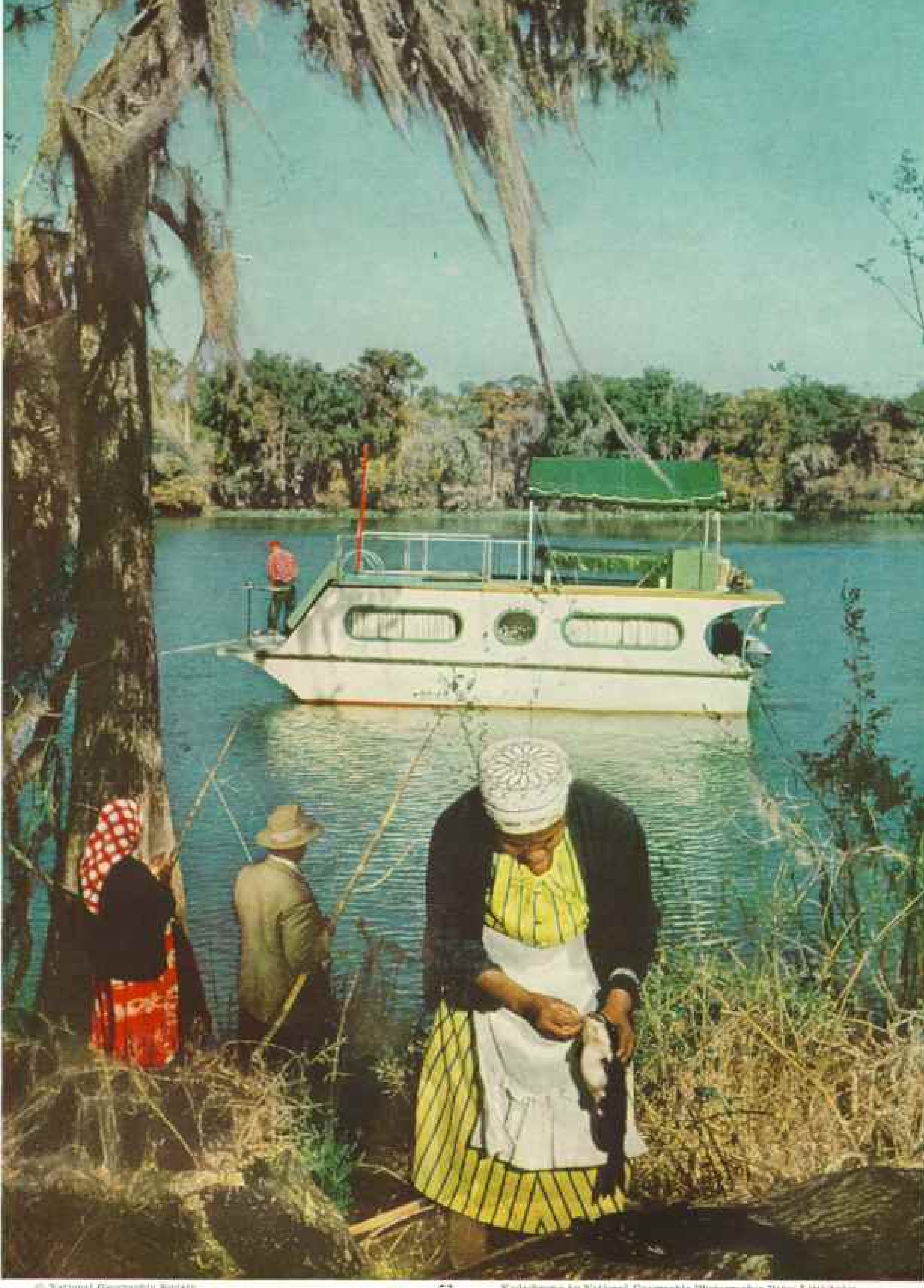
Around every curve our perspiring efforts were rewarded. Wild orchids flourish on the river's tangled banks, and tall, graceful pickerelweed, called *wampee* by the Indians, grows thickly at the water's edge.

Our craft sent wood ducks bursting into flight. Black-crowned night herons, Florida gallinules, and limpkins were plentiful. Tall gnarled trees supported the tangles of osprey nests; the high-voiced fish hawks wheeled above them.

Anhingas (snakebirds) hid behind driftwood branches and eyed us warily. Swimming with head and about 12 inches of neck showing, they looked like prehistoric reptiles. At a distance one would never guess that birds were attached to these sinister "serpents."

At Weekiwachee Spring, the headwaters of this challenging river, our lights picked up a man standing on the dock. He wore a re-

*See "Sponge Fishermen of Tarpon Springs," by Jennie E. Harris, NATIONAL GEOGRAPHIC MAGAZINE, January, 1947.



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Kodachrome by National Geographic Photographer Bates Littlehales

River Folk Beside the Lazy Suwannee Pull In Fat and Tasty Catfish

↑ ***Water Wagon* Cruises up the Anclote River**

Marshlands and virgin forests flank the stream above Tarpon Springs, home port of the sponge fleet (page 65).

← A 101-foot beacon on Anclote Keys guided the author to the mouth of the Anclote River. Its white light flashes across the Gulf at five-second intervals.

Florida State News Bureau

volver and a cowboy hat. As *Water Wagon* eased toward the dock, the man stared at us unbelievingly, and then blurted out:

"Where did you fellows come from?"

"St. Petersburg," Dorsey answered. "Surprised?"

Charlie Ross, the watchman, was surprised indeed. It took him a minute to find words.

"Well," he drawled, "let me tell you that if an aircraft carrier came up that river tomorrow I'd hold out my hand and say 'howdy.' I'll tell you, pardner, I've been here more than forty years—and until this day I didn't know a boat that big could get up this river."

The peace and quiet of Weekiwachee Spring seemed wonderful. After the backbreaking struggle up the river, *Water Wagon* floated

Sailing North, the Author's Party Hugged Florida's Gulf Coast →

Starting from St. Petersburg, the 4-man crew explored spring-fed streams flowing to the Gulf. They visited the Tarpon Springs sponge fleet, watched underwater ballerinas at Weekiwachee Spring, and relaxed in the charm of Cedar Key. Stephen Foster's shrine near White Springs, 145 miles up the serpentine Suwannee, climaxed the cruise.

serenely at anchor on a pool of clear water.

Then, as we turned in, the stillness of the night was split with blood-curdling screams; the sounds came from a limpkin. This long-necked brown-and-white wading bird was once hunted as food; now it is protected, existing only where it can find fresh-water snails, its favorite food.*

As we breakfasted next morning, *Water Wagon* was boarded by six pretty girls who announced that they were performers in Weekiwachee's underwater theater. The show is a graceful ballet in which skilled swimmers dance and swim weightlessly in the crystal water, followed by an assemblage of fish and turtles.

Spectators, seated in a glass-fronted underwater loge on the brink of a chasm 70 feet deep, have a clear view of the stage from which the "mermaids" appear. Sipping air

* See "Saving Man's Wildlife Heritage," by John H. Baker, NATIONAL GEOGRAPHIC MAGAZINE, November, 1954.

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Bearded Cypresses and Cabbage Palms Tower Above the Sparkling Weekiwachee

Weekiwachee's Indian name means "little water." The narrow stream winds 12 miles through a wilderness. Ten miles of swampland stretch to the south, 20 miles of forest to the north. Bright-feathered wood ducks inhabit this region, together with limpkins, black-crowned night herons, ospreys, and anhingas, or snakebirds. Razorlike sawgrass in foreground could cut a wader's bare skin to ribbons.

Kodachrome by National Geographic Photographer Bates Littlehales

Gliding Gulfward, *Water Wagon* Skirts Floating Beds of Water Hyacinth

Masses of pickerelweed and a dozen varieties of wild orchids flank clumps of palms and pines along the riverbanks. Issuing from scenic Weekiwachee Spring, the transparent waters swarm with fish and turtles. Overgrown banks hinder navigation as the river nears the Gulf. Upswept bow and runnerlike keels often lifted *Water Wagon* across fallen trees blocking the passage (page 63).

↑ **Canada Geese Serve as Live Decoys**

To lure the migratory birds farther south from overcrowded wintering grounds, the United States Fish and Wildlife Service clipped the wings of a captive flock and penned the birds near the Chassahowitzka River. Here a Service employee explains the experiment to the author (page 61).

↓ Deer abound along Florida's western waterways. This young doe eyes intruders near Crystal River.

Rube Allyn

Hugo H. Schroder

"See . . . It's Empty!"

This eastern brown pelican haunts St. Petersburg wharves for handouts. With pouch extended like a pocket turned inside out, the bird begs a refill.

***Water Wagon*'s Crew Feasts on Oysters at a Dockside Raw Bar**

The author (stooping) watches a Riverside Lodge attendant shuck one of the mollusks plucked from the mouth of the Homosassa. His companions stand ready for action.

from a hose, the girls finally dive and disappear in the depths (pages 70 and 71).

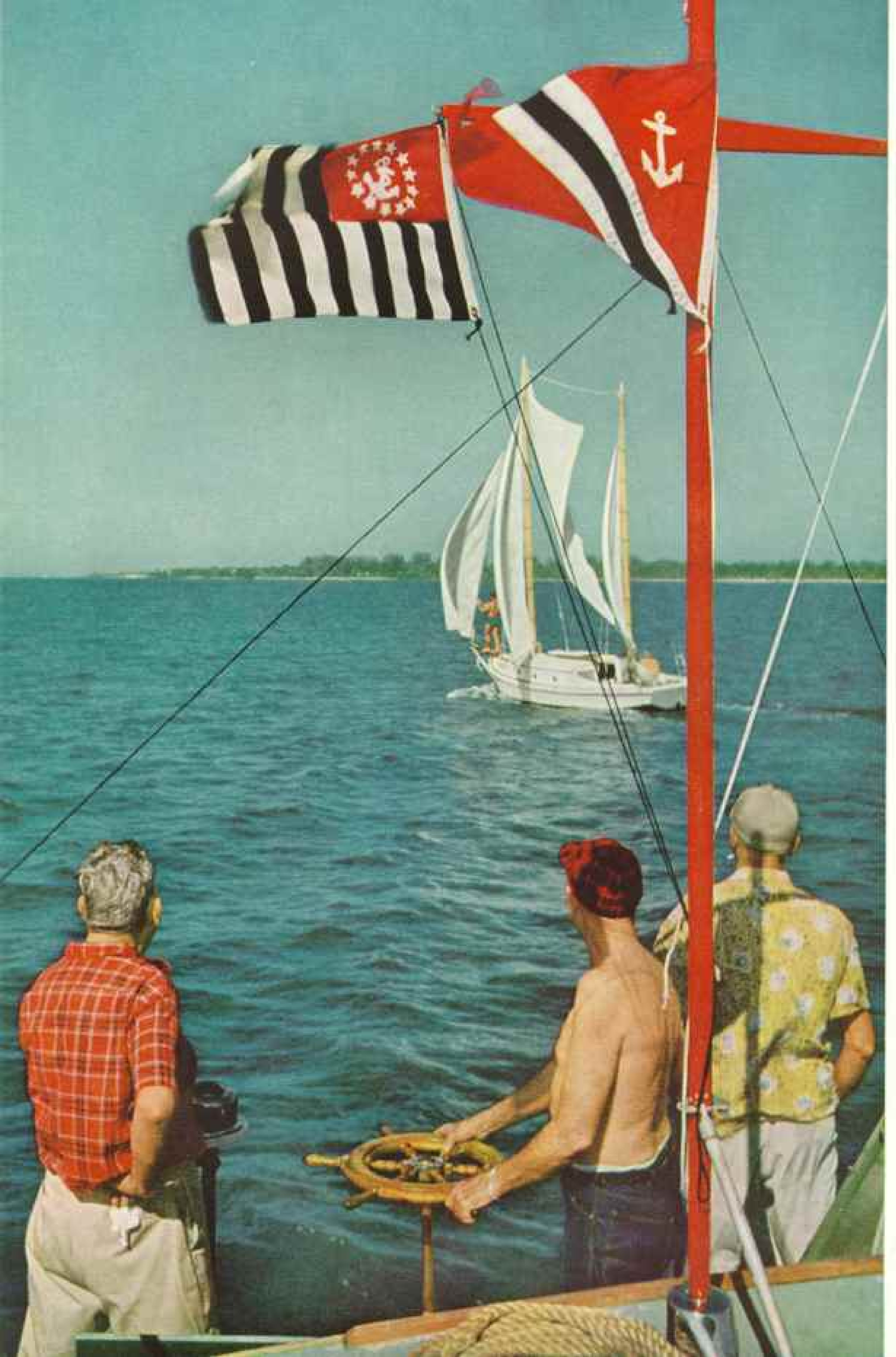
After the first show we were invited to float *Water Wagon* over the stage. Then we donned flippers and goggles to swim under water and explore the spring.

Eelgrass waved about us like wheat in a summer breeze. The cliffs framing the cavernous opening in the center of the spring are of dolomite, with outcrops of pure white clay. Fine white sand collects on rock ledges.

By going down in stages, taking frequent draughts from the air hose, it is possible to approach the very mouth of the tunnel, from which clear water gushes at a rate exceeding 100,000,000 gallons a day—enough for a city of more than half a million people.

When the earth was younger, seas rose and fell around Florida's coasts; ground water levels fluctuated with them and hollowed out subterranean reservoirs for Weekiwachee and 65 other major springs. Rain water followed fractures in the earth's crust to form sinkholes and underground cavities, now outlets for the limestone-filtered springs.

Getting back down the Weekiwachee proved almost as hazardous as the upstream voyage. The current was behind us now, and we dared not race around tight curves. At low power it was difficult to steer. *Water Wagon* crashed



into banks and mowed the grass on both sides, but somehow made it back to the Gulf. We spent the night anchored at the river mouth.

Next day startled flocks of coots swept above *Water Wagon* as we nosed into the Chassahowitzka River.

Safe behind markers that show the limits of the Chassahowitzka National Wildlife Refuge, mallards, ruddies, black ducks, and ringnecks swam in flocks. Canada geese honked mournfully in the distance. Rafts of baldpates swam on the river. Toward the Gulf we saw hooded mergansers, white pelicans, boat-tailed grackles, and herons of three species—little blue, great blue, and Louisiana.

Chassahowitzka is a Seminole name meaning "hanging pumpkin." As in other west-coast rivers, its water is sparkling. In contrast to the Weekiwachee, which has a heavy growth of hardwood trees to the water's edge, the Chassahowitzka's banks are grassy, the curves easy and gentle. Thick forests stand solidly on each side a few yards back from the river.

Seven miles upstream we were greeted by permanent residents—a family of otters. Unafraid of the boat and intensely curious, they followed us to a landing where a trail connecting with a paved highway met the river.

Otters Slide Like Kids in School

Otters, unlike many other forms of wildlife, are holding their own along Florida's rivers. These furry clowns of the animal world play many games for amusement; a favorite sport is sliding down slick banks into the stream.

The clear water of Chassahowitzka Springs, bubbling up from crevices and holes in the limestone, is surrounded by hovering giants—water oaks bearded with Spanish moss. As the sun moves across the sky, the oaks cast fantastic shadows resembling immense figures which appear to be studying the fish swimming below.

Bass, bluegill, and perch compete for space in the springs with salt-water species: channel bass (redfish, or red drum), sheepshead, mangrove snappers, and sea trout. Fish are especially numerous in the fall and winter, when Gulf waters are cool. Salt-water fish seem to love this clear river water, which stays close to 75° F. all year.

Kent Myers, manager of Chassahowitzka National Wildlife Refuge, loaded us aboard his air boat—a shallow-water craft driven by an airplane engine—for a fast look over the river country. Then we saw the geese I had heard when *Water Wagon* entered the river; with wings clipped, they were penned in the refuge. While the birds were growing new feathers, they served to lure other geese into the area (page 58).

Nature's Fish Bowl Inspires the Crew

From Chassahowitzka landing we cruised downstream, then northward in the Gulf to the Homosassa River mouth. Here we saw fishermen attach motors to the bows of their boats and operate the craft stern first. Nets are carried forward instead of aft as in other coastal waters.

I asked a fisherman about this unusual practice; he pondered carefully before answering.

"Well, it's like this," he told me. "Some people take a pointed bow and slice through the water and then drag the whole blamed river after 'em in backwash—and they ain't gettin' nowhere. We push our flat and slopin' end, like yours," he pointed to *Water Wagon's* bow, "over the waves, not through 'em. The sharpened end we trail, 'cause everybody knows that a canoe stern eases the backwash."

We cruised to the headwaters of the Homosassa River, then went ashore and inspected Nature's Fish Bowl, a spring-formed pool filled with snook up to 40 pounds in weight, mullet, sheepshead, catfish, mangrove snapper, and many other species.

The sight whetted our appetites for both fishing and the taste of fish. Until this moment we had disciplined ourselves and refrained from spending precious time with rod and reel. We could stand it no longer, however, and cast *Water Wagon* loose to drift downriver, fishing as we went. Long after sunset the sound of whirring reels, plopping lures, and cries of delight broke the stillness as one after another of the river's finny inhabitants hit our offerings.

Page 60

← Pleasure Boats Skim Tampa Bay, Where Galleons Bobbed 400 Years Ago

Conquistadors, searching for gold and pearls, berthed their fleets here in the 16th century. Five of Florida's springs empty into the twin-pronged bay; a 30-foot-deep channel carries ships to Tampa.

Water Wagon flies the triangular burgee of the St. Petersburg Yacht Club and the flag of the U. S. Power Squadron, an honorary unit of the Coast Guard. A ketch crosses her bow.

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Kodachrome by National Geographic Photographer Bates Littlehales

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Withlacoochee River Laps the Toes of a Bald Cypress Festooned with Moss

Cypress's fine-grained, rot-resistant wood makes it one of America's important timber trees. This hollow giant may have attained 500 years. The author found a flood mark on the trunk four feet above his head.

© Kodachromes by National Geographic Photographer Bates Littlehales

↑ All Hands Pole by Night Down the Narrow Weekiwachee

Sharp curves and strong current made steering difficult on the downstream run; the boat often crashed the overgrown banks. Swamp maple, sweet gum, and red bay trees grew to the river's edge and entwined overhead. Ralph Beville, a State wildlife officer (right), shared this part of the journey.

↓ Fallen Trees Block the Path on the Tedious Upstream Run

Water Wagon was the first large boat in several years to attempt passage of the Weekiwachee. Shallow draft enabled it to vault floating trees under full power; some logs had to be sawed apart or lifted with block and tackle. Here Channing Cope (left) and Dorsey Newson investigate a barricade.

Fog delayed us in the Homosassa and the sun was high when *Water Wagon* sailed for the Crystal River. Here again we threw discipline to the winds and happily took time out for another bout of serious fishing.

My first cast drew a blank, but Dorsey had a beautiful strike. On my next cast I hooked a sea trout. The fun was on.

Bates and Channing got their lures in the water quickly. The fish hit everything that we tossed at them. The four of us must have landed more than 100 in all. We counted 20 different kinds in an hour and a half. There was always a fish coming in, often four at a time. We kept only the large sea trout and released the others.

Fresh Fish, but No Manatee

The Crystal River is wide and deep, with no snags or trees to endanger a boat. Sweet bay, cedar, maple, and magnolia trees throw shadows over swirling pools created by bubbling springs.

Garfish rolled on the surface like miniature porpoises as we neared Crystal River village. At the harbor entrance sits a boat-shaped island; a house resembling a ship's cabin perches in its center. Lt. L. C. Poole, a retired submariner, and his wife built their snug harbor this way to preserve the feeling of living at sea.

The village, we found, is enjoying a modest boom; homeseekers have discovered its idyllic surroundings. Little change has occurred since settlers came from Georgia and set up a health camp a century ago. Today about 1,000 people, mostly fishermen and oystermen, live in Crystal River.

From our anchorage at near-by Paradise Point resort, we roamed the area, hoping to sight a manatee, the big, ungainly sea cow once plentiful on Florida's Gulf coast. A few survivors exist in Florida waters, including Crystal River. We examined deep pools teeming with fish, among them great tarpon, but no manatees appeared. As a consolation prize, we filled *Water Wagon's* refrigerator with redfish, trout, and bass.

A few hours took us out of the Crystal River into the open Gulf, and then to the Withlacoochee. Chugging upriver, we were struck by the abundance of bird life.

Willets, sanderlings, and sandpipers of different species scampered over rock piles on the Withlacoochee's sparse beaches. Royal and common terns were sighted, as were black vultures, fish crows, and kingfishers. Double-crested cormorants and herring gulls were plentiful. Each of us waited impatiently for a turn at the binoculars.

The Withlacoochee (little great water) differs from other Florida west-coast streams in being deep and narrow. One of the State's longest, it rises in the highlands of central Florida and winds for about 150 miles between verdant forests of cypress. Barges are towed 7 miles upstream against the current to Inglis. Oil is the principal cargo.

Four miles up the river, at Izaak Walton Lodge, we heard that a giant alligator, reputed to be 16 feet long, lived in the neighborhood. Bates and I set out to try to photograph the monster.

We saw the alligator, but it disappeared before we could get a picture. Both of us had cameras trained on the bank when we approached, but neither one caught more than half of the giant creature.

Water Wagon took us on to the Florida Power Corporation dam. Here foaming sheets of water cascade through a spillway into a swift whirlpool and rapids.

A channel of quiet water carried us around this dangerous stretch, and we entered a lock that lifted us 22 feet to the upper river. The dam has flooded what was once a thick forest of cedar and cypress. Now an immense lake takes its place; gaunt old cypress trunks pointed dead branches from its waters as we passed. Called the Backwater, it is regarded as one of Florida's premier territories for large-mouth bass.

Channing Swallows a Horse

About 12 miles upriver from the dam the Withlacoochee merges with the Rainbow River, the latter originating in Rainbow Springs, 5 miles north.

Enormous large-mouth bass inhabit the stream, lurking under tree roots along the bank and occasionally dashing out to capture a meal from passing schools of bluegills. Sight-seers study the teeming underwater world of the Withlacoochee from glass-bottom boats; others don Aqualungs to explore the depths.

As *Water Wagon* cruised downstream, a swift current transformed the leisurely craft into an express-speed cruiser. We logged better than 15 knots steadily. As we entered the Withlacoochee's mouth, I was about to sug-

(Continued on page 73)

↑ Tarpon Springs Girls Welcome the Author with a Sponge Lei

Florida's famous sponge fleet berths at Tarpon Springs, 27 miles north of St. Petersburg. From its gaily painted wooden boats seafaring Greek Americans dive to depths of 120 feet. Like farmers picking heads of lettuce, the divers pry loose sponges from the floor of the Gulf.

The sponge, a low form of marine life, wears a tenacious skin; its cells are filled with a gray jellylike substance. After the living matter is removed, the rubbery skeleton is cleaned, trimmed, and bleached.

Mr. Allyn's garland is fashioned from an unusually large sponge.

"He Was a Big One"→

Rare shells, marine specimens, and prized relics of Indian tribesmen adorn the private museum of St. Clair Whitman, historian at Cedar Key, near the mouth of the Suwannee River (page 66). The author holds the skull of a shark taken in local waters.

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Kodachromes by National Geographic Photographer Bates Littlehales

↑ **Gulf Swells at Cedar Key Lap the Piles of a Thatched Cottage**

Cedar Key, queen city of Florida's west coast in the late 19th century, owes its name to near-by forests which once fed pencil factories. In its heyday Cedar Key was a leading commercial port and rail center.

Stripped of its cedar resources, the town today caters to fishing enthusiasts and resort guests seeking solitude.

This sun-bleached, storm-braced dwelling houses a modern apartment. Tough fronds of the cabbage palm provide eye-catching thatch and porch umbrellas.

→ Members of *Water Wagon*'s crew join Greek fishermen at an open-air coffee shop on Athens Street, Tarpon Springs. Dorsey Newson, in blue shirt and cap, stands behind table at left; Channing Cope and the author, in red shirts, sit at right. Neighboring restaurants serve breakfasts of fried squid and octopus, pastry, and Greek coffee.

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↑ **Gourmet's Delight: the Succulent Stone Crab**

Common in the Caribbean, the stone crab became rare in Florida waters until conservationists took steps to save it. No crabs may be caught from mid-April to mid-October; only males with claws larger than four inches may be captured in the open season.

The crustacean is named for its hard-as-stone claws, which can crush fingers to the bone. Fishermen use traps resembling New England lobster pots.

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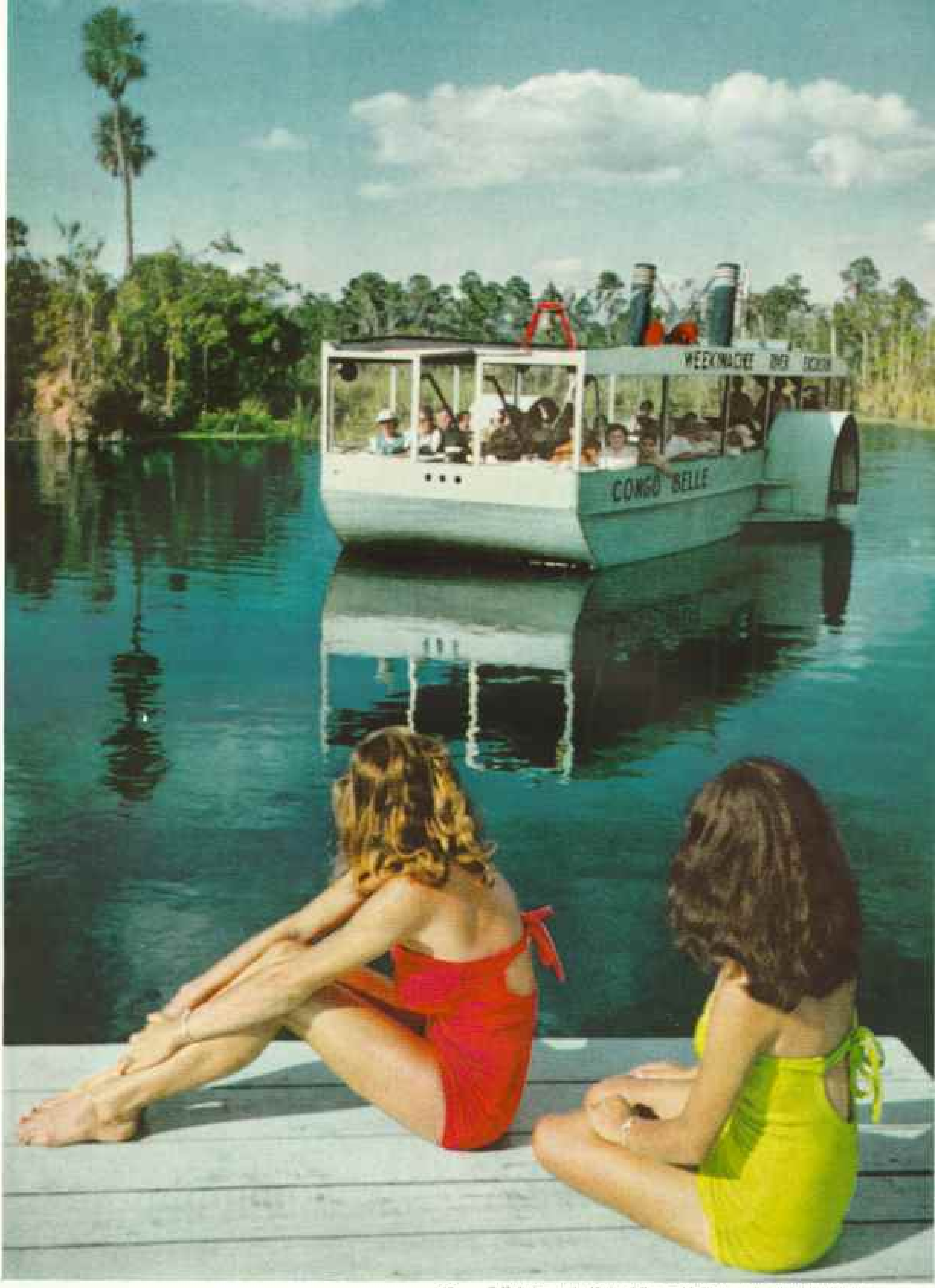
Noon on the Homosassa River: Beef Sizzles over Cedar Coals in the Topside Grill

Water Wagon contains a galley below decks, but the crew prefers outdoor lunches. The barbecue stove was designed to cook fish straight from the line, but these steaks from native cattle were also welcome.



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Excursionists Aboard the Paddle-wheeling *Congo Belle* Glide Down the Weekiwachee

Here and there the cruisers glimpse bears, panthers, baboons, and alligators caged along the shores by Al Zaebst, a big-game hunter. These bathing beauties perform in the underwater ballet at Weekiwachee Spring (pages 70 and 71).

← A Florida Mermaid Feeds Fish on the Floor of Weekiwachee Spring

Gushing more than 100,000,000 gallons a day, the spring flows out of a deep cavern. Its ballerinas, dancing and swimming among fish and turtles in 75-degree water, breathe compressed air from hoses. Glass-fronted masks over eyes and nose allow them to see under water; rubber flippers can increase swimming speed 50 percent.

Hungry fish hover about bread carried in waxed paper to prevent its dissolving.

↓ Spectators Stay Dry Below Water Level

Seated in a glassed-in loge beneath the surface, the audience watches performers eat, drink, and dive during a 35-minute show. Here the girls carry their face masks.

Weekiwachee, 52 miles north of St. Petersburg, is one of 66 major springs in Florida. Its even-tempered waters flow out of limestone. Weekiwachee River, spawned at the spring, winds 12 miles west to the Gulf (pages 56 and 69).

