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Airplanes Come to the Isles of Spice

Once Magnet of World Explorers, the Moluccas Again Stand at Crossroads of History in the Netherlands Indies

BY MAYNARD OWEN WILLIAMS

With Illustrations from Photographs by the Author

AFLOAT in tropic seas, surrounded by the Philippines, Borneo, and New Guinea, lie the Moluccas—the Isles of Spice. Some of them—Halmahera, Boeroe, and Ceram—bulk large on the map, but small in history (map, page 538).

Ternate and Bandanaira—mere pin points in space—have had their share of history's headlines, since their cloves and nutmegs inspired trade at least as long ago as 300 B. C. Amboina (Ambon) again thrusts its name into front pages as a Netherlands naval and airplane base guarding the outer Indies.

Having played their part in luring famed explorers, built with spice profits noble buildings in Venice, Lisbon, and Bruges, and lapsed into oblivion, the Moluccas again stand at a crossroad of history.

Here, midway between Australia and the Philippines, they are the outposts for the fabulous wealth of the Indies—not spices this time, but tin, rubber, and oil.

Over the groves of clove and nutmeg which lured Magellan to his death fly Netherlands Indies planes, based on Amboina and patrolling the skies between Borneo's busy oil wells and the largely undeveloped petroleum fields of New Guinea.

Although I saw naval airplanes come to the Moluccas, I knew the islands not as outposts of war so much as preservers of a wistful peace. Like a faded woman, dreaming of days when strong men fought for her favor, the Moluccas lived in the past. Now, after four centuries, their fate is again of world importance.

It takes months of meandering before one can visit even the main groups. My trip, shaped like the letter L, ran south from Ternate, Batjan, and Boeroe to Amboina, then east to Bandanaira's bright sea gardens and moss-backed nutmeg groves.

During many wanderings, I remember no dawn like that which came zooming up before our bows between Ternate and Tidore, the "Fortunate Isles."

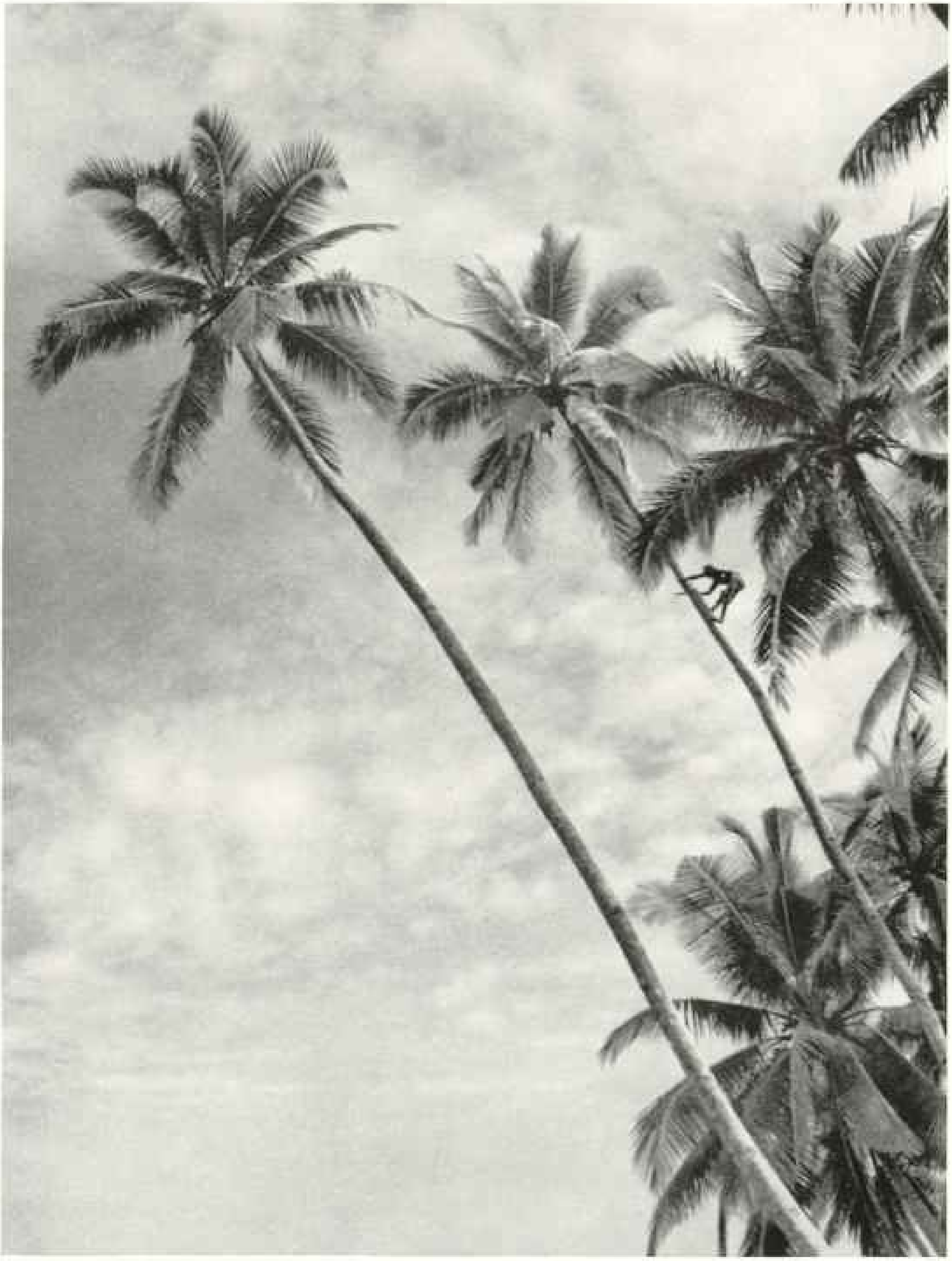
Two volcanoes framed a narrow passage at the end of which the sun burst forth below a storm cloud fringed with sheets of rain. On steep slopes deep shadow dissolved in soft green radiance, lighting the jungle where cloves once grew.

Home of Magellan's Friend

Here Francisco Serrão, Magellan's friend, serving the King of Ternate, had lived with his Javanese wife (page 539). Portuguese names, planted by such pioneers, still mark Moluccan family trees.

Here Magellan's veterans of the first Pacific crossing—the crews of the *Trinidad* and the *Victoria*—forgetting famine and scurvy, attained their spicy goal. From here the *Victoria* went on alone to Seville and glory, with a load of cloves in her hold to pay the cash expenses of three years of suffering, death, and triumph—the first vessel to trace its twisting wake around the globe.

It took 27 months for Magellan's ships to reach Tidore. But he himself, till then a demigod, had fallen on his face in the shallow



From Wind-swept Heights the Coconut Launches Its Far-ranging "Ships"

Because its tough-husked fruit is a great navigator, the coconut palm has extended its sway around the earth. Overhanging the surf, it drops its seed into the sea, which transports it to a new home. Many of our coconut products come from halfway around the world, yet the American Tropics are fringed with these useful trees. The Netherlands Indies lead in the export of copra (dried coconut meat), the Philippines in coconut oil (p. 557).

surf at Mactan, in the Philippines, pierced by lances and scimitars in a fight with the islanders. So the brave navigator missed his goal, the fabulous Isles of Spice.*

Strangely, the first round-the-world traveler was neither Portuguese nor Spanish. He was a Sumatran slave, carried off to Europe by Magellan when he returned in 1512 from naval service in the Indies. He was brought back to the Malay Archipelago by Magellan ten years later on this last fatal voyage.

Cloves and the Date Line

After exploring their difficult and roundabout route, Magellan's men found themselves in a region which had long traded with Europe.

Ludovico di Varthema, the first European to trace the precious clove to its source in the Moluccas, had visited Ternate about 15 years before the arrival of Magellan's two ships. But we owe much more of our knowledge to Antonio Pigafetta, Magellan's Boswell, who, having logged the tedious voyage, had a day left over at the end. By following the sun around the globe, he found that he "must have gained 24 hours, as is clear to anyone who reflects upon it."

Since then, the creation of the International Date Line has prevented even radio messages, outracing the westing sun, from repeating Pigafetta's error. A message I sent from the Moluccas at teatime reached my colleagues in Washington with their coffee the same morning, so slowly whirls our globe, a little more than a thousand miles an hour at the Equator.

Oil, not spice, flavors the conversation in the Moluccas today, for the wells of neighboring Borneo and New Guinea are both a promise of prosperity and an ever-present threat of war. The spice trade long since gravitated from Ternate, Tidore, Makian, and Batjan to Amboina and the Banda Islands.

The destruction of spice groves, the restriction of crops, and artificially high prices brought retribution. Today, the "Isles of Spice" are not the Moluccas, but Zanzibar, Pemba, and Madagascar, which produce more than 90 per cent of the world demand. But the Fortunate Isles, robbed of their old aroma, stand guard between the rich Netherlands Indies and the widely scattered Carolines, controlled by Japan.

At Ternate we were met by a wrinkled old man with a half-dozen bright-green parrots shackled to their perches by bits of coconut shell. On our ship were some modern explorers, back from air-mapping New Guinea,

* See "Greatest Voyage in the Annals of the Sea," National Geographic Magazine, December, 1932.

"See—It Has Wings!"

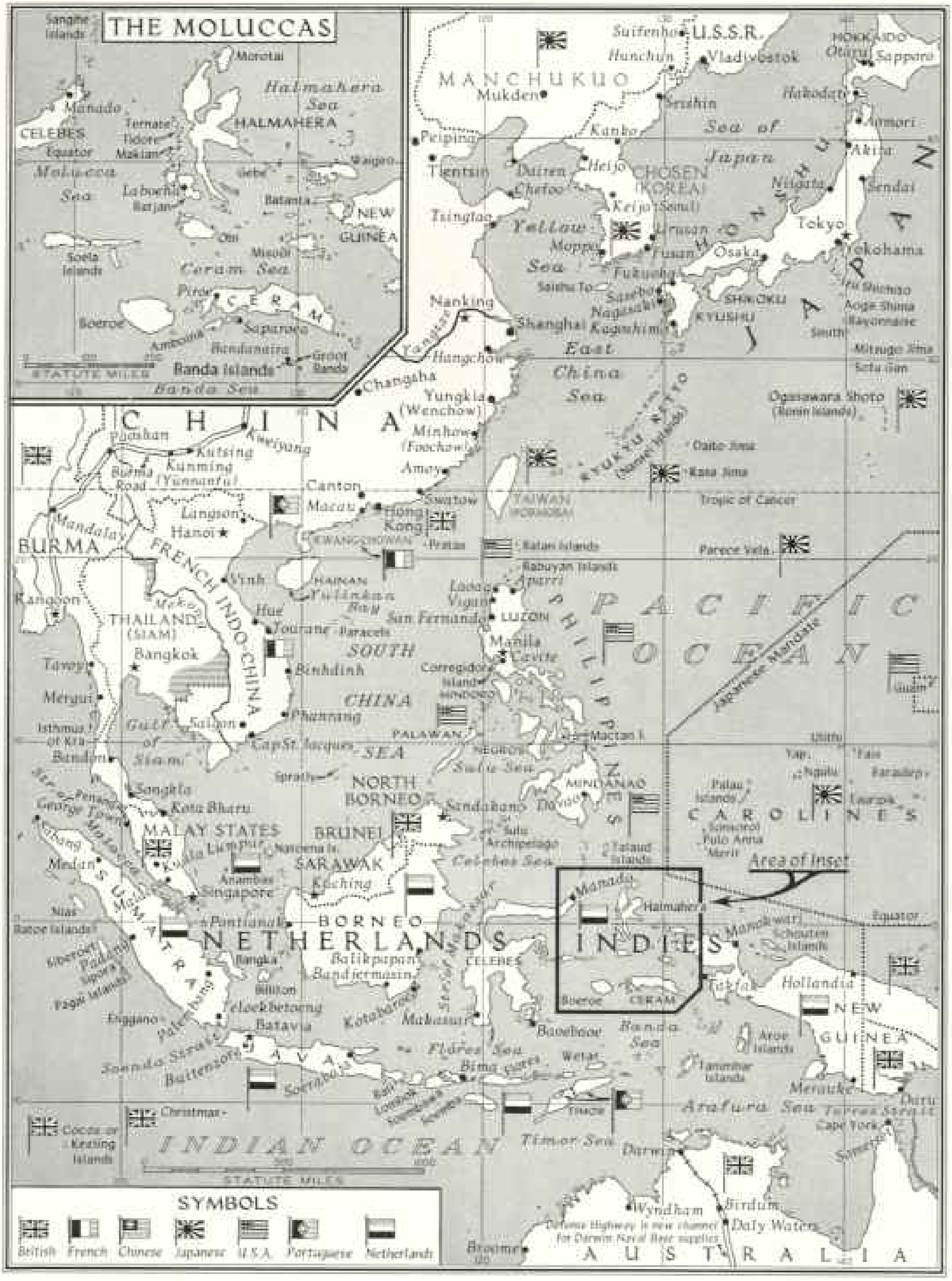
The waters above Bandanaira's famous sea gardens swarm with edible flying fish (page 557).

photographing tropical glaciers, and defending their planes against wild-haired Papuans. There they had lived among birds of paradise and other rare creatures. At Ternate, homeward bound, they bought parrots—just for fun.

We drove to the "Burnt Corner," where, in 1763, a flood of molten lava burned a rusty gash from the crater to the sea, and clouds of vapor wilted the palm trees. Even from miles away at sea one can note where this somber scar slashes the green-clad Peak of Ternate (page 542).

Memories of the *Golden Hind*

Above green lawns, from the palace of the Sultan, came the sounds of phonograph or radio. From here an earlier music-loving Sultan had rowed out to Sir Francis Drake's



History's Spotlight Swings Again to the Moluccas—"Isles of Spice"

Clove and nutmeg inspired explorers to girdle the earth 400 years ago. Now oil, rubber, and tin are the coveted prizes in the island-studded seas between Australia and Japan. From Amboina Netherlands Indies planes patrol the archipelago. The new Thailand (Siam)–French Indo-China boundaries were settled on March 11, 1941.

Such Women as the One Serrão Loved Still Tread Ternate Shores

So pleasant was life with his native wife on this peaceful isle that Magellan's sailor friend lingered on. His "wish-you-were-here" letters inspired the explorer to a voyage that changed the course of history. Though Magellan died before he reached the rendezvous with his friend, one of his ships completed the first circumnavigation of the globe (page 535).

Golden Hind, with his white-dressed courtiers sheltered under perfumed canopies, to fall under the enchantment of the ship's band.

Delighted by this "musical paradise," the Malay invited Drake to visit his palace. But shrewd Sir Francis suspected treachery, so not he but his officers were entertained at a gorgeous durbar brilliant with jewels and cloth-of-gold.

In 1619 the East Indies government was transferred from this verdant foreshore of Ternate's volcanic peak to Old Batavia's malarial flats in Java.

Deep foundations for modern bank buildings have been driven into the once-deadly ooze of Old Batavia, and the near-by urban center bears the comfortable name of Weltevreden—"well content." Ternate remains a lonely island outpost where green parrots preen themselves and perky lizards run on little lakes.

Back at the steamer, with the afternoon rain sweeping the wooden pier, we saw a long procession of men and women, their finery partly protected by umbrellas, accompanying a party of humble pilgrims to our ship. Mecca-bound, with the good wishes of the Faithful, these Malays from the Fortunate Isles were setting out to kneel in the Great Mosque, to kiss the black stone in the Kaaba, and drink of the waters of Zamzam before returning to Ternate as *hadjis*—honored men who have touched Mohammedanism at its heart.

As we sailed south, crossed the Equator, and approached Batjan, palm-fringed islands closed in on us. Clustered behind coral beaches were small groups of thatched houses on stilts.

When a home slumps over to one side, the Malays twist jungle fibers into rope, insert a length of bamboo for a turnbuckle, and drag their wayward dwelling back to rectitude.

Clever, too, were our boatmen. The ship's boats were in and out of the water several times a day. The minute our anchor was down, they cast off their pulley blocks, and the launch began playing snap-the-whip, towing a string of boats and tossing one after another at the copra-piled beach.

Floating Department Stores

Between-decks, I scraped up an acquaintance with the Mecca-bound pilgrims. There, too, are the counters of floating department stores which make the far cruises to the Moluc-

This Landfall at Tidore Spelled Success for the Greatest Voyage of All Time

For more than two years Magellan braved shipwreck, scurvy, starvation, and strife to reach the "Fortunate Isles," Ternate and Tidore. On November 8, 1521, soon after his death, this view stirred his men to a frenzy of joy, a salvo of guns, and thanks to God.

cas and New Guinea. A score or so of Chinese merchants live and sleep among their merchandise. Their safes are there, their holders bristling with writing brushes, ink sticks, and the clicking abacus which sets the tempo of Chinese trade in the Malay seas (page 554).

Football shoes and flashlights, cotton towels and bright-colored silks, shirts, and neckties, celluloid toys and phonograph records—the little ship is hard at work selling to the natives.

At each port a huddle of canoes awaits the whistle. Then they scurry at the vessel, with paddles flashing. Men fight for a grip on the ship's ladders and rush in upon the placid Chinese traders, seeking supplies for a fortnight or a month.

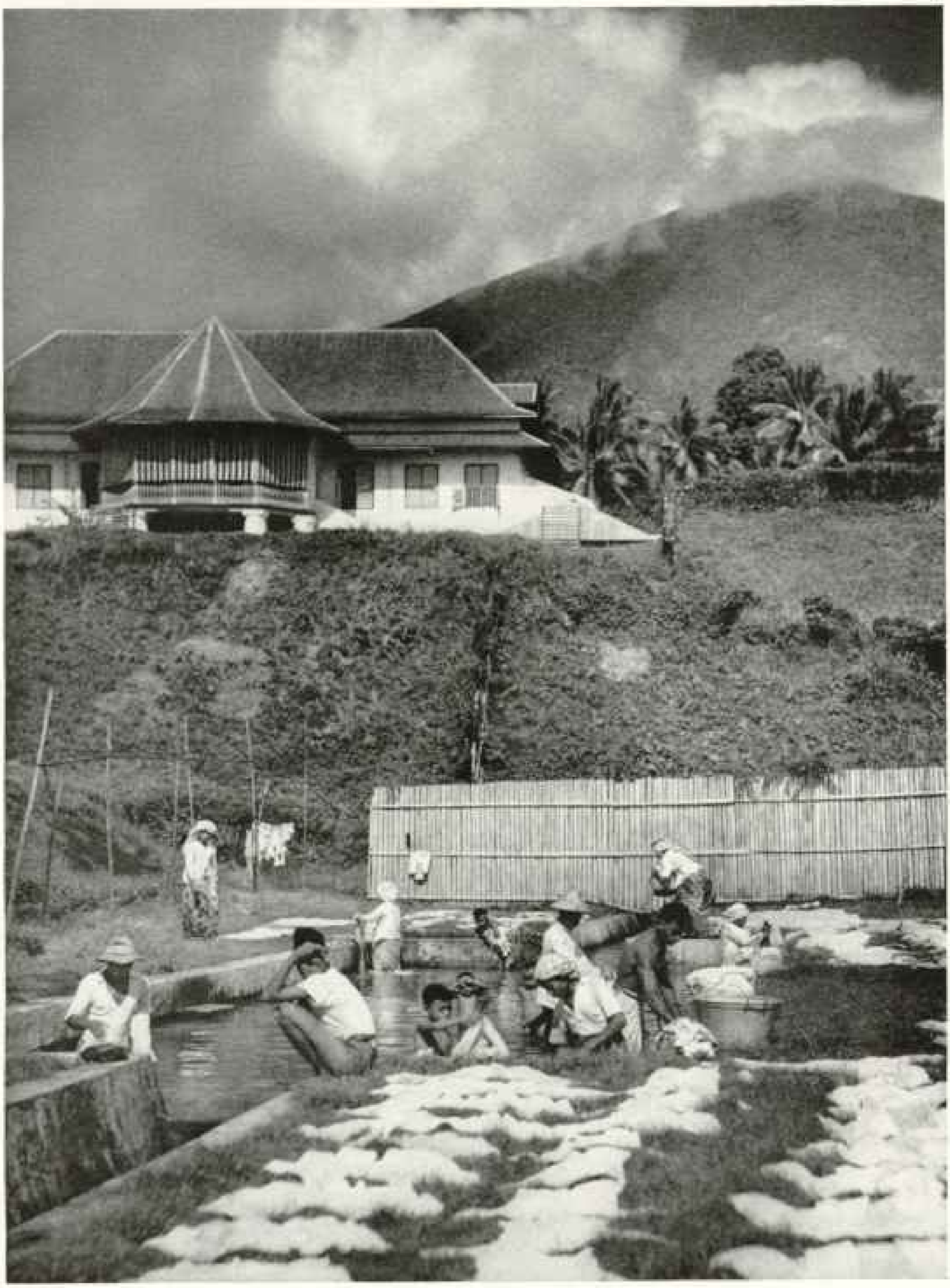
Business booms, interisland gossip catches up with events, a whistle sounds, the canoes drop astern, and the Chinese traders count their cash, lock their safes, set the abacus back to zero. They go on with their games, play phonographs, strum strange musical instruments, or lie back on their camp beds, buttressed in by a steadily diminishing supply of trade goods.

They pay no fares, only freight on their merchandise. They have their own cook or cooks, live their own lives, and repeat the voyage many times a year—maritime traveling salesmen whose customers meet the boat.

When night comes between-decks, it is like the description Joseph Conrad gives of the pilgrim ship in *Lord Jim*. Meanwhile, the clean little steamer chugs rhythmically along through placid tropical seas.

The Modern "Flying Dutchman"

At Laboeha, Batjan, on the football field of the Oranje Plein (the public square), I found that several of the street Arabs were real Arabs. At the modest post office, with its antimalarial posters, winged letters emphasized the fact that the modern "Flying Dutchman" uses a Douglas plane.