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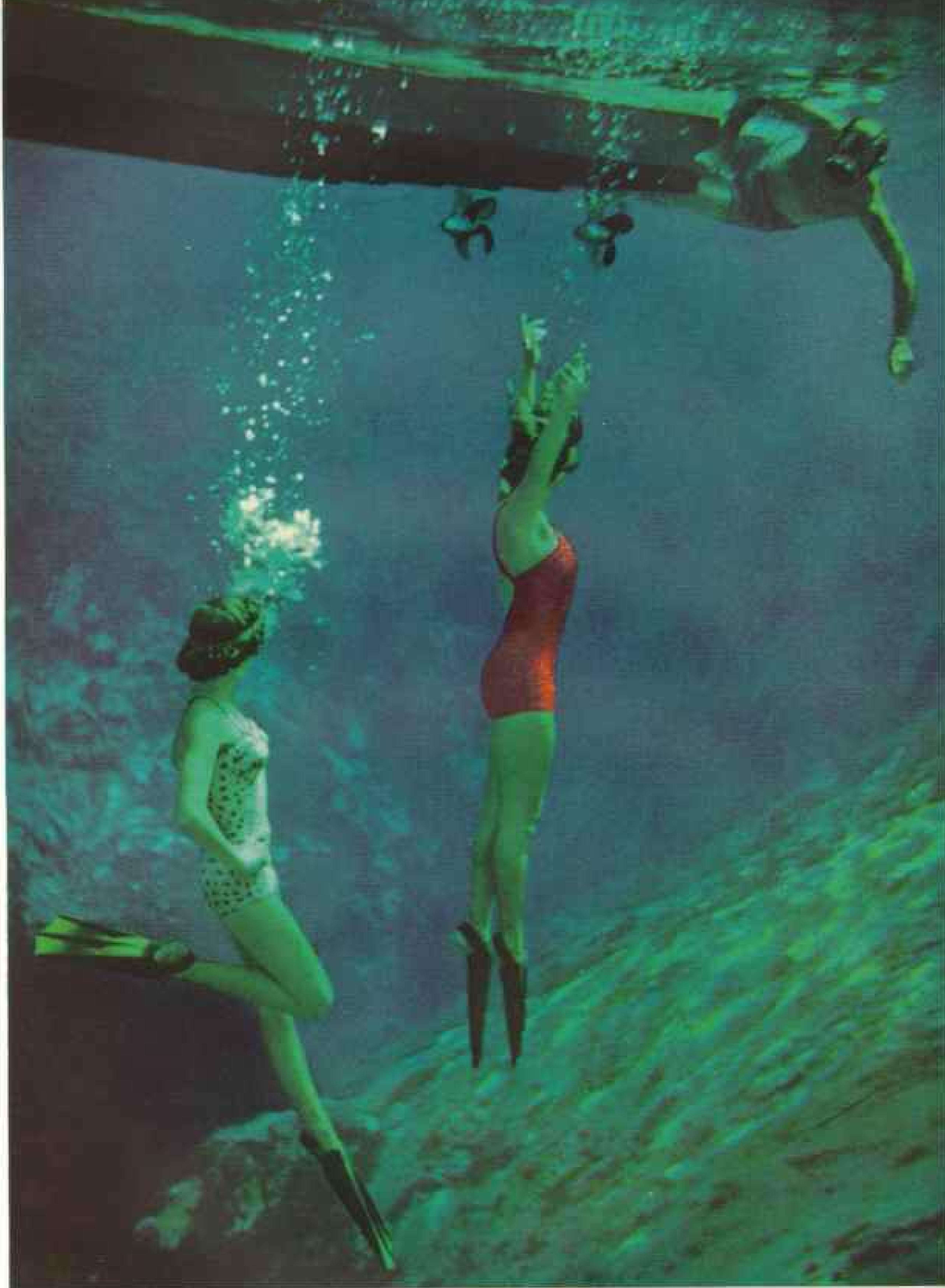

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Aquabelles Lure *Water Wagon*'s Skipper to Their Underwater Stage

Goggled and flippered, author Allyn plunges from his boat to watch the performers. Dolomite cliffs below him rise from the base of the spring. Mantled with clay and fine white sand, they resemble snow-covered mountains.

© National Geographic Society

Kodachromes by National Geographic Photographer Bates Littlehales

↑ **Catfish Trapped in the Suwannee Weigh Up to 25 Pounds**

To prevent extinction of the flavorful fish in this river, Florida law prescribes slat traps similar to those once used by Indians. Cottonseed or soybean cakes lure prey through a funnel-shaped opening.

↓ **Hammock and Mandolin Spell Siesta on the Placid Homosassa**

Water Wagon cruised to the Homosassa's headwaters, where more than 30 species of fresh- and salt-water fish inhabit Nature's Fish Bowl, a spring-fed pool. Here the author relaxes at Riverside Lodge.

gest some fishing. Suddenly an unearthly scream came from below. Startled, Bates, Dorsey, and I stared aft.

The noise continued above the throbbing of the motors. Channing was staggering around in the galley clutching his throat. His eyes were as big as saucers, and he held a plastic tumbler at arm's length.

The three of us abandoned the steering wheel and piled through the hatch. I shut off the motors. Dorsey and Bates supported Channing as he struggled. Strangling sounds came from his open mouth as he pointed down his throat.

Bates looked in Channing's mouth, then grasped an object and dragged it out. "My sea horse! You've killed my sea horse!" he shouted.

Channing, red-faced and panting, yelled: "If I haven't, it will be a pleasure to drown both you and your sea horse!"

Here's what had happened. In the Gulf the night before, when the anchor was hoisted, Bates found a sea horse in the weeds hooked around the shaft. Planning to photograph it later, he placed the little animal in a tumbler and set it where our glasses were stored.

Channing, looking for a drink, saw the filled glass, picked it up, and drank it—sea horse and all. Fortunately, both Channing and the sea horse survived the mishap.

In the Gulf off the Withlacoochee we stopped to fish for trout and were having only fair luck when a school of bluefish came along. The water about us frothed as the blues tore through a school of small fish. Quickly we cast metal lures. The bluefish instantly clipped off the leaders with their sharp teeth. By the time we rigged new lures with sturdier leaders, the fish had vanished.

Arrowheads Found on Cedar Key

From Withlacoochee *Water Wagon* pushed on to Cedar Key. The first known residents of this village on an island near the Suwannee mouth were Indians. Thousands of stone arrowheads have been gathered on Cedar Key's beaches. A large collection is owned by St. Clair Whitman, venerable keeper of a private museum in Cedar Key (page 65).

This gentleman, who has believed in keeping the records straight all the 85 years of his life, disputes practically every published medium of historical fact except the NATIONAL GEOGRAPHIC MAGAZINE. He is the proud owner of a file dating from 1907.

Mr. Whitman told us that treasure hunters still scour the islands and the Suwannee River for Spanish gold, supposedly buried by Gasparilla and others.

"In 1860," he went on, "when the Florida Railroad Company built the State's first railroad connecting the Atlantic with the Gulf, Cedar Key enjoyed a boom that lasted until the turn of the century. Deep water and plenty of cedar were the main reasons for its prosperity. Sawmills shipped slats of the wood to northern pencil companies."

Indiscriminate cutting of cedar and the opening of Tampa's deep-water port helped send Cedar Key into decline. Today the village has 900 people; one of its greatest charms is its peaceful solitude (page 66).

Water Wagon Meets a Storm

Rain, gusts of wind, and a falling barometer followed us from Cedar Key. *Water Wagon* was battened tight, every movable object was secured, and all hands wore foul-weather gear. The wind, hauling directly into the northwest, finally reached a speed of 40 miles an hour.

Water Wagon crashed into the oncoming waves, meeting them with her blunt bow. They pounded her forward deck; spray rose 10 feet above the upper deck. Rain beat down and destroyed visibility. The waves seemed to reach ever higher, curling and breaking to smother us with green water.

The idea of pushing on to the Suwannee River mouth began to seem imprudent. We must have protection, and quickly. I put *Water Wagon* into a careful 180° turn. Now the waves pounded against our stern, lifting the vessel high and shoving the nose down. This was our best position, for the buoyancy afforded us a chance to race and skid over the water.

Fortunately the rain let up just long enough for us to get a good bearing on a light. From then on we were out of trouble, eventually reaching the shelter of North Key, where we waited out the storm.

Three days later, after a 15-mile run in crisp, clear weather, we entered the Suwannee, best known of Florida rivers.

A hundred years ago Stephen Foster wrote "Old Folks at Home"—known to millions as "Way Down upon de Swanee Ribber"—though the songwriter never saw the stream his words made famous. Foster chose it for a song to wind around the hearts of lonely

men because the name fitted into his melody.

Chugging northward, *Water Wagon* churned water from amber depths and sped past banks where cypress trees with beards of Spanish moss tower like patriarchal guardians. Beside them live-oak trees peeped through green patches of bay and myrtle.

The majestic Suwannee is undeniably ruler of the forest, jungle, and swamp through which it meanders on its journey from the Okefinokee to the sea. There has been little change in this wild and untamed land since the white man came.

Folks along the Suwannee like nothing better than catfishing. To me, the Suwannee River "cats" are the tastiest in the world. A considerable industry in catfish dinners thrives along Florida highways.

The State protects these whiskered denizens of the Suwannee by enforcing strict rules governing commercial fishing. Slat traps are used; they must not be more than 20 inches in diameter and six feet long. Nets and metal traps are taboo. Fishermen on the Suwannee place an average of two pounds of cottonseed or soybean meal cakes in each trap.

The surface of the Suwannee, being warmer than the air, gives off a continuous vapor which becomes dense at night. Billowing up, it hides the river surface like clouds seen

↓ **Florida Honors Stephen Foster**

Banks of the Suwannee provide a sylvan setting for the Stephen Foster Memorial Park near White Springs. The museum contains animated dioramas of the composer's most famous songs. Actually, Foster never saw the wide, winding river which he immortalized in "Old Folks at Home."

Florida State News Bureau

Bob Gruber: St. Petersburg News Service

Sunshine Skyway—15 Miles of Bridges and Causeways—Spans Tampa Bay

This $21,250,000 structure connects St. Petersburg's "dead-end" peninsula to a through highway down Florida's west coast (map, page 55). Here a motorcade rolls across the span on dedication day, September 6, 1954.

from an airplane. Islands of hyacinths appear suddenly, looming out of the vapor like icebergs on a foggy sea. I ran over one to convince myself they were soft and harmless.

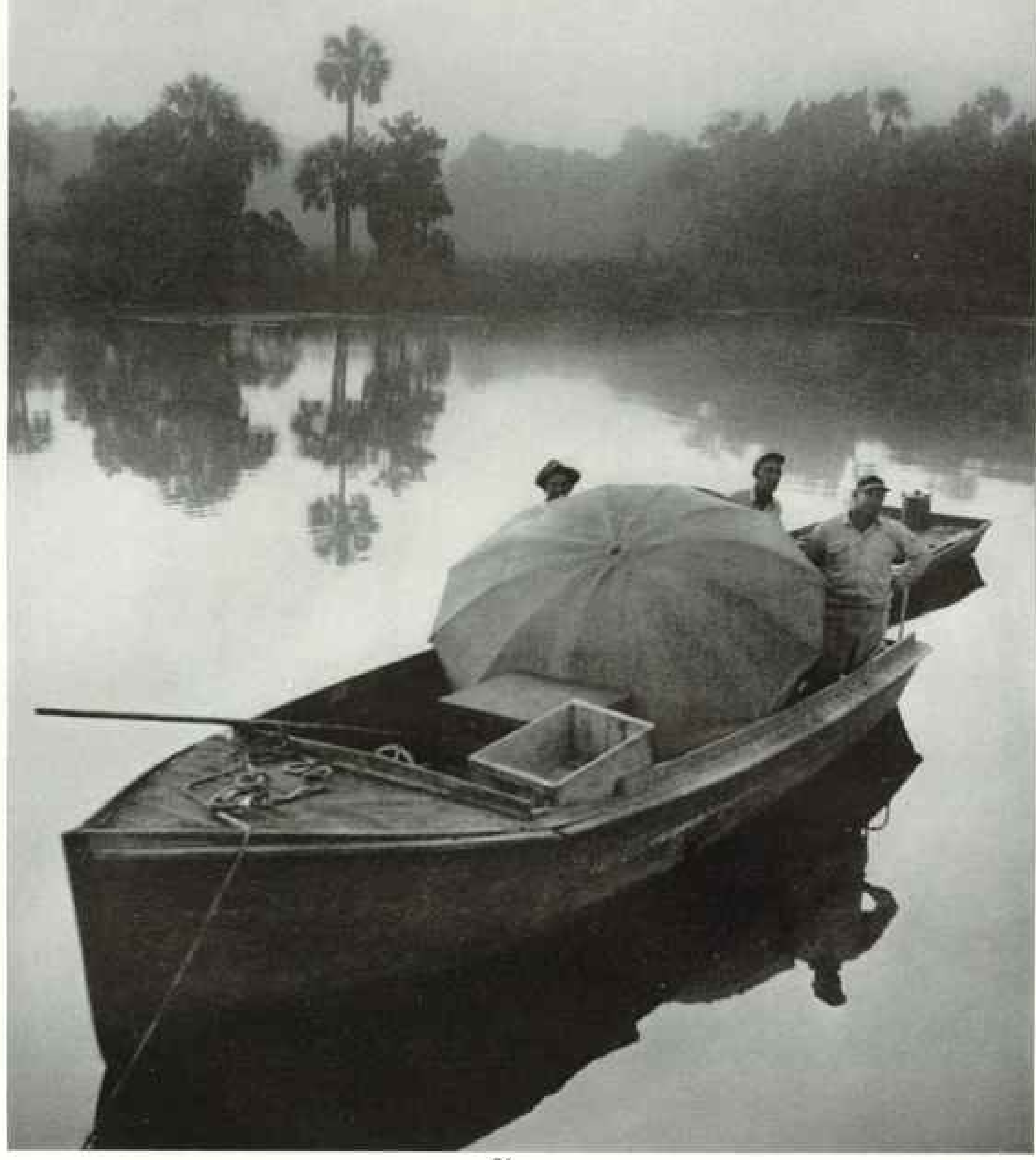
Suddenly a ghostly structure appeared out of the vapor ahead. In seconds the apparition materialized into the highway bridge of U. S. Routes 19 and 98, near Old Town.

Now a mere floating dock landing, Old Town was once a port where river steamers unloaded supplies bound from Cedar Key to plantations in northern Florida and neighboring Georgia. Steamers sailed from its docks with cargoes of tobacco, smoked hams, beans, and cotton.

The effects of the Civil War and the development of rail transportation combined to change all this. Gradually the steamers disappeared, the plantations were abandoned, and the land went to sleep.

At least one Suwannee River resident is trying to save the flavor of bygone days. We spent a day riding on jungle trails beside the Suwannee in horse-drawn surreys belonging to retired showman Marx Cheney. These period vehicles restore a touch of the past to the storied river's banks.

Beyond Branford, plantations brought to mind Stephen Foster's beautiful ballads. At one, cotton grew to the water's edge and cabins



Fog Shrouds the Salt River; Double-duty Umbrella Shields Against Mist and Sun Alike

Water Wagon's crew got lost in an early-morning fog blanketing the Homosassa River. A wrong turn took the craft into the shallow Salt River. These fishermen gave directions.

stood in a row beside the field, just as one would imagine the scene in "My Old Kentucky Home."

Bates and I made a game of picking out locales for Foster's songs. Many fitted well into the quiet dignity of the upper Suwannee.

White Springs, 145 miles upriver, has long been known as a medicinal spa. Tradition says the Indians referred to it as "medicine waters" and came from miles around to be cured of rheumatism.

After the Indian wars and the coming of steamers, plantations, and Stephen Foster's folk songs, a village sprang up at the head of navigation on the Suwannee.

In a park overlooking the river, the State has erected a beautiful memorial to America's most famous song writer, and White Springs today plays host to more visitors than ever before (page 74).

For us this quiet spot on the Suwannee held overtones of melody and made a fitting climax for our cruise of western Florida's beguiling river byways.

South Seas' Incredible Land Divers

New Hebrides Islanders Prove Their Manhood by Leaping Headfirst to Earth from a 65-foot Jungle Tower

By Irving and Electa Johnson

In our round-the-world cruises in the brigantine *Yankee*, we Johnsons see more than our share of the strange and curious. Nevertheless, we were almost incredulous at the sight we witnessed in the New Hebrides last spring—islanders diving from a tall tower, not into water but onto land.

Until three years before, we had never even heard of this amazing performance. We learned of it from our good friend Oscar Newman when we called on him and his wife at their home on the New Hebrides island of Malekula (map, page 82). At first we thought he was joking.

Divers Land in "Pool" of Earth

On the neighboring island of Pentecost, Mr. Newman said, the natives have a custom of building a tower on the side of a hill and then, on a given day, climbing it and jumping off, headfirst, to the ground on the downhill side.

"How high? Sixty, seventy, eighty feet," he said, "and the record is even higher."

"Why aren't they all killed?" we asked.

"Well for one thing, the earth they dive into is pulverized and cleared of stones and sticks, but the main thing is the jungle vines attached to their ankles and the tower. They are measured exactly right to let the man's head hit the ground but stop him before his neck breaks."

Mr. Newman and his wife had lived on Pentecost for years and were old friends of the natives there.

"Let me know when you're coming back," he said, "and I'll get them to wait and put on the show when you're here. Only a few white people have ever seen it."

Thus it was with a real sense of excitement that we neared the New Hebrides on our 1953-55 trip, our sixth cruise around the world with a crew of American college students.*

We had kept in touch with Mr. Newman, and he made good his promise 100 percent.

Wall, the chief of the village of jumpers, was a jolly, rotund fellow.

"In his younger days," Mr. Newman told us, "Wall was the champion land diver of all time. I've seen him do a hundred feet."

On the day before the ceremony, Wall led us inland to see the tower. On the way he told us how the odd custom is supposed to have started.

"It was all because of a woman," he began. "She ran away from her husband with another man, and when pursued she took refuge in the top of a tall coconut palm. Her husband had followed and was about to grab her when she leaped from the treetop and got away unhurt. Everyone was stupefied until it was realized that she had tied vines to her ankles to break her fall.

"Her feat was still pretty impressive, but the men said to themselves, 'Anything a woman can do, we can do better.' Then they proceeded to prove to each other how brave they were by headfirst jumping demonstrations from greater and greater heights."

"Each year," Mr. Newman explained, "the men select a new hillside site for the ceremony. First the workers clear the jungle, an arduous job in itself. They spade up soil in the dry-land diving pit and soften it by hand. Saving a high tree as the tower's main brace, they strip off leaves and twigs but spare two or three strong branches as supports."

Jungle Tower Built Without Nails

A maze of small, straight tree trunks lashed with vines, the tower stood 65 feet above its base and a measured 78 feet above the landing target on the downhill side (page 78).

No nail or wire held it anywhere. Green viny backstays, stretching like a circus tent's guy ropes, secured the tower to stumps in the rear. At various heights 28 platforms jutted like diving boards from its front. Long curling vines were attached at the tower end of each board. They were soon to be lashed around the divers' ankles.

Had they been stretched to their full length, each pair of woody lianas would have ended

* See, in the National Geographic Magazine: "*Yankee* Roams the Orient," March, 1951; "The *Yankee's* Wander-world," January, 1949; and "Westward Bound in the *Yankee*," January, 1942, all by Irving and Electa Johnson.

six to eight feet above the ground (page 82). The correct length is a matter of life or death. A vine cut too long would not stretch its limit in time to save a man's neck. Too short a vine would joltingly arrest his flight in mid-air.

Vines were shredded at the ends to make soft, pliable ties for the ankles, and these lashings were wrapped in banana leaves to keep them moist and fresh (pages 80-81).

Shouting and singing from the jungle signaled the arrival of Pentecost's dancing and cheering squad. Dressed especially for Western eyes, the men wore shorts in lieu of the usual patch of leaf matting and had coconut fronds draped across their backs (page 85). Women put on cloth petticoats beneath short skirts of shredded pandanus leaves, but remained bare to the waist.

Chanting, whistling, and cheering, the dancers marshaled themselves into six lines, men in front, women behind. A veteran choreographer named Beconan infused the troupe with life and spirit. He changed the chants, beat out rhythms with his club, and leaped about like a clown (page 85).

As the dancers ended their overture, the jumpers began to perform.

The first dive was the lowest, 25 feet, and the jumper the youngest, eight years. As the boy climbed the tower for his first jump, we felt glad it was not one of our sons risking his neck to prove he was a man.

(Continued on page 87)

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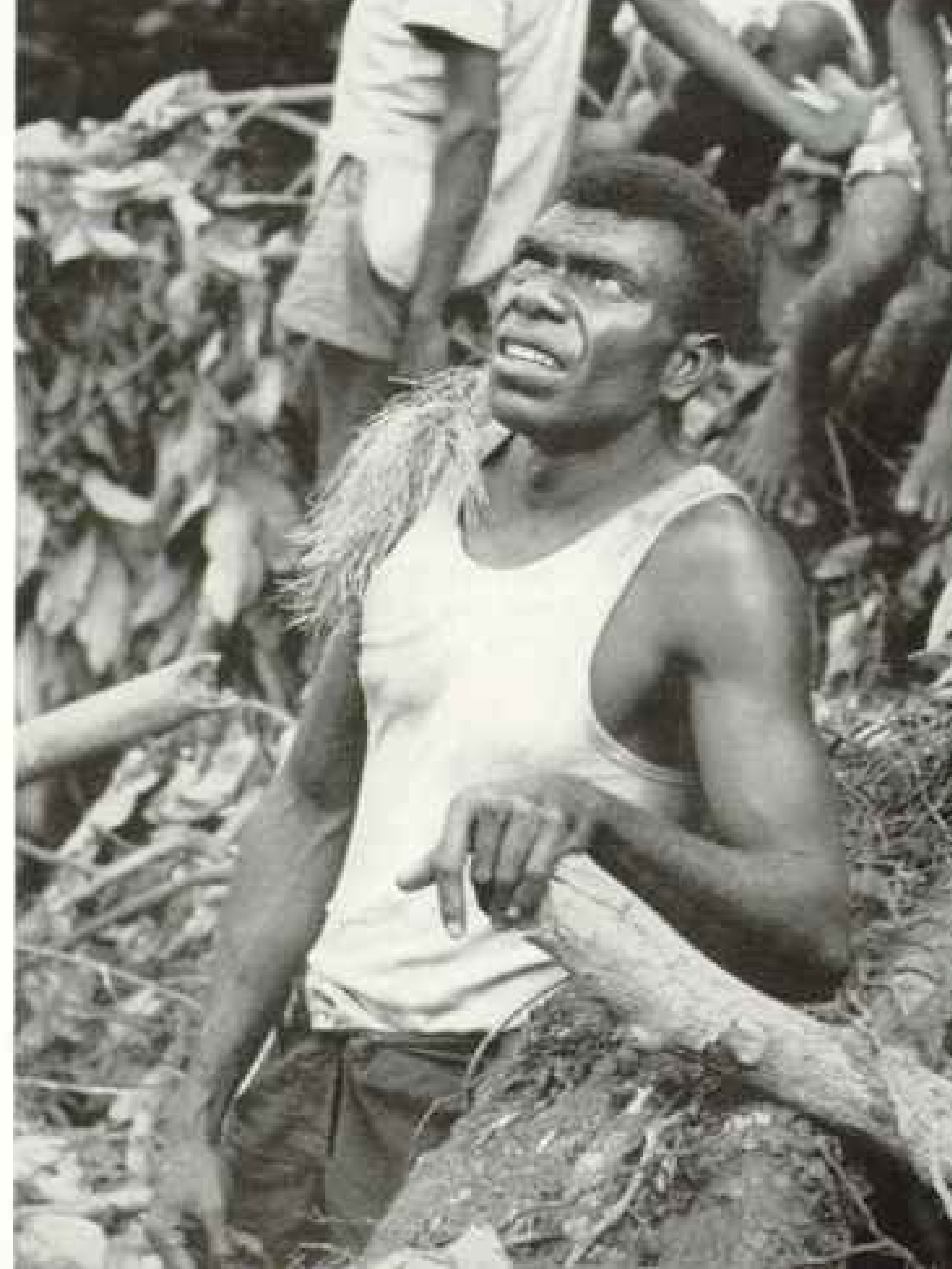
A New Hebrides Man Atop His High Tower Stands Ready to Dive Headlong for the Earth

While making a world voyage on the brigantine *Yankee*, skipper Irving Johnson and his college-student crew stopped at Pentecost Island, New Hebrides, to watch Melanesians make terrifying land dives, checked only by trailing vines tied to their ankles. Climaxing the show, a champion diver named Warisul climbed to the highest platform, lashed on vines, and made a speech. A moment later he spread his arms wide and sailed into space, dropping 78 feet.

Just as the man was about to hit earth, pressure from the arresting vines snapped springy green boughs supporting his diving platform, causing the board to slant downward. Timed to a split second, this action broke the diver's fall. Then, as his head hit the dirt, the tautly stretched vines and the recoil of the rickety tower snapped him onto his feet unhurt.

Here the champion's assistant checks the vines' anchorage to the tower. Sagging boards used by previous divers appear below the two men.

© National Geographic Society
Kodachrome by Irving Johnson



Wide-eyed Watchers Tensely Wait →

The rapt look of small boys at a circus is stamped on faces in the jungle audience.

Roger Dellinger

High Diver Walks a Plank →
Above Forest and Sea

According to legend, the land dive originated when a runaway wife leaped from a tall palm tree to escape her avenging husband (page 77).

Here a Pentecost man stands ready to show his mettle. He moves on the board with care lest his weight snap the platform before he takes off. Soon he will wave the leaves in his belt as a farewell salute, mount the two prongs on either side of the plank, and sail headfirst into space.

Vines tied to the man's legs run beneath the board's wrappings to a secure anchorage. Lianas on either side hang ready for the next divers.

Upper right: Moist banana leaves encase vine ends to keep ankle ties soft and pliable until jumping time.

Kodachromes by Irving Johnson and (far right) Dodd Harris

↑ Vines Are Frayed to Make Ankle Straps for Jumpers

In preparation for dives, Melanesians scour the Pentecost jungles for long, strong lianas. These they lash to the tower. Free ends of the vines are shredded into strong fibers that are knotted around the ankles of the divers. Last spring 28 islanders took the plunge from different heights on the tower. The youngest was 8 years.

Dancers Prance Between Jumps; →
Their Chants Fan the Divers' Courage

Bodies glistening with coconut oil, Pentecost dancers swirled for six hours. Their routine was simple: a few stamps on one foot, then on the other (page 83). In deference to Western visitors, men wore shorts instead of the usual patch of matted leaves. Women put on cloth skirts beneath garments of rustling leaves. Here planter Oscar Newman looks toward the next jumper on the tower.

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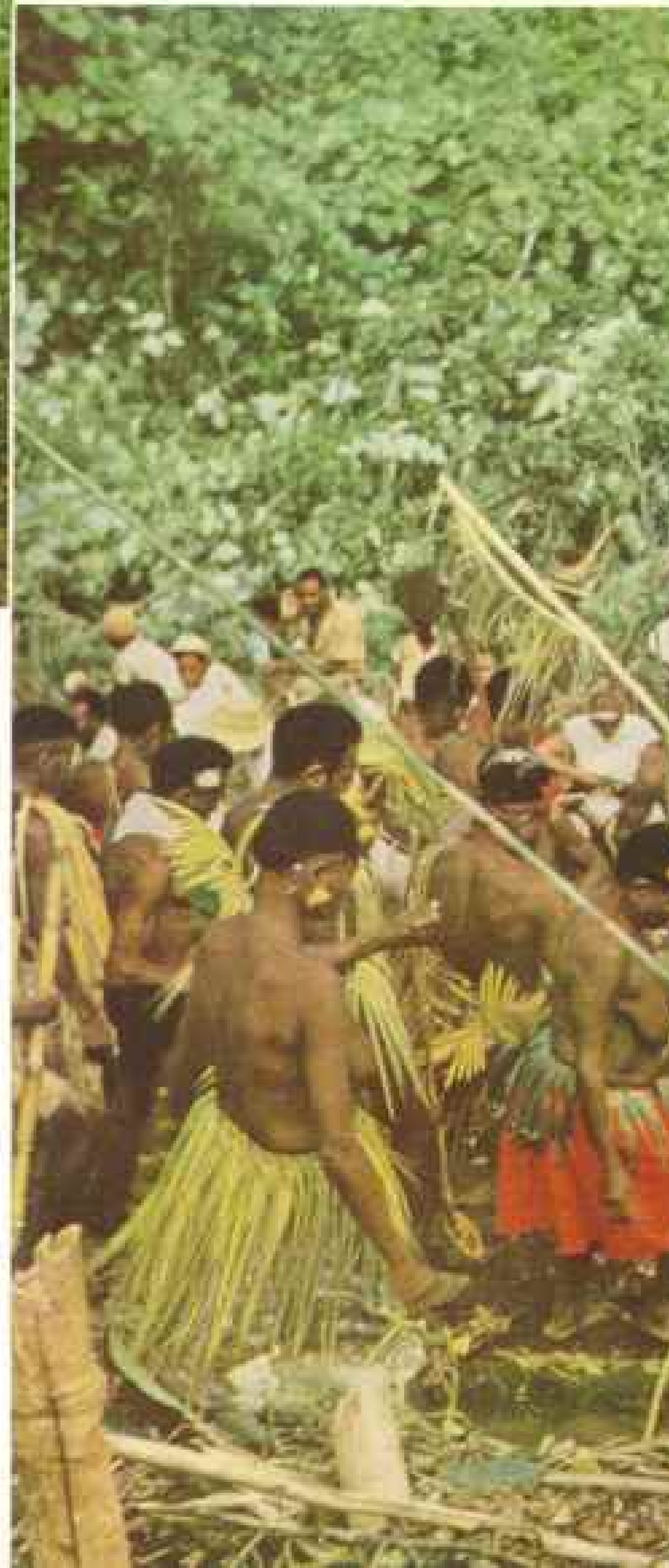
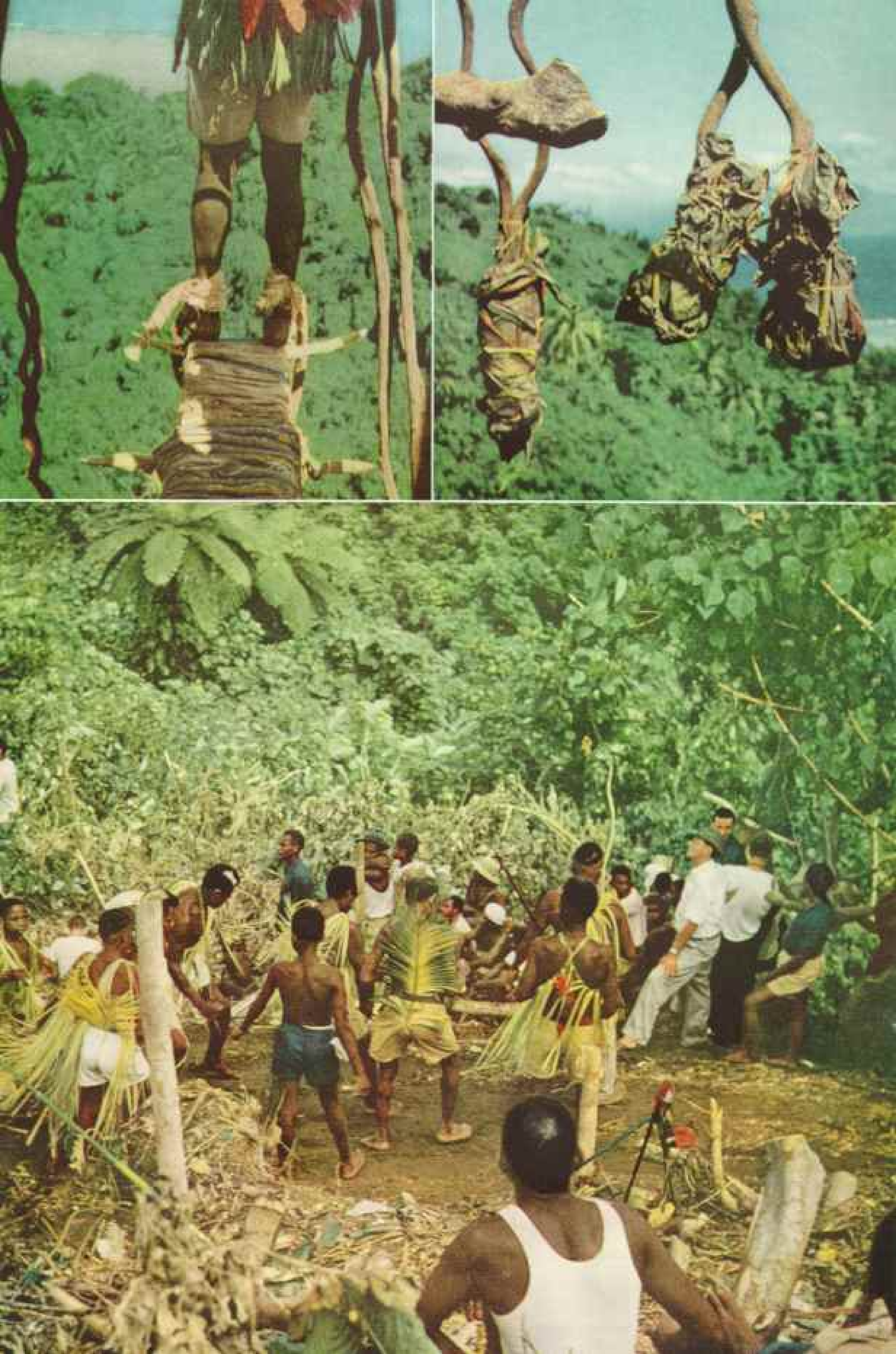
Kodachromes by Roger Bellinger and (right) Arthur Johnson





← A Diver Tests Gear: Too Long a Vine Could Take His Life

Lianas are cut to dangle six to eight feet above ground. Tied to a diver's ankles, they tauten just as his head hits earth. A split second more and the man's neck might snap.

Roger Bellinger

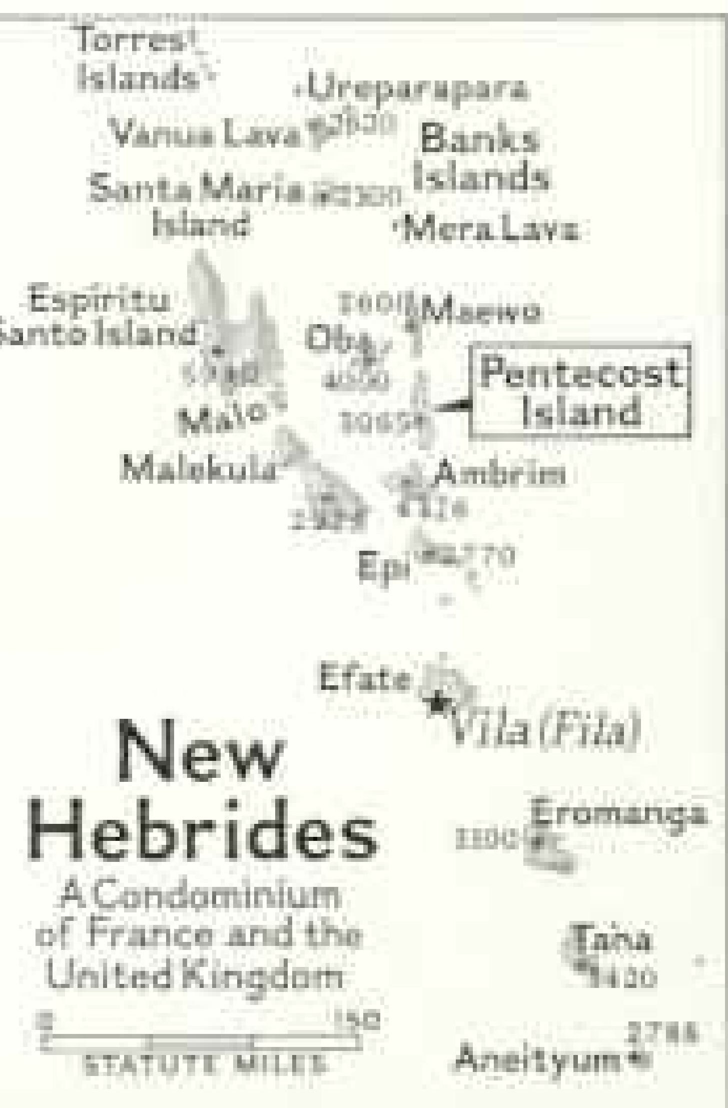
↓ Volcanoes Built the New Hebrides

Pedro Fernández de Quirós, a navigator for Spain, discovered the islands in 1606. He thought Espiritu Santo was Australia. Capt. James Cook, exploring 168 years later, named the group New Hebrides.

During the 19th century, labor recruiters, commonly called blackbirders, kidnaped islanders by the hundreds for work on cotton and sugar plantations in Australia. As a result, innocent travelers found the New Hebrideans treacherous. Many visitors were killed by cannibals. Eromanga became known as the "island of martyrs" after six missionaries were murdered.

Fifty-odd islands, covering an area larger than Connecticut, compose the New Hebrides chain. Map shows only the larger isles, home of most of the 52,600 people.

British and French have ruled jointly from the capital city of Vila on Efate since 1906. The Japanese did not invade the archipelago in World War II.



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Kodachromes by Arthur Johnson and (below) Dodd Harris

↑ A Maze of Timbers and Lianas Leads to the Jumping Platform

This flimsy-looking contraption, which swayed and trembled each time the divers took off, proved sturdy enough when Mr. Johnson and his crew scrambled over it to make pictures. Jungle engineers used no nails or wires; they lashed the soaring tower with vines.

↓ Frenzy Mounts Among the Dancers as Jumpers Climb to New Heights

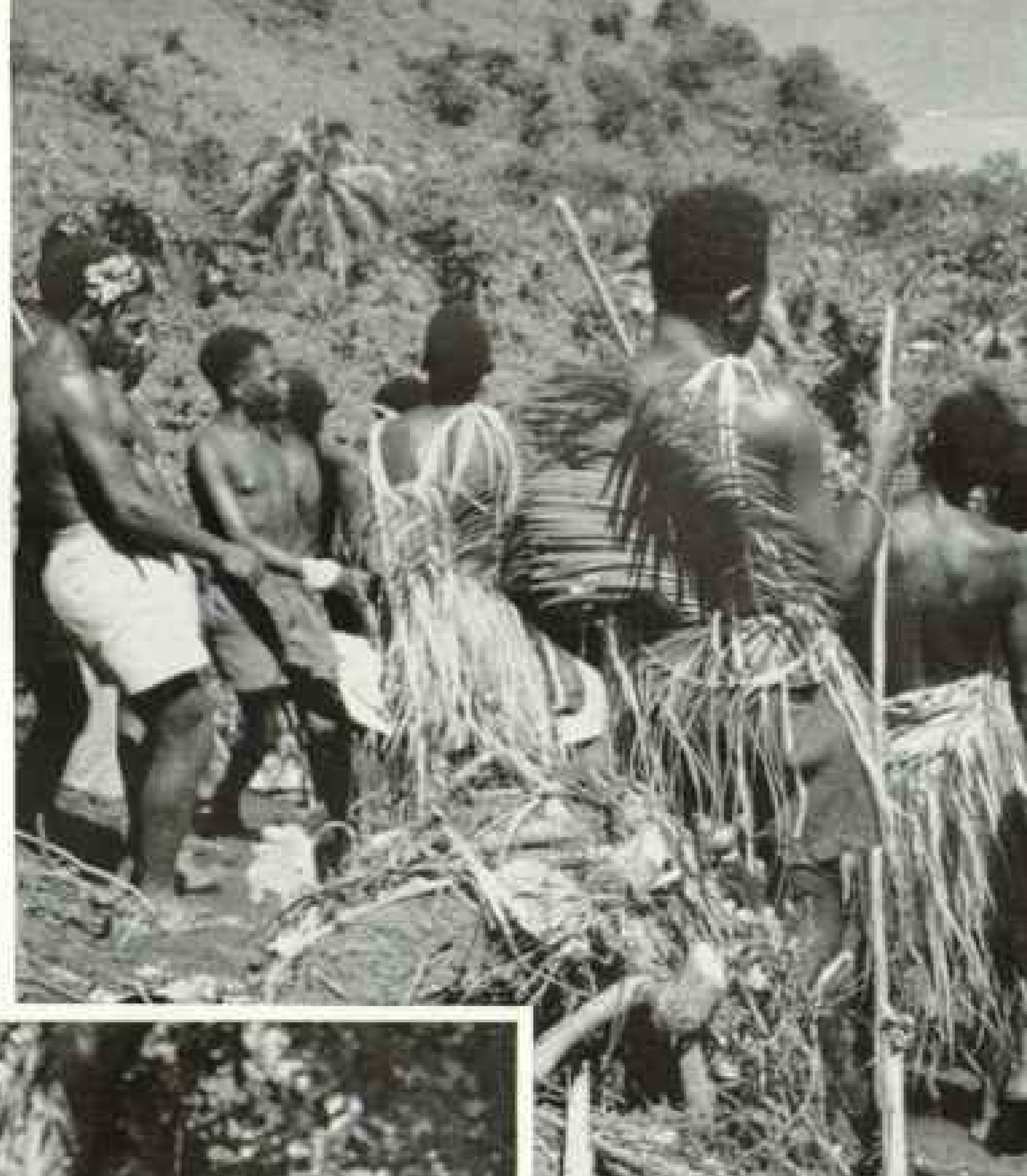
Quaking palm-frond drapery and swinging wooden batons intensify the dancers' gyrations. Here and there one of them tucks a flashy hibiscus blossom into woolly hair (page 85). Beconan, the master of ceremonies, wears a palm-leaf skirt around his neck.

Dancers Face the Sky → Like Firemen with a Rescue Net

Groundlings watching the highest dives were so spellbound they stopped chanting and stamping. The profound silence proved more dramatic than the wildest shouts. Coral lime whitens the close-cropped heads of these islanders.

Thousands of Americans got to know the New Hebrides people in World War II, when the United States established military bases on Espiritu Santo and Efate Islands. Islanders did a brisk business selling pigs' tusks, clubs, canoes, and grass skirts to servicemen. Espiritu Santo served as an air base during the Guadalcanal campaign.

Wartime New Hebrides and neighboring islands inspired the musical play "South Pacific."



← Earth Is Pulverized to Soften the Blow

To prepare the jumping ground, workers first cleared sticks and stones from the space beneath the tower. They spaded the soil, then laboriously sifted it by hand to make the landing spot as cushiony as possible. Earth fluffing was repeated for each jump.

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A Drinker Tilts → His Bamboo Jug

A length of bamboo severed just beyond one of the joints holds a man-size drink (page 97).

Roger Bellinger

© National Geographic Society

Kodachrome by Irving Johnson

Headfirst Goes the Jumper, Flying Earthward from His Lofty Tower

As the man kicked off into space, the tower trembled so violently the photographer had to grab support. When vines snapped taut, the structure rocked again as if in a gale. Cameramen on the ground focus on the leaper.

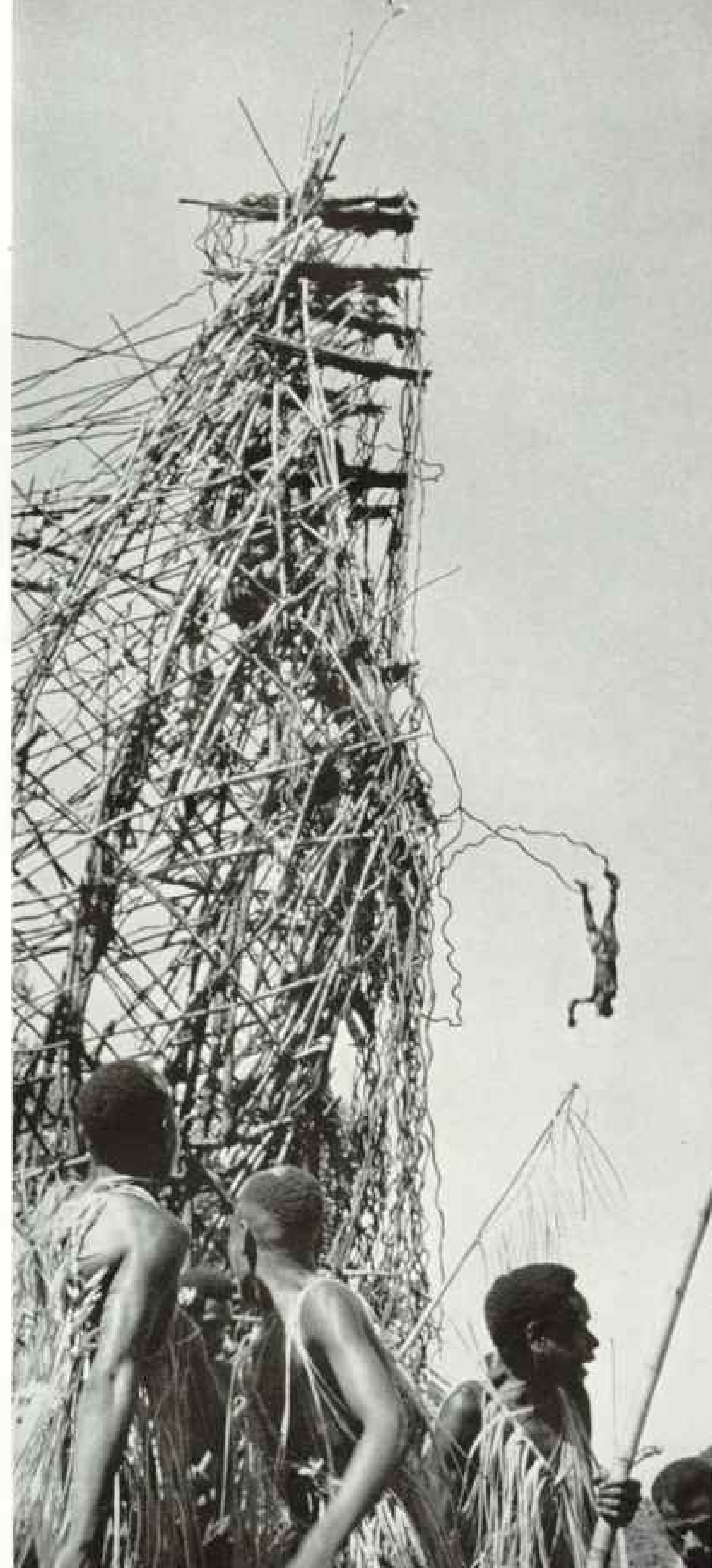
A relative, serving as the lad's second, untied the green leaves encasing the vine ends, shook out the long shreds, and knotted the ends of the lines around the slender ankles.

The youngster advanced to the end of the platform and shook each foot in turn to make sure the dangling vines hung clear. He forced a smile, slapped his hands against his sides, then clapped them high above his head. From a waist belt he took a spray of leaves, waved it bravely, and cast it earthward. Then he followed it into space.

At just the right moment, tension from the vines broke the diving platform's props. The collapse of the platform slowed the diver's fall. As the boy's head touched the ground, the vines stretched taut and, recoiling like steel springs, snapped his legs into the air. Then the slackened vines dropped the boy to earth. Friends and family rushed in, picked up the child, and brushed off the dust.

The next boy took a look at the void before him and stepped back in dismay, but his second pushed him sprawling. Landing safely, the child grinned in relief and triumph.

As the jumps got higher, excitement mounted and



Going Down! A Diver Heads for Bottom

Softened earth, elastic vines, and the tower's recoil will ease the jolt when this man reaches the end of his rope. He must land as far as possible from the tower lest the vines prove too long for safety.

Roger Bellinger

© National Geographic Society

Kodachromes by Arthur Johnson

↑ **Women Reach Out as if to Save a Man Tumbling from the Tower**

← Page 88: To build suspense before taking off, divers balance precariously on the platform, wave arms, and shout messages. Others arch over backward and pretend to fall. Here, as his "ready" signal, diver Olul waves a flag of bright leaves. In a moment he will drop it, and all eyes will follow its flutter to the ground. One spectator remarked, "The diver salutes his world like a gladiator hailing a Roman emperor."

Dick Blair

Striking the Jumping Pit, a Diver Absorbs the First Shock with His Arms

This man shows cowardice, according to native code. Proper technique demands that his head be the first to hit earth. The most skillful jumpers land on their feet after the snapback.

preparations took longer. These gratifying delays gave *Yankee's* photographers time to adjust cameras. Throughout six hours of diving we made more than 1,600 pictures.

A few of us climbed the creaking, swaying tower to snap a jumper leaping from the platform (page 86). When the vines stopped his plunge, the tower trembled violently.

The higher a diver climbed, the better his act. One man posed motionless against the sky. Another performed a ghostly slow-motion pantomime with his arms. Others sang, shouted messages, or pretended to fall.

During dramatic intervals Beconan and his dancers stopped stamping and chanting. At other times women broke into an eerie whistle and held arms outstretched (page 89).

Two men faltered and refused to jump, but substitutes quickly took their places.

Sometimes a vine broke; once both lashings snapped, but only after the man's fall was safely checked (opposite page).

We estimated that the topmost diver reached a speed of 45 miles an hour; but, incredibly, not a bone broke, not one dancer limped away. Blood flowed only from a man who scratched his ankle.

A rub on the back, a pull of the hair to

Both Vines Broke → After Arresting This Man's Fall

A cut right ankle, here seen in a bandage, was Olul's sole injury and the only apparent harm suffered by any of the jumpers. Draped in palm fronds, he lets a friend slash the lashings from his left ankle. This was not Olul's first dive of the day; he substituted earlier for a jumper who balked.

Clouds of dust in the distance rise from volcanic Ambrim Island. *Yankee's* crewmen a few days earlier saw it erupting by night. Fiery "bombs" shot high into the air and fell back onto the cone.

↓ His Ordeal Ended, a Diver Smiles

Yankee's doctor, a bone specialist, could not understand how the human skeleton held together under the shocks taken by the divers. Most walked away none the worse for wear. Others required "treatment"—shaking by the hair, massage of the neck, and dousing with water.

© National Geographic Society
Ansco Color by Roger Dellinger (above)
and Kodachrome by
Edward K. Shetmerdine

Roger Bollinger

A Leaper's Friend Supports Him; the Water Girl Brings Refreshment in a Bamboo Tube

"Middle-aged Bebe," comments planter Newman, "was a little shaken by his jump. He insisted on making the leap because he hated to see the young bucks get all the credit."

straighten the neck, or a splash of cold water restored men who, it seemed to us, must surely have had the life jerked out of them.

No aircraft carrier's arresting gear ever stopped a fighter plane as abruptly as the jungle lianas halted these divers in full flight. Our ship's doctor could not explain why hips were not dislocated. Chief Wall told us that no diver in his memory had been killed.

Pentecost Champion Leaps 78 Feet

Close to day's end the tower still held firm. Only the final jump from the topmost platform remained.

Now the bravest man of them all, a handsome young aerialist named Warisul, began the long climb to the top amid a fanfare of screams from the dancers' chorus (page 78).

A slim, lonely figure against the sky, Warisul stood on the end of his platform and spoke to the crowd. Friends had urged him not to risk his life, he said; yet he must.

The young man tossed his spray of leaves as if in gallant salute to the volcano on near-by Ambrim Island, which he could see puffing dust above the blue Pacific. Calling up the final spark of courage, he leaped off and out, an arching drop of 78 feet.

Timed to a split second, the platform props cracked and the board dropped, braking the fall. Warisul's head struck the earth, the elastic vines stretched and convulsed, and pulled him back into the air.

One vine broke! But the other jerked Warisul up the slope. With the dexterity of a cat he landed on his feet. Women rushed up, tugged his hair, and splashed cold water in his face.

Then, acrobatics ended, divers and dancers raced off to their jungle village for a feast.

A Naturalist in Penguin Land

Braving Stormy Seas in a Converted Lifeboat, a Briton Studies the Strange Wildlife of Lonely South Georgia Island

By Niall Rankin

With Illustrations from Photographs by the Author

ON the oil-streaked waters of Leith Harbour, one of the chief anchorages of the island of South Georgia, my 42-foot cruiser *Albatross* bobbed jauntily. She had just completed a 10,000-mile pickaback voyage from England on a factory ship of the whaling trade; off-loaded now, she seemed oblivious to the skeptical stares of seamen lining the wharf of this storm-chewed outpost of the Antarctic (map, page 97).

Leith's station master summed up the whalers' opinions of *Albatross:* "A nice little boat for a summer cruise," he told me, "but not for South Georgia."

Stormy Dot in the Far Atlantic

I must confess I had a few doubts myself. The island is a rocky dot in the far South Atlantic, amid some of the wildest seas in the world. Off its shores a dead-flat calm can turn into a gale within half an hour, the whole surface of the ocean being swept into the air and flung forward in a blinding sheet of spindrift (page 96).*

Yet I still thought that if any small craft could weather South Georgia's squalls and navigate round its cliff-lined coasts, *Albatross* could do it as well as the next, or better.

I had stumbled upon her in the shipyards of the Clyde, near Glasgow, Scotland. On sick leave from the British Army, I was searching for a boat that might let me realize a long-cherished dream: to settle upon a far-southern island and study for an entire breeding season bird and animal life typical of the Antarctic. Round the yard I wandered, puttering among forlorn deserted craft that the Admiralty had requisitioned at the outbreak of World War II, used to the limit, and then laid up.

Suddenly I saw a hull that brought me up short. The deck was dirty, the paint was cracked and chipped, and two metal patches marred its double mahogany skin. But it bore the unmistakable lines of a Royal National lifeboat, the tough, stoutly built vessel of the British lifesaving service, designed to buck the worst weather the North Sea and the English Channel can throw at it.

Overhauled and refitted during the next few months, and christened *Albatross*, this was the boat I finally took south with me (page 101).

In my crew I was even luckier. Campbell Gray and Robert Inkster, from the Shetland Islands, had sailed together in the merchant navy during the war; they made a good team. And in South Georgia I acquired a third and invaluable member as pilot: Capt. Konrad Olsen, master of an overage whale catcher now used solely as a communications vessel between the island's whaling stations.

It took us several days in Leith Harbour to stow our gear, scrub ship, tune up the engines, and fill the fuel tanks. But late one December morning we slipped our mooring at last and headed toward the open sea. Our first objectives were breeding colonies of the king penguin and wandering albatross.

The barometer was steady, and the day promised the best type of boating weather in South Georgia—a dull, leaden sky with traces of mist trailing round the mountaintops. Bright sunny days may be pleasant ashore, but off the island they are usually accompanied by a strong breeze.

As *Albatross* drew away from the harbor, we could get a better conception of South Georgia's dimensions. If one were to take a giant carving knife, slice beneath a mountain ridge just where its huge glaciers tumble into the valley, and then drop its snow-frosted peaks

* See "South Georgia, an Outpost of the Antarctic," by Robert Cushman Murphy, National Geographic Magazine, April, 1922, and the following by Rear Admiral Richard E. Byrd in the National Geographic Magazine: "Our Navy Explores Antarctica," October, 1947; "Exploring the Ice Age in Antarctica," October, 1935; and "Conquest of Antarctica by Air," August, 1930.

The Author

Lt. Col. Niall Rankin is one of Great Britain's leading wildlife photographers and a Fellow of the Royal Photographic Society. At his home on the Island of Mull, in Scotland's Inner Hebrides, he maintains a notable aviary of ducks, geese, and other birds.

The author's wife, Lady Jean, is a lady in waiting to Her Majesty Queen Elizabeth the Queen Mother.

An Army of King Penguins Masses in Solemn Conclave on a South Atlantic Isle

The author spent five months on desolate South Georgia Island studying its abundant wildlife. Of all the types he met, he admired king penguins the most. The photograph shows about a fifth of a 10,000-bird colony.

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Dress Suits and White Shirts Lend a Formal Air to a Homey Hatching Bee

Though not an egg shows, brooding birds give away their secret with the bulge that hides their feet: they have lowered warm feathered flaps over the single egg balanced on their insteps.

A Demoniac Gust Bears Down on *Albatross* at More Than 100 Miles an Hour

Crewmen of the expedition ship liked this anchorage in Cooper Bay until a howling westerly, funneling between barren hills, produced a screaming williwaw that whipped spray 50 feet into the air and knocked *Albatross* on her beam ends. A man on deck races for the wheelhouse.

into the sea, it would look not unlike South Georgia. For this barren isle is long and narrow, and its towering, ice-mantled peaks rise straight from the water's edge to more than 9,000 feet.

Rounding Start Point, we came upon a splendid little cove. Free of kelp in the center, and with a gently sloping shingle beach, it offered ample shelter from south, east, and west. We nosed in and anchored 30 yards south of the headland.

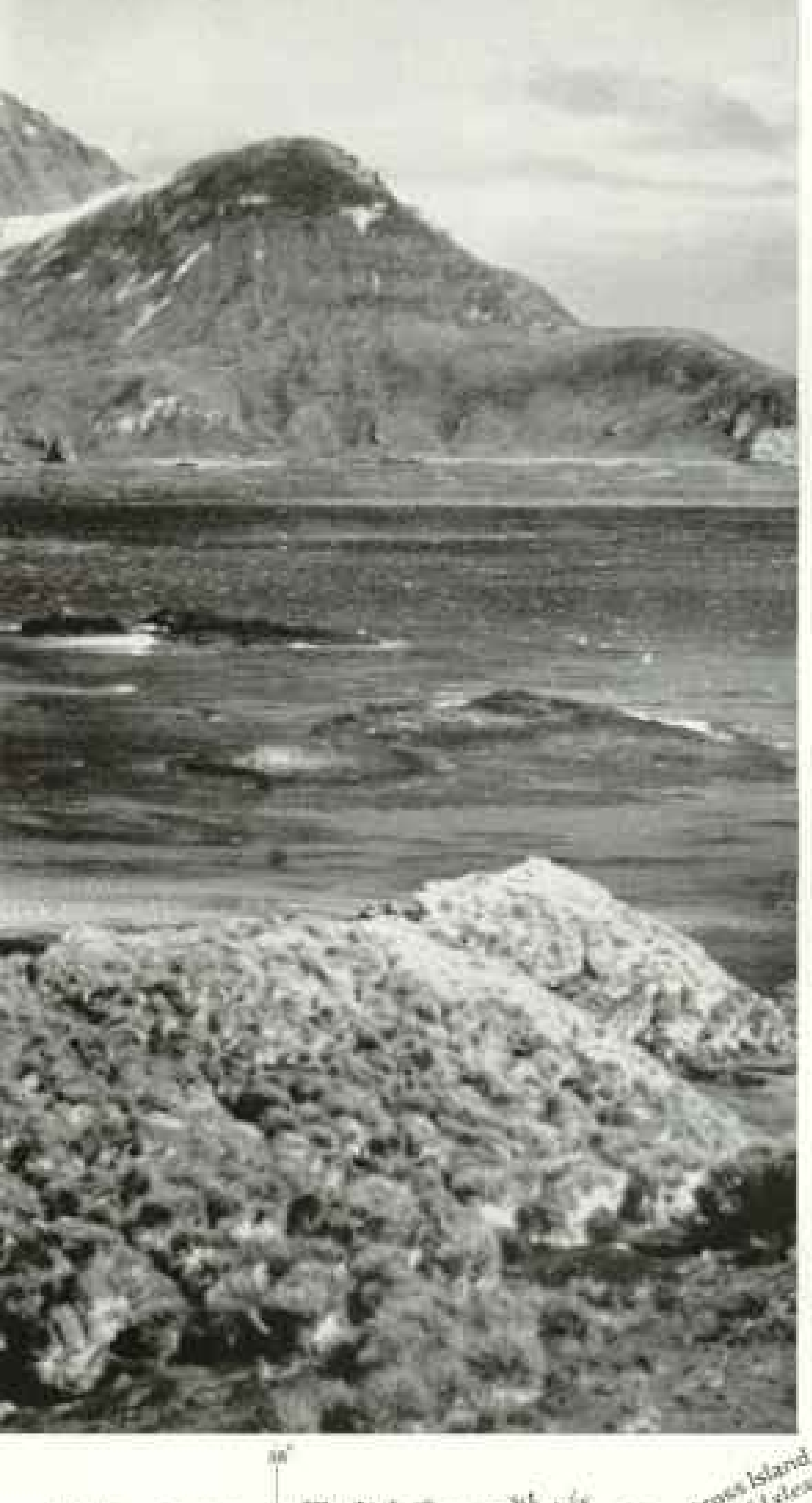
Royal Welcome from Fifty Kings

At once half a hundred king penguins (*Aptenodytes patagonica*) advanced to the water's edge, all shouting their surprise, disapproval, or welcome—it was difficult to say which.