Not Egg-rolling But Laundry Animates Ternate's White House Lawn

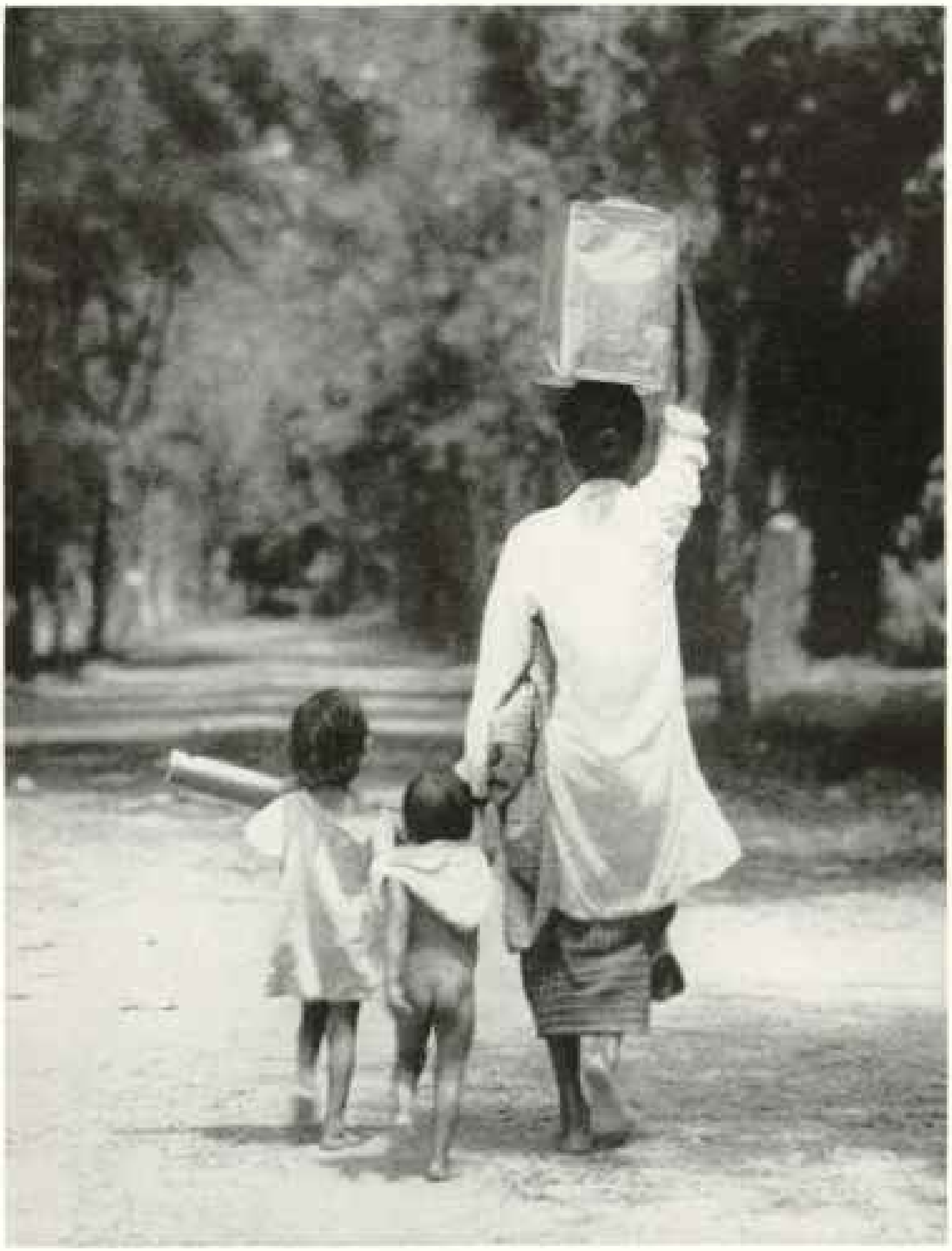
Gone from cloud-capped slopes are the cloves which made this tiny "Fortunate Isle" the goal of Magellan, the stopping place of Drake. This palace of the former Sultans is now a museum. The old costumes in its museum halls lack the flesh and blood of dusky lords and ladies who once wore them. But life and laundry go on.

Ternate's Once-wild River of Molten Lava, Now Cooled into Fantastic Shapes, Is a Motor Attraction

The island's chief excuse for automobiles is the "Burnt Corner," too distant for most walkers. In 1763 a river of white-hot stone flowed down the historic clove slopes until it sizzled into the sea. In that big sterile scar only a few weeds have found a foothold (page 537).

Time Out from "Marbles"—Below Historic Fort Terlugo

On the sandy shore near the fort, where Jan Maurits withstood an English attack in 1795, the sons of fishermen play long-distance marbles like a game of bowls. These Ternate youngsters shoot the marbles across the rough beach, scoring amazing hits at twenty yards, pitching distance in baseball.



A Far Carry for the Ever-present Oil Tin in Piroe, Ceram

Familiar in the East as is a filling station in the United States, the five-gallon oil tin serves many uses after the fuel is emptied. Ceram, visited once in four weeks by steamers from Amboina to New Guinea, is near the end of the road. Yet tin and oil deposits are close at hand. Little sister carries water in a length of bamboo. Junior came along for the walk.

Back of the village, old Fort Barneveld slumbered in peace, and in the harbor triangular fins of small sharks cut the water around the rusting wreck of the *Earl of Leicester*, sunk there half a century ago. When brown boys are bathing and see a shark fin cleaving the water like a periscope, they splash lustily and the shark swims away.

Following the Spice Trail

We followed the spice trail southward, stopping at the peaceful island of Boeroe, known for its cajuput oil, a panacea if there ever was one. During my travels in the Spice Islands no one tried to induce me to buy, use, or praise cloves, nutmegs, or pepper. But I seemed to be a moving target for this magic oil of Boeroe. You drink it. You anoint yourself with it. You sing its praises.

Boeroe's aroma outlasts that of cloves, once called "the pleasantest smell in all the world."

Cajuput oil is exported in large quantities. You have doubtless used it, internally or externally, without knowing it.

Our ship went on to Amboina, where the 17th-century Dutch hoped to preserve a world monopoly of cloves. When 4,000 inhabitants, each "allowed" to plant 125 clove trees, failed to appreciate their allowance, they were forced to do so.

The Kings of Ternate and Tidore, historic clove magnates, were pensioned off, and clove-destroying expeditions were sent out to the former production centers. Unfortunately Amboina had no monopoly on clove-growing soil and climate. A vice-governor with the spicy name of Poivre (Pepper) smuggled specimens off to Mauritius, and from these the culture spread to Zanzibar, off the east African coast (p. 537).

It would take 540 clove cargoes like that which paid for Magellan's record-making trip to meet the world demand today. Few such shipments would come from the Netherlands Indies, almost none from Amboina.

Three equal-paced dolphins convoyed our little steamer into Amboina's bay. From our ship's ladder I could have almost touched their shiny, curving backs. But times were getting tense; photography had just been forbidden, and the playful dolphins went their way unphotographed.

On the green hillside an earthy patch showed where a gun emplacement was being constructed. Farther up the bay, coconut trees were being cut down to make way for aviation barracks. The peaceful waters of this idyllic bay were already echoing the roar of seaplanes policing the crossroads of the Malay Archipelago.

Along the "Wallace Line"

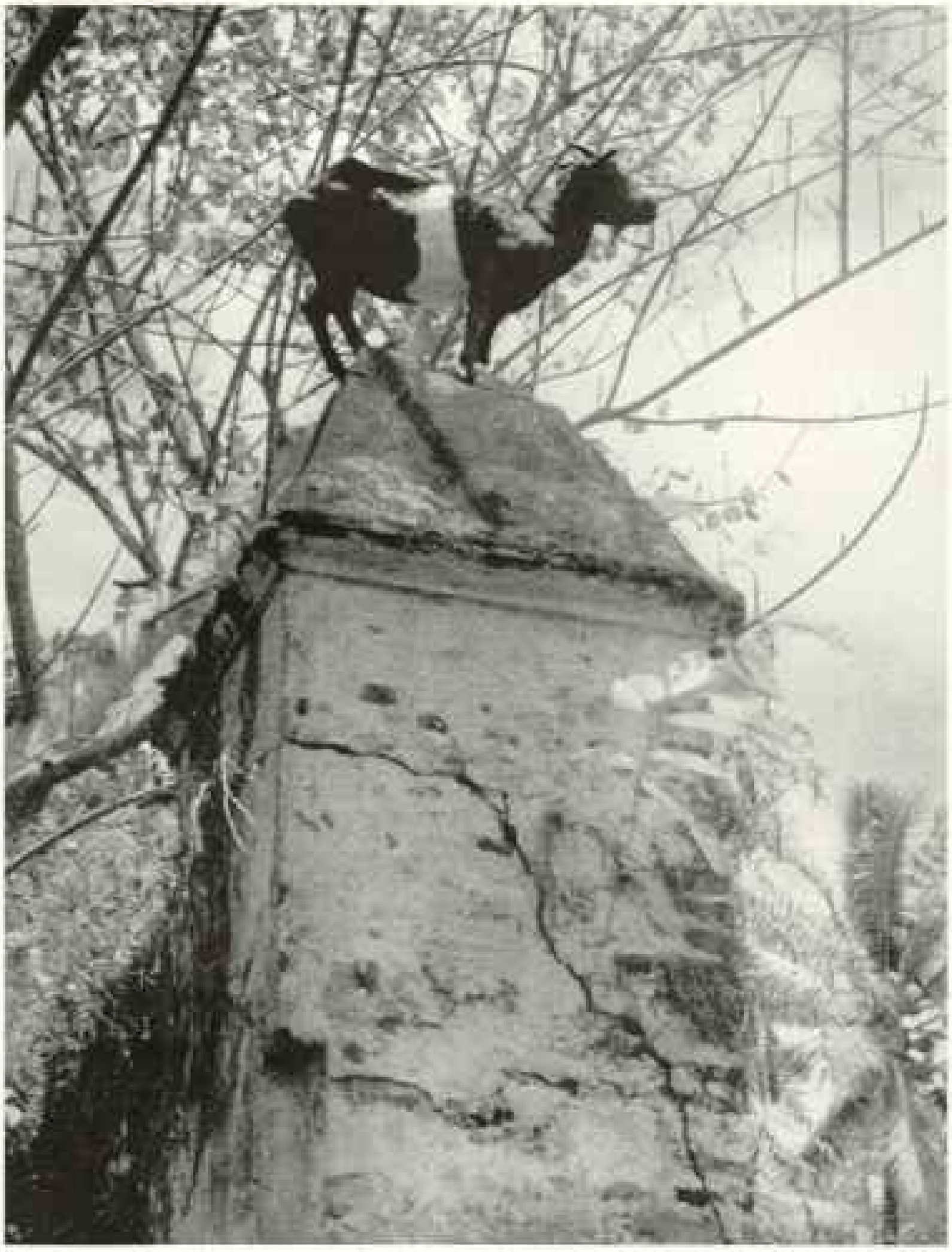
Here runs the Equator. Here volcanic craters swing up from the eastbound Sundas toward Luzon, Japan, and Katmai. Here met Spain's Far West and Portugal's Far East. Here ran the line laid down by Alfred Russel Wallace between Australia and Asia, with marsupials and frizzy-haired Papuans on one side and Bengal tigers and straight-haired Asiatics on the other.

Nutmegs, whose brown dust greets the New Year sprinkled on eggnog; cloves, whose aroma dispels the suspicion of drink—these were the trifles that made the Cape of Good Hope a turning-post and the Atlantic a highway.

The Moluccas made history because they were the Isles of Spice. A hound of history might sniff his way back along the spice trail to the dawn of recorded events. A swollen tooth would link him with those ancient sufferers who used oil of cloves to allay their pain.

With a flower-bud "nail" (clove—*clou*—means "nail") he could join himself with the sons of Han who sweetened their breath before appearing before Chin Shih Huang Ti to discuss the Great Wall, or at the throne of Wu Ti, whose trade routes bound old Cathay with the Persia of Mithradates and the Rome of Cicero.

"Sugar and spice and everything nice"—that's what helped make history.



A Goat Guards a 16th-century Gateway to Ruin at Ternate

Tropical verdure on the romantic "Isle of Cloves" has slowly wrecked the Castello, a Portuguese fortification dating back almost to Magellan's day.

Between rainy seasons, Amboina's wet palm leaves wear a spangled fringe. Yellow strands stretch between blue water and green mountainside. White clouds dot a sky whose blue, domed above the Malay Archipelago, is unbesmirched by dust or smoke.

See Amboina's bay in sunshine and the word "idyllic" springs to the tongue. But the short rainy season of four months, and the long one of eight, hardly give the barefoot boys time to mop the courts with gunny sacks and allow the tennis championships to be run off during the change of seasons.

Outlanders say the little hotel runs itself. But morning coffee arrives the moment one comes out onto his veranda. The mosquito net is tucked in again, no matter how many siestas one takes.

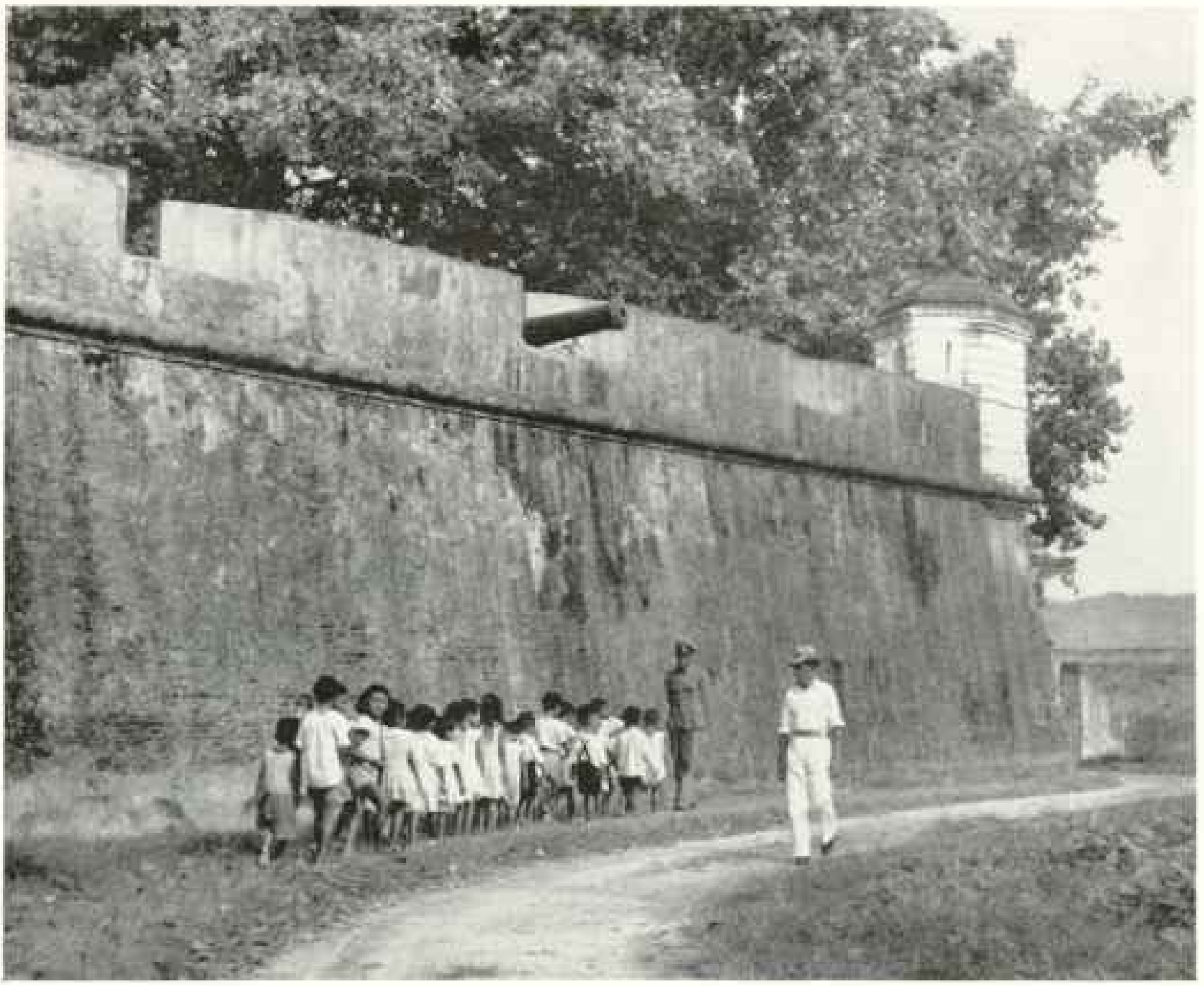
A Tricycle Taxi at Amboina Might Puzzle Magellan, But Not Its Name

Four centuries ago Amboina was in Portuguese hands. Still common are Portuguese names, such as Lindo (beautiful) on this little car with its open front-wheel-drive motor.

Photograph by J. C. Beck

A Geographic Field Man's Last Laugh Before a Ducking!

Hardly had the small outrigger canoe left the pier at Batjan in the Moluccas than water began to spout in through a crack, filling the craft. Except for the author's camera, which was kept above water, sinking was a joke, for the clothing couldn't be spoiled and the young lads scared away sharks by splashing their feet. The canoe was promptly bailed out and paddled away.



An Outmoded Cannon Points Toward Amboina's New Defense Base

A class of young children of Amboinese troops stationed at Fort Victoria parades beside old walls (page 551). Farther up the bay are barracks for the young Netherlands Indies aviators who police the Malay Archipelago between Borneo and New Guinea, and between Java and the Carolines.

Meals are on time. Purple-and-white mangosteens are piled higher than in most places, and half a dozen varieties of banana culminate in the matchless *pisang Ambon* (Amboinese banana, page 553).

The Best-dressed Town

Amboina, largely Christian, provides many of the best soldiers in Insulinde, as the Dutch East Indies archipelago was known. Coconuts and pensions afford modest comforts, and Amboina prides itself on being the best-dressed town in the Moluccas. The older women wear black dresses and Portuguese names. Middle-aged women add a long, thin jacket-blouse to the usual sarong (pages 549, 551). Young women prefer the one-piece knee-length cotton dress called "European."

People call the Amboinese lazy. This is a relative term. Amboina soccer is a fast game, and a strenuous sort of basketball is played by mixed teams of boys and girls.

"Why should I work?" asked one industrious friend of ours. "My family is well to do. My wife runs a flower shop, teaches tennis, and has roomers. So why should I work?"

In Amboina I played a gay and cosmopolitan game of tennis. An Armenian girl, a Javanese girl, a Danish-Amboinese girl, a Chinese-Amboinese man, an Amboinese man, and a Hadhramaut Arab-Amboinese man were my playmates.

Across a tiny creek, behind the wire-protected military swimming pool, we could see the old Fort Victoria at Amboina where Dutch troops massacred the British in 1623 (page 551). Now the Queen of the Netherlands is a guest in England, and Singapore and Amboina are friends.

Almost separated into two islands by beautiful bays that run far inland between two ranges of hills, Amboina is a story-book island. Behind the nondescript town are steep hills covered with buffalo grass and jungle or palm

On Sailing Day Europeans, Chinese, and Malays Come Down to "Sing the Ship Away" at Amboina

Next to the Customs Office a godown (warehouse) emphasizes the large part the Chinese play in Netherlands Indies commerce. Now Amboina is a naval and seaplane base as well as port of call for ships to Celebes, New Guinea, the Aroe Islands, and Ceram.

Low Tide on Saparoea's Rocky Shore Is Hard on the Feet of Porters Who Carry Cargo through the Surf

At high tide they tread a sandy beach. Storm clouds here hover over the Moluccas, but a ray of sun spotlights the antiquated guns in the old battlements.

From Malay Sarong to One-piece European Dress; from Head-load to Sunshade, Women's Rights Advance in Amboina

"Fight Mold While the Sun Shines" Is the Rule in Ceram

Tropical moisture spoils film, paints a fungus on the camera lens, rusts tools, cracks leather, and turns a pith helmet to pulp. When the sun does come out, footwear and typewriter case are dried out.

groves higher up. Red clay paths cut down through the greenery, and stately women in light pink blouses descend from the cool, rainy hills, bearing high-heaped trays on their heads.

From a distance these trays of bananas or coconuts look like glorified hats worn with queenly grace. And somewhere across the silence there cuts the sound of bamboo flutes.

Blind Botanist of Amboina

A company of white-clad students playing these distinctive instruments came down to honor a departing missionary, and such gay music, interrupting the dull drone of a plane arriving from Boeroe-way, seemed like the flash of a bright bird under a stormy sky.

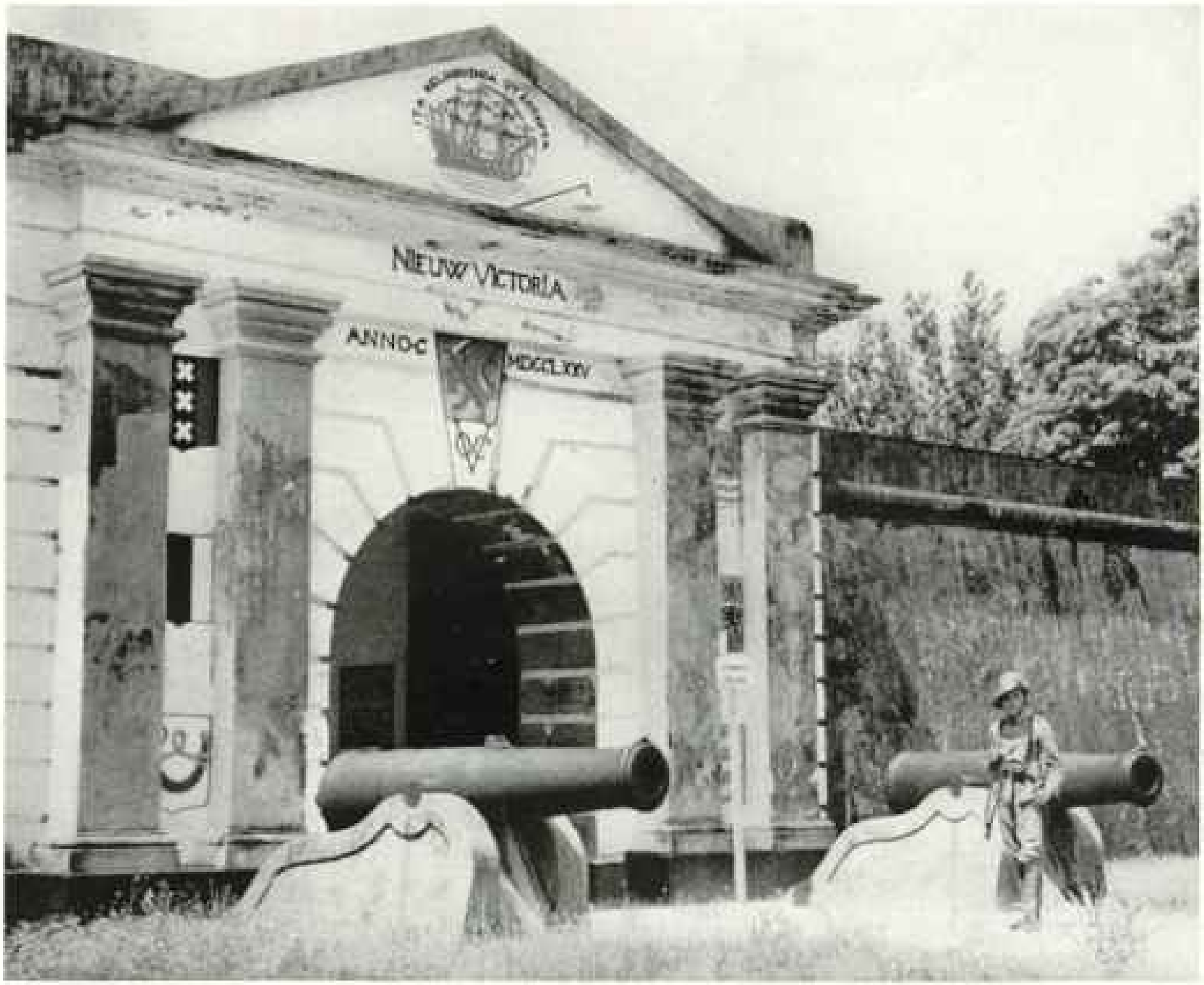
Two famous men are remembered in Amboina. Georg Everard Rumpf lived at a time when a scholar, like his specimens, had a Latin name; hence Rumphius, author of *Herbarium Amboinense*. He spent most of his 67 years at Amboina, where he was stricken blind at the age of 42.