To reach the sea, the birds had to thread their way between scores of elephant seals lolling on the beach and past a colony of the smaller gentoo penguins busy with their domestic affairs. From the headlands above, hundreds of little heads peered at us through the high grass, while an unbroken string of penguin relatives hurried up the hill to bring news of our arrival.

Dominican gulls in the bay protested our invasion of their privacy; their raucous cries seemed feeble beside the groans, hisses, sneezes, and belchings of the sea elephants (page 107). From this noisy chorus arose tones so startlingly human we could scarcely believe our ears.

The cove, we decided, would provide a safe anchorage as long as the gentle easterly wind prevailed, and would be convenient for investigation of the penguin rookery we hoped to find on the side of the Lucas Glacier. Next morning we set out to investigate.



Our path was strewn with the carcasses of recently slaughtered elephant seals. Government regulations allow the killing of up to 6,000 mature males each year; the bodies, stripped of skin and oil-yielding blubber, are left to rot on South Georgia's beaches.

Skuas, the predatory gulls of the Antarctic, fought for the last ounce of dried and putrid flesh in these mournful graveyards. Giant fulmars (called "stinkers" in these parts) hung about in small parties, but fled to open water at our approach. There with half-opened wings they waited, bickering among themselves as to who should return first to the loathsome banquet.

Rookery Mimics a Garden Party

Glacial torrents forced us to make several detours; their gray, muddy waters often reached above our knees. After fording one of these, I stopped on a hillock and trained my telescope on the crowd of penguins, now

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↓ South Georgia Island: Target of Gales

A storm-scoured dot in the path of the world's fiercest winds, South Georgia lies in the cold South Atlantic, 1,200 miles east of Cape Horn. Capt. James Cook claimed the barren island for Great Britain in 1775. Sealers and whalers ravaged its teeming wildlife in the age of sail. Today whaling is South Georgia's sole industry. Summer population is about 1500; in winter it dwindles to half as many.

Willis Islands
Bird Island
Elsehul
Right Whale Bay
Albatross Island
Bay of Isles
Whaling Station (Abandoned)
Prince Olaf Harbour
Possession Bay
Undine Harbour
Start Point
Jaeger Glacier
Antarctic Bay
Fortuna Bay
Leith Harbour
Stromness Bay
South Atlantic Ocean
Whaling Stations
Shackleton Glacier
King Haakon Bay
South West Bay
Cape Nuñez
Cumberland Bay
West Bay
King Edward Point
Grytviken
East Bay
Whaling Station
Burial place of Sir Ernest Shackleton, Antarctic explorer
Sugarloaf Peak
Nordenskjöld Glacier
Penguin Point
Mt. Paget
Newark Bay
Allardyce Range
St. Andrews Bay
Annenkov Island
Royal Bay
South Georgia
Included in Falkland Islands Dependencies administered by the United Kingdom
Novosilski Bay
Cooper Bay
Drygalski Fjord
STATUTE MILES
Cape Disappointment
Rumbolds Point
Scotia Sea
Equator
SOUTH AMERICA
South Atlantic Ocean
AFRICA
Argentina
Falkland Islands
South Georgia
Cape Horn
ANTARCTICA
South Pole

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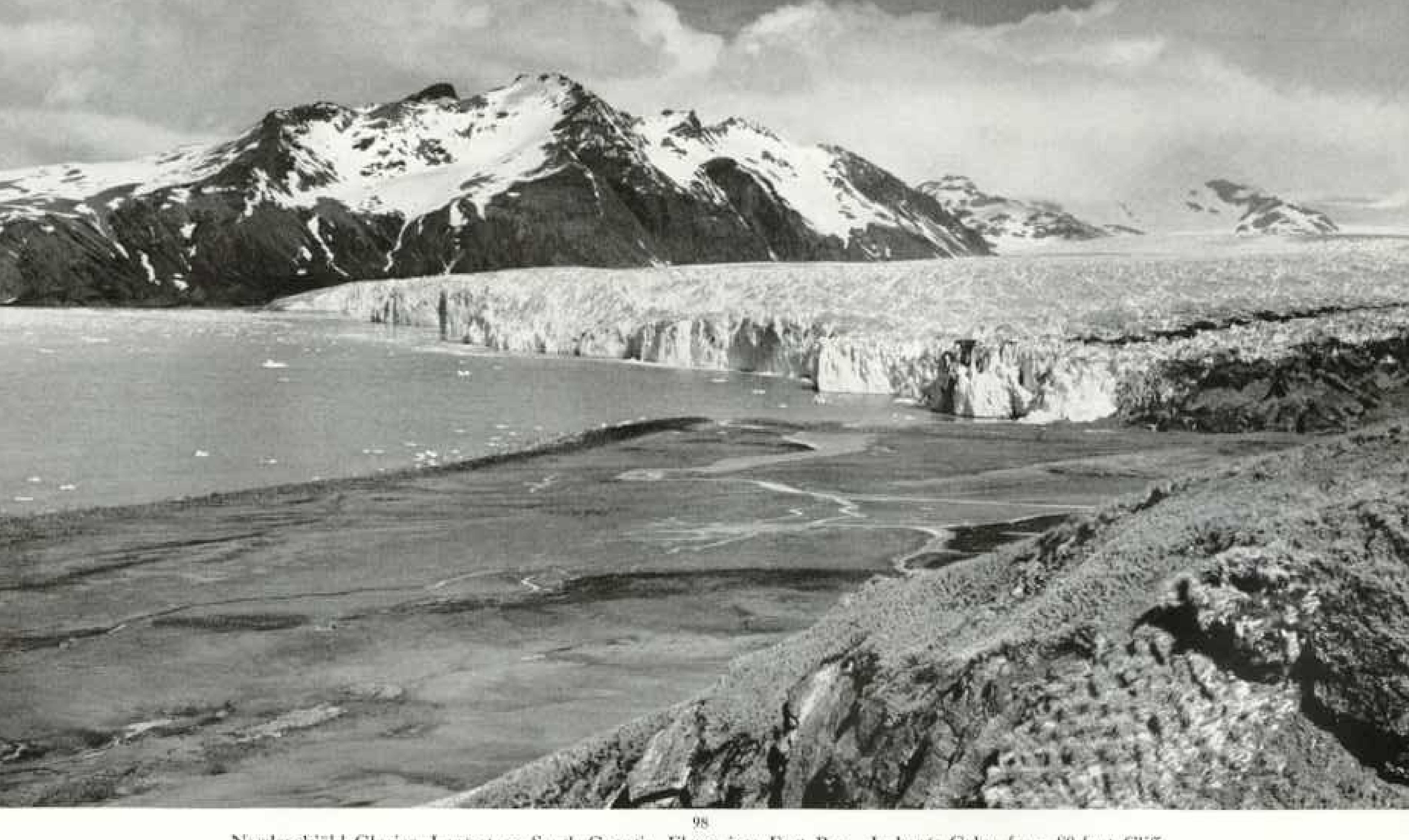

Nordenskjöld Glacier, Largest on South Georgia, Flows into East Bay. Icebergs Calve from 80-foot Cliffs

A desert of crevasses, the glacier creeps from the snow fields of 9,200-foot Mount Paget, the island's highest peak. Once, while seeking a rookery of gentoo penguins during a fog, the author nearly drove *Albatross* into the ice cliff. Tussock grass covers slopes in foreground.

← Baby Penguin Thinks He Still Fits

When he was smaller the young gentoo, or Johnny, penguin (*Pygoscelis papua*) snuggled easily beneath mamma's or papa's chunky body. There he was safe from skuas, savage gull-like predators of the Antarctic and implacable enemies of small penguins (page 114).

When this Johnny grows larger, his parents will turn him over to community baby sitters, who look after all the small fry in a colony. Mother and father then devote themselves to fishing for the nursery.

"Look! Two Eggs!" →

The author played a trick on this king penguin (*Aptenodytes patagonica*) by giving it a second egg. Possessor of an exceptionally strong brooding instinct, the puzzled bird tried in vain to tuck it into hatching position.

Only king and emperor penguins brood eggs on their feet. Kings incubate their eggs 52 to 56 days. Male and female take turns with the chore. Sleek gray backs, snowy breasts, and orange trim on black head plumage make them the most beautiful of penguins.

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Two King Penguins, Pets of the Expedition, Oversee a Watering Party at Work

Nineteenth-century hunters took advantage of penguins' trustful nature to slaughter them for the oily blubber that protects their bodies from cold. Laws now forbid such fearful massacres.

only three-quarters of a mile away. Their size was difficult to gauge, but the long pointed beaks and flashes of bright orange just behind their ears put the matter beyond any doubt. Here were our king penguins (page 94).

The ridge where the kings had founded their colony was about 150 feet high. Covered with drifts of gray trampled snow, it ended sharply beside the sloping flank of the glacier. The birds evidently favor this site because it combines the largest area of snow-free ground in the early spring with the year-round ice and snow of the glacier.

To avoid disturbing the birds, we made a detour and came down on the rookery from above. The majority of kings had already paired. Penguins stood about in couples as if waiting for something to happen. No doubt the something was the appearance of the precious egg. Meanwhile, the birds chattered deafeningly.

Wandering about was heartily frowned upon. When a penguin wished to leave its post for a while to swim or hunt for a meal, every neighbor it had to pass took forcible exception to its plans (page 102).

Apart from this communal ban against circulation inside the colony, I have never seen anything look more like a ceremonial garden party—the gay colors, the dense crowd, the incessant jabber, occasionally a high-pitched peal of mirth, and, above all, the continuous turning of heads.*

Handshakes Upset Penguins' Dignity

My first and most vivid impression of the kings was of their immense dignity. It takes a lot to ruffle a king. When a person goes very near, the bird shoots its neck up straight, turns its head, and utters a quiet gurgling protest. If one goes closer still, the penguin wheels and gives a couple of warning waves of the flipper. If the bird decides to retreat, it

* See "Nature's Clown, the Penguin," by David Hellyer and Malcolm Davis, NATIONAL GEOGRAPHIC MAGAZINE, September, 1952.

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Albatross Visits a Dead Whaling Village

South Georgia's Prince Olaf Harbour station has stood abandoned for 24 years, but its tumbledown buildings still house machinery that processed a fortune in whale oil.

The 42-foot *Albatross* began life nearly 40 years ago as a British Royal National lifeboat. The author converted her into a cruiser with whaleback deck. She journeyed to South Georgia and back aboard a whalers' factory ship. "I picked her," says the author, "not for her beauty but for the stubborn seaworthiness bred in her by generations of shipwrights who knew their trade."

The Author Stands in His Snug Wheelhouse

Naturalist, wildlife photographer, and veteran of Britain's World War II army, Colonel Rankin is also an explorer. Recently he went to Nepal to survey the Annapurna range of mountains. His experiences on South Georgia are more fully recorded in his book, "Antarctic Isle."

Albatross had a radiotelephone for emergency communication with whaling ships and stations.

"When You Say That, Smile!" Neighbors Will Turn This Squabble into a Free-for-all

Using powerful flippers that make them the best swimmers among diving birds, king penguins deal blows that can knock down a stooping man. Most quarrels start when a bird moves about among its companions. Penguin at left, brooding like most of the others, shows how kings sit on brushlike tails.

will move backward, but the quiet dignity remains—no fuss or flurry, and no lashing of the air with flippers, as so often happens with the smaller penguins.

Only if one tries to touch a king does it resort to violence. An attempt at a handshake will bring two or three sharp flipper blows in return for one's impudence.

Bugler's Neighbors Resent the Noise

Though not a demonstrative bird, the king penguin occasionally must let off steam. This usually takes the form of a loud trumpeting bugle call. Apparently an expression of sheer joy of living, it is not confined to the courtship ceremony, but can be heard whenever kings are gathered together.

The onset of a bout of trumpeting by any individual seems always to come as a great surprise to its neighbors, who invariably raise their necks in a disapproving and disdainful manner. As the bugler drops its head at the finish of a call, the nearest penguins will often give it a few sound pecks for such selfish, overexuberant disturbance of the peace.

The trumpeter, rudely aroused from its last convulsive effort, not unnaturally lets fly right and left with flippers and beak, causing far more annoyance and confusion than did its high-spirited outburst. But then it is not for a penguin to reason out such things.

The courtship of the king penguin, on the other hand, is calm and dignified. The whole affair is carried out with extreme gentleness and grace.

Courtship begins with a deferential bow on

If Powerful Wings Were Free, This Wandering Albatross Could Rout Both Men

Diomedea exulans, prize flyer of the southern ocean, can barely take off and land in still air, so he lives in the belt of earth's fiercest winds. His air-speed averages a mile a minute; wings may spread 11 feet. This male, friendly except when handled, went calmly back to his nest after being measured.

the part of one of them—I have no idea who instigates it—which is politely answered by the other. It may be repeated several times. Then the couple cross their beaks and lay their necks against each other, all the while keeping up a gentle murmur. Presently one starts nibbling at the neck feathers of the other, producing a rattling, castanet effect; this, too, is reciprocated, slowly at first but with a gradually rising tempo, until excitement becomes intense and the birds mate.

Penguins Keep Eggs Under Wraps

As I hovered about the edge of the rookery, it suddenly dawned on me that certain individuals in the center of the colony—they seemed to be concentrated in two or three small clumps—were adopting an attitude quite different from the rest. Their pose was slumped, with chest thrown forward and head drawn down on the shoulders. Strangest of all, each had a bulge of feathers protruding from the lower abdomen that completely obscured the feet, as if a white fur motor rug were wrapped round its middle (opposite).

Threading my way past a number of penguins on the fringe of the colony, I approached the nearest hunched bird. I remained motionless, and it quickly forgot all about me. Its grumblings ceased, it retracted its neck, and with half-closed eyes resumed its quiet meditation.

Then I took an unpardonable liberty. Slowly my hand stole forward; with the tips of my fingers I lifted the bulging "fur rug." Promptly a sharp blow between the shoulder

An Albatross Woos His Lady Fair with Song and Dance

Could the Ancient Mariner of Samuel Taylor Coleridge's *Rime* have seen the tender courtship of the wandering, or great, albatross, he might not have loosed the crossbow bolt that brought down the bird.

Here, on South Georgia Island, a fine male (on nest) has cajoled a prospective bride into listening while he pleads his case. Already he can consider himself a favored suitor: when the lady first dropped from the skies, many another fine-feathered gentleman tried to inveigle her into matrimony.

←Here she joins heartily in conversation. The pair gabble for 15 minutes or so. Every now and then they stop chattering to nibble each other's necks.

↓As excitement grows, the birds rise on big webbed feet. Stretching hooked bills to each other, they gobble, wheeze, and rattle mandibles.

Pictures on opposite page show what happens next.

Tom Stretches Wings as if Taking a Vow to Be a Good Husband

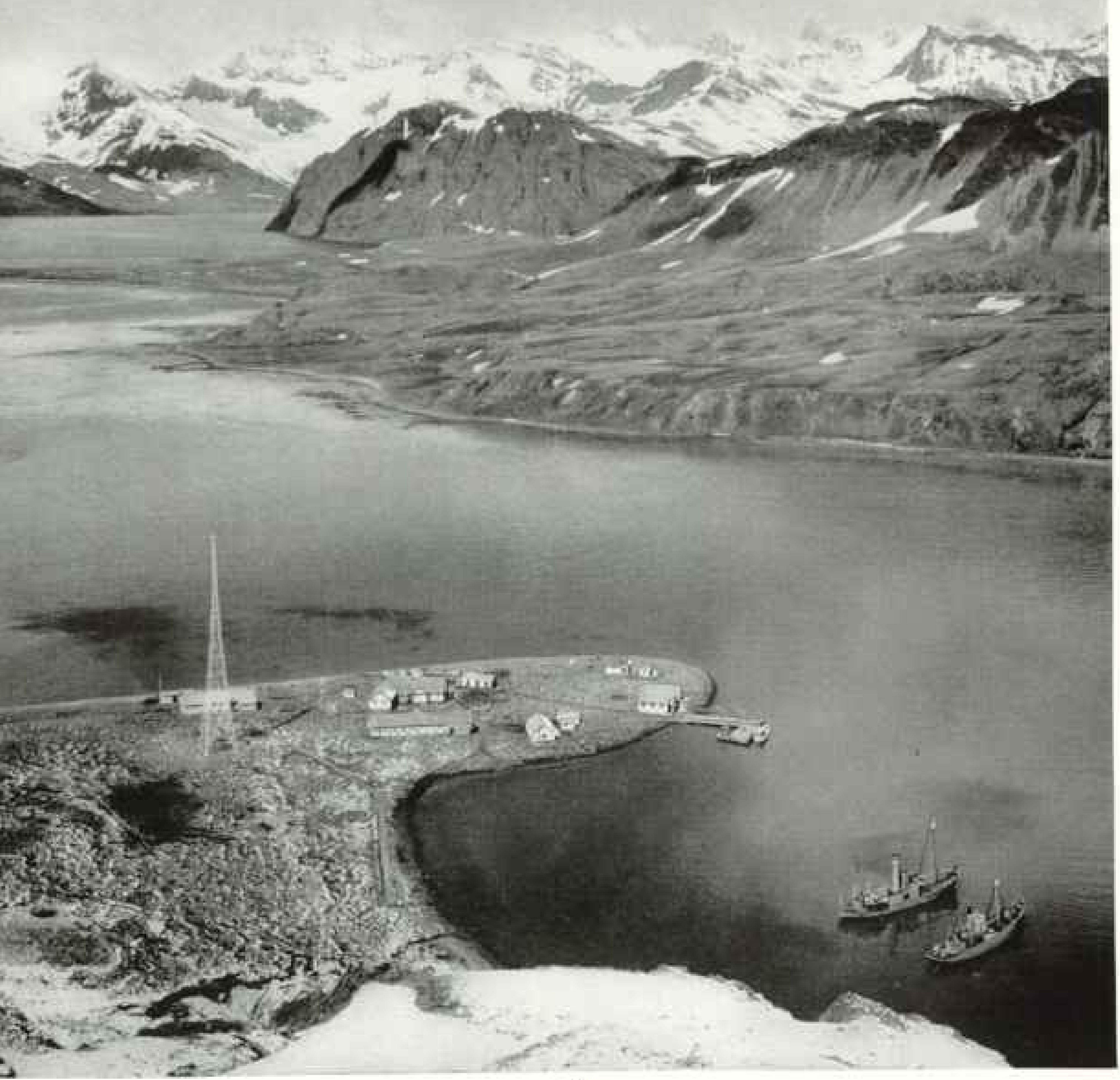
This suitor may have overstated his merits, for the lady in the background has overheard the conversation and is favorably impressed.

"Would the gentleman care to look further before deciding?" she inquires, strolling over. Such interruptions of a courtship can cause unladylike battles.

Center panel: Her rival gone, the female spreads wings in an invitation to the dance. The gentleman trumpets his acceptance.

↓Standing on the nest, the male pirouettes and emits a piglike squeal. His lady chooses to follow him in the figure; another might tread a solemn tap dance by herself or stand stock-still in ecstasy. Eventually, when he completes his circle, she will stamp toward him until chests almost touch. Then suddenly both birds will collapse, exhausted. After a rest, the intricate performance starts all over.

Albatrosses usually mate following one of these noisy performances.



King Edward Point, the Island's Tiny Capital, Looks Up to the Allardyce Range

Here a magistrate represents the Crown and doubles as postmaster. *Albatross* occupies the wharf; two whale catchers ride at anchor. The radio tower sent Colonel Rankin's messages to England for delivery a day later. Sir Ernest Shackleton, Antarctic explorer, lies buried in Grytviken, half a mile away.

blades knocked me to my hands and knees in the mud.

Without turning my head, for fear that the devastating flipper would descend again, I waited on all fours till I felt the incident had blown over. Then I tried once more. This time the bird appeared less aggrieved but slightly impatient; I had just enough time to raise the fold of skin. Hidden underneath and balanced skillfully on the penguin's feet was an egg.

Then the bird shuffled away out of reach. The whole attitude of this very dignified parent made me feel I had behaved in a most ungallant manner; but I fear that as time went on I grew more callous, and carried out these intimate examinations with the point of a walking stick.

The growth of the young penguin is extremely rapid. By the end of the first 10 days the small body is almost covered with dusky down and may weigh as much as 17 ounces. The baby more than doubles birth weight before getting a full coat (page 113).

By this time the young king has become so rotund and bulbous as to outgrow its nursery. However, accustomed to life beneath its parents' feathers, the small bird still forces its head under the fold and struggles to get the rest of its body hidden away. Exhausted,

it eventually gives up and remains, ostrichlike, with head out of sight and body exposed. It is a ludicrous sight to see rows of brooding penguins, each with a small brown parcel bulging out from under its apron (page 99).

At the beginning of their first winter, young king penguins are not capable of going to sea and fishing for themselves. Instead they bunch together in one huge nursery presided over by adults detailed to act as nursemaids.

From what I saw, these baby sitters are not bowed down with the weight of their cares. They wander about among the down-coated young with no apparent purpose, more often than not in pairs, reminding me vividly of military policemen.

Far be it from me, however, to belittle their functions. In the depth of winter their task must be an unenviable one: moving an unruly crowd of youngsters into fresh shelter with every change of wind; shepherding stragglers who might otherwise become engulfed in drifting snow; and generally supervising the welfare of an irresponsible crowd in the vilest weather imaginable.

Pneumatic Nose Marks This Elephant Seal as a Male

By 1885 hunters almost wiped out *Mirounga leonina's* South Georgia colonies. Protected now by law, the seal is increasing again. At sea he fears only killer whales. This 3-ton bull inflates his hollow proboscis in anger. The author risked a bite to get this portrait.

It often happens that, when we have been keyed up in expectation of something famed in literature, we feel a trifle disappointed when we meet it in reality. It was with some misgivings that I looked for my second major objective in South Georgia, the much-vaunted wandering, or great, albatross (*Diomedea exulans*). Fortunately I was not disappointed.*

Albatross Soars on 11-foot Wings

I had first seen one of these magnificent birds some 250 miles after we had cleared the Tropics on our voyage to South Georgia. The day was dull and overcast, with a strong breeze blowing—weather beloved of the greatest of all seafowl—when from below the stern of the floating whale factory appeared this giant bird, rising on motionless snow-white wings till it floated far above the masthead. It hung for a moment, then swung away toward the foam-crested waves on our windward beam.

The strength of the albatross is one of its most famous characteristics, and an attribute it certainly needs, living as it does in the zone of the fiercest winds on earth. Its average air speed has been calculated at around 60 miles per hour; its wingspread is sometimes 11 feet (page 103). There is no doubt that

* See "Birds of the High Seas," by Robert Cushman Murphy, NATIONAL GEOGRAPHIC MAGAZINE, August, 1938.

it is the most powerful sea bird on the wing, though there are many who consider its smaller cousin, the sooty albatross, a formidable rival for sheer beauty and grace of flight.

Apart from some courtship scenes watched in the Undine area at the northwest extremity of the island, all my observations on this wonderful bird were made on Albatross Island, a tussock-covered islet a little over a mile from shore in the Bay of Isles.

It was on December 14 that I first landed there. A large number of giant fulmars occupied nests in folds of the hillside, and all the hummocks and ridges carried the voluminous remains of old albatross nests. On top or beside most of these relics of past breeding seasons sat albatrosses—male birds awaiting the arrival of the ladies.

The landing of a female is the signal for all the males in sight to abandon their posts and congregate around her. The males bow low on the ground, groaning harshly. The female groans in return. Then the suitors begin a jig in front of her, first with wings half opened, then fully spread, and with necks stretched upward.

Not for a moment is the lady left alone by that prattling, importuning circle until she consents to accompany one of them to a place of greater seclusion. Whether or not it is always back to the old nest from which he came helter-skelter to meet her, I cannot say.

Courting Sea Birds Croak and "Bubble"

At any rate, the cock albatross sits down on the nest with the female close by at the foot (page 104). Then begins a long bout of hoarse croaking, for 15 minutes without a break; to me it sounds like a man with a cleft palate commanding a horse to stop: whoa, whoa.

This is followed, or even interspersed, with periods of neck nibbling and occasional tugs at tussock stalks; first one bird nibbles, then both simultaneously. Occasionally the female works at the male's breast feathers with her bill, but usually it is at the cheek and crown of the head.

Next the male stands up, stretches his neck, and "bubbles" as if he were blowing air through a bottle of water. As he does so, he vibrates the halves of his beak like a rattle. This usually brings the lady to her feet, and she stretches her neck toward his. Very often a small drop of saliva appears at the end of the male's beak. It seemed to me that she sometimes took this in her bill, but it was not easy to see.

Both start bubbling and bill-rattling, extending their necks and puffing out their chests. As each bout of bubbling approaches its finish, the two gradually bring their bills together until they are about to touch. Then with a jerk and a loud snap of the bill each withdraws as if at the last minute afraid the other is going to bite. Almost invariably after this snap the birds lower their heads and touch their breast feathers with the beak as a sort of token preening.

Dancing Suitor Squeals Like a Pig

All this, of course, leads to a whirl of excitement. Suddenly the male spreads his wings in a graceful curve with the points advanced beyond his head, at the same time stretching his neck vertically with the beak pointed straight up (page 105).

This is the beginning of the dance proper. Slowly the albatross rotates on his own axis, wings held motionless, huge feet lifted high in the air and then replaced heavily in the nest. As he completes a full circuit, he squeals like a young pig.

The female reacts in various ways. She may side-step in time with her mate, so that she is always facing him as he makes his 360-degree turn, with or without raised wings. She may waddle around at some distance from the nest, neck stretched low in front of her, in a rolling gait with her great feet clicking like a tap dancer's shoes. Or she may remain motionless, lost in an exquisite stupor.

The climax is reached when the male, having completed his slow circuit of the nest, comes to rest facing his original direction and stands there in all the glory of his wide wingspread, tail cocked jauntily upward, shrieking his love for all to hear. At this the hen slowly advances, neck and wings in the same attitude, until both are almost touching. Suddenly the whole performance collapses like a burst bubble, and the birds sink exhausted. After a while the cycle begins again. Mating may take place at the close of one of these dances.

Of all the creatures I came upon in South Georgia perhaps the least attractive was the sea elephant (*Mirounga leonina*). Coarse and ugly, this hulking brute has little to commend it other than impressive size and an oily undercoat (page 107).

By far the largest of the seals, a bull sea

elephant may measure up to 20 feet in length and weigh as much as three tons. Its thick layer of blubber beneath the skin yields an oil as valuable as that of the baleen whales.

This seal constitutes the only real hazard to human movement amid the tussock grass of South Georgia. On at least two occasions I found myself with one foot on the grass and the other on the wobbling body of a sleeping sea elephant. A sudden movement of the seal's body and I might have fallen beside it, with the likelihood of getting a savage mauling from its powerful canine teeth before being able to wriggle clear.

For the sea elephant the year can be divided into four distinct phases: the winter spent at sea, a spring breeding season, another short spell at sea, and a period on shore in the fall for the annual molt.

Toward the end of August the cows start to haul out on the beaches in ones and twos, then in a steady influx. Within a week or so of their arrival the pups are born, and the bulls make their appearance. Last of all, the virgin cows come up to join the throng.

Chaos ensues. Newborn pups squeal for their moth-

Baby Aeronauts Look Like Cones of Cotton Candy

One of the three lesser albatrosses, or mollyhawks, the black-browed albatross (*Diomedea melanophrys*) is the commonest in all the oceans from the Tropic of Capricorn to 60° south. These dour youngsters are about three months old.

A Wary Johnny Penguin Eyes the Foe, a Sleeping Leopard Seal

In open water gentoos can usually outmaneuver the torpedo-shaped beast, fiercest of its kind. Near land, amid rocks and kelp, the seal ambushes penguins, killing and skinning them with powerful shakes of the head (page 117). Angry sea leopards have been known to attack men savagely.

ers in high-pitched little barks. Old bulls rampage around, bellowing and trying to round up unwilling cows busy with family cares. A screaming, bickering crowd of gulls, skuas, stinkers, and sheathbills dashes hither and thither to fight among themselves for bits of offal.

The pups remain with their mothers only three or four weeks. Then young of about the same age club together in small groups. These gangs gradually enlarge but do not immediately take to the sea, contenting themselves with playing around in the fresh-water streams and shallow waters off the beach for the next six weeks or so.

Watchful Bachelors Raid the Harem

In the larger rookeries the harems that the bulls have created are pressed close together with no sharply defined boundaries. Possession may be nine points of the law, but a bull sea elephant must work mighty hard to retain all his cows. Around the outskirts of his harem are strings of bachelor bulls, mostly younger ones, ready to slip in and poach a cow if the old gentleman relaxes his vigilance for a moment.

Any such raid, of course, instantly produces a roar from the lord and master. Raising head and chest on his foreflippers, he bellows a challenge that should make even the bravest intruder pause. From deep in his throat come three or four reverberating explosions, ejected with such force that a shower of mucus is shot out as well.