Physician, merchant, and governor, Rumphius is best known as a botanist, although his famous six-volume work, including a precise description of the clove plant and its diseases, was long hidden in Dutch archives.

In 1810 the Moluccas were captured by the British. The future founder of Singapore, Stamford Raffles, with his customary energy and sense of justice, sought to better the condition of the growers.

In 1816 Raffles called on Napoleon at St. Helena. That amazing exile turned from his own gardening to inquire about Amboina's spice gardens. But the Moluccan spice trade was on the decline. Two years later the clove was introduced into Zanzibar, which soon became the chief producer (pages 537, 544).

When Malay kings ruled the Moluccas, the annual crop of cloves averaged about 1,800 tons a year. Portuguese supremacy reduced this to 1,200 tons. When Amboina had the



Not Muzzle-loaders but Modern Planes Guard Amboina's Fort Victoria, Built 1605, Rebuilt 1775

monopoly, the output went down to 600 tons, about twice the amount furnished by the Netherlands Indies today.

Lest it be thought that the cargo aboard Magellan's *Victoria* sold for a fabulous price, it should be noted that cloves had brought twelve times as much in Marco Polo's day and again sold at 33 cents an ounce in 1785. In September, 1918, cloves cost three shillings a pound—nearly 70 per cent more than did the historic cargo that paid the cost of Magellan's five ships. The cloves which repaid Magellan's backers brought less than three cents an ounce. Scientific exploration cost little money but many men in Magellan's day.

Island of Tree-climbing Fish

A palm-shaded road leads across Amboina to Toelehoe whence a small government motorboat carried us to Ceram, least known of the Moluccas.

With tree-climbing fish swarming along the shore and scores of bright butterflies spattering the jungle shadows, the morning walk was always a pleasure. Beside the path the loud splash might be that of a crocodile or a lizard; or Alfoer women—Christian or Moslem—might be doing their laundry or taking a bath, using that all-round cylinder of cotton cloth called a "sarong."

When worn with a blouse, the sarong is folded in at the waist and becomes an ankle-length skirt, with every part of the pattern properly placed. During working hours it is fastened under the armpits and the blouse is laid aside. If its wearer plunges into the water, it becomes a bathing dress.

When the woman leaves the water, she stretches up into a dry sarong, within whose modest shelter she drops the wet one. Ultra-chic when worn by a Javanese lady, ultra-useful when worn by peasant folk, the sarong, be it cotton print or hand-dyed batik, is pre-eminently a utility garment.

People speak of "rice Christians" with disdain, but rice is a back-breaking crop. "Coconut Christians" would better describe other recipients of God's bounty. But "sago Chris-

He Can Dig Food for a Year from One Sago Palm

At the age of 15 and a height of about 20 to 30 feet, a sago produces a single flower spike. Before the flower matures, natives cut down the trunk and carve out the pith with dull bamboo axes. If the fruit is allowed to ripen, the starchy core feeds it, leaving the tree trunk a hollow shell. In a day, a sago gatherer can hack out enough raw starch to last his family for months (page 554).

tians" would be the ultimate in expressing those who eat bread without sweating for it.

A single palm trunk will yield hundreds of pounds of sago in return for a day's work, and sago bread, looking like a giant waffle, is the chief food. In Ceram the staff of life is a tree trunk (above, and page 554).

Beside me is an old leather-bound volume with gold-leaf lettering: *Forrest's Voyage to New Guinea*, dated 1779.

When Captain Thomas Forrest wrote about sago and ships, his nation and ours were at war. But his information still holds good.

In the Moluccas, I have seen sago flour, wrapped in leaves, left out in a torrential rain and standing in pools of water. I have also tasted sago bread. The first impression is that sago flour must be indestructible, the second that it is unpalatable. Forrest gives light on both points:

"I have kept *fago* bread twelve months. Fre*f*h from the oven it eats ju*f*t like hot rolls. A *fago* cake, when hard, feels like *f*and in the mouth. I have often reflected how well Dampier, Funnel, Roggewein, and many other circumnavigators might have fared, when pa*f*fing this way in di*f*tre*f*s for provi*f*ions, had they known where to find the groves of *f*ago trees."

A native of Ceram uses sago fronds to thatch his hut, the midrib of sago leaves to build walls and ceilings, and sago flour for food.

Separating the pith in the trunk from the fibers is simple. The trunk is split in two, and a native, using a dull bamboo ax, hacks out the snowy-white pith and light-brown fibers. A sharper ax would give shorter fibers, harder to extract. When washed, the fibers float away; the flour remains. Nowhere can such quantities of bread be had for so little labor.

A "Pudding of Three Palms"

Tasteless as is sago bread, the sago palm plays a noble part in the most delicious of desserts. Over a mound of pearl sago is ladled coconut milk to which grated coconut is added. Over this is poured golden palm syrup. This incomparable East Indian dessert is called the "pudding of the three palms."

Black pepper from south Sumatra and white pepper from the port of Muntok, on the isle of Bangka, most important spices, lie outside

the limits of this story. Not so the nutmeg.

Back in the old days, when Dutch merchants were long on profits but short on knowledge, they sent the message, months on the way, "Plant fewer nutmegs and more mace." It would be as sensible to say, "Fewer cornobs and more corn," for each nutmeg is surrounded by a network of ruddy mace.

The nutmeg comes from a fruit like an apricot (page 556). When the fruit is ripe, the flesh comes off in two halves and leaves the kernel covered with mace. A nutmeg, surrounded by this elastic membrane, is like a baseball core, wound in red rubber. When the mace is first peeled off, it suggests tiny rubber gloves for dolls. Later it goes flabby and dry.

Ungrated nutmegs are frequently covered with white lime to discourage mold and pests. But in the old days of nutmeg monopoly this white powder, following a bath in lime water, was designed to prevent the seed from germinating in competing territory.

"Right Shoulder Lunch" in the Moluccan Manual of Arms

This banana bearer was a frequent visitor to the resthouse at Piroe, Ceram. He carries a tree-ripened *pisang* (banana), noteworthy for its giant size and delicious flavor.

The nutmegs grow in one of the fairest little island groups in all the archipelago, the Banda Islands, far out toward New Guinea.

Bandanaira, the port, is perched on the edge of a dead crater. The wharf faces a 2,150-foot volcano which has built itself up near where its ancestor blew off its head and gave the group its harbor.

Curving around these two smaller bits, like a thick-backed boomerang, is the nutmeg island of Groot Banda (Lontor), where the moldy, thick-walled compounds of the nutmeg barons still stand in the luxuriant forest.

Banda still produces most of the Oriental nutmegs, though you'll see Chinese women in Singapore cracking the seed coat for the inner kernel. Penang produces a few. More than three-fifths of the world crop of 5,200,000 pounds comes from Grenada in the British West Indies. Banda and Grenada are tiny isles; the nutmeg, unlike the coconut, must "grow within sound of the sea."

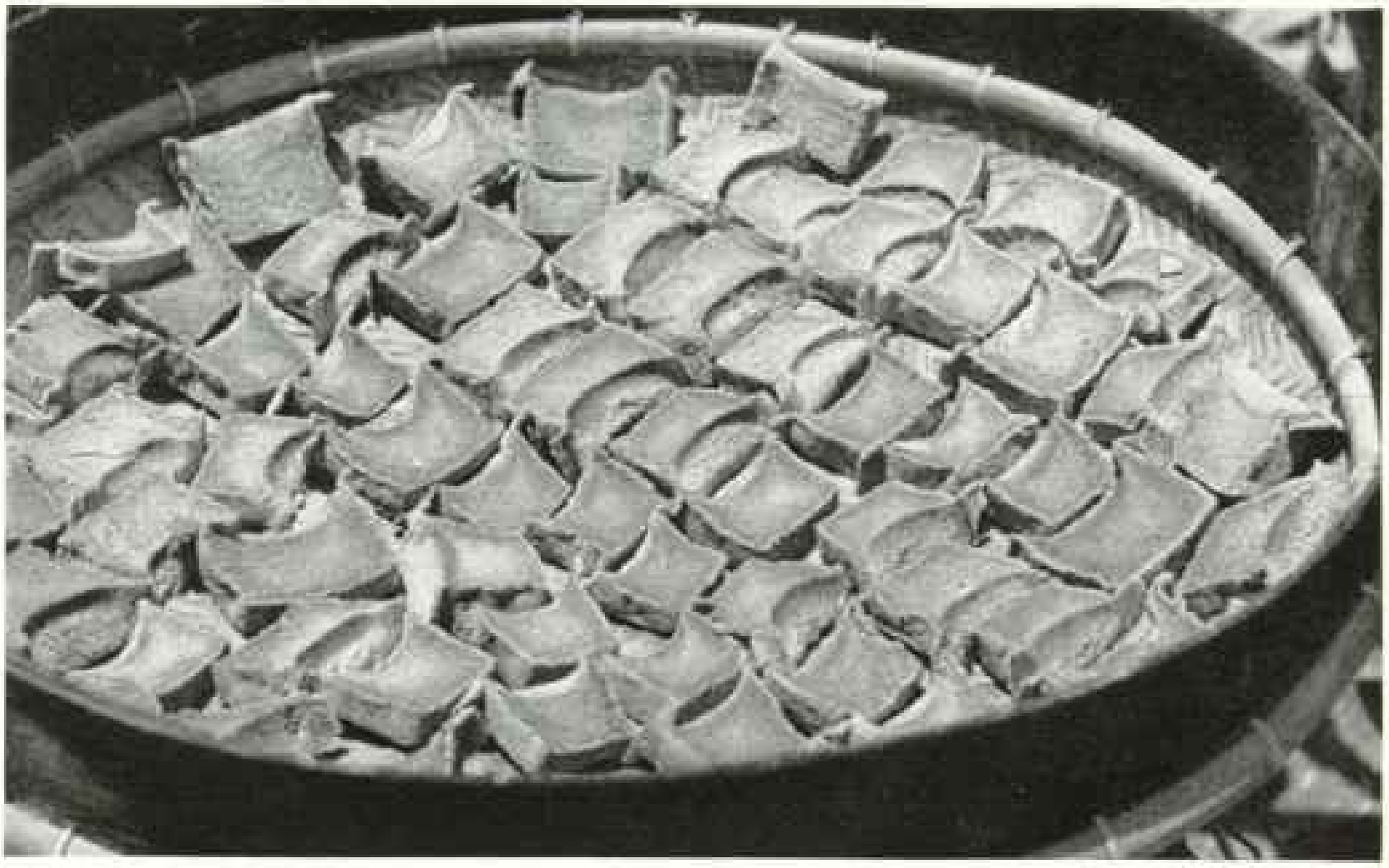
Men Fought, and Died, for the Nutmeg

For the Moluccan nutmeg, men fought and died far from home. The whitewashed compounds in the shady forest suggest such wealth as does a gracious old Southern plantation home. Sprinkled on various drinks and dishes, the nutmeg betokens quality.

In front of the government office at Bandanaira is a quotation board giving the price of local fruits, vegetables, and nutmegs. The

Seagoing Salesmen, Amid Their Stores, Play Chinese Dominoes

On Molucca steamships between-decks is a maritime department store catering to island visitors. Proprietors pay freight on their goods but no passage money, and make several voyages a year (page 539). Umbrellas, alarm clocks, football shoes, flashlights, and sunglasses are carried to outer districts.



Ceram's Staff of Life Is the Sago Palm, from Which Comes This Tray of Daily Bread

Sago bread is relatively tasteless, but is wholesome, plentiful, and almost indestructible. The pith resists mold, and the bread can be kept as long as sea biscuit (page 552). Sago is easily gathered, so natives largely escape the curse on Adam: "In the sweat of thy face shalt thou eat bread" (Genesis 3:19).

Amboina's Garbage Cart Has "Ox Power" and Modern Balloon Tires

Beside Fort Victoria the harbor front is being filled in by such soft-treaded dumpcarts. Close at hand, three-wheeled taxicabs wait to take shoppers home to their villages along historic Amboina's bay or across the island to Toelehoe (page 544).

quotation during my visit was a bit over five cents a pound, delivered in Amboina. Workers complained that this luxury spice, lure to world exploration, rich booty of Bedouin bandits, coveted treasure cornered by tycoons and protected by monopoly and the force of arms, is hardly worth the picking.

Selected nutmegs, five to an ounce, with freight and duty paid, now sell in New York for from 15 to 20 cents a pound, a far smaller spread in price between grower and consumer than in the early days of the spice trade.

"If it weren't for the mace, they wouldn't bother with it," said a Chinese, who disdained the nutmeg trade but waxed fat on tennis shoes, phonograph needles, and cigarettes. Perhaps the burghers were right: "Plant fewer nutmegs and more mace."

Forts, Radio, and Tennis

Bandanaira had two forts. The Belgica has recently been restored, and from its roof one has a fine view over town, volcano, and nutmeg groves. A new radio station occupies a site near the crumbling walls of Fort Nassau, within whose reach a cement tennis court is the center of what social life there is in the Banda Islands.

Social life is a bit mixed, for Europe, Polynesia, China, and Arabia contribute their quotas. The Chinese merchants who now inhabit the thick-pillared townhouses of the vanished nutmeg barons invited me in out of the rain, and I had a good laugh with one to whom I had gone to buy some pen-points. He had none.

"Do you sell writing brushes?" I asked.

"No, I use a fountain pen."

"So do I, but I lost it."

"Sorry."

"From Urumchi to Langson I was never beyond the reach of writing materials. Yet you, who wear European clothes and sell phonograph needles, can't sell me even one pen."

"Oh, but I can. I have very good fountain pens—American."

Hoping to find my lost pen, I passed up the chance of buying one in the Banda Islands. The Wisconsin-made pen I use was bought in Singapore.

In the Banda Islands there live hundreds of Hadhramaut Arabs. Commerce had brought me in touch with the Chinese, but my point of approach with the Arabs was fashions. Sitting before an Arab shop, several bright-eyed

A Fruit Like an Apricot Encases Both Mace and Nutmeg

Here in Bandanaira's damp, dark groves, the nutmeg—poisonous if used to excess but pleasing in taste—played a major part in the exploration of the East Indies. Seventeenth-century burghers in the Netherlands sent a classic "boner" to planters to "grow fewer nutmegs and more mace" (page 553).

Bandannira's Nutmeg and Mace Inspired Monopoly, War, and Exploration

Between two prongs the fruit is drawn into the open mouth of a bamboo picking basket. Inside useless pulp is a red rubberlike network aril, known as mace. This covering surrounds a shell within which is the wrinkled brown nutmeg. These, like coins, are tested by bouncing them. Wormy ones fall with a thud.

Coconut Trees Fringe the Shores of Amboina, Where Cloves Failed to Flourish

Fearing Spanish attack from the Philippines and English intrigues, the Dutch chose Amboina as the unsuccessful seat for a clove monopoly. Now coconuts—"the lazy man's tree"—are widely grown along the shore and add charm to a beautiful but rainy island (page 556).

children were scanning the woman's page of a New York newspaper, once news, now wrapping paper (page 558).

The mention of Damascus brought me an invitation to sit down to an Arab feast which filled the porches and front rooms of several houses.

It was surprising, here where Mohammedanism fades off into paganism, to mingle with hundreds of Arabs whose language—that of the Koran—was as comprehensible as that in Jerusalem or Beirut or at a desert camp on Sinai.

The Sea Gardens of Banda

Far-famed—and rightly—are the sea gardens of the Banda Islands.

Bright-blue fish, swimming over chocolate-colored masses with dull-blue starfish between them, present a memorable sight. And the youngsters who paddle the boat jump overboard in their one-piece romper suits to pluck huge fans of delicate coral. But it is even more impressive to walk barefoot across toe-stubbing tidal flats and see the shapeless chaos of weed and coral come to life and beauty with the return of the tide.

We went across to Groot Banda to get photographs of the picking poles, fruit, mace, and kernel of the nutmeg.

On returning through a pelting rain, we found that our motorboat had retreated with the tide and was half a mile away.

The boatman's feet were leather-soled. Mine, long sheltered by shoes, were "sissies." After cutting them several times and reflecting that my Chinese friends sold tennis shoes made by their fellow Chinese of Singapore, I put my rubber-soled shoes back on and waded.

By the time the tide-directed drama of the sea and its plants and animals began, I was fed up. But on looking down at what seemed an old hemp mop and seeing the rising water transform it into a symmetrical tuft of

New York Fashions Are Wrapping-paper Designs in Bandanaira

Here children of Arab immigrants on one of the "Nutmeg Islands" look at the pictures in a copy of a New York newspaper 34 weeks old. Old newspapers are widely used in the Orient for wrapping.

delicate loveliness, I realized that the best way to see a sea garden is to wade in one.

Shimmering fish swam about my brown ankles, and strange-looking things that might be animal, vegetable, or mineral clung to rock bits and waved whiskers, fringes, or shreds at us.

During my between-rain rambles in Bandanaira, I came upon the Christian cemetery, whose noseless gardener, stricken with frambesia, a skin disease, was one of the Hadhramaut Moslems. When the call to worship took him from the Christian graves, it was only a step to the mosque, and a bit farther on, leading up to the restored upper fort, was the Chinese graveyard.

Netherlander Met by Polynesian Canoe

Banda spread its lure across uncharted seas. Nutmeg barons from far-off Europe built their fortlike compounds, and the Dutch raised two fortresses to protect this priceless treasure, half a world from home.

But that was long ago. At Banda I saw only one Netherlander and a few Amboinese Christians, with Portuguese names. Most of those I saw were white-ducked Chinese and Arabs from Hadhramaut.

The lone Netherlander, with his Amboinese wife and his entrancingly beautiful daughter, was back from Rotterdam on a visit. When his ship came in, he was met by the many-paddled native canoe, Polynesian in outline and resplendent with decorations. His reputation for honesty and cordiality brought him high honor.

But as he sat there, listening to the radio, the only European I saw on the Banda Islands seemed to dream of Vlaardingen and Delft. I wonder if he does now.

Homeward led my own trail. My fellow passengers were returning from New Guinea oil fields. On the Bandanaira dock were imported drums of aviation gasoline for the planes which police the Banda Sea. Airplanes of war wing over the Isles of Spice.

Fruitful Shores of the Finger Lakes

By Harrison Howell Walker

With Illustrations from Photographs by the Author

THAT first morning on the road to Rheims I wanted to greet all Pleasant Valley with an exuberant "Bonjour!"

Over a hillside rippling with vineyards, Lombardy poplars shot shadows toward a grape grower's home. Thick, rough walls of the stone house harbored the coolness of a French cottage. And a summer sun poured its warmth on a roof as red as any in France.

But this Rheims—*Reems* to us in the United States—is in an active region of farms, factories, and transport, encompassing the Finger Lakes with a firm hand.

Streaking fertile central New York State, six slender lakes stretch approximately north and south. On a map they look like the sensitive fingers of an artist.

Listen to Iroquois lore, and they become the imprint of the Great Spirit's hand. To reward these Indians for courage in battle, their god shoved down to earth a choice lot of the Happy Hunting Grounds.

A slip of the hand left the sixth impression. And six lakes—one for each of the Iroquois tribes—filled the depressions made by the mighty fingers.

Carved by Glaciers; Named for Indians

Actually glacier-made, the Finger Lakes still go by their Indian names: Skaneateles, Owasco, and Cayuga, Seneca, Canandaigua, and Keuka.

For centuries Indians of the Six Nations ruled the region. Courted by both French and English long before the Revolution, the lords of the western wilderness eventually threw their strength with the British. It took some 3,500 men of the Continental Army under General John Sullivan in the expedition of 1779 against the Iroquois to determine whether white man or red would rule here.

Sullivan's soldiers marveled at the rich grainfields, variety of vegetables, and luxuriant orchards. Why, corn grew tall enough to hide a man on horseback! As reward for their military service, many asked to settle on tracts in the Finger Lakes district. And others, too, moved in, hungry for land and homes.

The lake region has always had soil appeal. Today it lies in a farm belt rating as a pioneer land for big-scale grape industry. Soils of the Keuka slopes, especially, are those the grape likes best (page 591).

The Finger Lakes district grows two-fifths of the cabbage, over a third of the alfalfa, beans, and wheat, and 20 per cent of the oats of the State. Along the shores of the lakes flourish apples, peaches, pears, plums—and more grapes. Dairies help supply New York City with milk, cream, cheese, and butter.

Criss-crossing highways and nine different railways ensure swift delivery of milk, eggs, and fruit to New York City, Philadelphia, Pittsburgh, and other eastern markets.

Acres of Vineyards

A local grape buyer offered to show me some of the vineyards sweeping in a tidal wave of luxuriance over Keuka's hillsides.

"We have been buying from the same farms for forty-odd years," said my companion. "Of course, different varieties of grapes sell for different prices, but in our case the average price is about $67 a ton."