If the intruder is a smaller animal, this is usually enough for him, and he will consider it wise to move away. But an equally large bull, newly arrived from the sea, will often return the challenge and advance toward the owner of the harem. Such a gesture cannot pass unheeded. The enraged owner makes a headlong rush at the newcomer, steam-rolling cows and pups in his furious drive.

If the challenger holds his ground, the two seals rear up on their hindquarters and lunge, each trying to tear the other with his huge upper canine teeth. Usually their necks meet with a resounding whack, and they try to get in a quick gash before withdrawing for a second attack.

Occasionally, however, one bull misses altogether, and falls on his face. The other seizes the opportunity to give him a good mauling, often tearing large lumps of skin and blubber from the neck and shoulders.

This usually brings the fight to an abrupt end, and the wounded bull beats a hasty retreat to the sea. If there is no decisive victory, one or the other soon tires of the battle and makes off.

Though a great deal of flesh may have been ripped away, wounds are not usually deep. Occasionally an eyeball is scratched; less frequently, one is torn out.

Cows Unimpressed by Mate's Prowess

Having dealt successfully with the challenge to his supremacy, the owner of the harem returns to his ladies. They, however, do not appear in the least impressed by his prowess. If the fight has lasted more than a few minutes, the chances are that a watchful bachelor, biding his chance, has slipped in to mate with one of the cows. It is a matter of supreme indifference to them which bull it may be, so long as one turns up at the critical moment.

Confronted by a human intruder, the barem bulls issue the same challenge, and if he does not halt, they start for him. For a short stretch the sea elephant can move remarkably fast. The only safe course is to watch the position of the bull's foreflippers and plan one's movements accordingly. In order to heave himself forward, the bull must bring his flippers at right angles to his body; so long as the flippers remain parallel to the body and pointing toward the tail there is comparative safety in a close approach. But when those flippers travel forward, it is time to get going!

A Nesting Wandering Albatross Eyes the Author's Cumbersome Camera

South Georgia's sea birds generally showed little fear of man. Skuas even attacked expedition members who ventured too near their nests (page 113). The bird brooding beyond the tripod is a giant fulmar.

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Mollyhawk Broods on a Cup-shaped Nest

Soft bluish-gray feathers on head and neck give *Diomedea chrysostoma* its popular name, gray-headed albatross. The bird shares the far-flung range of its cousin, the black-browed albatross, but is rarer.

The sea elephant may seem gross, homely, and revolting to some, but the sea leopard of the Antarctic *(Hydrurga leptonyx)* is, to my mind, far more sinister in appearance. Other seals, such as the Atlantic, Weddell, or crab-eater, are fat, rotund, and benevolent looking. The leopard, however, is long, lithe, and serpentine, with a head unlike any other of its kind, and a hard, cruel expression. Its terrible teeth are designed for the tearing of flesh; it feeds almost entirely on penguins and other seals.

Not gregarious, the leopard seal comes ashore by itself to sleep, hauling out on the beach a short distance from the water's edge; it never reaches the tussock grass (page 110). An untrusting and untrustworthy creature, the leopard seal hugs the safety of its natural element. Unlike other seals in this part of the world, it shows fight when first disturbed, then makes quickly for the water.

When suddenly awakened, the leopard snaps its jaws, exposing fearsome teeth that seem out of place in a seal. If any further approach is made, particularly if the intruder stands between the seal and the water, the leopard will lunge to the attack.

I have never heard of a man being caught by one, but people wintering on South Georgia, where leopards are sometimes found on snowbanks above the sea, are careful not to pass between them and the water; the leopards can jump with uncanny power. At sea they have been known to leap onto ice floes six feet above the water.

One evening off Start Point we had the unpleasant experience of having a large leopard shoot its head out of the sea between our dinghy and the *Albatross*'s companion ladder, just as we were coming alongside. We had no idea what its intentions were, but a sharp blow with its hind flippers could have severely damaged our little boat. I gave it a resounding whack with my oar, and it disappeared.

Hungry Leopard Skins a Penguin

Whether a leopard can catch a penguin in the open sea is questionable. Though the seal can move with incredible speed, a healthy penguin when hurried can disappear like a streak of lightning. The seal's usual method, therefore, is to lie in wait amid the kelp on the main thoroughfare to a rookery and grab an unsuspecting victim as it passes.

One day I looked down from the macaroni

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Baby Kings Are Scarcely Slick Chicks

For their first year, king penguins stay around the rookery. Their frowzy Teddy-bear costumes are chocolate brown. Correctly attired grownups turn away from these three unkempt fellows standing with feet in slush.

penguin colony on Elsehul and saw two leopards lurking off the rocks. They floated with the humps of their thin backs just awash, raising their heads only to breathe before resuming their surveillance of the submarine traffic below.

I turned away for a while; then, happening to look back, I saw that one of them had something in its jaws. It gave two or three vigorous jerks of its head, sending the spray flying, and dived steeply in the clear water, leaving an object floating on the surface. I had no telescope with me, but I am sure that I witnessed the peeling of an unfortunate penguin and that it was just skin and feathers that remained afloat.

Following the riverbank on our homeward journey from Undine Harbour one afternoon, we were attacked by several pairs of skuas in turn.

The great skua *(Catharacta skua)*, which breeds in Britain only in the Orkneys and Shetlands, plummets downward like a dive bomber. It makes straight for the head, checking its descent only at the last second and delivering an unpleasant blow with the backs of its feet as it passes. This skua will attack only from the rear. I had learned that if I turned my head sharply as the attack came in the bird would instantly alter course. A walking stick held a few feet above my head sufficed to ward off an assault.

The Antarctic, or brown, skua *(Catharacta lönnbergi)* shows all the traditional tactics and cunning of this northern bird, but with one noticeable difference. It will attack from any direction—front, flank, or rear—so that a facial battering is a real possibility.

Walking Stick Angers Skuas

When I first saw a South Georgian skua coming straight at my face, I assumed it would sheer off while still some distance away. Many days spent with the Shetland Island birds had taught me their particular methods; with a skua of similar appearance I expected similar behavior. But when this great brown bomber held on its course and was within a few feet of my eyes, I hurriedly forgot all I had learned in Shetland and almost banged my nose on my knees getting out of its way.

Another difference between the Antarctic skua and its northern cousin is that the former will attack just as intensely any article carried above the level of the head, even a gun barrel.

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Giant Fulmars Share a Fin Whale Carcass with Smaller Cape Pigeons

British, Norwegian, and Argentine companies operate three whaling stations on South Georgia. Their fast killer ships hunt with harpoon cannons and tow the dead whales ashore for processing.

My walking stick held aloft seemed to infuriate these pirates. They struck it repeatedly and with such violence that I was afraid they would injure themselves.

It would be interesting to know how many generations would be required, if these birds were transported to a populated area, before they would acquire the wariness of their Shetland cousins, who no doubt at some period in their evolution displayed the same fearlessness and paid for it accordingly.

In the case of the southern skua, there is less harrying of flying birds for what they are carrying than for outright murder; only two or three species are robbed, whereas several of the smaller petrels are regularly killed on sight for their own flesh.

The richest pickings, of course, are among the penguin rookeries. Adult penguins are too large to be persecuted by these rapacious birds, but unguarded eggs, newly hatched young, and surplus food around the nestlings contribute largely to the skuas' economy. It is rare to find a rookery without its complement of a pair or two.

We studied many other birds in South Georgia—Dominican gulls, wreathed terns, teal, sheathbills, shags, pipits, Cape hens, Cape pigeons, whalebirds and several other varieties of petrel—and we admired and grew fond of nearly all. But one, the giant fulmar *(Macronectes giganteus)*, struck us as being without a redeeming feature.

Thieving Stinker Is Island Villain

To put it bluntly, this unpleasant bird is a killer, robber, and consumer of all that is loathsome. I personally dislike referring to it as the giant fulmar, a name which to my mind conjures up a bird even more magnificent than the benevolent and graceful fulmar of northern waters; "giant petrel" at least keeps it separated, but, better still, the name stinker puts it in a class by itself, where it belongs. So stinker it shall be.

At every whaling station of South Georgia this feathered villain is common, feeding on offal from the platforms where whales are stripped of their blubber, fighting all who dare to contest its right to the largest and crudest

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Flensers Strip Leviathan's Blubber and Chop Baleen from Gaping Jaws

Intensive hunting long ago killed off the whale herds in South Georgia's bays. Now island-based killer boats range far to sea. They and "floating factory" ships operate under treaties designed to prevent extinction.

morsels, and, when no ready-cut food is available, resorting to the untouched whale carcasses awaiting dismemberment (opposite). The stinker will seize anything: fish, crustaceans, or the young of other birds. If the albatross is excluded, it is the largest of the petrel family, being about 37 inches long and weighing around 8 pounds. Its wings extend more than six feet.

The stinker's nest is a bulky affair about two feet across and two feet high, built of tussock, moss, and mud. The young are hatched in December. Here I have another grudge against the stinker. Whenever I approached, it had no hesitation whatever in forsaking its diminutive chick.

In most cases stinker colonies are built on hilltops and headlands to assist the bird in taking to the air, for, compared with albatrosses, they are notoriously bad performers on land. When pressed, the stinker runs with legs almost vertical, but after a while it reverts, like so many petrels, to a clumsy gait with tarsus barely raised from the ground.

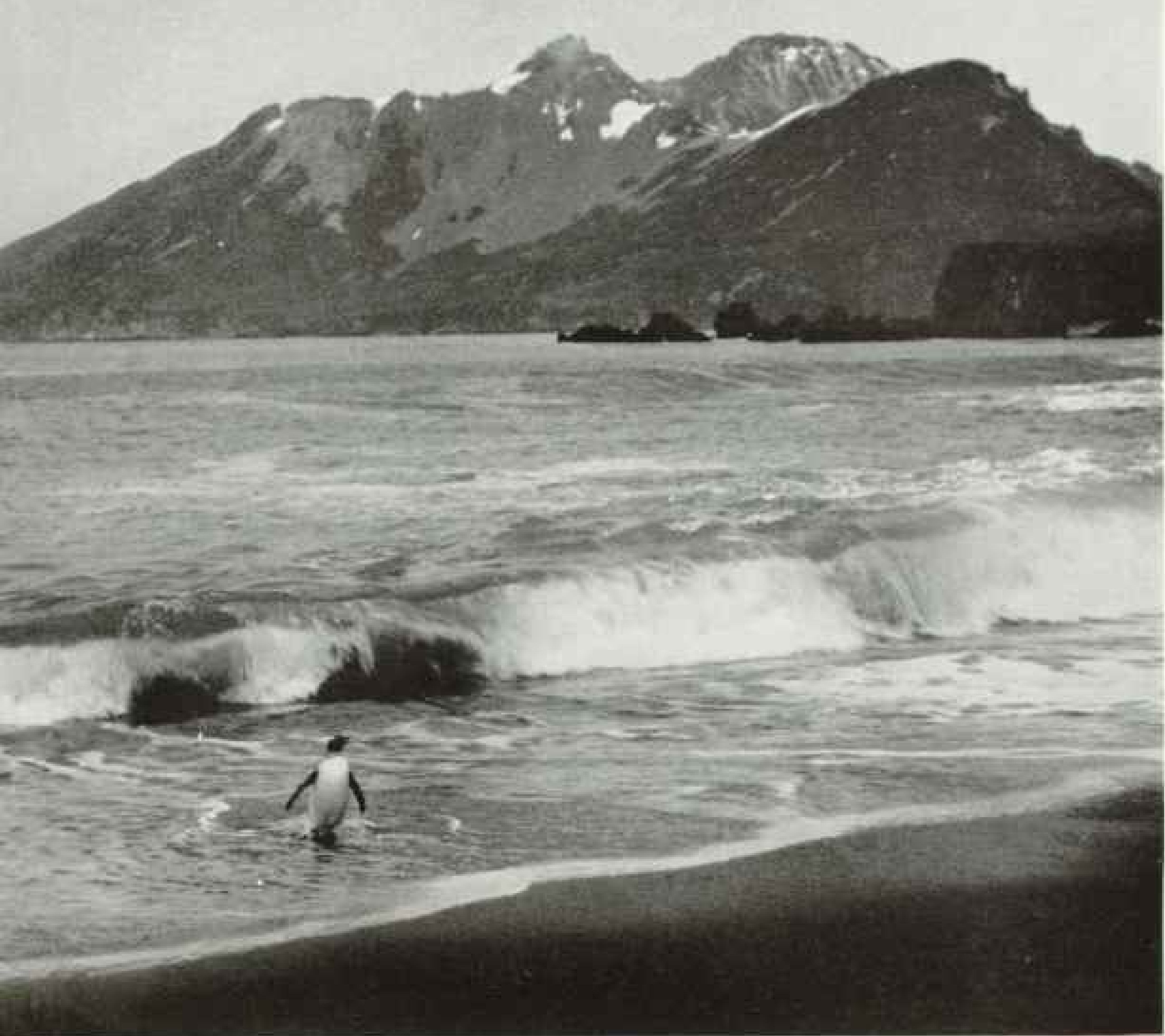
On Albatross Island it could not always find a nesting place on high ground, and there was immediate panic if we came over a hillock to surprise one in a hollow; a blind rush through the tussock usually produced one or two somersaults before the frightened bird got into the air.

Clumsy Birds Use Island "Airfields"

On this same island there were a number of flat grassy "airfields," smooth as tennis courts; it amused me to see a number of unoccupied stinkers always at the downwind end of these, ready to take off at the slightest alarm.

When approached during incubation, chances are that the stinker will throw up its entire last meal. Since it can shoot up to six feet, we always approached warily, or some of its choicest dishes would land as a permanent reminder on our clothes. No amount of cleaning will remove the odor.

From the very start the stinker chick, too, can deliver a powerful little jet of oil, and its aim seems to be even better than that of its parents.



Like a Portly Bather on His Private Beach, Johnny Comes Waddling Home

Gentoo penguins walk with flippers outstretched for balance (page 99). Returning from a fishing trip, this bird peeps over a shoulder at the onrushing wave. If it overtakes him, he will dive back through it.

Our final task in South Georgia was to collect penguins, some of which can be seen today in the zoos of Edinburgh, Glasgow, and London.

We made trips to the Bay of Isles and to Cooper Bay in a whale catcher. Bringing the birds back to Leith Harbour, we put them in a temporary pen until they could be shifted to more luxurious quarters on the *Southern Harvester*, with a swimming pool, diving boards, and ladders for their amusement.

Our last night on South Georgia was one of the loveliest I remember. Winter was approaching, and it was bitterly cold; but, as if in gesture to the parting guests, the stars shone and a brilliant moon cast its blessing from a cloudless sky.

In the small hours I looked out of the wheelhouse. The lights of Leith Harbour twinkled beside us, but all was silent.

Margaret Slept While Emma Brooded

On the forward deck of *Albatross* our pet penguin, Margaret, was asleep, her beak tucked behind her flipper. Her sister, Emma, sat hunched, however, with neck drawn down on her shoulders, brooding. Emma had no eye for the bright lights near at hand, but sat staring across the silvery water of the bay to the distant peaks beyond, as if she had some premonition of her long journey half across the world to an unknown land.

The next day *Albatross* was hoisted aboard the factory ship again, and we sailed away to the north.

Air Age Brings Life to Canton Island

Planes Spanning the South Pacific Transform an Uninhabited Mid-ocean Coral Reef into a Busy Base

By Howell Walker

Foreign Editorial Staff, National Geographic Magazine

With Illustrations from Photographs by the Author

"PERHAPS some day this bit of quiet lagoon will become a busy mid-Pacific haven for flying Clippers."

These prophetic words appear under a picture of Canton Island in a 17-year-old issue of the National Geographic Magazine. The photograph helps illustrate an article about what was then a lonely, barren speck of land.

To observe an eclipse of the sun, American and British astronomers had set up camps on Canton in 1937 (page 121).* In the course of their appointment with darkness they enlightened the world about the little isle, 1,909 watery miles southwest of Honolulu.

The scientists found no humans on Canton. The only living things were sea birds, turtles, hermit crabs, rats, and lizards among sparse, scrubby vegetation; a few coconut palms towered above the coral. Temperatures were high, rainfall was low, and the island lacked fresh water.

There was nothing inviting about this mid-Pacific atoll, but in a fast-developing Air Age it offered possibilities obvious to the star-gazing visitors of 1937. "Canton Island," wrote a member of the American party, "promises to be an important commercial airplane base in the South Pacific."

Small Atoll Welcomes Big Aircraft

Pan American World Airways has seen to it that the promise was kept. Two years later the company established a seaplane base in the reef-circled lagoon of Canton Island. It serviced flying boats operating between the United States and Australasia.

Then, after World War II, Pan American switched to landplanes, using Canton's military airfield. Today, three airlines under different flags regularly stop at Canton's airport, and the seadrome can still be used by flying boats.

Lights along the 6,000-foot runway guided our 47-passenger Stratocruiser in to a smooth landing the night I arrived on Canton Island to see how it had changed over the years since the eclipse expedition.

A well-appointed hotel managed by Pan American stands where astronomers once pitched their tents. I moved into one of its rooms overlooking the lagoon. A breeze in the palms near the beach sounded like gentle rain on the roof. A sea bird called in the darkness. To the drone of an electric fan I fell into wanted sleep after the long flight from Honolulu.

Island the Rim of a Dead Volcano

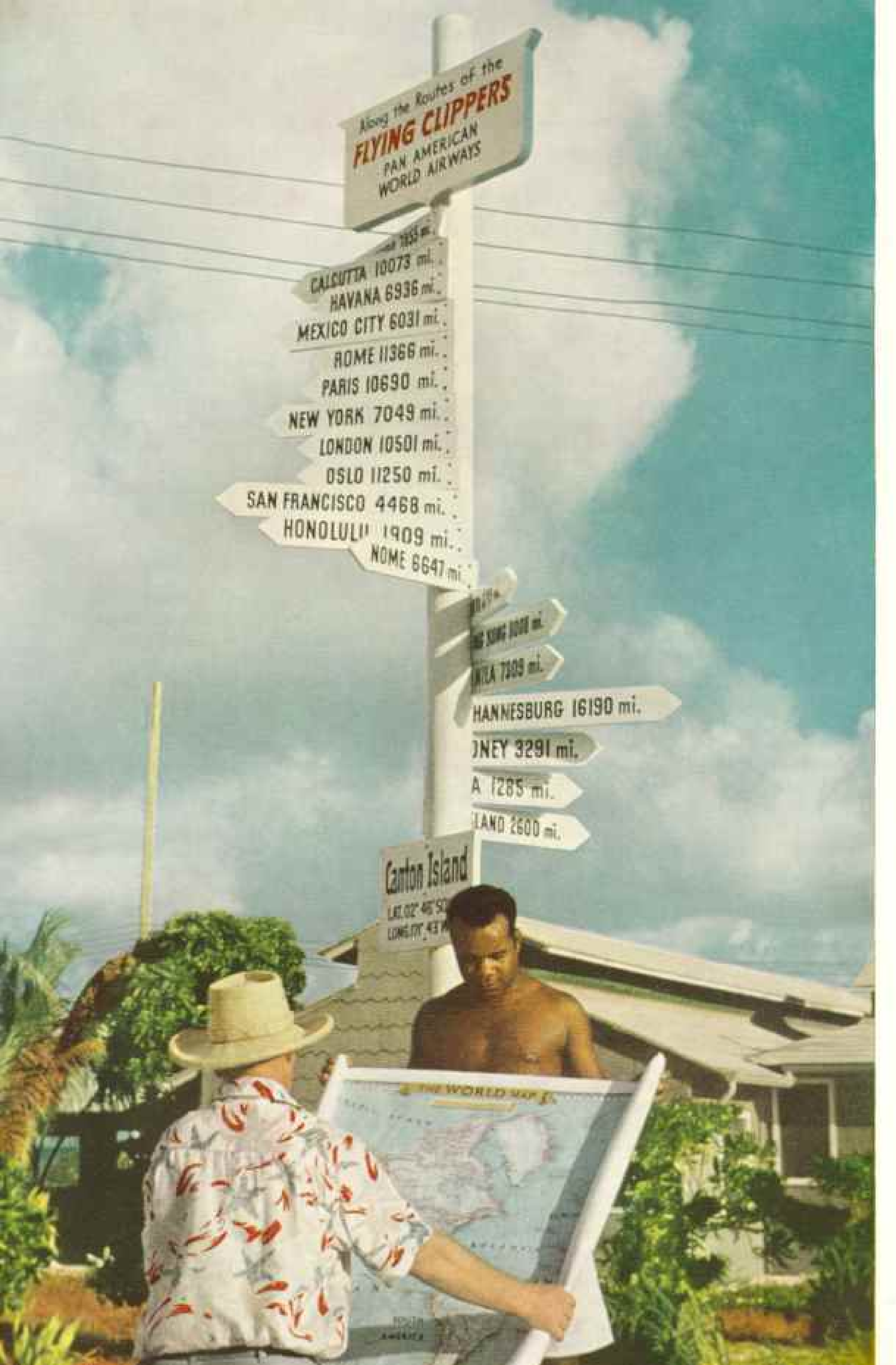
Canton, a coral atoll 198 miles south of the Equator, is built on the rim of an ancient volcanic crater about 30 miles around. Ranging in width from 100 to 700 yards, the belt of land girdles a body of turquoise water abounding in fantastic fish and fascinating coral formations. The island's highest point rises 20 unimpressive feet above sea level.

On a map the atoll looks like a hollow pork chop (page 122). But from the air Canton resembles a gem. Its exquisitely colored lagoon is bordered by pearly coral. The island is a particularly welcome sight to pilots; no alternate landing ground lies within hundreds of miles of this little strip of reef in a vast expanse of ocean.

Some 280 persons form Canton's two communities—Northside and Southside. These settled sections receive their names from locations north and south of a ship channel that provides the main entrance into the lagoon from the sea. The tide rushes through this cut in the atoll's western flank like a swift river in spate. Vessels up to 400 feet long can navigate the passage to berth at a dock in the dredged harbor.

I found Northside more of a town than Southside, which is largely residential (page

* See, in the National Geographic Magazine: "Crusoes of Canton Island," by Irvine C. Gardner, June, 1938; "Eclipse Adventures on a Desert Isle," by Capt. J. F. Hellweg, and "Nature's Most Dramatic Spectacle," by S. A. Mitchell, both for September, 1937.


Along the Routes of the
FLYING CLIPPERS
PAN AMERICAN
WORLD AIRWAYS
CALCUTTA 10073 mi.
HAVANA 6936 mi.
MEXICO CITY 6031 mi.
ROME 11366 mi.
PARIS 10690 mi.
NEW YORK 7049 mi.
LONDON 10501 mi.
OSLO 11250 mi.
SAN FRANCISCO 4468 mi.
1909 mi.
NOME 6647 mi.
HANNESBURG 16190 mi.
3291 mi.
1285 mi.
2600 mi.
Canton Island
THE WORLD MAP

120). The United States Civil Aeronautics Administration manages and occupies most of the northern area, while Pan American employees and the British Resident Administrator with his family live in the southern community.

Northside contains all airport facilities: runway, terminal building, maintenance shops, refueling equipment, navigational aids, communications station, and meteorological offices. Near the depot a village has grown up to support the units providing aircraft services.

Here I lunched with Americans, dined with Dutch, photographed Japanese and Portuguese, sipped coffee with an Englishman, visited the home of a Hawaiian, talked with Australians and New Zealanders, met Chinese and Koreans, and watched natives of the Gilbert, Ellice, and Fiji Islands fishing, servicing aircraft, or helping out as family domestics. Together they make up a happy, international population.

By an agreement in 1939 the United States and the United Kingdom assumed joint control of Canton Island for 50 years, and "thereafter until such time as it may be modified or terminated by the mutual consent of the two Governments." Air companies of both nations have equal rights to port facilities on the island.

Canton Was Once Named Mary

In the early 1800's several whaling ships independently discovered the atoll. At least three of the "discoverers" gave it a name: Swallow, Mary, and Mary Balcout.

The name that stuck came from the New Bedford whaler *Canton* which piled up on the reef in the mid-19th century.* The captain and crew of the ill-fated vessel survived a 49-day voyage in open boats from Canton to Guam. Out of respect for this feat, a U. S. Navy officer who surveyed the island in 1872 named it after the ship that foundered on its shores. I saw a rust-encrusted part of the wreck still on the beach.

Not much happened to Canton during the next several decades. British guano diggers arrived in the '80's, but soon abandoned the costly venture. Two shipping and trading companies leased the island at different times; apart from planting coconut trees, they did nothing to develop it.

The 1937 eclipse expedition really put Canton on the map; its importance to aerial navigation in the South Pacific kept it there. With planes came civilization.

World War II Jumping-off Place

What Canton meant during World War II to the United States and its allies in the Pacific can never be overestimated. Without this steppingstone for airborne supplies on their way to far-flung fronts below the Equator, events might have taken quite another turn—for the worse.

The Japanese realized Canton's importance, but the little island's defenders discouraged an enemy landing. U. S. Army, Navy, and Air Force men held the ground. Thousands of others took off from here to fight their way, island by island, toward eventual victory in the Pacific.

At Northside I met Mr. William J. Evans. Officially, he is the United States Resident Administrator of Canton and Enderbury Islands under the Department of the Interior; Island Manager for the Civil Aeronautics Administration under the Department of Commerce; and U. S. Special Deputy Marshal on Canton and Enderbury Islands for the Department of Justice. But to almost everyone who can talk he is simply "Bill."

"Jump in my jeep, and I'll show you Northside," said Bill.

We pulled up at the Canton Island School as midmorning recess began. I talked with the two teachers while all 32 pupils played outside the 3-room building remodeled in 1952 from an old Army mess hall.

Children from 3 to 13 years old attend classes from kindergarten through the eighth grade (page 128). I saw two Gilbert Islanders and a Japanese among the youngest. Before the island had a schoolhouse, a public-spirited Canton resident held classes on her back porch.

* See "American Pathfinders in the Pacific," by William A. Nicholas, NATIONAL GEOGRAPHIC MAGAZINE, May, 1946.

Page 118

← **Canton's Crossroads Sign Points to the World's Far Corners**

An uninhabited coral reef 18 years ago, the island is booming today as a transocean stopover. Three airlines, Pan American, Canadian Pacific, and Qantas Empire, route passenger and cargo planes through Canton. Most of the island's 280 inhabitants provide services for aircraft and passengers. This American official and his Fijian helper scan the National Geographic Society's World Map.

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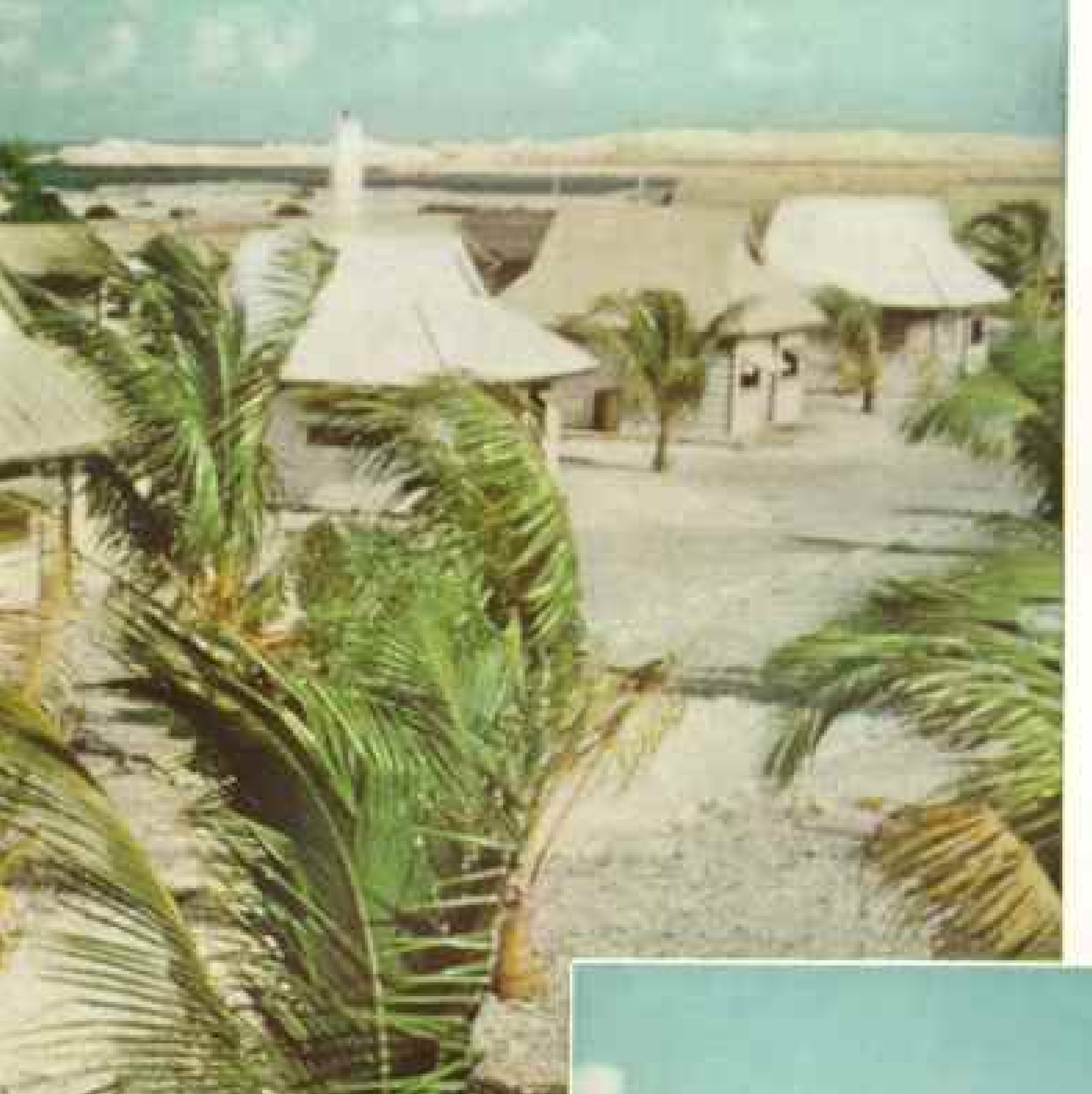
Kodachrome by Howell Walker, National Geographic Staff

PAN
PAA



↓ **Deep Scars Pock National Geographic's 1937 Eclipse Marker**

Largely ignored since its discovery in the early 1800's, Canton Island in June, 1937, burst into the news as host to the National Geographic Society-United States Navy Eclipse Expedition. A radio network's transmitter beamed an on-the-spot description of the solar show to the United States.

This concrete marker, erected by the expedition, bears a stainless-steel U. S. flag on its face and The Society's metal seal on its sides. No one on the island knows how the flag was defaced. William J. Evans, Canton's U. S. Resident Administrator, Mrs. Evans (left), and Mrs. James E. Brundell, wife of the British Resident Administrator, stand behind the monument.

↑ **Coral Paves the Paths and Yards of Southside**

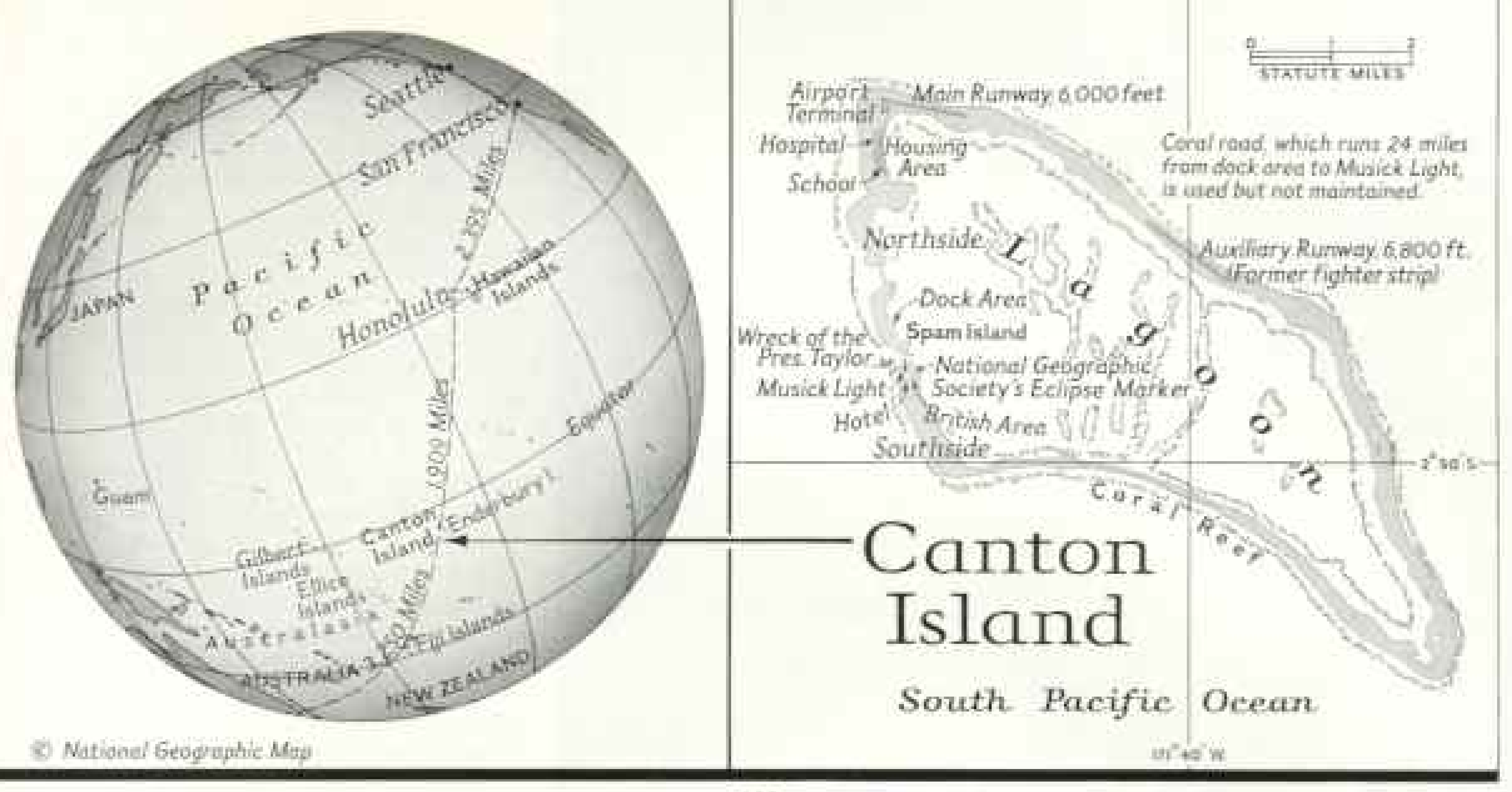
Canton's bleak coral barely supports the young coconut palms planted for shade by residents. *President Taylor*, a burned-out troop carrier, lies off the beach. Grounded, the 10,500-ton ship served as a clubhouse until fire ruined its interior.

The light tower (right) stands as a memorial to Capt. E. C. Musick and the crew of the PAA Clipper *Samoan*, lost while pioneering the South Pacific air trade route.

← Pan American's *Queen of the Skies* makes ready for take-off.

© National Geographic Society

Kodachromes by Howell Walker, National Geographic Staff



Canton Island: A Thin Rim of Coral Around a Huge Bowl of Water

Remote in terms of miles, Canton by air is but 17 hours from San Francisco and 26 from New York. Most planes land on the main runway. World War II's fighter strip serves as emergency runway.

Canton Island's U. S. post office is in the airport terminal. At mailing times queues form at the stamp windows like post-office lines in Seattle, Cleveland, or Chattanooga, and customers buy the same kinds of stamps they do at home. It costs no more to send a letter by air from Canton Island to New York than it does from Washington, D. C.*

British residents mail letters bearing Her Majesty's stamps at a post office in Southside, or from a branch at Northside's airport.

For a brief period Canton's school occupied a Quonset hut which now serves as the Canton Island Hospital. A husband-and-wife team operates the 4-bed affair; he's the doctor, she's the nurse.

They showed me around the rooms used for X-ray department, laboratory, surgery, office, and waiting room. Here, in February, 1953, the first American child born on Canton came into a coral world. His mother runs the island's U. S. post office.

Normally the hospital flies a flag with a red cross on a white field. On the occasion of a birth a baby blanket flutters from the staff—blue for a boy, pink for a girl.

Fire Department Starts a Blaze

Another Quonset hut houses Northside's fire department—a versatile jeep and a larger truck, both painted bright red. They had the makings of a color photograph, so I asked Bill if we could work them into a picture.

"That's easy," he said. "We'll just have a drill; let's see the fire chief about it."

Thirty minutes later a siren sounded the alarm as an obsolete army storehouse roared up in orange-red flames and thick black smoke. Not only the two I had already seen, but several other fire-fighting vehicles raced to the scene. Men, old and young and brown and white, swarmed over the machines; they handled the hoses and themselves like professionals (page 129).

I watched two barefoot Gilbertese plow through smoldering debris to reach the central conflagration. Even if I'd worn an asbestos suit and heavy boots, I should have hesitated to follow them.

Gardening Calls for Work and Water

Such burning of wartime eyesores affords fire-fighting practice and improves Canton's landscape. But ugly reminders remain: old plane wrecks, junk piles of rusting military equipment, snapped-off wireless poles, grown-over artillery posts and ammunition storage bunkers, hundreds of useless fuel drums, abandoned buildings plundered for lumber, and even a troop transport, the *President Taylor*, rotting on the beach for the past 13 years.

Canton's clean-up campaign and modern improvements are winning out. Comfortable homes, small but neat, line Northside's lagoon front. Despite coral "soil" and lack of rain,

* See "Everyone's Servant, the Post Office," by Allan C. Fisher, Jr., National Geographic Magazine, July, 1954.

Frigate Bird: Ace Aerialist of Ocean Skies

Among birds, the frigate, or man-of-war, carries the longest wings for the size of the body. The narrow wings of an adult span seven feet, permitting effortless gliding. Tail design allows high-speed maneuvering. During rapid flight the birds snap and fork their tail feathers like scissors.

→ *Fregata minor* wears the white breast of a juvenile. Unlike many sea birds, the frigate lacks waterproof plumage. To avoid water, adults dive-bomb flying fish or snatch their prey from the crest of a wave. Often frigate birds turn marauder, attacking a booby on the wing and forcing it to drop its fish dinner, then seizing the loot before it hits the water.

↓ During courtship on Canton Island, this male frigate gaily balloons his red pouch. Fatherhood saddles him with much of the work of incubating the single egg and brooding the chick.

Polynesians have used tame frigate birds to carry messages from island to island.

© National Geographic Society

Kodachromes by Howell Walker, National Geographic Staff, and (below) Patricia Bailey Witherspoon

Pan American World Airways

Night Fishermen Lift a Net High Lest Nimble Mullet Leap Back to Sea

Although mullet will take the hook, most are netted. Catches of 1,000 pounds are not unusual off Canton. Spotting a school, these islanders placed their nets and splashed water to drive fish into them (page 127).

nearly every resident tries to grow something green on his sunbaked lot.

Bill Evans told me that the community had recently planted a thousand coconut trees. Among other things, he himself cultivates mint brought to Canton from Yugoslavia. Whenever I saw Bill in his yard, he was usually holding a watering can.

Canton Has Few Native Plants

One evening before dinner at a Northside home my hosts' 8-year-old son took me on a tour of the garden. The boy pointed out poinsettia, mimosa, and castor bean, Mediterranean olive trees, young coconut palms, a tobacco plant, and papaya, sea grape bushes, spider lilies, morning glories, portulaca, and *Scaevola frutescens*.

The last is one of the few plants native to the island, and there's not a great deal of it on Canton. It grows into a coarse, branching shrub with thick magnolialike leaves, white trumpet-shaped flowers and white spongy fruit.

In the area commissary I mingled with housewives pushing grocery baskets on wheels. Well-stocked shelves held French and Japanese mushrooms, Spanish olives, canned sukiyaki, bamboo shoots, thyme, baby food, American cigarettes, Portuguese sausage, shrimp from Georgia (U.S.A.), bread from Honolulu, frozen concentrated milk, frozen fruits and vegetables, and even tinned dog food.

I saw numerous pets on Canton. Dogs and cats seem to be everywhere; one dog has a habit of catching fish in the lagoon. A small boy proudly showed me his 10 rabbits. Parakeets are popular; I met a pair called Bill and Coo. A Gilbertese family is taming a red-tailed tropic bird *(Phaethon rubricauda)*, native to this island. And a maintenance engineer maintains a monkey named Mary, not a native.

Driving around Northside, I passed carpenter, auto, paint, electric, machine, and heavy equipment shops, a power plant, and a distillery. But not the kind of distillery you might imagine.

All fresh water used on Canton comes from distilling sea water or from catching rain in

storage tanks. Since the annual rainfall averages only about 20 inches, the stills work much of the time. For drinking, cooking, bathing, and laundry the island consumes some 335,000 gallons a month.

Northside and Southside each has an open-air theater. Natives like moving pictures so much they will see a feature on Southside one night, then journey to Northside the next night to see the same film. The Gilbertese especially enjoy cartoons and westerns.

With signs that warn "15 Miles Per Hour" and "Slow School Zone," and a local radio station of "The Hermit Crab Network," Northside tries earnestly to be a small town. It lacks, however, a bank and a church. Cashing of checks has its problems.

Still, one rarely handles money on Canton. I seldom carried any except to buy stamps, razor blades, or cigarettes. There's no tipping, no purchasing of bus, boat, or theater tickets, no charge for local telephone calls. In short, cash is strange stuff.

125 National Geographic Photographer B. Anthony Stewart

Mullet Arrive in Honolulu Via the "Fish Fly"

Fast transport makes possible Canton Island's fishing industry. These mullet were flown from Canton in 7½ hours.

Pennies Unknown to Island Child

On one unusual occasion a resident was counting a few dollar bills and some small change. Her young daughter looked on, fascinated.

"Mummy, can I have one of the brown kind?" the child asked, pointing to a penny.

Absence of a church on Canton once almost prevented a happy marriage. The groom-to-be arranged for his fiancée and a minister to fly from Honolulu to Canton on the same CAA plane. The wedding day had been fixed, and friends planned prenuptial parties. She arrived all right, but the minister had lost his place on the plane.

Frantically, Canton began to search for a local person authorized to perform the ceremony. The Pan American station manager, who is also designated by the Department of Justice as Canton's U. S. Commissioner, could not legally officiate. Not even Bill Evans as deputy marshal had enough power.

Someone suggested the British Resident Administrator. Yes, he could marry them, but only after the banns had been published for three weeks; and they would have to send to New Zealand for the proper papers. That seemed the sole solution.

Then Providence sailed in. A ship appeared on the horizon. She arrived at Canton with a work party to salvage scrap iron from the wrecked transport on the beach. Her captain married the couple on board.

But what about that beached transport? Early in 1942 the 10,500-ton *President Taylor* was ferrying hundreds of United States troops to Pacific battlefronts. Japanese submarines surprised her off Canton. Attempting to bring the *Taylor* into safer waters, crewmen ran her aground. Heavy swells forced her farther ashore, where she was finally abandoned.

Servicemen stationed on the island found the ship's furniture handy for their crude living quarters among the coral. Blue porcelain bathroom fixtures graced hastily built shacks.

← An Undersea Hunter Emerges with His Prey, a Parrotfish

Diving into Canton Island's lagoon, the author explored a "flowery jungle of coral creation." Through it swam fish "striped like tigers, spotted like leopards, black as jet, yellow as butter."

Accompanying the author, Jim Beudeker wore a glass-fronted face mask and breathing snorkel. He used the S-shaped tube for cruising on the surface with face in water. When he submerged, a float like a ping-pong ball sealed off the tube's air intake. A homemade waterproof case shielded his camera.

A spear gun powered with a rubber band impaled the parrotfish, a wary creature armored with coarse scales. The diver speared it by swimming close and penetrating between the scales. The parrotfish is prized in the Pacific for the delicate flavor of its flesh. A bump on the forehead marks this specimen as mature.

Kodachrome by Howell Walker, National Geographic Staff

A Fijian Dancer Celebrates → the Crowning of His Queen

For the 1953 Coronation of Queen Elizabeth II, Fijian residents of Canton Island staged a *meke*, or gesture dance. This spear shaker wears a skirt of coconut palm fronds and a paper *salusalu* around his neck. Talcum powder whitens his hair; his headband and spear wrappings are made of paper.

Canton Island's sparse flora denies to the dancer the brilliantly colored leaves and flowers that distinguish the ceremonial costume of the fertile Fiji Islands.

Most of the Pacific peoples on Canton are British subjects from the Gilbert, Ellice, and Fiji Islands. The United States and the United Kingdom administer the island jointly under a 1939 agreement. Planes of both nations have equal right to port facilities.

© National Geographic Society

Kodachrome by L. K. Bufan

Shiny sugar bowls and gleaming silverware looked out of place on rough mess-hall tables.

After the war civilian residents used the *President Taylor* as a sort of clubhouse. They held fish fries and broiled steaks on her decks. Apparently one party failed to put out its fire, and the ship burned for days. Now a flame-gutted, rusting hulk, the *Taylor* grows smaller as time and salvage crews whittle away at her.

Since 1942 the *President Taylor* has been Canton's only prominent landmark. From almost any point on the atoll one can see her bulky silhouette (page 120). At a distance the ship appears to be steaming right into the lagoon.

"We'll miss the *Taylor* when she's gone," I heard more than one island inhabitant say wistfully.

Once I boarded the wreck to watch the salvage crew at work with cutting torches. The captain who had conducted the recent wedding ceremony showed me all over his workshop—the entire eerie vessel.

Fishermen "Airmail" Catch to Hawaii

Salvage of the *Taylor* is one of the few activities on Canton that is not connected with the airways. Even the local commercial fishing companies depend upon aircraft to deliver an average 20,000 pounds of chilled fish a month to Honolulu markets. Pan American planes normally handle two shipments a week at a special commodity rate. Time lapse from netting off Canton's reefs to serving on Hawaiian tables seldom exceeds 24 hours (page 125).

With Gilbertese fishermen I went out several mornings to see how they work their nets. Most often they use the "surround" method. Two men carry a long net in a straight line through waist-deep water toward a likely place for a school of fish. The fishermen try to keep their net between the fish and open water.

Half a dozen Gilbertese wait on the beach. At a given signal they rush for the net, shouting, splashing, and generally endeavoring to drive the fish ahead of them. Meanwhile the men on each end of the net form a horseshoe with it. Then they bring the ends together. By now the "drivers" have reached the scene; they help fold the net into a circle around the fish. The catch comes ashore in large baskets.

One such operation I watched yielded about 100 pounds of bonefish; another netted some 70 pounds of surgeonfish, still another, mullet (page 124). Occasionally the nets yield crevalle, sting ray, and balloonfish.

Not all the fishing is done with nets. To hook mullet, the Gilbertese take poles and a plentiful supply of hermit crabs to the dock in the lagoon harbor. They choose a time when the tide is racing in through the ship channel close by. The crabs are pounded to pulp and tossed into the water.

I watched the fishermen lure hundreds of mullet up to the dock. As far away as we could see, the fish kept crowding in to feed on the crab. All seemed to be about 16 inches long. They came in such thick packs that a pebble dropped anywhere among them would certainly have struck one.

Time to start fishing; men reached for poles and let down lines with barbless hooks. I prepared to photograph mass action.

Suddenly scores of mullet broke water in a body, making a loud whoosh! When the surface calmed, there wasn't a mullet in sight. Some large, hungry fish had frightened them nearly out of their fins.

So ended my first lesson in mullet fishing. The fishermen headed home, resigned to the incident. A few glanced back at me as if to say, "Better luck another day." Even with such bad breaks, the Gilbertese catch enough by net and hook to ship two tons or more of mullet to Honolulu each month.

Ferry Links Northside, Southside

The restless ship channel separates Northside from Southside. Between the areas a 40-foot Diesel-powered ferry carries passengers and goods back and forth from sunrise to midnight. If you miss the last trip, you can drive 24 miles around the island on an indifferent road.

Slightly less than half of Canton's population lives on the Southside in family houses, bachelor quarters, and at the island's one hotel; Fijians and Gilbert and Ellice islanders employed by the British government have their own village inside the British area.

Since the principal business—servicing aircraft—belongs to Northside, much commuting takes place. You might call Southside a residential suburb of Northside, but each has the necessary workshops and plants for electric power and water distillation to call itself a separate community.

Although I tried to divide my stay fairly

↑ **Volunteer Firemen Douse a Practice Blaze**

Wartime eyesores—abandoned buildings and wrecked airplanes—give Canton's fire fighters ample material for drills.

The island's fire chief ignited this neglected storehouse to demonstrate the skill of Northside's force. Two Gilbertese plowed barefoot through hot corrugated iron to get at blazing timbers.

← Students of assorted ages and nationalities bend over books in Canton's 3-room schoolhouse. Two teachers instruct 30-odd pupils from 3 to 13 years, including Gilbertese and young United States citizens of Chinese, Korean, Hawaiian, Samoan, and Caucasian racial strains. Classes range from kindergarten through the eighth grade. Warm climate makes bare feet stylish the year round.

Here the teacher sits beneath windows built high to shut out glare from coral and the sight of a distracting blue lagoon.

Before the schoolhouse was completed in 1952, a volunteer teacher held classes on her back porch.

Upper left: Canton's Girl Scouts carry flags of the United Kingdom, the United States, and their own Troop 1.

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Kodachromes by Howell Walker, National Geographic Staff

between the two, I found more advantages around Southside. It has the recreational edge. Here grow more trees to shade the glaring coral; the lagoon with its submarine wonders seems nearer, more inviting; the natives' love of music and color brightens the already brilliant setting; and sea birds colonize the vicinity.

Ornithologists Alfred M. Bailey and Robert Niedrach of the Denver museum listed a total of 28 bird species and subspecies at Canton Island in 1952. These include three shearwaters, a petrel, the red-tailed tropic bird, three kinds of boobies, two species of frigate birds, terns, curlew, golden plover, and wandering tattler. Turnstones, or sea dotterels, inhabit the island the year round, and some migratory ducks come here to rest.

Angry Parent Dive-bombs the Author

Not far from Southside a friend and I visited a breeding ground of the gray-backed terns. They form immense colonies, noisily active day and night.

As we walked toward their territory, they screamed with indignation and rose in a ragged cloud. It was as if someone had burst open a hundred pillows to watch the feathers fly. In jerky flight the birds made jagged passes at our heads, cursing us as only terns can do. We had to step mincingly to keep from crushing bantam-size eggs casually laid on the gray coral with which they blend perfectly.

A few fuzzy chicks scampered for cover under ground-creeping vines. When we caught two for picture purposes the adults raged, shrieking around us like mad things. Quite understandably, one irate parent dive-bombed the back of my head.

A mile or so beyond the terns we came to a booby colony. The gannetlike birds spend hours sitting among scaevola branches, looking blank or quietly thinking over their problems. They are powerful flyers. In mating season they take no chances with humans; they take off.

We moved on to the frigate bird, or man-of-war bird (page 123). I particularly wanted to make a color photograph of a male with his throat pouch inflated like a big red balloon. But it wasn't the breeding season; deflation was in style. We did, however, see a bird in flight with his sac blown up. In my excitement at the spectacle I shouted, "There goes one with an inflated bosom!"

Canton Island's birds once "went on the air." Boobies and frigate birds squawked into a microphone held by radio announcer George Hicks, who accompanied the 1937 eclipse expedition; the birds' voices were carried into United States homes over a National Broadcasting Company network.

Far more colorful and numerous than Canton's birds are the fish in its lagoon. In 1939 Dr. Leonard P. Schultz of the Smithsonian Institution catalogued 221 species in the watery world of Canton Island and its neighbors. And what a world! To dive into it wearing a glass face mask is to forget almost absolutely your own earth.

You can sail the lagoon in a swift outrigger (opposite), flash over it on aquaplane or water skis, land on it with a flying boat, or simply marvel at its delicate, almost artificial color. But nothing can surpass the thrill of venturing below the surface.

Two enthusiasts of undersea life invited me to accompany them one brilliant morning. Into a dinghy we piled spear guns, swim fins, face masks, and cameras snug in homemade watertight cases. We headed for a section of the lagoon rich in coral formations attractive to fish as well as to us (page 126).

Riot of Color in a Watery World

Slipping gently from the boat into the clear water, I moved as if in a dream through a flowery jungle of coral creation. Sometimes I skimmed mountains reaching nearly to the surface; then abruptly I looked down into obscure depths of mysterious valleys. Sunlight filtering through ripples above me played softly on remarkable living structures—lavender, orange, green, brown, yellow, blue, reddish, pinkish, or indescribable.

Page 131

A Canton Sailor Jumps to Windward → to Keep a Canoe on Its Feet

Gilbert Islanders made this outrigger canoe in the traditional way. Importing materials, they cut the planks by hand and sewed them together with coconut fibers. No nail, screw, or glue went into the craft. Calking and paint sealed it watertight.

The canoe's hull on the leeward side is flattened to reduce side motion; outrigger acts as a windward balance. Canton Island's outrigger enthusiasts claim speeds up to 30 miles an hour for their craft, making them among the world's fleetest sailboats.

When this skipper comes about, he carries the steering oar to the opposite end of the canoe and swings the sail around. The bow then becomes the stern, and the boat races merrily off "backward."

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Kodachrome by Howell Walker, National Geographic Staff

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Canton's Children Live in a Vacation Climate and Atmosphere

Sun-drenched beaches are open the year round. As in a holiday resort, the population comes and goes. Most residents arrive under contract and return home after two or three years.

If I failed to observe all the coral types, blame the myriad fish, tiny to huge, in every conceivable and inconceivable color combination. Striped like tigers, spotted like leopards, black as jet, yellow as butter, jade green, lapis lazuli, scarlet, russet, or of a silvery transparency, these creatures eclipsed the other wonders of their stunning sphere. I saw long fish, short fish, round fish, flat fish; fish fat as pigs or thin as sticks; giant eels; and massive clams ready to slam their purple jaws.

"Want to look at a shark?" asked one of my companions when I surfaced for air.

That was the last thing I cared to see, but I half-heartedly submerged just long enough to watch six feet of gray horror slink past. I surprised myself at how quickly and easily I sprang back into the boat. Only the incredible beauty of that incredible world below could entice me into the water again. I had succumbed to undersea fever.

Now let anyone suggest a submarine excursion in Canton's lagoon and I'll go at the drop of a face mask. For me, one such adventure is worth the journey to this distant island.

Distant? Mile-wise, yes; but not in time. Nowadays you can leave New York City on Wednesday and land at Canton Island Thursday.

Planes Keep Canton Alive

Aircraft brought this once-empty isle into full focus. The remote reef proved itself an indispensable steppingstone on the way to war in the South Pacific. Although a small atoll, it's big enough to handle today's largest passenger planes. They keep Canton alive; and Canton keeps them flying regularly between North America and the far antipodes.

All of which reminds me that tonight I'll board a Clipper on Canton Island for an appointment early tomorrow in Australia.

At Home in the High Andes

Village Life in Peru's Mountainous Back Country Has Its Ups and Downs, Including Blood Sacrifices and Bewitched Scientists

By Harry Tschopik, Jr.

Assistant Curator of Ethnology, American Museum of Natural History

With Illustrations from Photographs by the Author

EVER since the days of the Incas the Aymará Indian village of Chucuito has stood on a high, rocky outcrop overlooking the blue expanse of Lake Titicaca and the glittering snow mountains beyond (map, page 136).*

As a small town in the southern Peruvian Andes, it is in no way distinctive. Its thatched stone huts and massive Spanish colonial churches could be duplicated in many other villages around the lake. The Indian farmers and fishermen differ in no important respects from those of neighboring towns.

Yet my wife and I have a special affection for this village, our home for two and a half years. To its friendly people we were known as "Señor and Señora Gringo."

Town Nearly 2½ Miles High

We had gone to Peru on an expedition sponsored by the Peabody Museum and the Division of Anthropology of Harvard University. My objective was to make a detailed study of a contemporary community in the Lake Titicaca region. My wife planned to excavate archeological sites in the same area.

After a brief survey of the Aymará Indian towns clustering around the northwestern shore of the lake, we selected Chucuito as the most likely spot for our studies. There were various technical reasons for our choice, but the fact that we fell in love with the place almost at once probably decided the issue.

The town stands at an altitude of almost two and a half miles and is surrounded by higher peaks. With a slight alteration of details, it might be colonial Peru of more than 300 years ago. Altogether, it has about 800 residents—some 50 *mestizos,* or mixed bloods, and the rest pure Aymará Indians.

Life in Chucuito was often uncomfortable, frequently hectic, but never dull.

We were fortunate in getting one of the larger and more attractive houses in the town, a solid old structure with thick walls and a thatched roof. The rooms were arranged around a patio that was planted with flowering shrubs and honeysuckle vines and paved with black and white pebbles set in geometric designs.

During the day we literally lived in the patio. The sheltering walls trapped the sun and cut off the chill breezes from the lake. Our chief source of discomfort in Chucuito, summer and winter, was the cold. For there was no means of heating the house in a region which is always chilly and frequently below freezing.

Our household, in addition to ourselves, was composed of Manuel, the houseboy, and Carmen, the cook. Carmen was a mestiza from the market town and railway center of Puno, 10 miles away. By virtue of a thin strain of Spanish blood acquired by her forebears many years ago, she considered herself to be several cuts above Manuel, a local Indian. Although active hostilities broke out but rarely, there was at first a marked undercurrent of antagonism between them.

Yankee Tastes Confound the Cook

After the dinner things had been cleared away in the evening, we could hear Carmen through the thin kitchen door.

"Fetch water to wash the dishes, Indian!"

"Sí, Señora Carmen." Then, after a pause, Manuel would add, "It is true that I am an Indian, señora, but my father owns much land. I have heard that *your* family is landless."

And so it went. Eventually, after working together in close association, even they came to see the humor of these exchanges.

Carmen, in addition to cooking, did all of our laundry. And as if these activities were not enough to keep her busy, she also ran a small *tienda,* or general store, in her spare time!

* See "Peru, Homeland of the Warlike Inca," by Kip Ross, National Geographic Magazine, October, 1950.

Peruvian Indians Still Farm the Ancients' Walled Terraces →

Centuries before Columbus, Andean farmers used methods of irrigation and fertilization that excite the admiration of modern soil conservationists. Much of the topsoil in these terraces near Chucuito was carefully placed by hand after being carried on men's backs. Today's Indians do not irrigate their plots; they glean only a fraction of the harvest produced in olden times.

The richest farmers in this settlement own less than three acres. Their chief crop is the white potato, a cold-climate vegetable cultivated by their remote ancestors (page 136).

↓ Unsinkable Bulrush Boats Float on Lake Titicaca

Boats like these were found by the first Spaniards to see Titicaca. Conquistadors called them *balsas* after the coast's light balsawood rafts, and the misnomer endured.

The rushlike *totora's* cellular air spaces make these boats buoyant even in the lake's sudden storms. If they become waterlogged, they are dragged ashore and dried.

This man's circular net rides like a sail. When he is fishing, he tows it with a stick. Each Indian community on the lake has exclusive fishing rights to adjacent waters.

Carmen took great delight in acquiring new *gringo* recipes and, under my wife's supervision, learned to produce dishes that would have done credit to any North American housewife. Our food tastes, however, continued to confuse her.