We stopped to look at an old-fashioned type of vineyard, some 20 acres. There all work is done by hand—no tractors or modern equipment. The owner has worked the same vineyard in the same way for 45 years.

"What's most important in the care of a vineyard?" I asked him.

"Trimming the vines. Each variety requires different and special handling."

"How long after setting out vines can you expect a paying crop?"

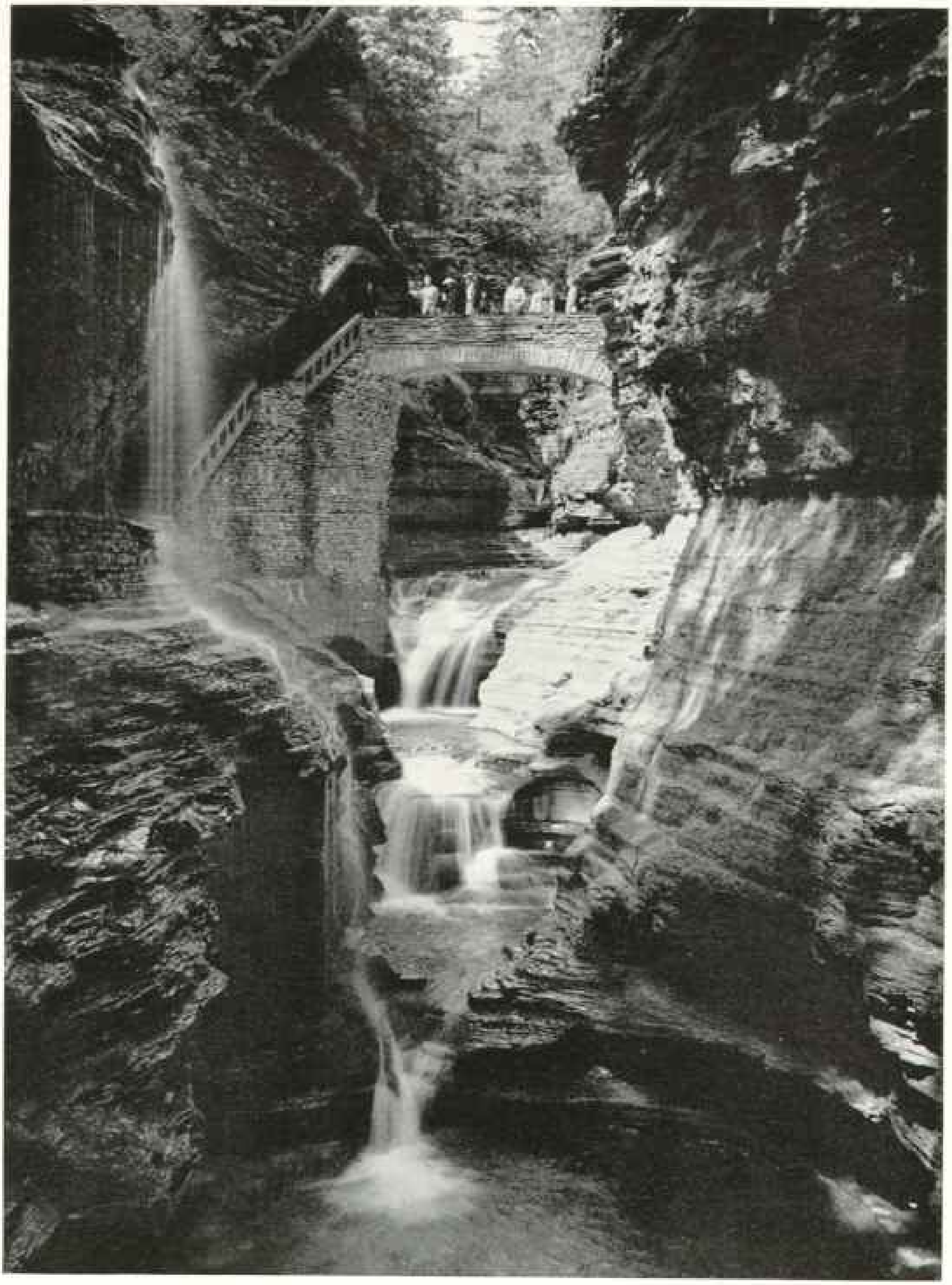
"Sometimes it takes four or five years; but you can get good grapes in three years if you have the right soil."

Normally, vines stay about the same size, controlled, of course, by trimming. An acre contains 680 individual vines set seven feet apart along rows eight feet wide. There seems no limit to the age of a vineyard. The oldest around Keuka has been growing for 75 years, I was told.

Vineyard care is an all-year-round job. No matter how hard and cold the north wind blows off the frozen lake and over the snowy slopes, men and women spend whole winter days trimming brittle vines. Often the work is so delicate that gloves cannot be worn. On blustery April days old vines are tied with willow wisps. In June rye straw secures the young shoots.

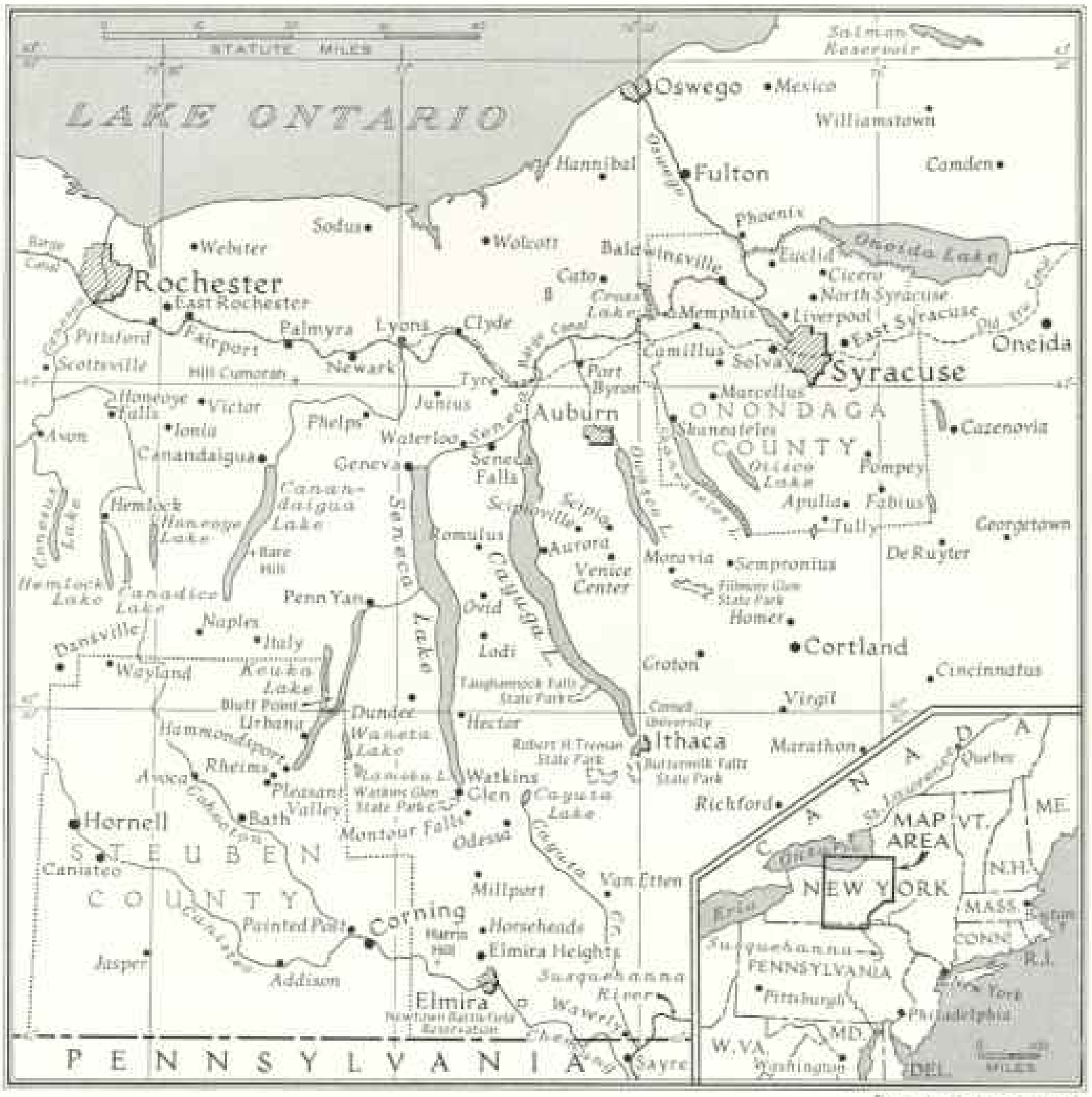
"A Swiss family lives here," said my companion, approaching a small white house.

Both Mr. and Mrs. Aeschbacher were born in the Canton of Berne, Switzerland. They



Rainbow Falls Spattering in Sunlight Paint Their Name in the Spray

Paths through two-mile Watkins Glen bug cliffs, lead to rocky stairways, or cross the rushing water by stone bridges. They wind through wooded aisles shady and cool as the nave of a great cathedral, lose themselves in moist tunnels, and slip behind curtains of falling water where strollers may pass without getting wet (page 575).



Drawn by Herbert Eastwood

Six Mighty Fingers Stretch a Welcoming Hand Across Central New York

Approaching the fertile lake country from the south, the author drove through vine-clad Pleasant Valley to Keuka Lake. After a stay with friendly vineyardists in this heart of the State's grape-growing area, he went east to marvel at Watkins Glen. A detour down to Corning and Elmira took in large factories vital to the country's defense. The writer continued east through the lakes to Skaneateles. Following the old Genesee Trail west, with stops at industrial Auburn, the orchard regions of Seneca Lake, stately Geneva, and historic Canandaigua, the journey ended in Hammondsport.

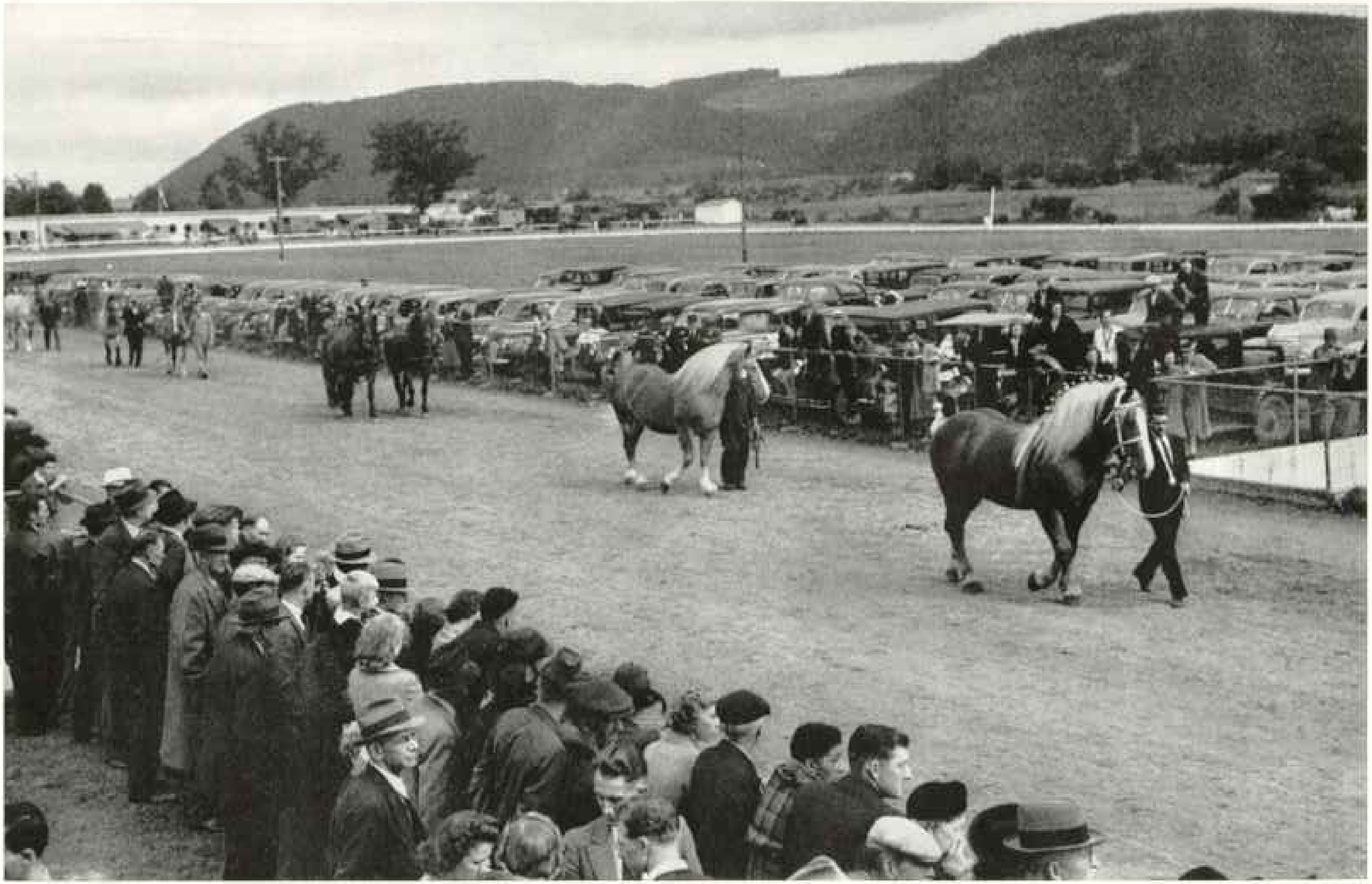
have lived in America some thirty years. When he first arrived in this country, Aeschbacher found work in a winery near Hammondsport. Later he bought his own house and vineyard (Plate V).

Other foreign peoples from many Old World countries have settled among the Finger Lakes. They developed truck gardens, orchards, and vineyards, and now fit into a modern American way of living. Ask them how they're doing; they answer with a vigorous "O. K."

As I said good-by to the Swiss, I told them I would be back again. I kept my promise, and one afternoon asked whether they had room to put me up for a week or so.

Next day I sat on the back porch of the Aeschbachers' house, my typewriter sharing a table with a freshly baked cherry pie set out to cool and crisp. As I wrote, I could look over the green vineyard and the narrow, crooked, blue lake. A song sparrow sang from the top of a pear tree; another answered somewhere among the grapevines.

The Aeschbachers' day began at 5:30 A. M. He had chores to do, the animals to take care of. She prepared breakfast for a son who



Horsepower on Parade—Stalwart Belgians Pound Past the Grandstand

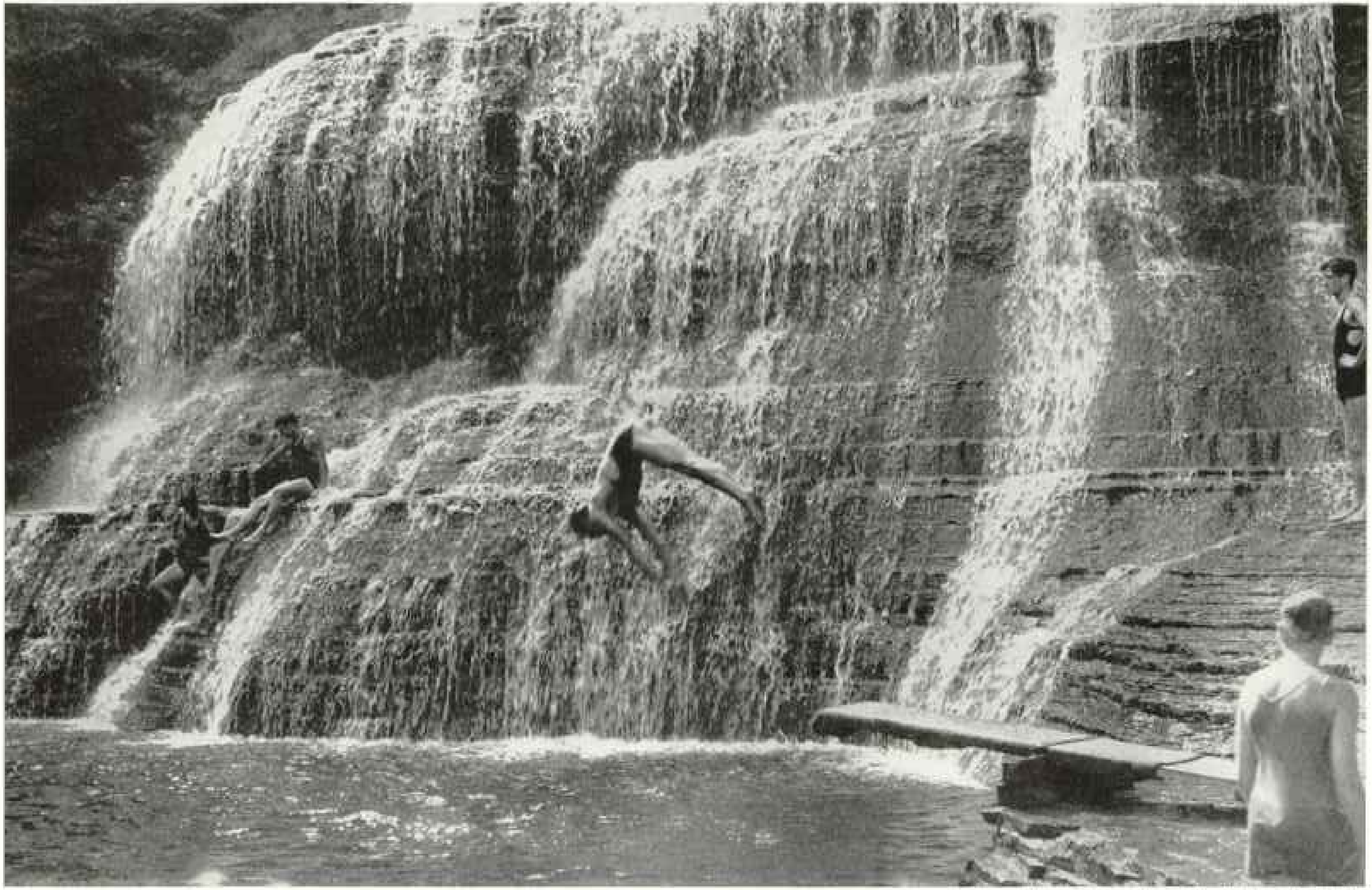
Purebred livestock passes in review at the five-day fair at Bath. As early as 1796, bewigged colonials waved three-cornered hats as "Silk Stockings" outran "Virginia Nell." The fair has been held here annually since the founding of the Steuben County Agricultural Society in 1819 (page 591 and Plate IX).

Get a Shave or a Haircut and Join the "Gent's Club"

Hammondsport's barber shop is owned and operated by the Justice of the Peace. Here gather men to swap stories and discuss the news.

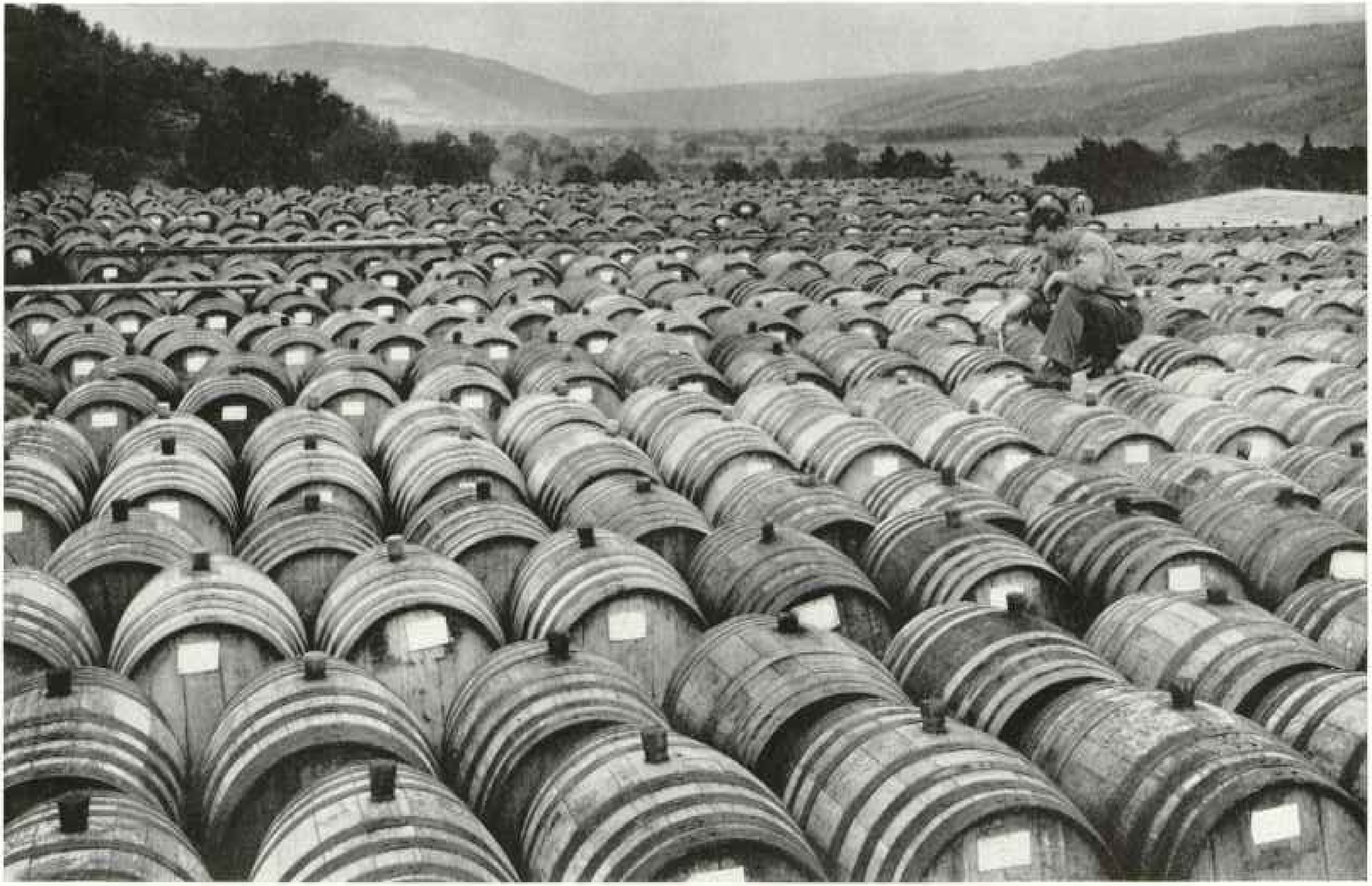
An Eye Weighing 20 Tons Was Cast for Peeking at Planets

World's largest when finished at Corning, the 200-inch disk cracked while cooling. A similar one now is at Mount Palomar Observatory.



Photograph from Pfluger Lakes State Parks Commission

Against the Lacy Backdrop of Lower Falls, Divers Splash in a Deep Pool in Robert H. Treman State Park



It's an Old Spanish Custom to Roll Out the Barrels—So 3,500 Filled with Sherry Sun-bake on This Roof at Naples, New York

There is a tradition that centuries ago a winery in Spain moved many unsold full casks into the courtyard, where they remained for months under the sun. After a year or so, a connoisseur happened to taste the wine and found it very good. Thus sherry was born (page 591).

went to work in a winery at seven o'clock.

There was not much to be done in the vineyard: just waiting and watching for grapes to ripen, and occasional plowing. Aeschbacher could take life gently. He fed and watered the one horse, put the cow to pasture, and saw that his twenty-odd chickens didn't escape from their yard, for they were fond of grapes. Under the porch was a pile of old vine stakes to be sawed into one-foot lengths for the kitchen stove. Sometimes I took a turn at the bucksaw.

In the evenings we talked about the war, or what the family might do if they had all the money they wanted.

Mrs. Aeschbacher told me her ambition to have an icebox; as soon as they saved up enough money, it would be the next thing they would buy.

"One Payday a Year"

"After all," she explained, "there's only one payday a year for us—when we sell our grapes to the winery."

I helped clear off the table and often dried the dishes. When this work was done, we went to the raspberry or blackberry patch to gather fruit for tomorrow's breakfast.

Corn ripened in the field beyond the flower garden. What Mrs. Aeschbacher did not cook for the table she preserved in jars and stored in the cellar. While I was there, she and her son Paul spent a whole day canning corn. Paul husked and she scored the cobs, pressing the kernels into glass jars (Plate XVI).

Waking to my last day at the farm, I found myself clinging to every moment of it. I dressed slowly, that I might have more time to look through my window at the flower garden directly below, the rows of vegetables beyond, the vineyards, the lake, and the checkered hillsides everywhere else.

On homemade bread, cheese, and coffee I breakfasted alone, for the farmer and his wife had risen shortly after daybreak. They had to crowd their chores into a shorter morning than usual because guests were coming.

Mr. and Mrs. Tuscher arrived about noon. They, too, came from Switzerland. Like the Aeschbachers, they have entwined their lives with grapevines. But now he was blind and could no longer watch his grapes ripen in the late summer sun.

With him Tuscher brought his accordion. While his wife helped in the kitchen, he entertained the men in the living room. He played a lively Swiss yodel song, "My Country, 'Tis of Thee" (incidentally, the same tune as the Swiss national anthem), "The Blue Danube," and modern favorites.

At dinner I listened to prophecies for the coming grape harvest: heard estimates for Concords, Catawbas, and Delawares. Would there be another flood this year? The CCC boys had been digging drainage ditches around the vineyards. A good thing, the CCC. It's late in the year for heavy rains. You never can tell, though. Anxious work, vine growing. And then there's an early frost to fear; diseases and dry spells. And rot—that awful gray rot.

America—and a Mattress

Conversation drifted to happy but hard days in Switzerland.

"I never slept on a mattress till I came to America," said Aeschbacher. "For those who could get it, straw was good enough. Some even had to go to the forests to fetch leaves to sleep on."

Pushing his chair back from the table, he lit his corncob pipe, and continued: "If we country children had a penny, we thought we were rich. The first time I ever saw paper money was the day my father let me go to a market in the town with him."

Reluctantly, after dinner I went up to my room to pack. One shoe would go into my bag; then I would sit on the edge of my bed, remembering how my hostess had shown me up to it. I almost heard her again as she apologized, "It's not a big room; I don't know if you will like it."

Like it? How I hated to leave it! The little window; the old-fashioned washstand; the single picture on the wall; the restless rag rug; the crude black latch on the warped white door.

Downstairs, everyone had gathered on the back porch. As Aeschbacher poured wine for each from a heavy glass carafe, blind Tuscher played "Farewell to Thee" on his accordion.

We said good-by. I started to drive away. Suddenly Aeschbacher called out, walking toward me.

"Have you plenty of water in the machine?" he wanted to know.

"Yes, thanks," I answered.

"Oh, well, I was just hoping to keep you here a little longer."

The Wright brothers flew five years before Curtiss, but Curtiss, in his *June Bug* on July 4, 1908, made at Hammondsport the first public preannounced flight.

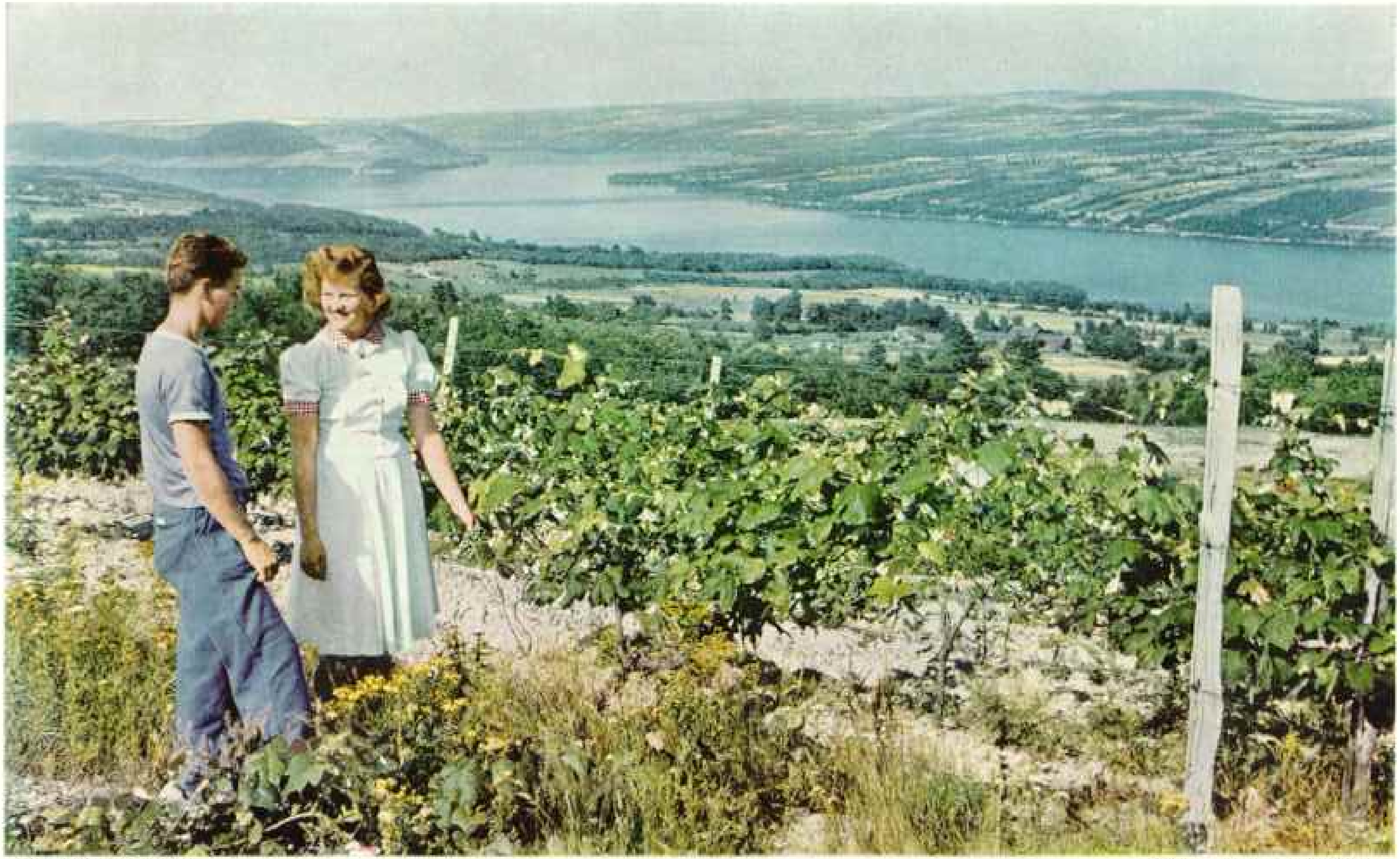
To Curtiss was issued pilot's license No. 1.

Mercury Aircraft, Inc., has replaced the Curtiss airplane factory. Where a cooper formerly made wine casks and Curtiss once had a carpenter shop, the modern company now

 Kodachrome by Harrison Howell Walker

Through Bottomless Buckets Pickers Pour Fragrant McIntosh Apples

Fruit thrives on the fertile shores of New York State's famed Finger Lakes. In 1940 this apple orchard averaged 250 bushels per acre. Trees were loaded with red or green spheres—McIntosh, Baldwin, Twenty-ounce, Wealthy, Cortland, Rhode Island Greening, Rome Beauty.



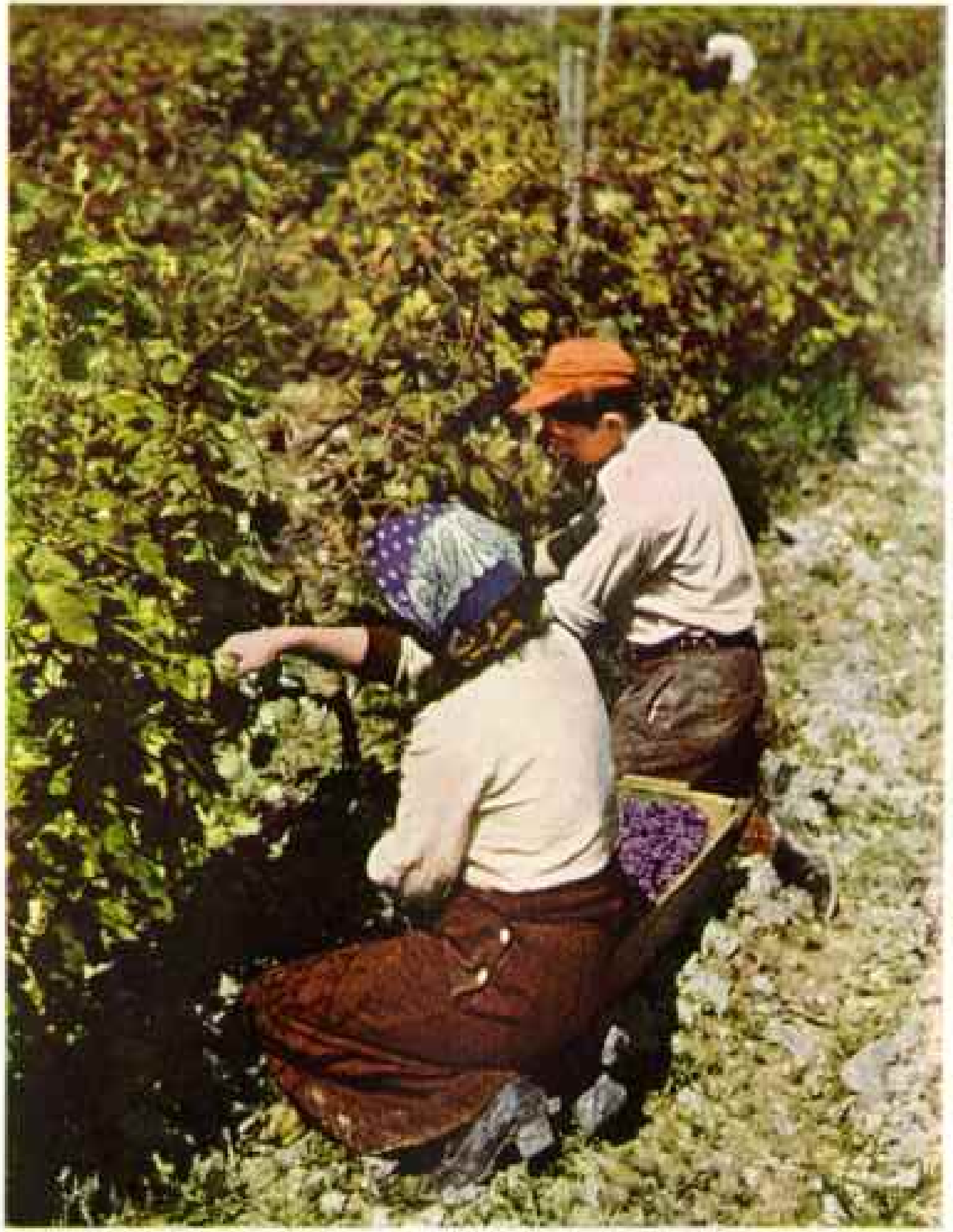
Kodachrome by Harrison Howell Walker

Sunny Slopes of Keuka Lake Smile with Miles of Vines

Soils of these hillsides rolling down to the water are those the grape likes best. Five thousand acres of vineyards bordering this lake bring annually half a million dollars. From local vineyardists, grape and wine industries of neighboring communities buy more than 7,000 tons of grapes a year. Split by Bluff Point (left background) 19-mile-long Keuka takes the shape of the letter Y.

Grapes Today—Juice Tomorrow

Harvesttime comes to Keuka vineyards in late September. Gathered in 42-pound trays, grapes are stacked at ends of vine rows. Wagons and trucks take them to presses near by. The Delaware, shown here, is one of the first to ripen.



Kodachromes by Harrison Howell Walker

Busily They Barber a Vineyard

Using scissors, grape pickers snip luscious bunches from the vine into trays. Workers are paid five cents a tray. A person picking steadily can gather about a ton in ten hours. Here in Pleasant Valley an acre averages two tons.

Kodachrome by Harrison Howell Walker

Grapevines Grow About Her Family Tree

Another month and the Elvira grapes will be ripe. They go to a press at the bottom of the hill which supplies a winery founded in 1860 by the young lady's great-grandfather. Vineyard care is an all-year-round job, what with winter trimming, spring and summer spraying and plowing, and eight weeks of autumn picking.

A Swiss Family Lives in a Chalet Overlooking New York's "Lake Lucerne"

Kodachromes by Harrison Howell Walker

Though Pure Grape Juice, Unfermented, It Foams with a Frothy Head

From the aluminum kettle the juice is piped to a filter, then pasteurized and bottled.

Kodachrome by Harrison Howell Walker

"Like Butterflies on a Mirror"—34 Boats in a Single Race Pepper Seneca Lake with Sails

Sailing enthusiasts from all the Finger Lakes mustered at Watkins Glen Yacht Club for a two-day regatta. Forty-two craft (eight not in picture) entered the meet, at which skippers from Keuka Lake won laurels.

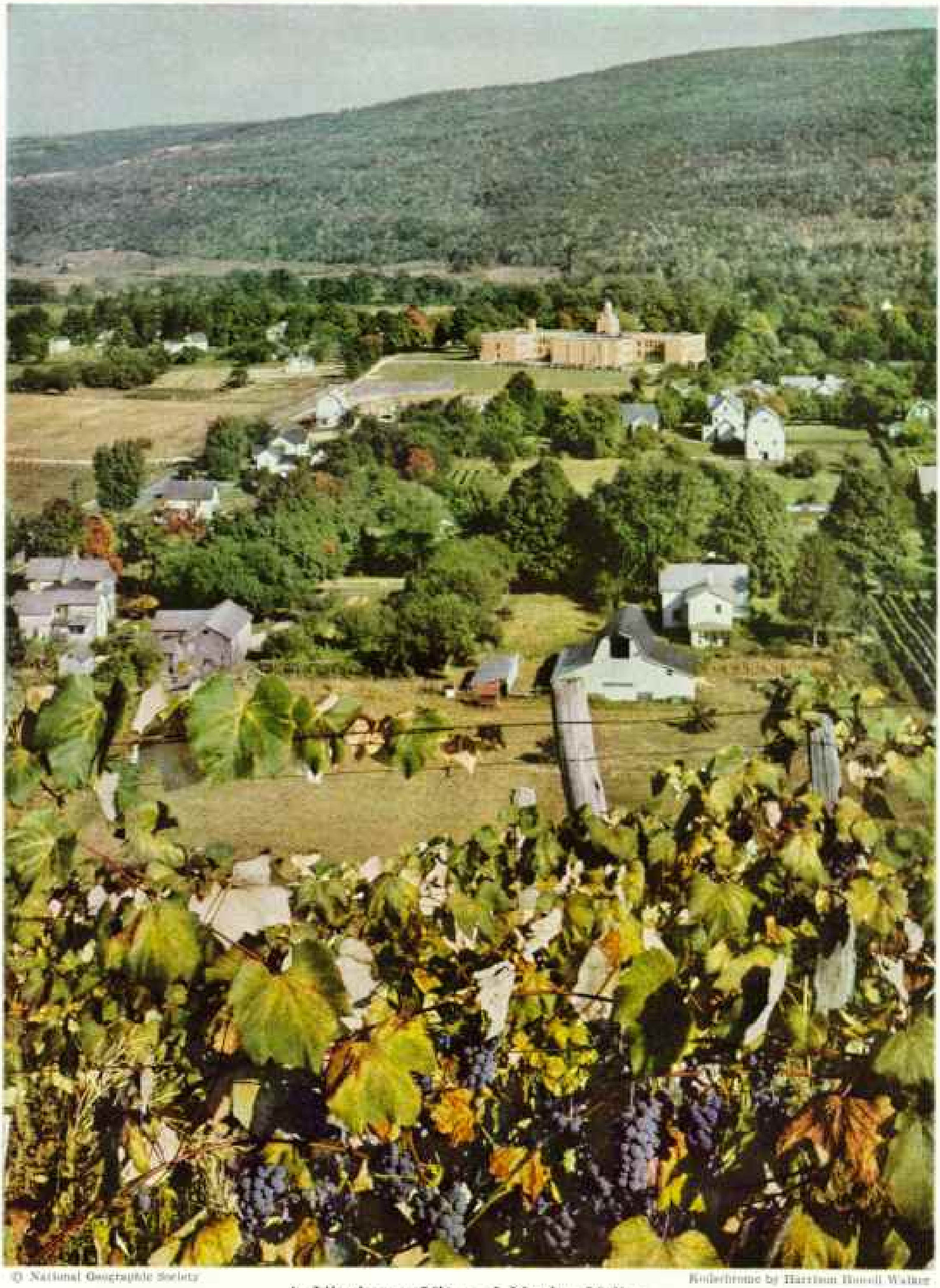
"This Little Tree Is Easy Picking"

In one of the many peach orchards sweeping over the east slopes of Seneca Lake, tanned young men with shoulder bags help harvest a variety called Hale Haven, grown abundantly near Lodi.

Kodachromes by Harrison Howell Walker

She Kicks Up a Lee Board and Heels in a Puff

Skimming over Keuka Lake, a fragile craft of the A class beats toward Bluff Point. Such "scows" are among the fastest sailing craft in the world. E class sloops have exceeded 20 miles an hour.



 Kodachrome by Harrison Russell Walker

A Vine's-eye View of Naples Valley

Concord grapes ripen in the September sun on hills west of Naples. The Concord accounts for more than half of New York State's grape crop. The high school in the background pays homage to the vine that nursed the community's prosperity; bunches of grapes chiseled in stone decorate its main façade.

completes contracts with the U. S. War Department, and for Great Britain.

Dr. and Mrs. Alexander Graham Bell inspired and financed Curtiss' experiments.

Keuka Lake also afforded a natural proving ground for Curtiss' pioneer work in hydroplaning.

One of our earliest naval air-training bases was located at Hammondsport. Rear Admiral John H. Towers, who still flies to vacations on Keuka Lake, was one of the U. S. Navy lieutenants trained by Curtiss here in 1911. Eight years later he was designated as commanding officer of the three NC (Navy-Curtiss) flying boats, one of which achieved the first transatlantic flight. Today he is chief of the Bureau of Naval Aeronautics.

Up to the last decade steamboats operated regularly on Keuka Lake and on the other Finger Lakes. At one time four steamers competed on Keuka. Then a passenger could travel from any point to another for ten cents. But when automobiles came and good roads circled the lakes, steamers were dry-docked, anchored, scrapped, or burned.

Now in summer roads swarm with autoists bound for "the lake." From farther afield vacationists come by regular trains on the Pennsylvania, Lehigh Valley, New York Central, Delaware, Lackawanna and Western, Erie, or Buffalo & Susquehanna—a network of railroads cooperating with smaller lines such as the Owasco River, Skaneateles, and Bath & Hammondsport.

From Hammondsport, roads skirting both east and west shores meet at the foot of Keuka Lake in Penn Yan. Keuka's largest community was settled by Pennsylvanians and Yankees (whence its name). First white man to settle where Penn Yan now stands was adopted by the local Indian tribe.

East of Penn Yan I passed through well-tilled farm land and came to Seneca Lake. Largest of the Finger Lakes, Seneca is almost as long as the road between Washington, D. C., and Baltimore, Maryland; yet its width averages less than three miles. In some places bottom lies 174 feet below sea level, making a maximum depth of 618 feet.

The Lure of Watkins Glen

Glaciers scooped out these beds, but weird subsurface rumblings, the supernatural "death drums" of the Iroquois, have not been satisfactorily explained. Some believe the "muffled cannon roar" issues from salt beds above which operates a big salt factory.

Long before Iroquois or white man listened to Seneca's puzzling groans, Algonquians inhabited a natural fortification in a lonely gorge at the head of the lake. Now Watkins Glen, twisted and scaly as an angry dragon's tail, on a single Sunday draws hundreds of visitors.

I walked the two-mile gorge on a Sunday afternoon. Everyone moved quietly as in a great cathedral (page 560).

Glen paths take you into cool, shadowy aisles, solemn as the nave of Westminster Abbey; others lead out into sunshine beside noisy foaming waters. A vertical tunnel with a spiral stairway hewn from solid rock will remind you of the time you climbed a hoary castle tower or descended dark dungeon steps.

Without leaving the trail you can even pass under some of the eight waterfalls, look through them as you would through imperfect glass, and emerge dry as a Bedouin. Or you can sit on a stone bridge and watch a liquid curtain drop over a cliff.

Passing through Montour Falls, almost as disastrously flooded in 1935 by rain-swelled rivers as by Sullivan's soldiers in 1779 (page 559), I retraced the general's route south from Seneca Lake.