Although we could depend upon the local market for poultry, eggs, fish, and potatoes, most of the marketing was done twice a week

in Puno. There, by degrees, but not without considerable trial and error, Carmen introduced my wife into the mysteries and intricacies of highland Peruvian markets (page 138). The chief difficulty was that many of the bewildering number of vegetables and fruits to be had in Puno were new to us—*ocas* and *isaños* (potatolike tubers), *chirimoyas* (custard apples), and *lúcumas* (relatives of the eggfruit).

One day my wife purchased a luscious purple object which she took to be an eggplant. That evening she was in the kitchen discussing the dinner menu.

"Carmen," she said, pointing to her purchase, "would you prepare this for dinner?"

"Precisely how, señora?" Carmen's eyes narrowed with suspicion.

"Fried, I think. In butter."

"*Fried?*" Her worst doubt confirmed, Carmen shrugged and turned her back.

At dinner we were served, but could not

↑ **Indian Villages Ring Lake Titicaca, a Center of Aymará Culture**

Author Harry Tschopik, Jr., and his wife made Chucuito, a village on the lake, their home base for a 2½-year study of the Indians. In pre-Inca times the town served as capital of a powerful Aymará state. Later, under Spain, it rivaled Cusco and Lima. Today the home of 800 people, Chucuito lives in the memory of its bygone splendor.

Aymará Indians Plant Potatoes at 13,000 Feet in the Andes →

Driving a yoke of oxen, the Chucuito farmer guides a wooden plow of a type introduced by 16th-century Spaniards. The two women tote seed potatoes in shawls, their purse and carryall. South America's gift to the world, the white potato grows in 40 varieties around Chucuito. Bahia de Puno, an arm of Titicaca, cuts the valley below.

eat, the fried "eggplant." It was a melon!

Not only were the products themselves strange to us. So were the marketing techniques. The ingenious ways of cutting meat would have baffled a well-trained anatomist. While usually we knew what kind of animal we were eating, we could never be quite certain as to what part. Perhaps it was just as well.

Striking bargains and making purchases often posed curious problems. Lard, for example, was brought to market in gasoline tins and sold by the spoonful.

"I should like 15 spoonfuls of lard," my wife said one day to an old market woman.

"No, señora," was the prompt reply. "There are only 15 spoonfuls left. You may have three."

"But I come to market only twice a week," my wife protested. "Three wouldn't last any time at all."

"I'm sorry, señora. I have come many kilometers to market. If I sold you all my lard, I would have to go home early."

Economic gain, clearly, is not the only motive for commerce.

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Eighteen-year-old Manuel was man-of-all-work around the house. He cleaned, swept, hauled drinking water from a spring half a mile above the village, and waited on table.

How Santa Claus Came to Manuel

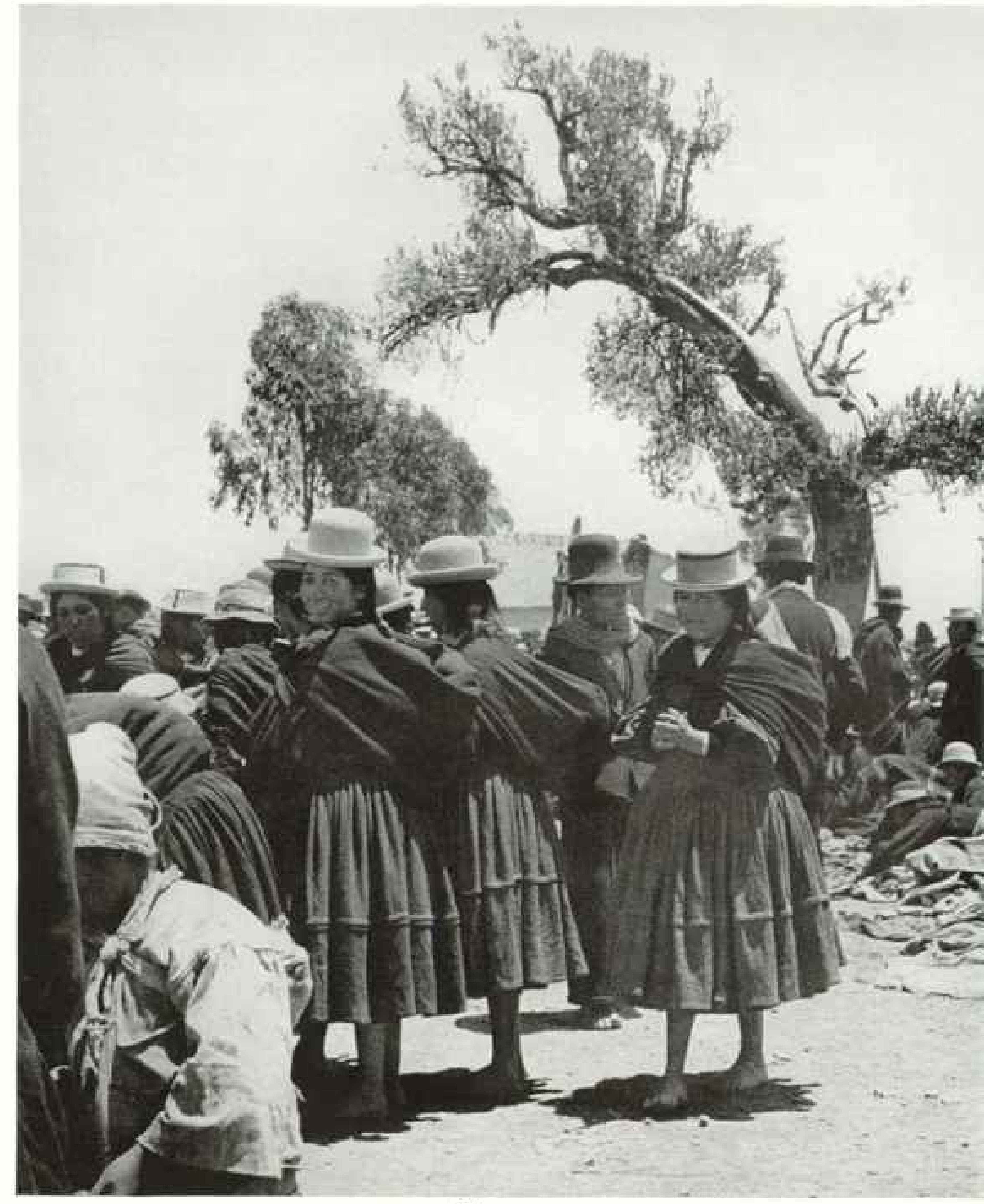
Manuel had been partially educated to become a priest, and, although he spoke—and even read—Latin fluently, his Spanish was virtually unintelligible. We communicated in a mixture of Aymará and Spanish, plus whatever vocabulary I remembered from Caesar and Cicero.

Manuel asked the price of every article we possessed and particularly admired our collapsible rubber bathtub. As a special privilege he was allowed to wash our automobile, a decrepit delivery truck.

We became very fond of Manuel and his constant thirst for information. The first Christmas after we had settled in Chucuito, we were discussing presents to give him.

"In addition to money," I said, "let's give him something different—something he couldn't buy in Chucuito or even in Puno."

"I know," my wife replied. "He loves



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Aymará Women in Felt Derbies Mill Through the Market in Chucuito

On festival days wives wear a dozen skirts of green, red, orange, and purple. Despite winter's frosts, they go barefoot the year round. Vendors here display potatoes, onions, eggs, and narcotic coca.

The Aymarás chew coca, the raw stock of cocaine, as they work; and they expect payment in the drug as well as in money. Coca plays an important part on ceremonial occasions, for the Indians believe it promotes good will. Aymará fortunetellers use the narcotic just as certain clairvoyant grandmothers employ tea leaves (page 146).

Santo Domingo Church (right and page 145) was partly destroyed about 1780, when the Aymarás rebelled against their Spanish masters. Today corrugated iron, substituting for tile, roofs the nave.

fudge. He always scrapes the pan when I make it."

So my wife made Manuel a box of fudge and wrapped it up in Christmas paper and ribbon. On top of the box she glued a small figure of Santa Claus, one of several she had salvaged from a Christmas party in Boston the previous year and had brought to Peru, thinking to give them to the Indian children.

On Christmas morning Manuel was speechless with delight, an unusual state for him.

"And this little figure, who is he?"

How to explain Santa Claus in a region where Christmas is not a major celebration?

"This," I said, "is San Nicolás. He is a saint, you know," I added unnecessarily.

"San Nicolás!" breathed Manuel, and, clutching the box of fudge, raced home to show it to his parents.

We had forgotten the incident when, months later, I happened to go into Manuel's room—which was also the storeroom—to get something or other. There was Santa Claus! Nailed to the wall was a little shrine composed of two whisky cartons, a cigar box, and an olive tin. Inside, carrying a miniature fir tree over one shoulder, Santa Claus reposed in isolated splendor. On either side burned a stub of candle, and before the little figure stood an aspirin bottle holding wild flowers.

For Manuel this had been his real Christmas present.

Harvard Museum Wanted a Llama

Our chief form of diversion, other than the almost endless succession of collecting trips and picnics to archeological sites, was entertaining visitors. Friends in Lima and Arequipa had standing instructions to send any and all interesting travelers to us.

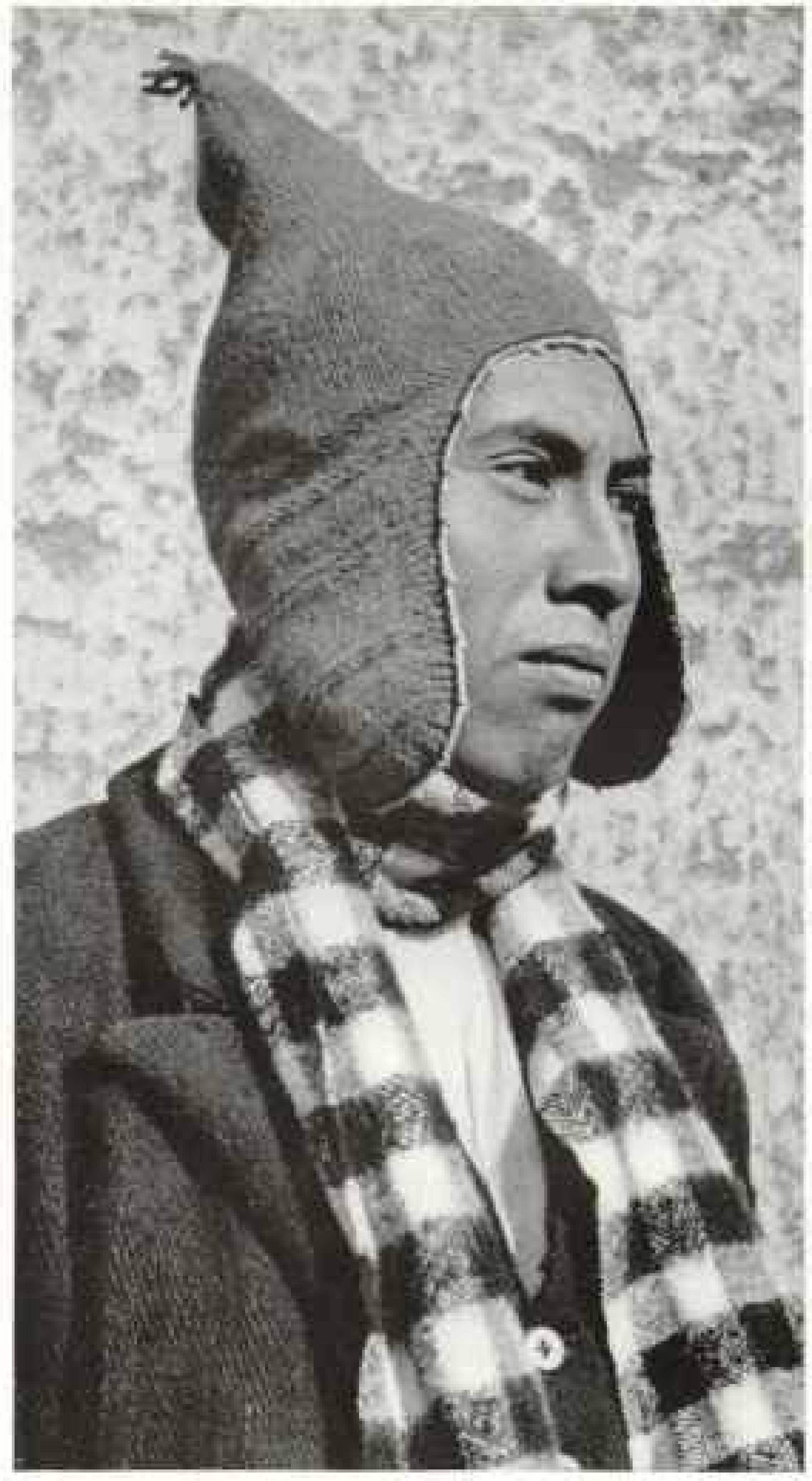
In this way we met Sandy, one of the most memorable on several counts. Colin C. Sanborn is a zoologist from the Chicago Natural History Museum. On the one hand he was our salvation, and on the other he almost ruined our reputation among the Indians of the village.

Shortly before Sandy arrived, we had received a letter from a friend at the Museum of Comparative Zoology at Harvard, asking us please to send him a llama skin and skeleton for the museum's collections. The big difficulty was not finding, but buying, a llama in the heart of llama territory.

The Aymarás are very fond of their llamas. They lavish great attention on them, hanging ornamental yarn tassels from their ears and little bells on the fur of their chests, and painting their shaggy coats with orange and yellow ocher. For the Aymarás the llama is a most useful animal, a source of meat and wool as well as a beast of burden (page 144).*

"That is a splendid llama," I would say

* See "Camels of the Clouds," by W. H. Hodge, National Geographic Magazine, May, 1946.



Ears Take Cover from Andean Cold

Manuel, the Tschopiks' house servant, often kept his knitted cap on indoors. Outside the house he sometimes wore a felt hat over it. An Indian, Manuel speaks Latin (page 137).

to some Indian. "I should like to buy it."

"He is not for sale, señor," the Indian would reply as he fondly stroked the llama's neck.

Sandy and I begged, bargained, and wheedled, but to no avail. There were llamas everywhere, but their owners would not part with them. In our hectic search for a llama we went far afield, and eventually to the ranches in the high mountains away from the lake shore. At one such ranch we made a deal with the rancher, who was willing to drive a small portion of his herd to Chucuito, where we might make the final selection.

On the appointed day the llamas arrived, and a grim lot they were—dirty, decrepit, and bedraggled. It seems that the rancher, at the last moment, decided that he could not bear to part with one of his better animals. As usual in desperate situations, we appealed to Manuel.

"You *must* bring us a llama, Manuel. The matter is really urgent."

On the following day Manuel appeared with a fine animal, and the financial arrangements were completed in a matter of minutes. Word quickly circulated that the gringos had finally made a purchase, and the villagers walked slowly past our door, gaping with curiosity. A crowd of idlers stood outside in the street.

Sandy led the llama triumphantly into the patio. The crowd was hushed, watching. In the center of the patio, while all looked on admiringly, Sandy pulled out a revolver and shot the llama through the back of the head. The animal dropped with a thud.

For a moment the Indians stood rooted, their mouths sagging. They stared unbelievingly. Then, slowly and silently, they went away.

"Those gringos!" said one, shaking his head. "For a month they look everywhere for a llama. When they find one, what do they do? They shoot him! How curious, no?"

House Dedicated with Blood Sacrifice

My daily work routine had one outstanding characteristic: one day was never like another. To gather information which would give a well-rounded picture of the life of the community, my interpreter and I interviewed the Indians on such diverse subjects as how they grow potatoes, how they make pottery, and how they treat disease. We used to follow them to the pastures, to the fields, and to market, to house-raising bees, and to funerals.

Although many of these events were commonplace, some were sufficiently exotic to impress even the toughest-minded ethnologist. Such a one was the blood sacrifice of a llama, an ancient practice still carried out in secret.

For months past Manuel's family and friends had been at work building a new house for Manuel's brother, Anselmo. The stone and adobe walls were completed, and the shell of the house stood on a rocky promontory, its bare gables reaching toward the cold gray morning sky.

Today was the day for dedicating the house

Handkerchiefs Whirl as Partners Stamp Out the Rhythms of a Peruvian Courtship Dance

At his wedding party, bridegroom Manuel pairs with Mrs. Tschopik. He proposed to his intended (center) by "stealing" one of her garments. They became engaged when her parents declined to steal it back.

and thatching the roof. Although the first rays of light were barely perceptible over the jagged black line of mountains to the east, a large crowd of men and women had gathered. They were busily hauling timbers and grass thatch (page 143).

Before the house a handsome white llama stood tethered, chewing its cud.

"He will make a fine sacrifice," said Manuel, appraisingly. "The spirits prefer the blood of white llamas. They will be good to my brother, and he and his wife will be happy and prosperous here."

Within the house walls, Manuel's father was carefully laying out the paraphernalia for the sacrifice—bottles of wine and alcohol, flower petals, coca leaves, and other offerings. The old man wore a frown of anxiety.

"The place where Anselmo lived before was not good," he said, as he completed the arrangement of the ceremonial objects. "His little boy and girl both died. The evil spirits were eating his children. He failed in everything."

Before I could reply, Anselmo himself appeared in the doorway.

"It is almost day, *tata* (father). Everything is ready. It is time to begin."

Family Friend Cuts Llama's Throat

The early light streaked the sky with yellow, and the black waters of the lake were shot through with icy green.

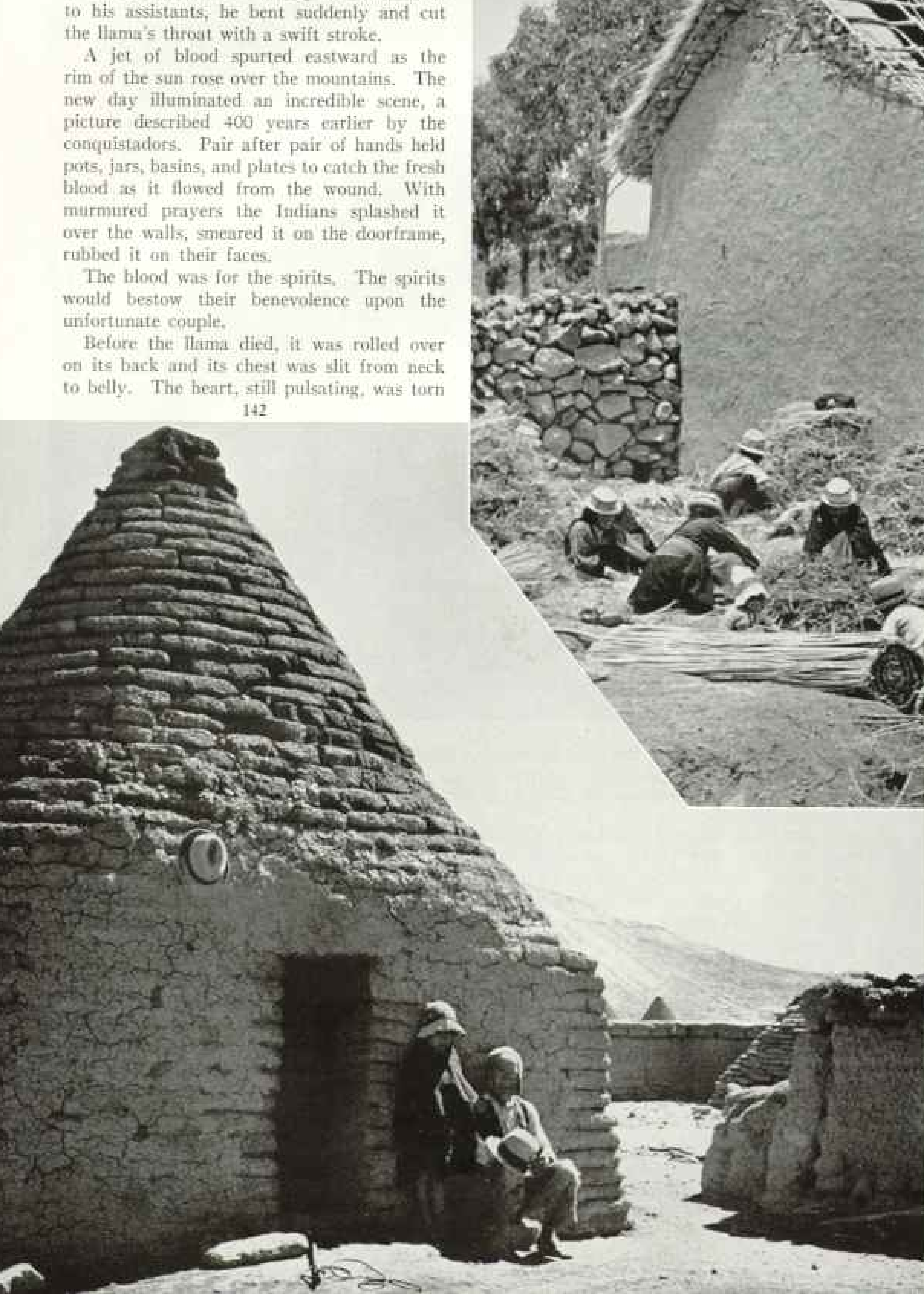
The llama was led through the doorway and bound in a kneeling position, facing east. A family friend who was to perform the sac-

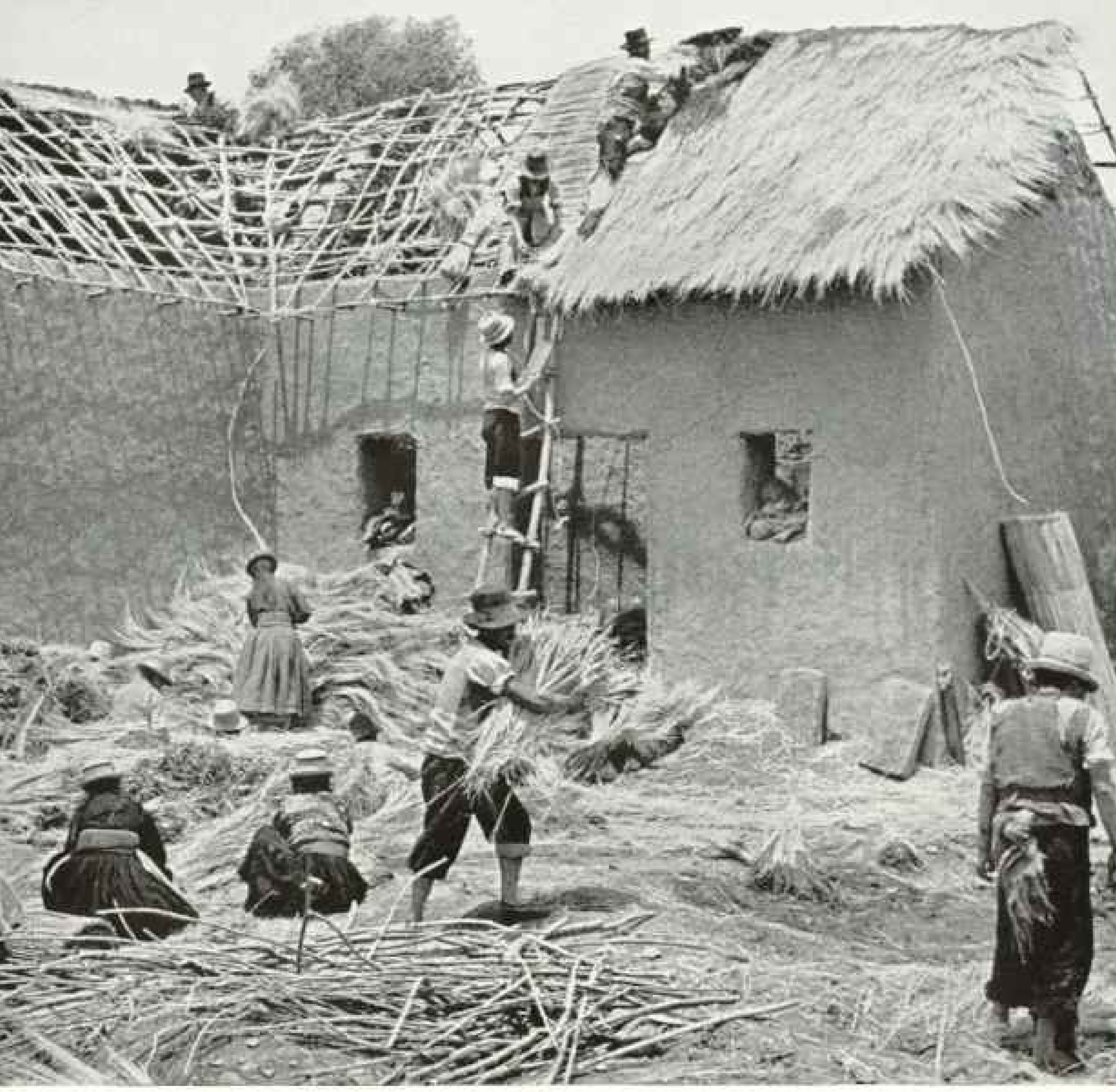
rifice stood, knife in hand, staring at the heavens, which changed rapidly from orange to the red of sunrise. Giving brief directions to his assistants, he bent suddenly and cut the llama's throat with a swift stroke.

A jet of blood spurted eastward as the rim of the sun rose over the mountains. The new day illuminated an incredible scene, a picture described 400 years earlier by the conquistadors. Pair after pair of hands held pots, jars, basins, and plates to catch the fresh blood as it flowed from the wound. With murmured prayers the Indians splashed it over the walls, smeared it on the doorframe, rubbed it on their faces.

The blood was for the spirits. The spirits would bestow their benevolence upon the unfortunate couple.

Before the llama died, it was rolled over on its back and its chest was slit from neck to belly. The heart, still pulsating, was torn





For Coca and Drink, Friends and Relatives Thatch a Roof at an Aymará Housing Bee

Field stone set and plastered in adobe forms the walls. Roofers lay down rolls of Titicaca rushes across the rafters, a latticework of poles. Clumps of *ichu* grass, dipped in mud, shingle the top.

← Windowless houses in beehive shape shelter the Aymarás in the Río Ramis region. Built of sod, such houses can endure 50 years. This one serves as bunkhouse and hat rack. Kitchen (right) is separate.

out, steaming in the cold mountain air. Then Manuel's father inspected the spleen carefully for omens of good or evil. With his finger he traced the pattern of fine veins.

"The signs are favorable," he said. "This will be a good house."

As the carcass of the llama was butchered for the feast that was to follow, the old man burned the heart and the offerings in a ring of fire. The tension of the ceremony was broken, everyone laughed and talked, and, after a pause for a drink and a chew of coca, the work of roofing the new house began.

It was after we had been living in Chucuito for more than two years that the most improbable of all events occurred. We were bewitched! And, unchivalrous though it may sound, it was my wife's fault. Many weeks were to pass, however, before we discovered that a curse had been laid upon us.

At the time, my wife had received her archeological permit from the Peruvian Government and was eager to get at some of the more impressive of the ancient structures, portions of which could be seen half buried and surrounded by cultivated fields.

Llamas, Non-humped Cousins of the Camel, Climb a Street in Chucuito

Beast of all burdens, the llama serves highland Peruvians as it once served the Incas. The animal's coat provides wool, its skin leather, and its flesh meat. If annoyed, the llama spits in its master's eye.

She had set her heart on a large building rearing its ruined masonry in the midst of a potato field owned by one of Chucuito's leading mestizo citizens, whom we shall call Señora Pérez, although that was not her name.

Potatoes Cause Trouble

One afternoon in February, just before the potato harvest, we, in the company of our good friend Señor Franco Inojosa, an Inspector of Ancient Monuments for the Peruvian Government, paid an elaborate call on Señora Pérez to request permission to excavate. As a matter of fact, the ruin did not belong to her. All ruins are Government property. We were more than agreeable, however, to pay the good lady the value of any potatoes damaged during the excavation. As it turned out, those potatoes were worth their weight in gold.

Señora Pérez received us in her formal *sala*, or parlor, a disorderly room furnished with straight-backed chairs, and with farm implements heaped in every corner. Sacks of grain were stacked beside the sofa, and an ox harness was hung on the corner of a faded framed photograph of illustrious Pérez ancestors.

Picking her way amid the debris, my wife greeted the lady. "Señora Pérez," she said, "we have come to ask a little favor. We should be most appreciative if we were permitted to excavate here."

"That is impossible," cried our hostess. "The place is planted with potatoes."

"Yes, I know, Señora Pérez," my wife replied, "but we should be more than glad to pay you for the loss of a portion of your crop."

"Quite impossible," sniffed Señora Pérez, blowing her nose on the hem of her skirt. "Those little potatoes are like my very own children."

"But, señora," Franco broke in, "the ruin is not yours. It belongs to the Government. Our good friend here is willing to pay you what the potatoes are worth. She has, moreover, permission from the Government to excavate."

"Quite impossible," Señora Pérez repeated tearfully. "Those little potatoes are like my

very own children. It is a judgment of God."

The net result was that three solid citizens of Chucuito, including the governor and a judge, estimated the amount of indemnification owed to Señora Pérez, and she was duly paid in full.