History on a Boulder

At Horseheads a bronze plaque affixed to a boulder told how settlers found skulls of Sullivan's horses (page 581 and Plate XV).

Some boulders so used as bases for historic markers are relics of the Ice Age. They came originally from farther north with the continental glacier that gouged the Finger Lakes and piled up moundlike hills.

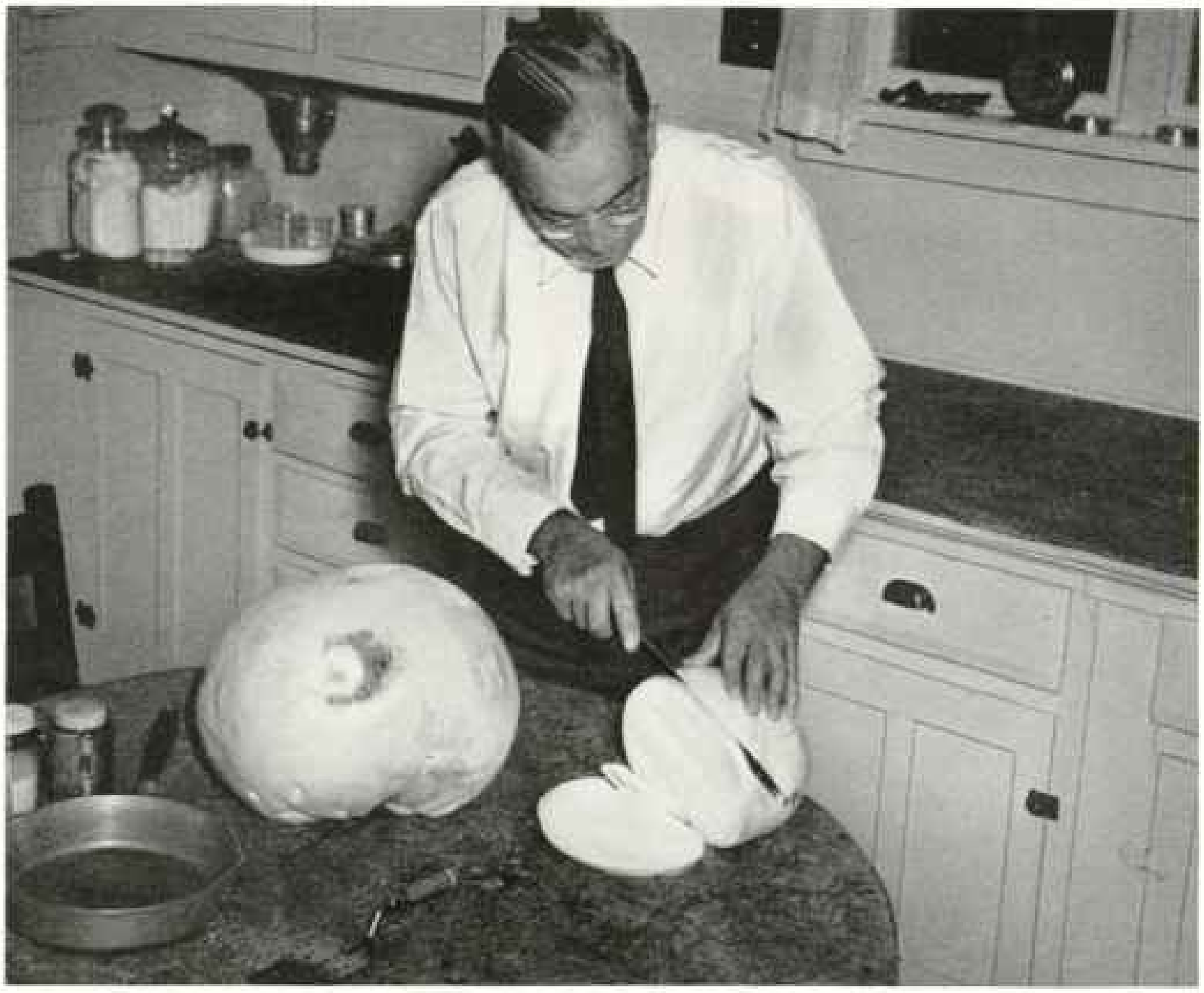
Glaciers also brought soil generally favorable for agriculture, and turned streams from gentler courses to abrupt slopes where they now give New York unlimited waterpower.

Still on Sullivan's trail, I continued to Elmira. At Newtown Battlefield Reservation, several miles southeast, Sullivan's army had its first encounter with the enemy in force. Fleeing from the roar of cannon, panicky red warriors vanished with the Colonials' advance. The Americans' victory cleared their way to the entire Finger Lakes country.

Because of this engagement's importance, a 68-foot-high monument tops a knoll where about a thousand Indians and Tories were killed as against four of Sullivan's soldiers.

In Elmira Mark Twain created some of *Huckleberry Finn* and *Tom Sawyer*. One of the earliest authors to submit a typewritten manuscript to a publisher, he owned a writing machine manufactured by E. Remington & Sons—today Remington Rand, Inc., which now has a large factory here.

It took me nearly two days to go through the plant—it has a floor area of 23 acres. Inspectors use motorized scooters to make their



Sliced Like Bread and Cooked Like Pancakes, Puffballs Make a Delicious Dish

These large mushroom growths were found in a semiwooded glen near Hammondsport. For a real feast, fry slices in a batter of egg yolks and bread crumbs, using plenty of butter. So cooked, puffballs taste somewhat like eggplant, somewhat like mushroom.

rounds. About 2,700 employees turn out typewriters, as well as accounting machines; combined plants of the firm also produce some 20,000 different articles of office equipment, including brass cuspidors (page 579).

From rough steel stock to a brilliant thing of letters, a foreman showed me what it took to make a machine that radically changed modern industry: mechanical presses controlled by women cutting out cogs, toggles, keys, and levers; screwy drills lubricated with soda water; casings sprayed with black paint called "Japan material" and dried in ovens heated to 400 degrees F.; springs coiled from wire finer than horsehair; assembly of a standard typewriter's 3,300 parts; catalogues of 600,000 dies cast for world-wide languages.

A production director demonstrated a mechanical printing calculator which could add, subtract, divide, and multiply.

"Will it take the average person long to learn how to operate it?" I asked.

"See how long it takes you. Try it once, following my directions."

I did.

"Now can you do it by yourself?"

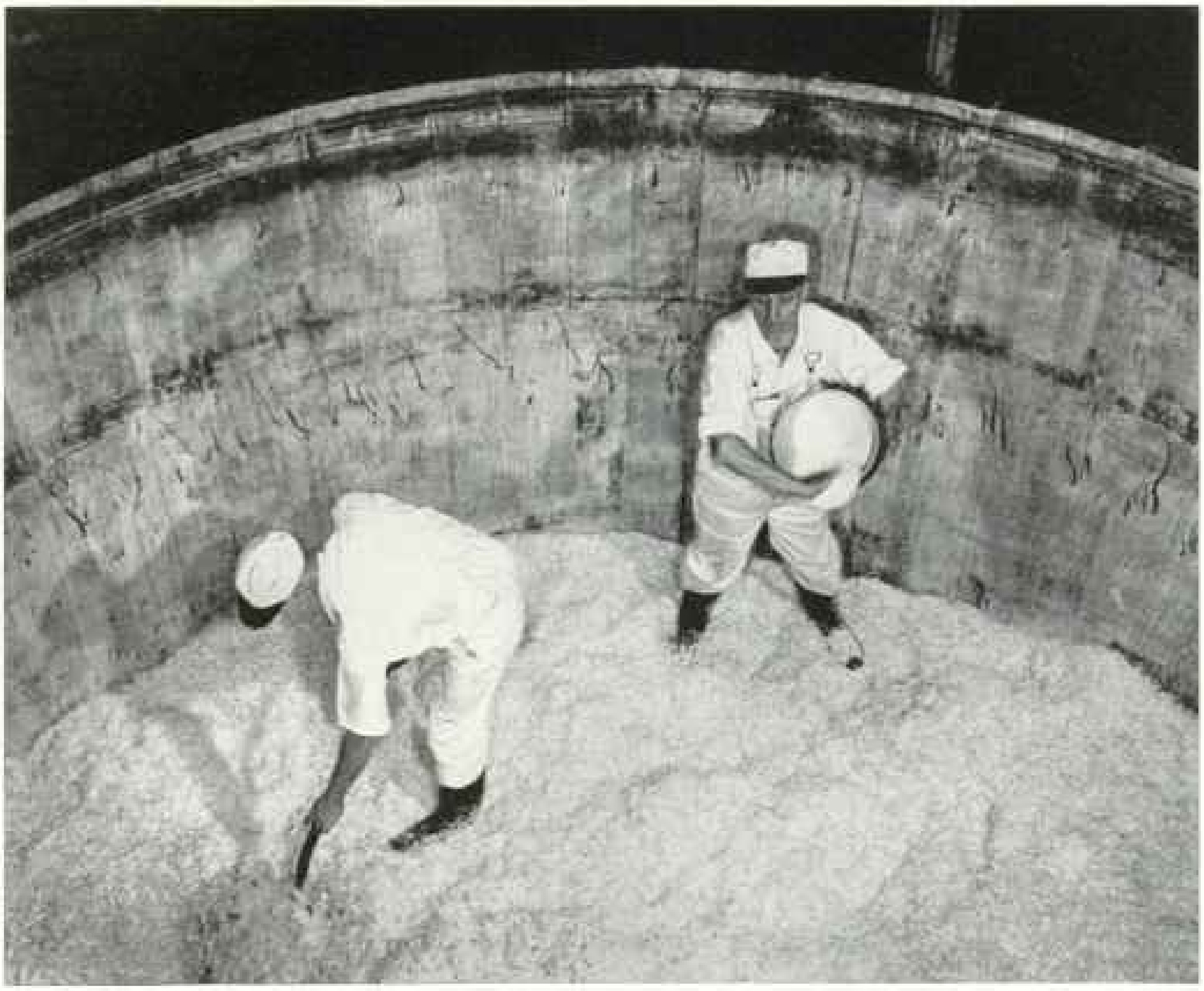
I could.

Before the introduction of the typewriter invited women to enter business, Elmira was the center of a strong feminist movement. When Elmira College, a pioneer in granting degrees to women, was founded in 1855, someone commented that the first thing you know women will be appearing on platforms with men!

A Site for Soaring

A few miles to the west is Harris Hill, America's No. 1 soaring site. Here for eleven years annual national soaring contests have brought gliders from the United States and from foreign countries (Plate XIII).*

* See, in National Geographic Magazine, "Men-Birds Soar on Boiling Air," July, 1938, and "On the Wings of the Wind," June, 1929.



Buckets of Salt and a Busy Pitchfork Prepare the Way for Sauerkraut

Men in white wearing black rubber boots mix a ton and a half of salt with 100 tons of shredded cabbage in this giant wooden tub. Fermentation begins almost immediately, tending to raise the coleslaw, so concrete blocks hold the cover down. After three weeks the kraut is ready for canning. At this packing house in Phelps there are 70 such vats (page 582).

Still farther west, at Corning, men working at furnaces hot as infernos created a great glass eye to learn of life on other planets. In the center of the town an observatory museum, visited by 80,000 sight-seers in two years, houses a 200-inch telescope disk weighing 20 tons, largest piece of glass on earth when cast in 1934 (page 563).

Because the disk cracked with too rapid cooling, a second one, similar but differently processed, was shipped two years later to Pasadena for the world's largest telescope at Mount Palomar Observatory.

A three-ring inferno, the Corning Glass Works is founded on a trio of circular furnaces, each nearly as big and certainly as active as the ring of a circus. A guide who had been with the company for half a century led me into one furnace shop that sounded as if 100 men with sledge hammers were demolishing a locomotive; and it was hotter than the engine room of a coal-burning liner.

Open doors regularly spaced around the gargantuan "oven" revealed glowing tons of orange-red glass in molten form. From the fiery sea, workers dipped the fluid they made into an amazing variety of objects.

The Magic of Glass Blowing

We stopped to watch an elderly workman shape a goblet. Busier than a movie director juggling three telephones, he maintained a cool poise and effortless grace that kept him free from a single drop of sweat. Over the goblet an assistant held gummy glass oozing like thick molasses, from which the craftsman snipped off just the right lengths. Quick flips of his little apple-wood stick gracefully arched and affixed the handles.

"He goes by a blueprint, yet this glass business is all in a keen eye and a skilled hand," said my guide.

A Big Black Bertha Aims at Electric Power

From Waneta Lake, almost 400 feet higher than Keuka (background), water shoots through a mile-long pipe to a hydroelectric plant. Natural gas found in the region pumped water through another parallel pipe up to Waneta during 1933 and 1934 to ensure a plentiful supply. With exhaustion of gas, uphill pumping was discontinued.

In another room men and machinery, too, blew long sections of neon tubing. A fat gob of molten glass responded like a balloon as a deep-lunged blower with bulging cheeks puffed into a pipe. Easing the "balloon" to the floor, he walked away backward, blowing all the while.

At first the glass stretched out into a tube twice as thick as a garden hose. Ultimately the blower completed a 100-foot length three-fourths of an inch in diameter.

The iron lung also has established its place in glassworks. Here rhythmically clicking machinery blew, stretched, cut, and even checked neon tubing for a constant diameter.

Tubing is blown for hundreds of other uses, too, ranging from giant thermometers to tiny glass straws.

"We make 12,000 different articles," my guide told me, "and keep some 6,000 in stock."

The Gamut of Glass

I saw $500 vases; brandy glasses ranging from a Tom Thumb model to one in which Goliath could have lost his head; frying pans and percolators transparent as open windows; stay-put ash trays of thick, solid glass; standard lamps for ships, autos, trains, and planes; laboratory equipment; green, amber, and red shades for traffic lights; tapestry and curtain fabrics—all "made from sand."

From Corning's glass it is only a 35-mile drive to Cornell's campus "far above Cayuga's waters" (Plate XIV). Distances among the Finger Lakes never discourage going anywhere and back again in a single day.

Through my bedroom window in Willard Straight Hall, Cornell University's social center with accommodations for visitors, I could look out over 40-mile-long Cayuga, lengthiest of the Finger Lakes, and Ithaca's rooftops in the valley below.

To this valley cascade streams through two deep gorges bounding the campus north and south. The rugged glens, alive with shrubs and flowers, seem magnified rock gardens.

In Fernow Hall I talked with a professor of forestry who is working on plans for an arboretum to enhance grounds already naturally beautiful. Cornell's horticultural sanctuary of 3,000 acres will be the largest in the eastern United States.

Even Typewriters Are Put Together on Assembly Lines Now

Coming to the table in skeleton form, the machine passes from one skilled worker to another. When all its 3,000-odd parts have been assembled and tested for alignment, it looks like the typewriter on a stenographer's desk. This Remington Rand plant in Elmira also manufactures calculating machines and other office equipment (page 575).

Used for Centuries, Bristly Teasels Still Fill a Gap in Modern Industry

As far back as Greek and Roman days, these springy burrs have been grown by farmers to supply woolen manufacturers with a means of raising the nap on cloth. Affixed to rollers, the teasels comb the surface of material drawn over them. Brought from England to Onondaga County a century ago, teasels flourish in this Skaneateles region. They are mostly grown in Oregon.

"The region around Ithaca," said the professor, "lies in a latitude where flora of the north and south meet; hence, for forty years Cornell botanists have dreamed of such an arboretum."

Unique in its combination of endowed colleges and State-maintained institutions, Cornell, with a faculty of 1,250, has an annual enrollment of approximately 7,000 representing every State in the Union and at one time about 40 foreign countries. The State College of Agriculture, affiliated with Cornell, has a world-wide reputation; the endowed College of Engineering rates among our foremost.

Research on the Aurora Borealis

Here Dr. Carl W. Gartlein of the Physics Department is directing three years of research on the aurora borealis under the auspices of the National Geographic Society and Cornell University.*

Three stations, at Geneva and Ithaca, in the Finger Lakes area, and at Hamilton to the east, directly connected by telephone, are cooperating in making simultaneous observations and photographs, some in color. This is the first systematic work of its kind to be attempted below the 50th degree of latitude.

I drove north on a sort of skyline highway along Cayuga's east shore. At the lake's widest point the road dips down to Aurora, where Henry Wells in 1868 founded a women's college which took his name. Here also he developed his ideas for an express service between Albany and Buffalo, and even farther west. Later he organized the American Express and Wells, Fargo Companies.

Instead of continuing along Cayuga's shore, I turned eastward, through Scipioville, Scipio, and Venice Center for the sheer pleasure of visiting villages whose names competed classically with other places on my regional map, such as Hector, Ovid, Euclid, Romulus, and Cato, Camillus, Junius, Homer, Virgil, and Cicero, Apulia, Marathon, Pompey, and Tyre.

Highest above sea level of the Finger Lakes, 15-mile-long Skaneateles lies in a territory particularly suitable for growing teasels.

* See "The Mystery of Auroras," National Geographic Magazine, May, 1939.

How Horseheads Received Its Name Is Recorded on This Granite Boulder

The inscription reads: "In 1779 near this spot General John Sullivan mercifully disposed of his pack horses worn out by faithful service in the campaign against the Six Nations of the Iroquois. The first white settlers entering this valley in 1789 found the bleached skulls and named the place Horseheads." Worn smooth in the Ice Age, the stone once served as "refrigerator" in the basement of an inn (Plate XV).

The springy burrs, about the size of hens' eggs, are cut from shoulder-high stalks. Pivoting on spindles affixed to big rollers, teasel burrs raise the nap on woolen goods drawn over them. Originally imported from England in the 19th century, the teasel continues to hold its own against all man-made nap-raising substitutes.

For many persons in or outside the State, the little town of Skaneateles is written Skan-*EAT*eles because of its superior eating houses. In a single day nonresident diners have doubled the population.

Toward Auburn, Busy but Reticent

Now eastern gateway to the Finger Lakes, Skaneateles was once the front door to the backwoods west. Through the village ran the first public road opened this side of Utica, then a frontier post. Known as the Genesee Trail and skirting the northern reaches of Owasco, Cayuga, Seneca, and Canandaigua Lakes, it became the State's principal east-west highway.

Because of Auburn's situation on the much-traveled route, it rapidly developed as a busy trading center. Ten years after the first white settler built his cabin, many mills lined Owasco Lake's outlet flowing through the community.

Today, no other Finger Lakes town has a larger population or more varied industries; yet Auburn appears to retire quietly like an old gentleman to the big house among tall trees well back from the street. The city, seemingly inactive and generally residential, is an optical illusion.

Unless you go out of your way to look for them, you will miss the ivy-clad buildings of a rope factory where 1,000 employees wind their workaday lives around cordage ranging from three-sixteenths of an inch to six inches in diameter.

Equally inconspicuous, a huge plant manufactures farm implements—mainly machines for tillage and hay-baling—found in farm belts around the globe.

Button works, wood products, spark plugs, and fireworks, milling, forging, and heat regulators, canners and carpet manufacturers, paint products, rubber stamps, ink pads, milk

and dairy products, electrically lighted diagnostic instruments for hospitals—these merely suggest a beginning of Auburn's endless industry, now busier than ever fulfilling contracts for national defense.

The United States Navy Department called on a single company for more than five million dollars' worth of propelling machinery for mine sweepers.

Even at Auburn Prison, where the first legal electrocution amazed the world of 1890, inmates make nearly 3,000,000 pairs of license plates a year for all New York State automobiles. Convicts also spin and weave woolen goods; the carpenter shop turns out furniture for the prison, schools, parks, and State offices; a tailor shop dictates what the well-dressed prisoner will wear.

I stood in Auburn's Seward Park, looking at a statue. Pausing in a game of checkers with a companion on a bench near by, an elderly man said to me:

"A great man, my boy. Lincoln defeated him for the Presidency, but Old Abe had enough respect for William Seward to make him his Secretary of State. And Seward had enough courage to purchase Alaska from Russia when such a thing seemed a great folly."

Before jumping his opponent's king, he directed my attention to the dignified mansion where Seward lived.

Going west on the Genesee Trail, I stopped a while in Seneca Falls, scene of the first woman's rights convention in 1848, and home of Mrs. Amelia Bloomer, famous advocate of the "bloomer" costume for women.

Like a gentle but firm old lady, Geneva lives in a dignified past that could never accept such a radical change in dress as bloomers. It isn't that the town at Seneca Lake's northern end is backward. It manufactures commodities ranging from furnaces to eyeglasses, razor strops to commercial automobile bodies. And a gigantic silo of a milling company towers above the industrial water front.

Its colleges—Hobart for men, William Smith for women—with its State Agricultural Experimental Station, help make it one of the most livable Finger Lakes communities.

A Touch of the Old South

Stately homes in the southern colonial style along tree-lined Main Street anchor the town to an atmosphere a century old. Wide lawns with shady elms put distance and time between the other-era homes and streamlined street traffic. Back yards—actually, extensive gardens—of residences on one side of Main Street spread like large and flowery counterpanes almost to the water's edge.

"Why the southern influence in Geneva?" I asked a native standing under the big white columns of his century-old house.

"Many early settlers found Geneva most accessible by water routes from the South; they could come up the Susquehanna River to tributaries running north toward the lakes."

"What attracted people to the country around Geneva?"

"It all goes back to the lush reports of Sullivan's soldiers returning to towns to the east and in the South. After settlement of this part of the country began, barges and rafts laden with grain and other regional produce were floated down the waterways I have mentioned.

"When they reached a market town or important shipping center, the barges were broken up for lumber; their navigators returned, pockets jingling with money. As the district's commercial possibilities became known, more and more settlers moved in; and they generally arrived from the South."

Also attracted to this fertile farming country, John Johnston came over from Scotland in the early 19th century. On land he purchased a few miles from Geneva, the Scot installed the first tile drainage system in America. The farmer now living in the house Johnston built occasionally plows up some of the original horseshoe-type tiles.

Apples and Cabbages

West of Geneva Seneca Indians once camped on what is now the lawn of White Springs Farm. A spring rich in lime attracted the red men; its bleached bed later gave the farm its name. From the spring white settlers using hollowed logs piped Geneva's first water system.

With the owner I drove over the farm's 1,100 acres. Orchards of cherries, peaches, apples, and pears covered most of the land. We came to an army of pickers among the apple trees whose branches sagged with magnificent McIntoshes (Plate I).

Thirty million cans of sauerkraut are packed yearly at a single plant eight miles from Geneva. Slicing up 30,000 tons of cabbage, the establishment produces annually about a third of all the sauerkraut made in the United States.

A huge billboard, "Welcome to Phelps, home of the world's biggest sauerkraut factory," gives autoists an answer for all the cabbage patches they've been passing (Plate XI and page 577).

A farm belt as productive as the Finger Lakes country had to consider transport of goods before the days of railways. Land travel was tough. Result: Erie Canal.

 Kodachrome by Bassano Rossell Walker

Blasé Bossy Accepts Blue Ribbons Blandly

A few years ago this young wife, then a girl member of the 4-H Club, exhibited Ayrshire cows at the Bath Fair. Also present was a boy showing Holsteins. Sequel—the two married. Now they come to the fair as one family, she with her Ayrshires, he with his Holsteins. Their entries have consistently earned blue ribbons.

Manes Fly, Hoofs Pound, Wheels Whir as the Race Track at Hemlock Becomes a Dust Bowl

Trotting races excite these spectators most. In one heat a sulky turned over on a crowded curve. An ambulance rushed the driver to a hospital. Two races later the "victim" of the accident was back on the track with only a slight scratch to show for his mishap. Hemlock lies just north of a lake with the same name—one of four baby finger lakes west of Canandaigua.

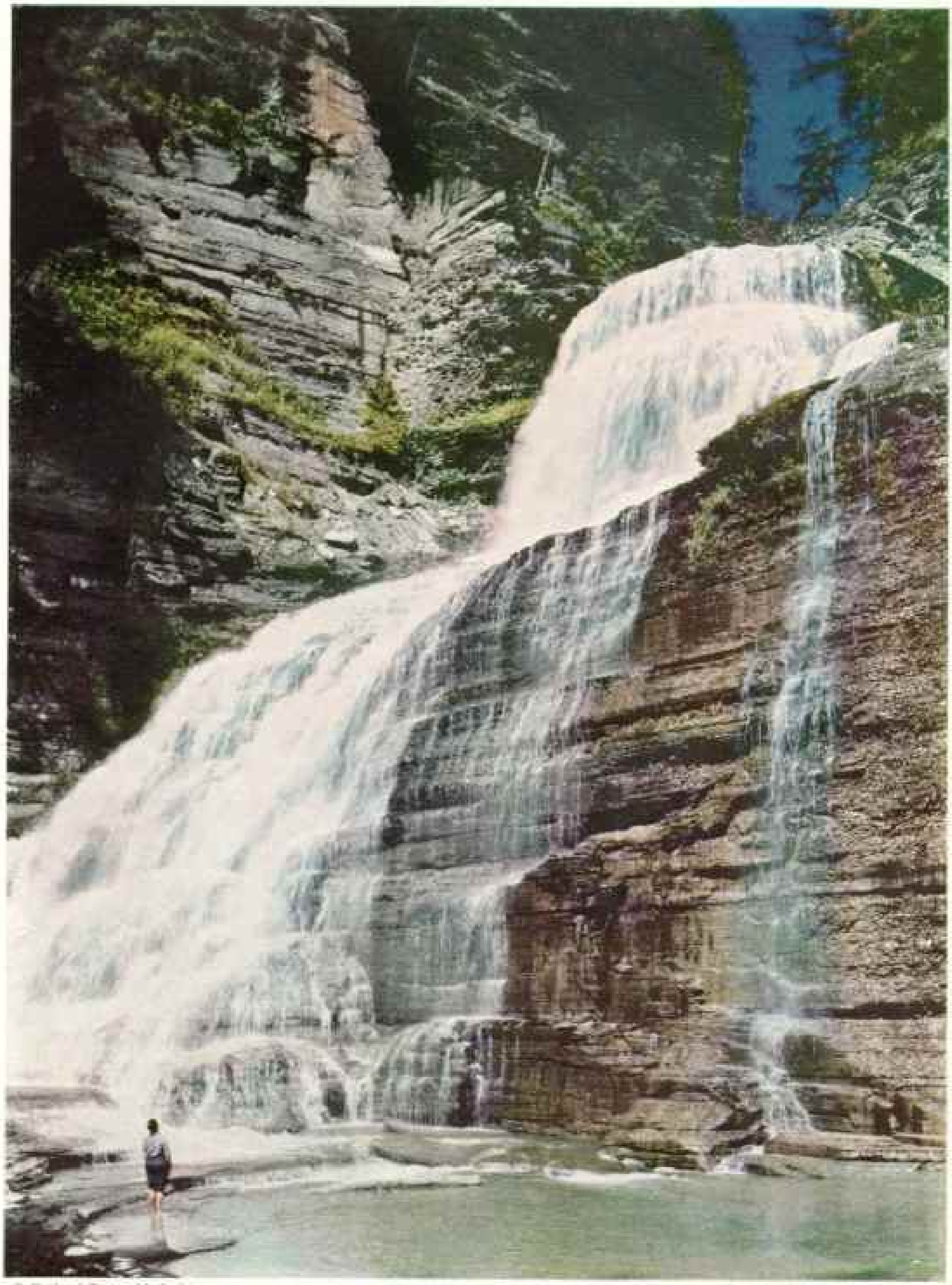
Cabbage, the King; Sauerkraut, Heir Apparent

Shredding thirty thousand tons a year, a sauerkraut company at Phelps fills thirty million tins. The factory makes its own cans.

Kodachromes by Harrison Howell Walker

Big Hat and Gloves Protect Complexion and Manicure

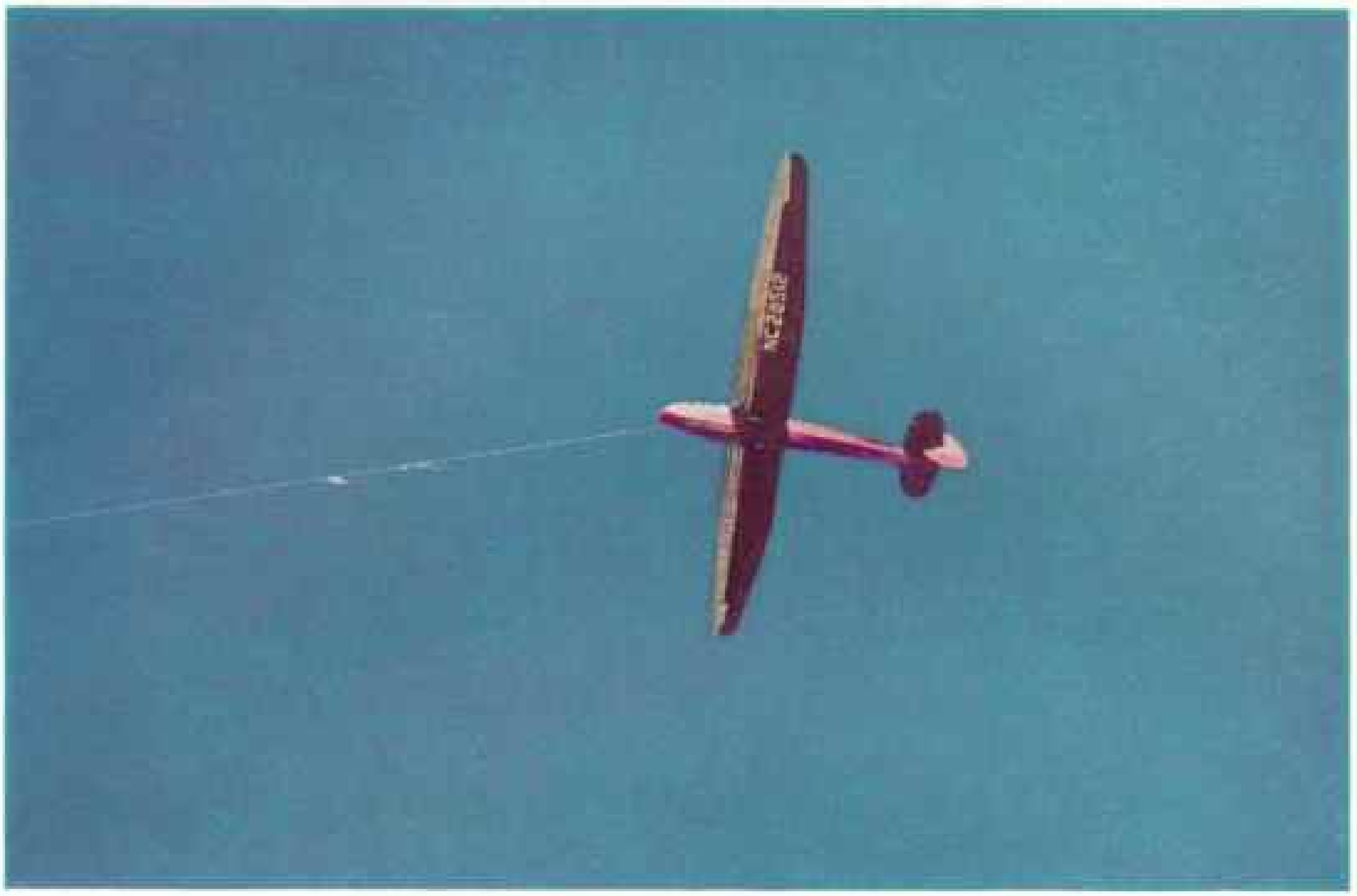
Although not so widely grown among the Finger Lakes as some of the other truck crops, beets are finding a more popular place in rotation with them.



© National Geographic Society Kodachrome by Bartlett Hayes Walker

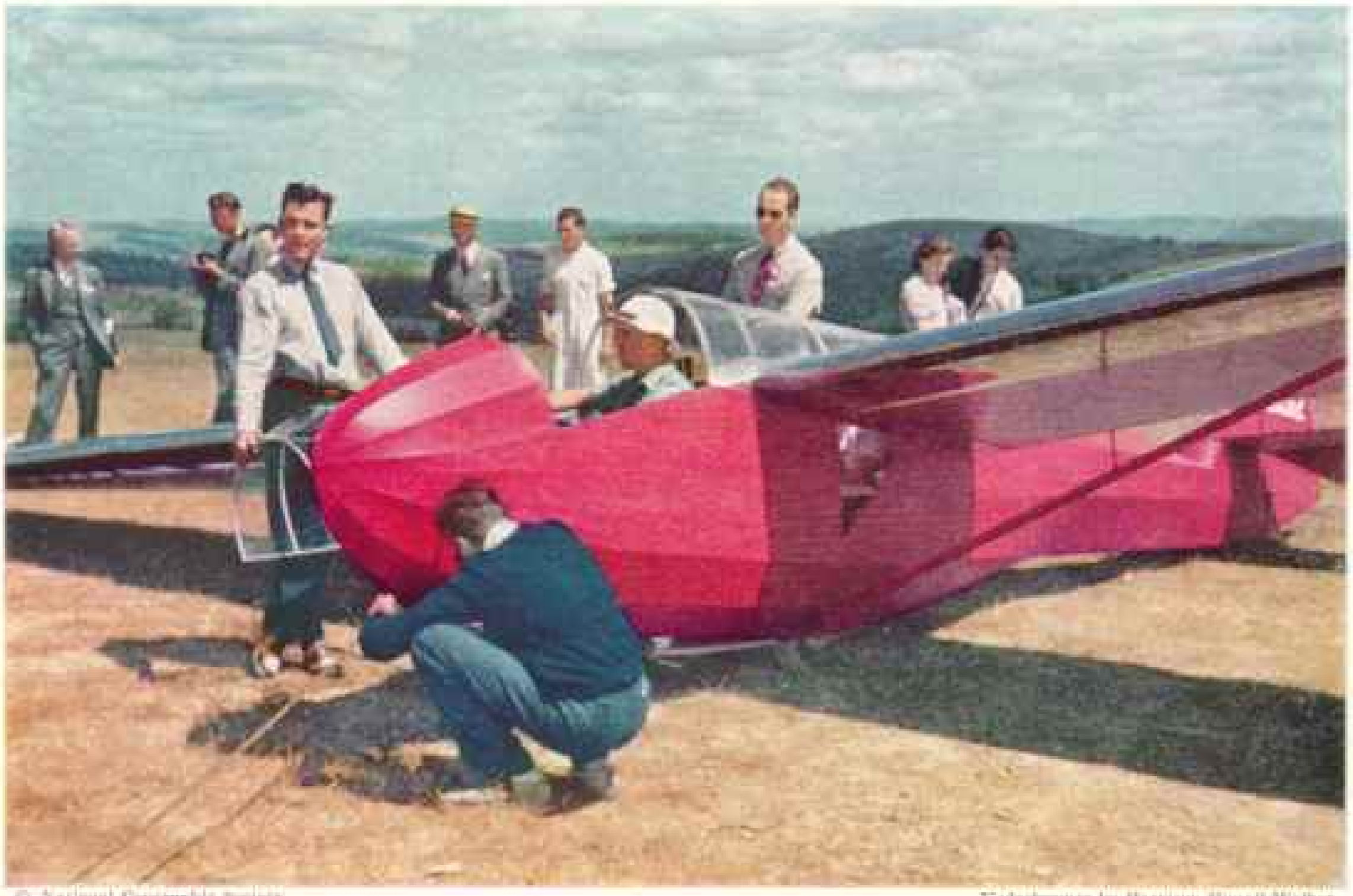
"How Art Thou Fallen from Heaven, O Lucifer. . . ."

Among twelve waterfalls cascading through the two-and-a-half-mile-long gorge of the Robert H. Treman State Park, near Ithaca, Lucifer, with its 115-foot drop, is highest. Trails on either side of the stream wind under rocky ledges and past cliffs where hemlocks, pines, and cedars cling. The massive grandeur of the ravine has provided settings for motion-picture companies filming "western" and "Alaskan" productions.



In Gannetlike Flight the Glider Soars Silently Against the Blue

Pilots gathered on Harris Hill in 1940 for the eleventh annual national gliding contest on heights near Elmira.



 Kodachromes by Harrison Russell Walker

A Hook to the Chin, and the Powerless Plane Is Heaven-bent

When the towrope is wound on a motor-driven winch at the other end of the field, it pulls the glider swiftly over the earth and shoots it into the air above Harris Hill. Then the rope is released.

Kodachrome by Harrison Bowell Walker

Like a Gateway to the Valley Beyond, Cornell University's Memorial Hall Stands for Sons Killed in the First World War

Erected by alumni gifts and contributions from friends, the shrine to 264 Cornellians is a men's dormitory.

Kodachrome by Harrison Howell Wylkie

Inspired by a Strutting Drum Majorette, a Band Steps Lively in a Firemen's Parade

Fire-fighting companies from neighboring counties and towns gathered in Horseheads for a two-day convention. The band parades down Lake Road, now Main Street, along which General John Sullivan marched in the expedition of 1779 against the Iroquois. The campaign opened the Finger Lakes region to white settlers.

Too Busy at Harvest to Tend Their Stand, Seneca Lake Fruit Growers Trust Their Customers

When asked whether the self-serving system worked, the owner replied, "We've never had any trouble."

Kodachrome by Harrison Howell Walker

In Winter She and Her Family Enjoy the Fruits of Summer Labor

Shelves are laden with preserved fruits and vegetables, from Seckel pears to pickled onions, and mincemeat.

Digging began in 1817. Six years later a schooner owned by enterprising farmers on Seneca Lake carried a cargo of wheat to New York. From Seneca Lake the ship gained the Erie Canal via Seneca River and locks at Waterloo. The waterway reached completion in 1825, when the first boats left Buffalo for New York by way of Albany.

As railroads keyed up competition, the old Erie gave way to the more efficient Barge Canal. Today the improved canal system represents an investment of many millions.

At Palmyra I left the canal and drove four miles south to the Hill Cumorah. In 1823 Joseph Smith said an angel appeared to him in a vision and told him of ancient records on golden plates buried here. His translation, known as the *Book of Mormon*, founded a new religious denomination.

Spreading west, the industrious Mormons pioneered in dry farming and irrigation.

Rural New York has been a veritable breeding ground for other individualistic religions. Here Shakers, Spiritualists, Harmonists, Adventists, and the Oneida Community have thrived, and some still carry on in or near the Finger Lakes district.

As I drove south along the west shore of Canandaigua Lake, I watched Bare Hill across the lake grow larger and balder. Even until 1834 Seneca Indians believed their tribe originated from the earth of this Great Hill, as they called it. The Delaware name for Seneca means "Great Hill People."

Hills and vineyards are the heady essence of Naples and its valley at the southern end of Canandaigua Lake. Grapevines link the town with high horizons. Toward infinity vineyards reach from the very doors of a winery where hundreds of barrels lie on a roof.

A Roof Garden for Wine Barrels

The manager took me up to the roof garden blooming with barrels (page 565).

"You are looking," said he, "at 3,500 barrels of sherry in the making. We still use the method by which the Spanish traditionally made the first sherry wine. Perhaps you know the story. No? Well, hundreds of years ago, a winery in Xeres (now Jerez de la Frontera) pressed more than it could sell. Many unsold casks were rolled out into the courtyard under the Spanish sun.

"A year or so later, a connoisseur happened to taste the sun-baked wine and found it very good. The accidental process, so the story goes, was purposely repeated the next year, and the next, and so on through the centuries.

"The English liked it so well they imported large quantities. Because the wine came from Xeres, the British, I'm told, called it by that name, which they pronounced 'sherry.'"

Almost as numerous as the barrels, five-gallon earthenware jugs crowd cellar shelves like big books in stacks. They contain pure grape juice which, when bottled, makes up half the winery's annual output.

A Colonial County Fair

Rising with the road out of Naples Valley, I headed south into Steuben County. Ever since the Steuben County Agricultural Society was born in 1819 in the courthouse at Bath, the county fair has been held in that town. In fact, my regional picture map pointed out that Bath staged a "world's fair" in 1796. And the picture showed bewigged colonials waving three-cornered hats as "Silk Stockings" outran "Virginia Nell" (Plate IX and page 562).

At the annual five-day Bath Fair 20 amplifiers of 20 different side shows blazed away at the same time, all with the same suggestion—"Come in, come right in, and see the greatest show in the world. Only ten cents!"

Sweeping over the tallest elms, aero-cars flashed and pivoted with happily terrified passengers. Two Ferris wheels competed, side by side. Small boys and girls rushed about excitedly licking ice-cream cones or burying their faces in big puffs of pink cotton candy.

Near the cattle barn men judged bulls. And all afternoon every day trotting races kept the grandstand packed.

While trying to edge through throngs swarming over the fair grounds, I ran into my old friends, the Aeschbachers. They seemed different from the Aeschbachers I had known on the vineyard farm ten miles to the north (page 559). He wore a neat, dark suit and a polka-dot tie under his cleanly shaven chin. She was nattily dressed in blue serge, topped by a fashionable hat with gay flowers.

The last day of September was the first of the grape harvest in the Aeschbachers' and neighboring vineyards. When I arrived shortly after nine in the morning, Mr. Aeschbacher and Paul and two hired pickers from Bath were scissor-snipping luscious bunches of Delawares (Plates II to V, and VIII).

Because the dozen or so varieties of wine grapes ripen at different times, scattered harvesters in other vineyards gathered only Elviras and Delawares, the first to mature.

In the grape-harvest season farmers and townsfolk, too, come from the surrounding country to pick. A good worker can gather a ton a day. Pickers are paid by the tray, not the day. They receive five cents

Photograph from G. F. Morrell

Still Life—by Winter

To marvel at the highest falls east of the Mississippi, hardy sight-seers trudge through snow up the wooded glen in Taughannock Falls State Park near Cayuga Lake. In summer visitors wade or bathe in a pool here buried under a mountain of snow and ice (opposite page).

for each tray of about 42 pounds.

Vineyardists tell stories about persons who are engaged to pick, but find the grapes so delicious they just sit and eat.

I passed a parade of wagons and trucks taking grapes to wineries for the season's first pressing. Already long queues had formed on lanes that led to unloading platforms behind the cellars. Patiently farmers waited to weigh in and discharge their precious cargo, result of a whole year's tender care and work.

Thirty-five years ago packing houses shipped the fruit, mainly for tables, all over the eastern United States. As the wineries received increased recognition, they multiplied their demands for grapes, and packing houses collapsed like their empty crates. Nowadays, 7,000 tons go to presses.

The Intricacy of Making Champagne

Most of the champagne made in the Finger Lakes section comes from wineries around Keuka Lake.

At Rheims, not far from Hammondsport, I talked with the president of one of the oldest and largest champagne cellars in America. Since 1860 his grandfather, later his father, and now he, have been making wine. As early as 1867 their vintages won a coveted award at the Paris Exposition even among French entries.

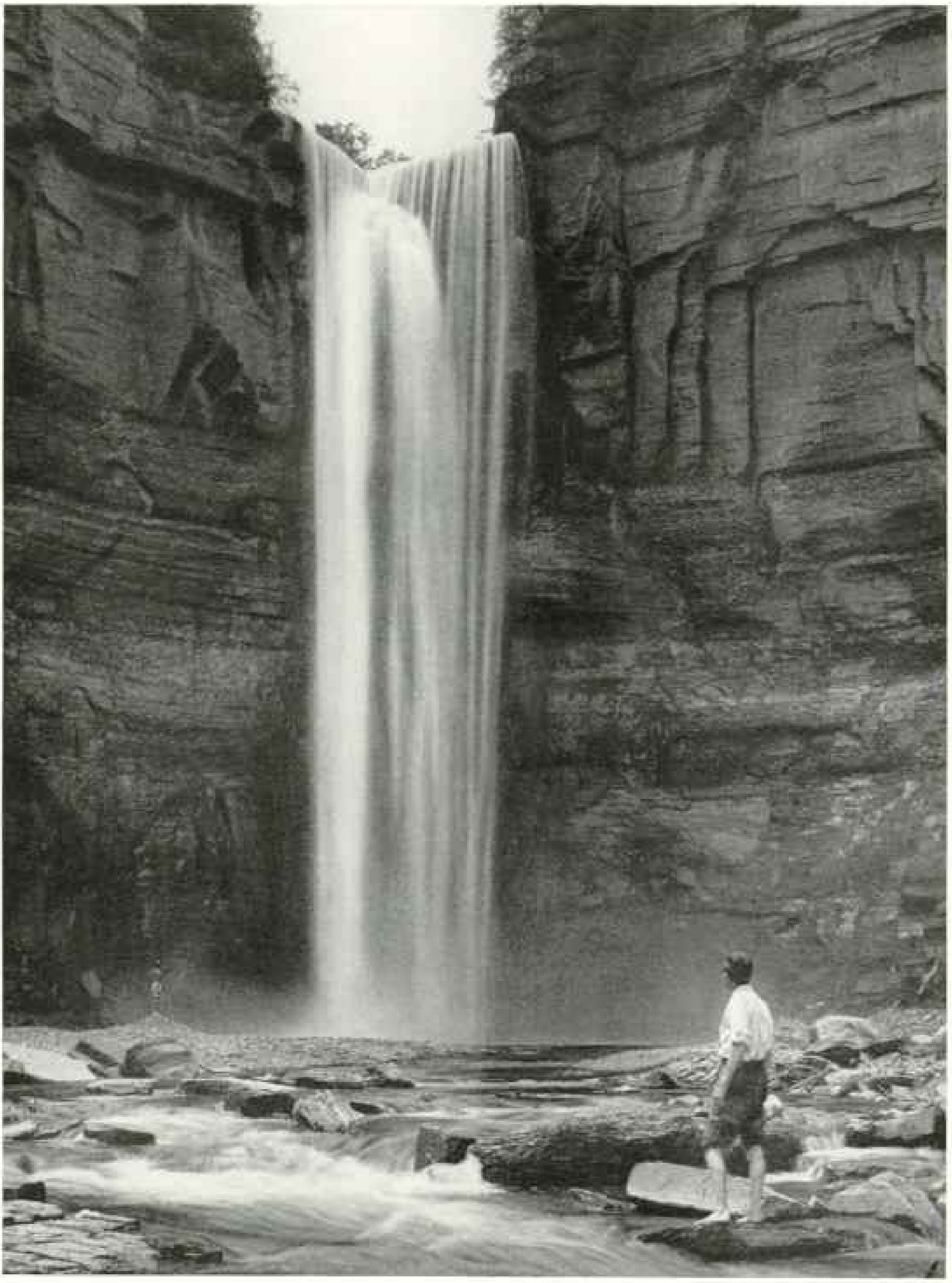
Grape pressing continues about eight weeks. In huge oaken tubs fermented juice ages for months. Filtration for the final polish is an all-year-round process, and so is bottling.