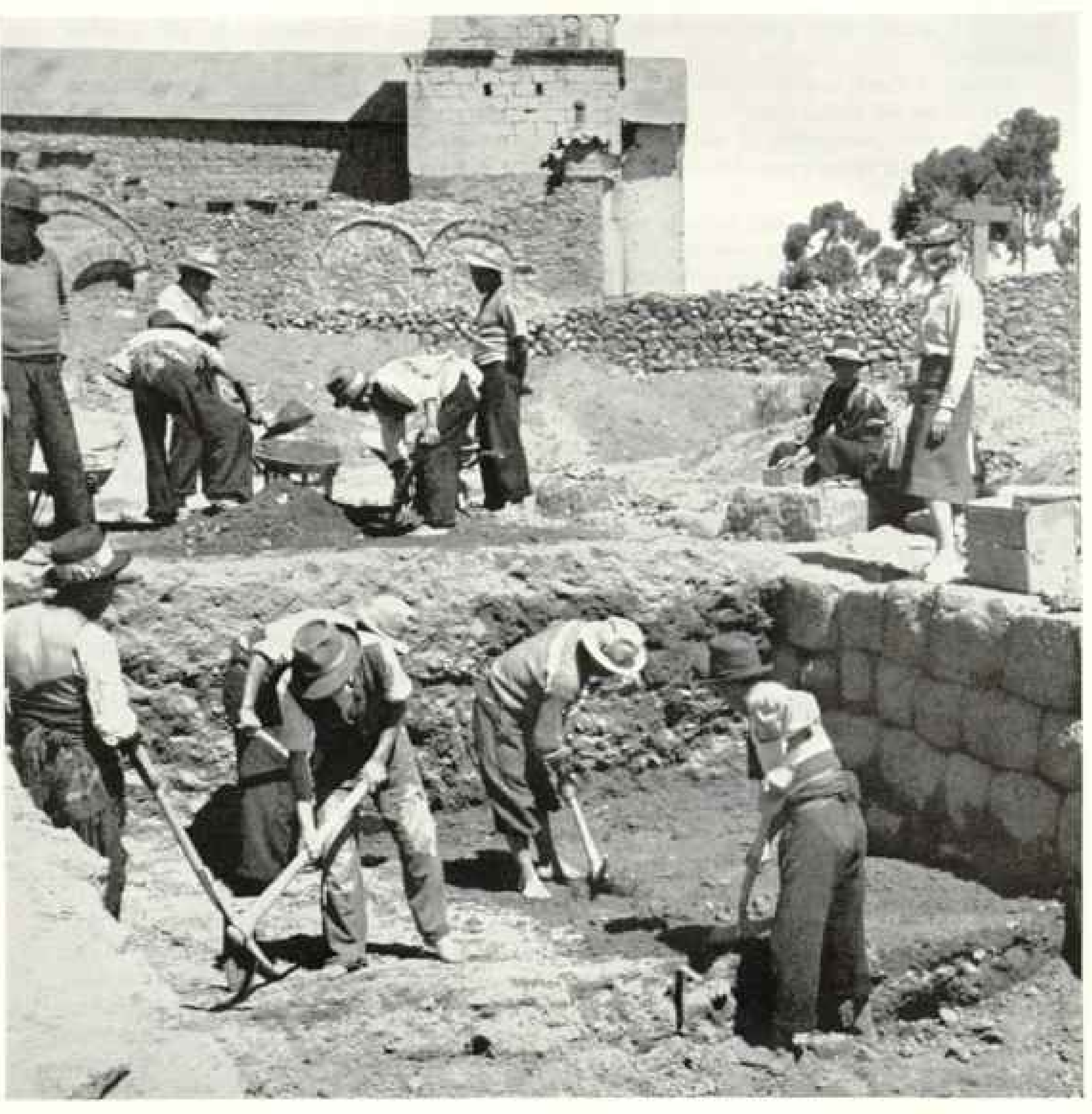
As it happened, a killing frost that year destroyed the potato crop, so that, having been paid in advance, Señora Pérez actually profited by the excavation. However, she felt that she had been made to appear ridiculous to her Indian laborers, which was her real, although unstated, objection. The Indians laughed at her behind her back and privately nicknamed her *Pacha Mama,* after the ancient fertility spirit whose children were cultivated plants.

When my wife began to excavate, Señora Pérez quietly went to a witch and had an evil spell put upon all of us, including the Indian workmen on the dig.

But all this developed much later.

For Digging in This Inca Ruin, Author, Wife, and Workmen Were Bewitched

The owner of the land surrounding the pit felt that the excavation robbed her of prestige. Accordingly, she had a spell cast upon the Tschopiks and their crew. To keep the frightened Aymarás on the job, the author hired benign magicians to work white magic (page 146). Palace or temple, the structure served as a stone quarry for 17th-century Santo Domingo Church (background). Mrs. Tschopik (right) oversees the job.



My first inkling that things were not as they should be was the changed attitude of the Indians. Old friends would make excuses in order to avoid us.

"I cannot work with you today, señor. I must go to Ilave to trade."

Or it would be: "Not today, señor. My wife's mother is ill. We must go to Huata."

Finally the Indians stopped making excuses altogether. They simply ran into their houses and slammed the doors.

"What is it, Clemente?" I asked my interpreter. "What have I done now?"

"It is nothing that you have done, Señor Doctor," he said. Then he added cautiously, "Of course I am a Christian and put no faith in pagan beliefs, but the people are saying that you and your good wife have been bewitched."

"What?" I cried, unable to believe my ears. "What do we do about that?"

"With your permission, I would suggest that we go to a diviner and ask him to read the coca leaves."

At this point, matters had become serious. The milkman said that his cow was dry and that there would be no more milk, and the egg man said that his hens had stopped laying. Moreover, Manuel intimated that he had better stop working for us. And so, taking my interpreter's advice, we consulted a diviner, old Eusebio Choque. The old man scattered out coca leaves and then shook his head sadly.

"You see, most of them are wrong side up. Perhaps you will die!"

That settled it! We would do what any frightened Aymará would do in our place. We would get unbewitched.

Counterwitchcraft Cost $10

As it turned out, the procedure was not particularly complicated and only moderately expensive. For the two of us, plus 18 Indian laborers, the ritual cost less than $10. That included two counterwitches, or magicians, and some very special and tasty offerings to the spirit world, the *pièce de résistance* being two desiccated llama fetuses!

Late one afternoon my wife and I sat in the magician's house while he, his colleague, and their assistants prepared 144 offerings to as many spirits. Each offering was simple, consisting of three perfect coca leaves powdered with shaved llama fat, wild mint leaves, and the dust of a silvery mineral. As each magician finished an offering, he breathed on it, held it aloft, and intoned, "Such-and-such mountain spirit, I salute you. This is your food."

At stated intervals we were obliged to stop for a drink and a chew of coca, for drinking and coca chewing are obligatory on all Aymará ceremonial occasions.

The afternoon passed, and well into evening the offerings to the innumerable spirits continued almost endlessly, or so it seemed. The night grew dark, and still the magicians droned on.

Finally the chief magician paused with an offering in mid-air to ask, "Is it nearly midnight, señor? At the stroke of midnight the spirits come down to eat their offerings."

I looked at my watch. It was a little after 10.

"Close to it," I said, without troubling to be more specific.

Burnt Offerings for the Spirits

With that the offerings were gathered into a bundle, and, our way lighted by flickering kerosene lanterns, we stumbled over the rough streets and fields toward the ruin.

The night was cold and pitch-black, with a freezing wind blowing from the lake. In the feeble light of the guttering lanterns it was easy to imagine that the spirits were indeed about to descend.

In the old ruin the magicians burned the offerings in a ring of fire. Incense and libations of alcohol sent sparks and flames shooting up toward the dark sky and cast long shadows on the ruined walls.

"They are coming!" cried the magicians. "The spirits are coming to eat their offerings! We must hurry away without looking back. If you see them, you will die!"

Hurry away we did, and I must confess that I, for one, did *not* look back.

The next morning there was no trace of the ritual in the ruin—no ashes, not a footprint. The burnt offering had been carefully collected and deposited in the waters of a swift-flowing stream. All traces of the night's activities had been obliterated.

As a final footnote, it must be added that for fear the counterwitchcraft would cause the spell to backfire upon herself, Señora Pérez left Chucuito, bag and baggage. When I returned to the village for the last time several years later, I found that she had never returned.

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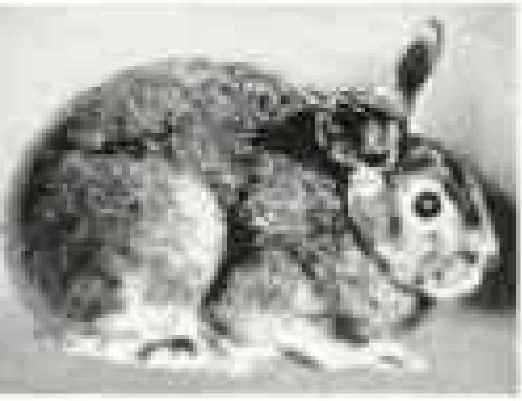

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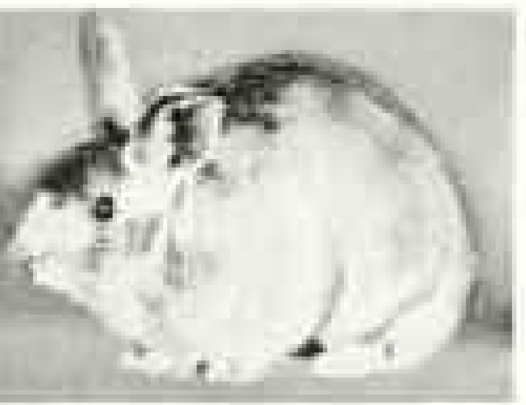

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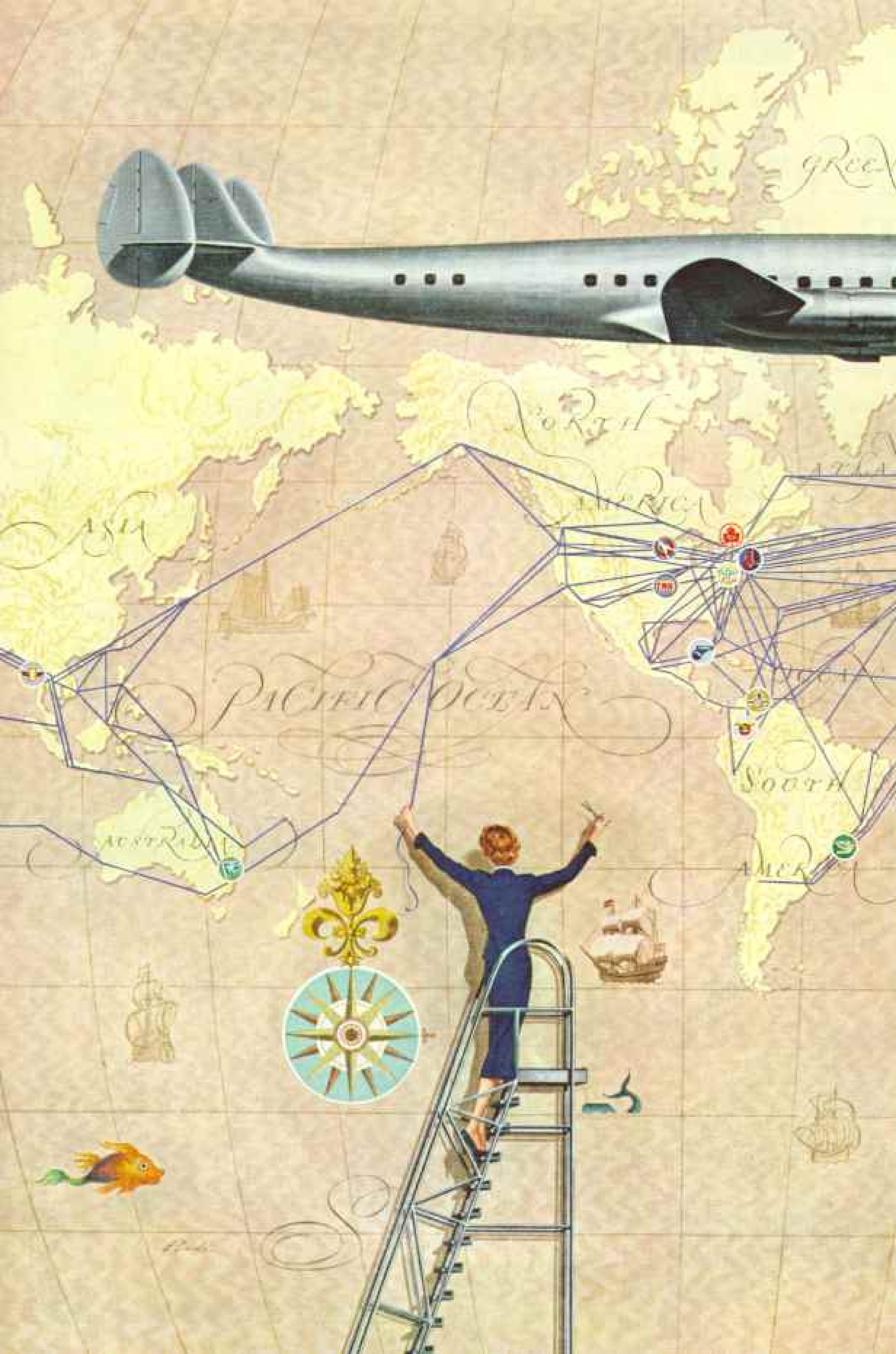
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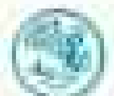
Air France 162,000

Air-India International 16,100

AVIANCA (Colombia) 28,500

Cubana (Cuba) 8,600

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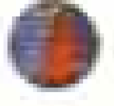
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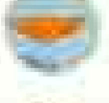
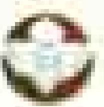
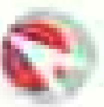

Iberia (Spain) 41,000


K.L.M (Holland) 144,000

LAV (Venezuela) 16,700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QANTAS Empire Airways 68,800

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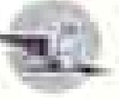
TAP (Portugal) 11,300

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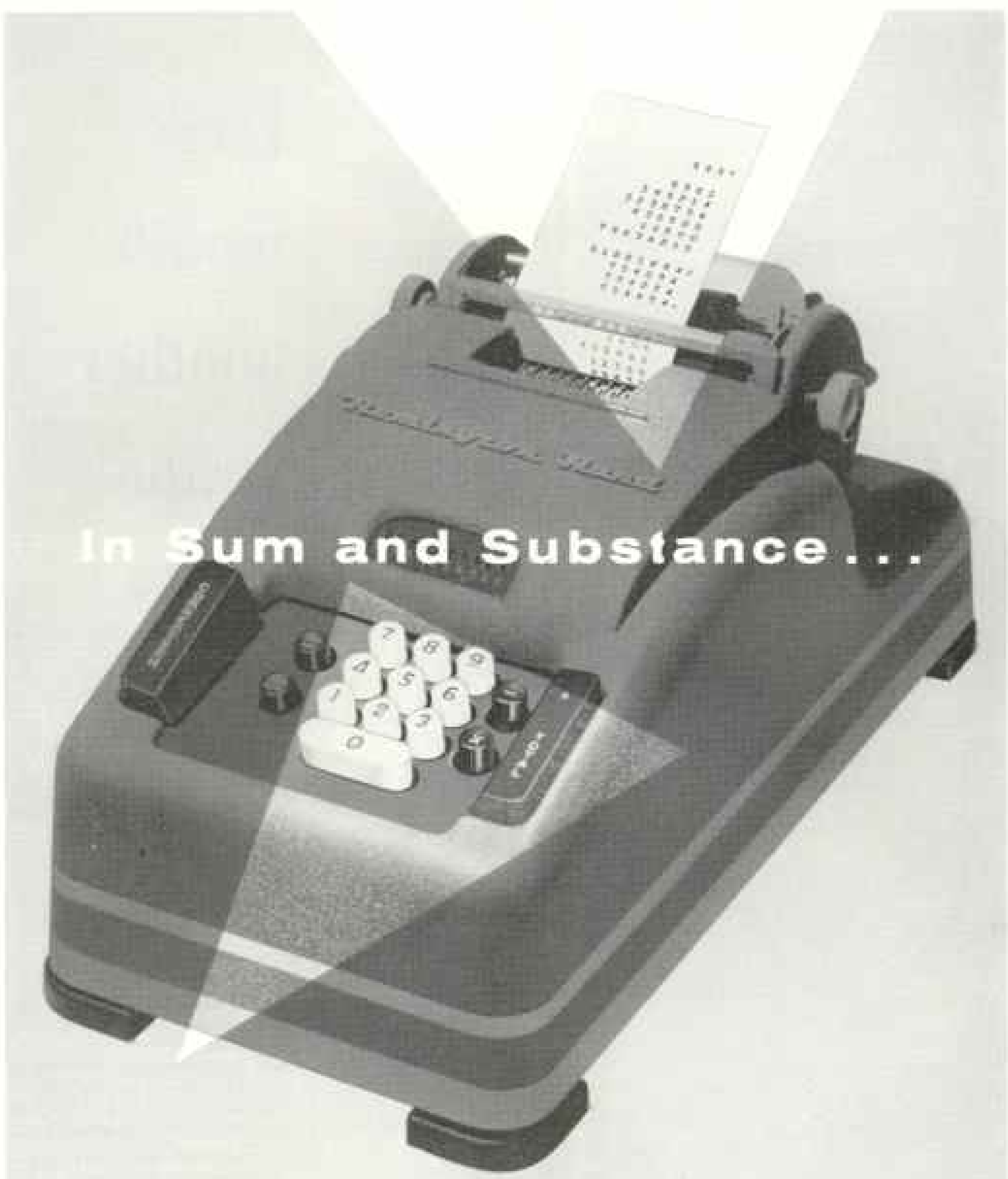

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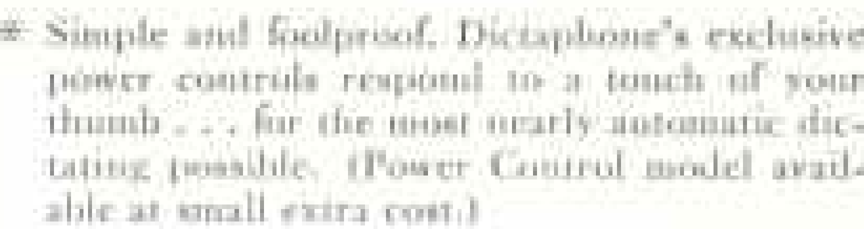

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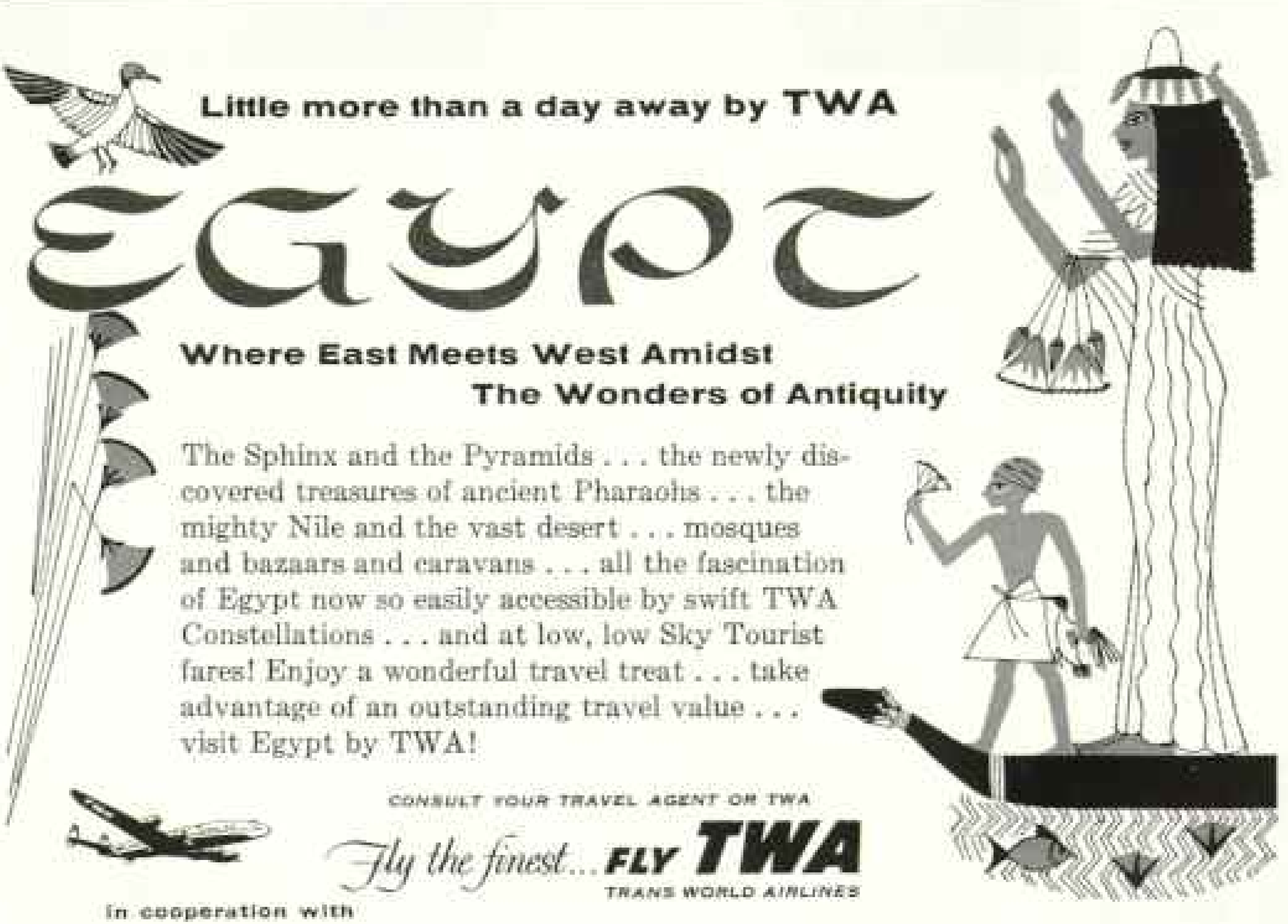

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Pneumonia is still dangerous when treatment is delayed. This was shown in a recent study of 15,000 cases. The case-fatality rate was *twice* as high for patients treated after the fourth day of illness as for those treated earlier. This is why you should call the doctor immediately when you suspect pneumonia. When treated promptly, pneumonia can usually be cured in a surprisingly short time.

What can you do to escape becoming a target for pneumonia? One of the wisest things is to take proper care of yourself when you have a cold. In nine out of ten cases of pneumonia, colds occur before pneumonia develops.

Should you "come down" with a cold, stay at home and rest in bed, eat lightly and drink plenty of liquids. *If a cold persists . . . and especially if you develop a slight fever . . . get in touch with your doctor promptly.*

High fever makes the difference between a "slight cold" and a "serious cold," because it usually means that complications have developed. If, in addition to fever, you also have *chills, painful coughing* or *difficult breathing*, report these symptoms to your doctor at once, for they almost invariably indicate pneumonia.

While winter is upon us, it is important to protect your general health. You may do this if you get all the sleep you need, eat a balanced diet and avoid exposure to severe weather unless properly dressed. In addition, keep away from anyone already suffering from a respiratory ailment.

By guarding your health, your resistance to colds, virus infections and pneumonia may be increased. In the event you develop one of these ailments, your ability to fight the infection and recover quickly will be greater.

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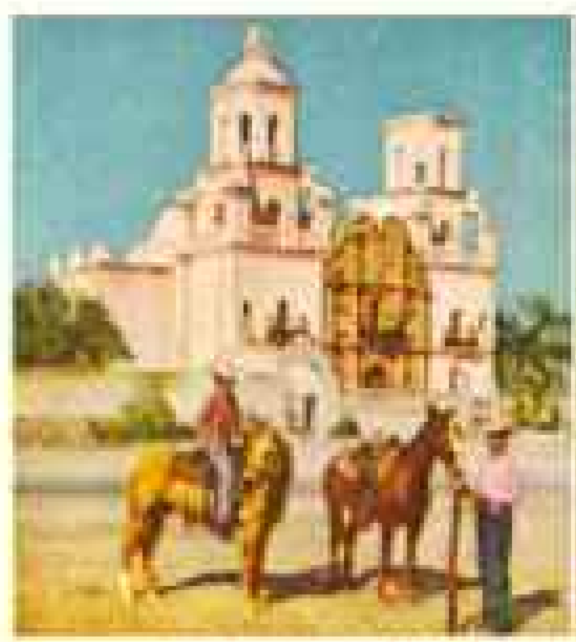

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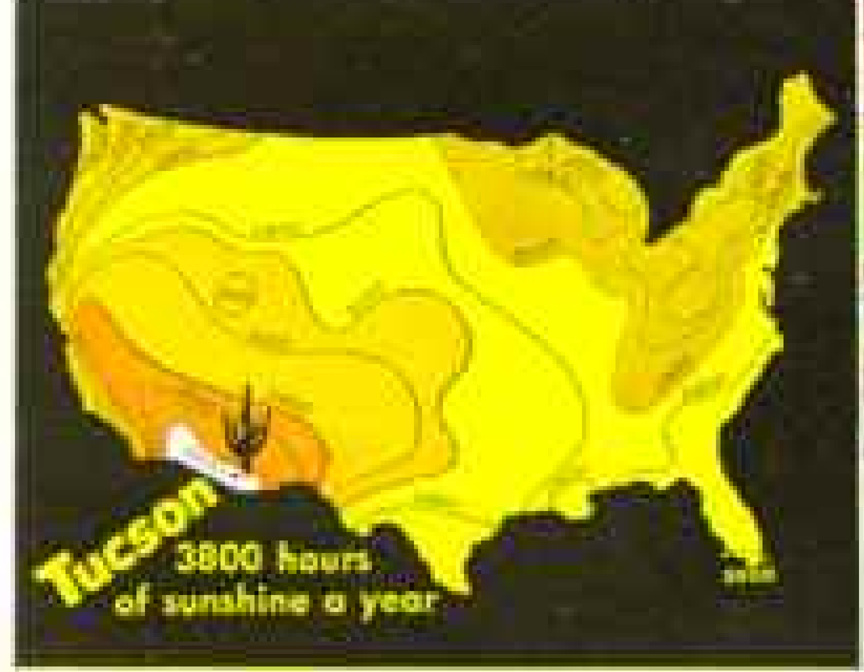

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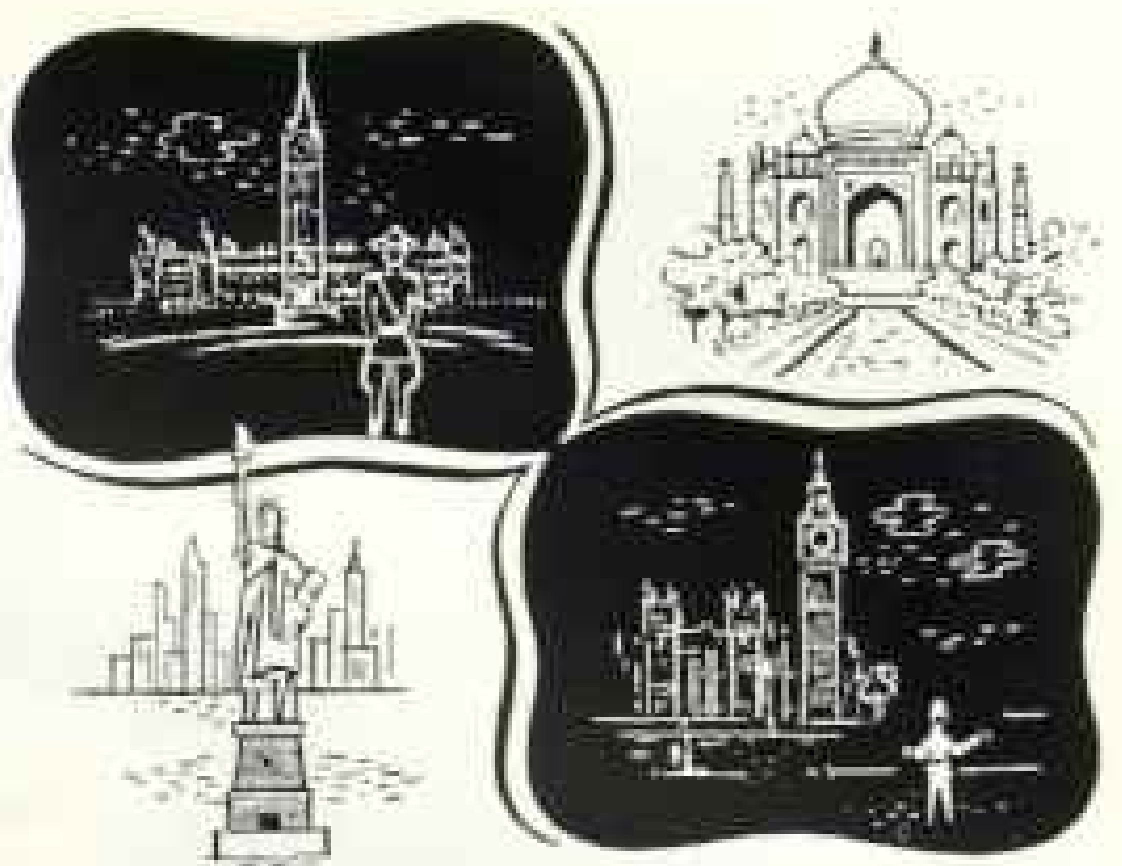

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GUIDE TO BRITISH FESTIVALS

IF YOU ARE planning a vacation in Europe, you cannot do better than start with a week at one of the great Festivals which have made Britain the cultural and sporting mecca of the modern world.

Probably the most famous is the Edinburgh International Festival of Music and Drama in August and September.

Here, in Scotland's romantic capital, you will see and hear the world's finest performers. Your days will be a heady round of concerts, plays, opera, ballet and sight-seeing. At night, you'll be thrilled by a Military Tattoo on the Castle Esplanade.

Then there is the Shakespeare Season on the banks of the Avon at Stratford. Performances every weekday from April to November: tickets from 35¢! In September, musical Europe flocks to the Three Choirs Festival, held in annual rotation at the Cathedrals of Gloucester, Worcester and Hereford (the last named, this year). A marvelous program of Handel, Bach, Haydn, Mendelssohn, plus important new music by contemporary composers.

The list of Festivals is almost endless. Folk dancing in London's Albert Hall in January. The Bath Assembly in May. Glyndebourne Opera, opening in June, and the Canterbury Festival, starting in July. The Welsh Royal National Eisteddfod in August.

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