A recipe for making champagne, written in cookbook style, would read thus:

Blend juice from several kinds of grapes. (Just what varieties are used, is, of course, a matter of personal choice.) Age in oaken casks. Bottle, adding yeast and temporary cork. Age further with bottle in horizontal position. Shake bottle with French-made machinery to loosen sediment. Stand bottle on its head so sediment will settle on cork.

Shake twice a day by hand, inspecting by candle light to see how sediment is doing. Freeze champagne in neck of bottle to force out temporary cork with sediment on it. Insert permanent cork (normally five cents each from wholesale dealers in Spain or Portugal).

Age further, keeping bottle horizontal and cork moist to prevent shrinkage, which would allow escape of the real



Like a Long White Mantle, Taughannock Drapes a Cliff Near Cayuga Lake

Dropping 215 feet, the water falls a greater distance than even mighty Niagara. The smaller figure (left background) is a key to its height. Indians once called the falls Taghkanic, meaning "The Great Fall in the Woods." The cascade is situated at the head of a rocky glen in Taughannock Falls State Park.

Photograph by Volkmar Wentzel

Pickering's Treaty with the Iroquois Brought Peace to the Finger Lakes

The armistice between the Six Nations and the United States was drawn up at Canandaigua in 1794 by Colonel Timothy Pickering, then Postmaster General. This original copy signed by the Indians is preserved here in the local museum. The other document went to George Washington for ratification, and is now in the National Archives Building at Washington, D. C.

spark in champagne. Keep cellar at 60° F. the year round. If planning to ship bottle, wrap neck in gilded English lead foil and place in special straw jacket from the Netherlands. (Corrugated paper will do in an international pinch.)

P. S. Indentation at bottom of bottle to strengthen it against 125 pounds of yeast pressure is no guarantee against its bursting during process.

A "Champagne Shower"

Friends and I explored champagne cellars five stories under the ground. Veritable caves gouged from a hillside accommodated three million bottles. As we walked beneath clearing racks where bottled champagne is left for sediment settlement, a cork blew out, and the foaming contents splashed on one of us directly below.

"First time I've had a champagne shower," commented the victim, rather liking it.

Busy as the president of the cellars was with all the rush of grape-pressing, he would not let me stay at a hotel. I was guest at his house for those final fall days in the Finger Lakes country.

For the last time I awoke in the big front room of the colonial home. Several months before I had stayed in the same room, looked through the same windows. Then I had seen a robin's nest with blue eggs in it. Now from a maple in its autumn blaze fell flaming leaves of red and yellow. For me the tree became an hourglass.

Over the road through Pleasant Valley I drove away from the Finger Lakes. The fruitful vineyards had changed to fall clothing, and the poplar leaves shivered in the frosty morning. I looked again at the little red-roofed house, quietly saying "Au revoir"—with an American accent.

New Brunswick Down by the Sea

By Lawrence J. Burpee

WE CREPT into the harbor of Saint John, on the Bay of Fundy, one foggy morning in June. That looks like a harmless way of introducing a visit to the principal city and seaport of the Canadian Province of New Brunswick. It has at least the merit of scrupulous accuracy, but it would not necessarily commend itself to the people of Saint John, for it happens to be almost as bad form to mention fog in Saint John as to speak of earthquakes in San Francisco.

A traditional gibe between Saint John and Halifax is that the other is perpetually wrapped in fog, while the home town does not really know what the thing means. The plain truth is that fog, while not so characteristic of the Bay of Fundy as its phenomenal tides, is common at certain times of the year. How often it visits Halifax Harbour is not a matter that need concern us here.

Well, that is one of Saint John's idiosyncrasies. Another—and this at any rate is one that we can accept without question—is not to spell the name of their town "St. John."

We came to Saint John by the Boston boat, partly because one thereby gets a comfortable night's rest, and partly because it is the traditional mode of travel between these two weather-beaten seaports, each of which has a distinct character.

Men have been traveling by water from Boston to Saint John and back again ever since the latter was founded, in 1783, by United Empire Loyalists from New England and New York; that is to say, by colonists who remained loyal to the British Crown at the time of the Revolution. Today you may travel between these two places by rail or highway, as well as by water, and even by air, but there is no better road, or at least so it seems to me, than the sea road.

A Town Built upon a Rock

There was some satisfaction in the thought that we were following in the track of our forefathers, who were members of the band of pilgrims that landed from a brig at the mouth of the St. John River, something over a century and a half ago, and set to work to build a town on an inhospitable rock.

The fact that the site they had chosen was a high, rounded hill of almost soilless rock did not discourage them, as it has failed to discourage their descendants, whose heads have been unbowed by even such a catastrophe as the great fire of 1877 which pretty well wiped out the town.

By long and unceasing toil they have driven well-paved streets up and over the hill and cut drains, a water system, and other public conveniences through it. They have built comfortable homes and shops and stately churches on its hard surface, and have brought earth and hidden the gray rock under squares of lawn and flowers and shade trees that flourish in the unpopular fog.

At the time Saint John was born, both sides of the Bay of Fundy formed part of the Colony of Nova Scotia, but the following year that section of the country between Fundy and the boundary of what is now the Province of Quebec was set apart as the Province of New Brunswick. In 1867 it became a province of the newly formed Dominion of Canada.

Geographically it bears a rough resemblance to the State of Maine, on a somewhat smaller scale. If you are interested in such comparisons, its area, about 28,000 square miles, is 3,000 less than that of Scotland and 5,000 less than that of Maine. Foursquare it stands, to its kinsmen, its neighbors, and the sea.

On the north side it faces the sister Province of Quebec, on the west the State of Maine, on the south the Bay of Fundy, and on the east the Gulf of St. Lawrence. More specifically, it also fronts upon those parts of the Gulf of St. Lawrence known as Northumberland Strait and Chaleur Bay (map, p. 597).

Harbor Never Frozen Over

Modern Saint John has grown completely around its spacious harbor, and when one has taken the ferry over to the west side, past incoming and outgoing ocean tramps, one finds himself on a wide alluvial flat cut up into a series of docks and basins and built over with grain elevators, warehouses, and railway tracks.

A considerable part of Canada's export and import trade, particularly in winter when the St. Lawrence River is closed to navigation, passes through the port of Saint John, for the harbor, thanks to the mighty Fundy tides, has never been frozen over (pages 600-1).

On either side of the harbor, tied up to one of the docks if it happens to be high tide, or lying dejectedly on the mud if the tide is low, are the little fishing or coasting schooners that remain to remind us of the great days of the sailing craft. Then shipbuilders of Saint John designed and built noble vessels, and Saint John captains and crews sailed them out into the Seven Seas.

Those were the days when you would find

Photograph from the Toronto Star

Everybody's Happy as a New Heavyweight Champ Hangs from the Scales

Anglers bring ashore a prize taken from the clear, cold waters of the Restigouche River, the famed salmon stream which New Brunswick shares with Quebec. Most of the fishing rights on the Restigouche are privately leased, but there are stretches open to the public. Other noted New Brunswick salmon streams include the St. John, Tobique, Nipisiguit, and Miramichi Rivers. Many streams and lakes throughout the Province afford fine trout fishing (page 613).

Bluenose ships anywhere from Rio to Hong Kong. As Bliss Carman, talented son of New Brunswick, wrote:

> Past the lighthouse, past the nunbuoy,
> Past the crimson rising sun,
> There are dreams go down the harbor
> With the tall ships of Saint John.

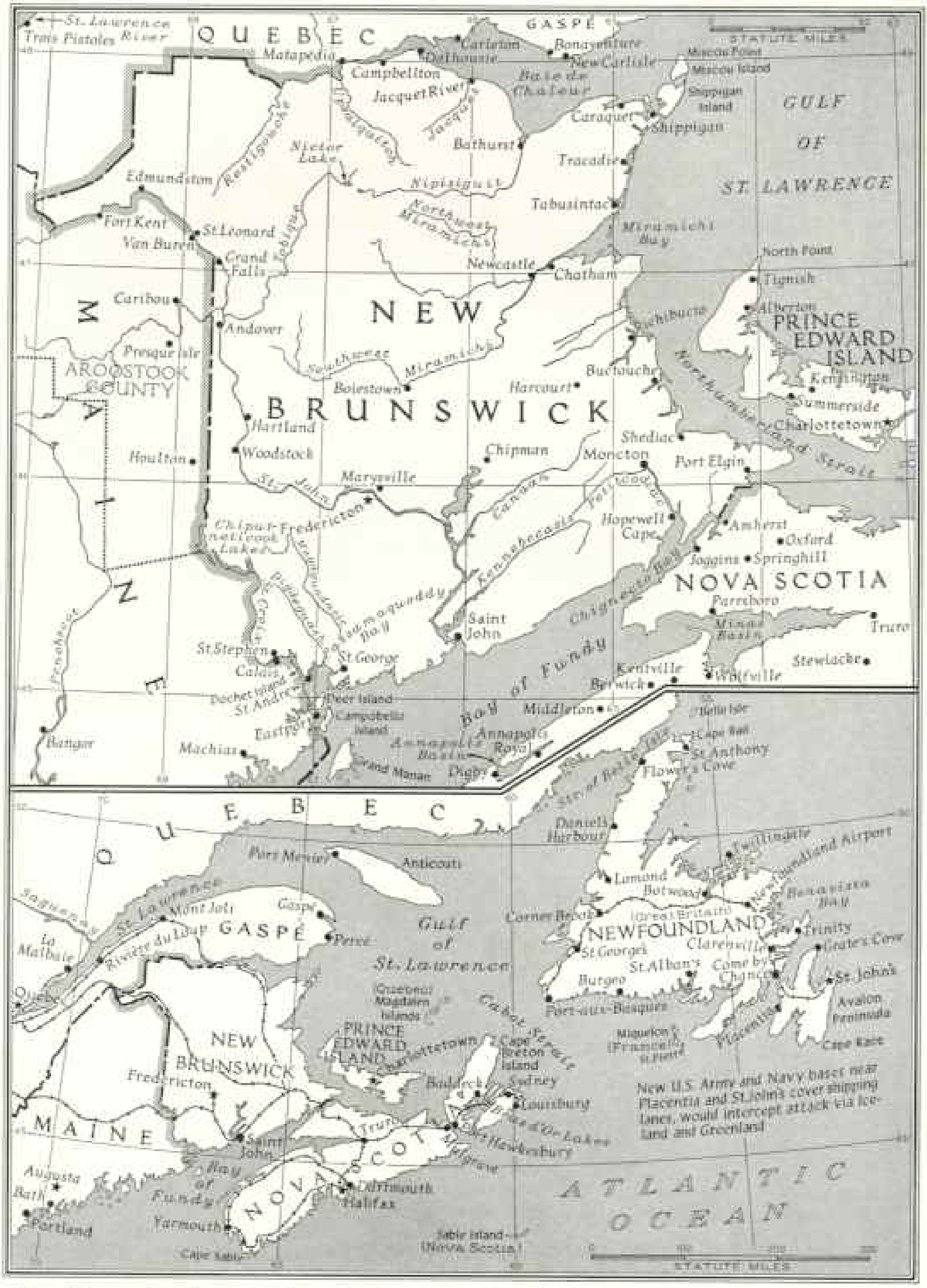
It is in keeping also with Saint John's maritime traditions that in Courtenay Bay, on the eastern side of the city, the Canadian Government maintains one of the world's largest dry docks; and that Robert Foulis, of Saint John, developed and built the first steam foghorn, and operated it on Partridge Island, in the mouth of the harbor, as long ago as 1854.

Saint John may not like to be reminded of its fogs, but has been practical-minded enough to devise ways of circumventing them.

In 1842 Benjamin Tibbits designed and built here the first steamer to be propelled by a compound steam engine. It is also worth remembering, though it has nothing particularly to do with the sea, that the first penny newspaper in the British Empire was the Saint John News, published by George E. Fenety in 1838.

Here and there, sometimes in such unexpected places as the interior of a warehouse, one finds inscriptions to remind the passer-by that the history of Saint John goes back not only to the coming of the Loyalists, but also to the days of French rule in this part of the world, and, in fact, to the naming of the St. John River by Samuel de Champlain in 1604.

Champlain dropped anchor in the harbor on the Feast Day of St. John the Baptist, June 24, 1604, and therefore named the river after the saint.



New Brunswick, Between Nova Scotia and Quebec, Faces Strategic Newfoundland Across the Gulf of St. Lawrence

Photograph by H. H. Smith

Pit Props by the Truckload Head for British Mines and Air Raid Shelters

Fresh from New Brunswick's rich forest lands, these peeled logs will be whisked to a waiting boat for shipment overseas. They will be used to support the roofs of mine workings and in shelter construction. Now that Britain is cut off from Scandinavian sources of timber, she relies more than ever for softwoods on Canada and the United States.

Nothing much now remains but memories, some in musty documents, some in tales carried down from father to son, of the events of the period when the Loyalists made their homes here at the mouth of the St. John, or of the still earlier days when French sea captains and adventurers sailed into the Bay of Fundy and held precariously for a time certain spots here and there on the New Brunswick shore and up the valley of the St. John.

Around no other place do these memories of the past cling more closely than the harbor of Saint John.

A Panorama of Adventure

One afternoon I climbed up from the ferry and sank down to regain my breath on a bench that had been charitably placed at the summit of the hill, high above the harbor.

A fog that had been rolling in from the bay gradually swallowed the harbor and its shipping and billowed around either side of the promontory on which I sat, until nothing remained but a damp smother of swirling gray cloud. Sound was drowned as well as sight. Nothing came through but the eerie bellowing of a foghorn.

I sat there and smoked my pipe, and thought of the things this old gray rock had seen. Half dreaming, I looked out toward the mouth of the harbor.

The fog lifted for a moment, and, through a misty curtain, I seemed to see a ship of other days, of unfamiliar build and strange sails and rigging, feeling her way in toward the land. In the ship's high bow stood a group of gentlemen, in the slashed doublets and feathered hats of 1604. Champlain, Pierre de Monts, and Jean de Poutrincourt—they studied the possibilities of this basin as a site for the colony.

What passed through the mind of Champlain on that June day of long ago? Might there have been some dim thought of the busy seaport that one day would grow up about this well-protected harbor?

Then my mind wandered on to a later period, and I saw a log fort, above which fluttered the flag of the old kingdom of France. A handful of defenders, led by a woman, made a vain attempt to hold the fort against overwhelming odds.

It was 1645, and Charles de Charnisay, newly appointed governor of Acadie, was tak-

Photograph by Associated Screen News, Ltd.

The Stars and Stripes Flank the Flag of Canada at the Door of President Roosevelt's "Summer White House"

Here near Welshpool on Campobello Island the Chief Executive has enjoyed many holidays on Canadian soil. The President's mother, Mrs. Sara Delano Roosevelt, has a summer home close by. Many people from the United States have vacation residences on the cool and craggy shores of Campobello, Deer, and Grand Manan Islands (page 606). Note yacht model in window at left.

ing advantage of the absence of his ambitious rival, Charles de la Tour, to attack and capture Fort La Tour, massacre its garrison made up of his own countrymen, and carry away La Tour's wife to die in captivity.

The fog sweeps down and blots out the picture. When it rises once more, the fort is gone, but in the harbor rides at anchor a fleet of sailing ships, from which are disembarking a company of men, women, and children with their goods and chattels. The Loyalists have reached the end of their journey.

Saint John is a convenient point from which to explore New Brunswick. With the aid of a map issued by the Provincial Government we gleaned the information that New Brunswick produced such luxuries as lobsters and Buctouche oysters, salmon, trout, shad and smelts, venison, wild geese and woodcock, as well as excellent potatoes, and such other commodities as gypsum, coal, antimony, timber and pulpwood. From the chart we worked out what proved to be an attractive and very interesting ramble around the Province.

It involved a trip down the coast to Passamaquoddy Bay and the island of Grand Manan. Then we would come back to Saint John and go up the river to Fredericton, the Provincial capital. Again returning to Saint John, we would follow the Fundy shore to Chignecto Bay and the Nova Scotia boundary.

Finally, we would travel north—through a part of the Province that has been populated by Acadian French for many generations—to Chaleur Bay and the Restigouche River, where New Brunswick meets the French-Canadian Province of Quebec.

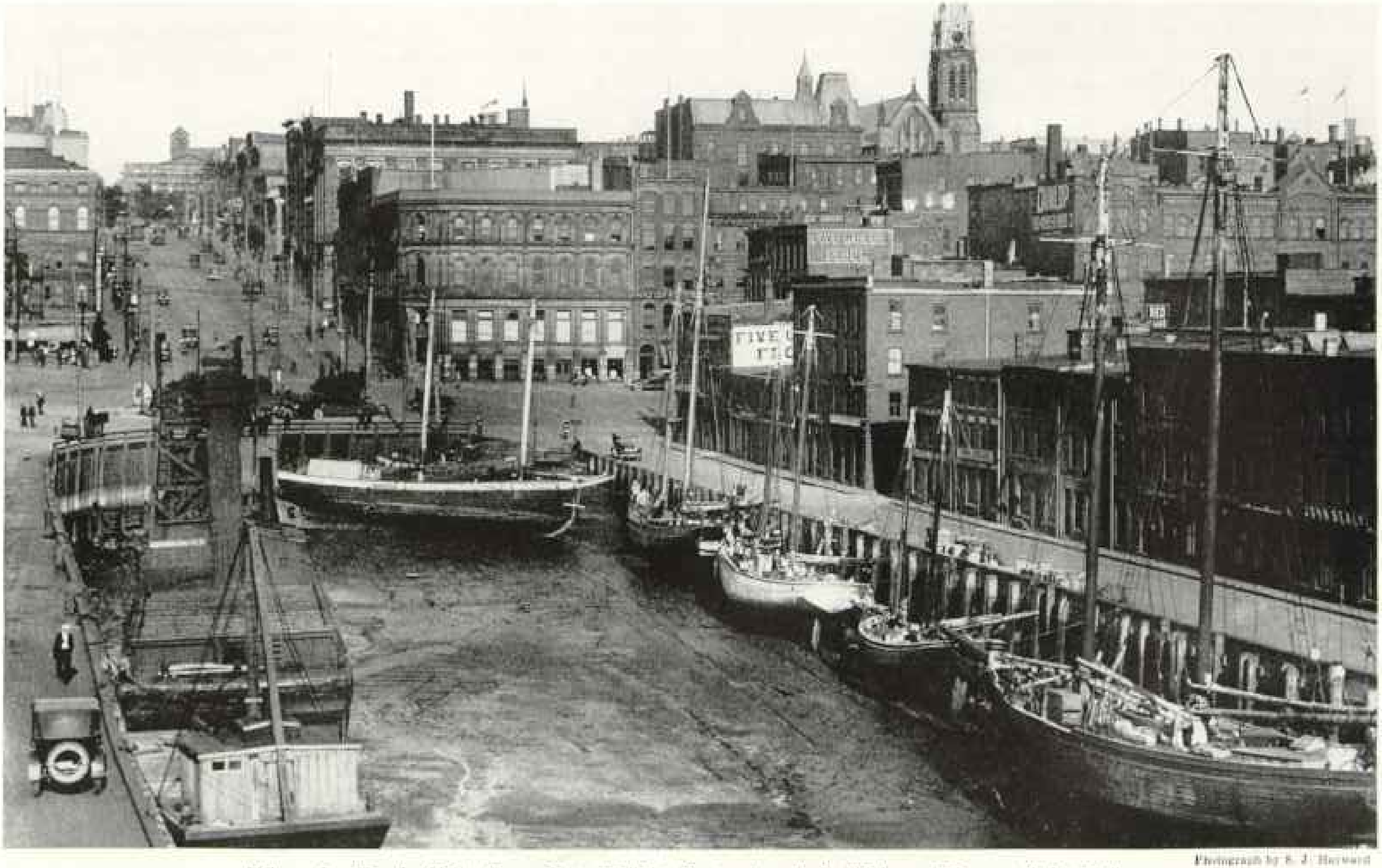
That was the plan, and experience proved that it was a good one. If you will study the accompanying map (page 597), you will see that we kept pretty well to the coastal regions and the valley of the St. John. There you find most of the people of New Brunswick, as well as its most striking physical characteristics.

The interior of the Province, from Fredericton north to the Restigouche, and from the upper St. John east and southeast to the Miramichi and the Richibucto, is an almost uninhabited wilderness, a real sportsman's paradise. In this rolling and heavily wooded

Crown Copyright, Royal Canadian Air Force

In Winter Saint John Divides with Halifax the Lion's Share of Canada's Atlantic Shipping

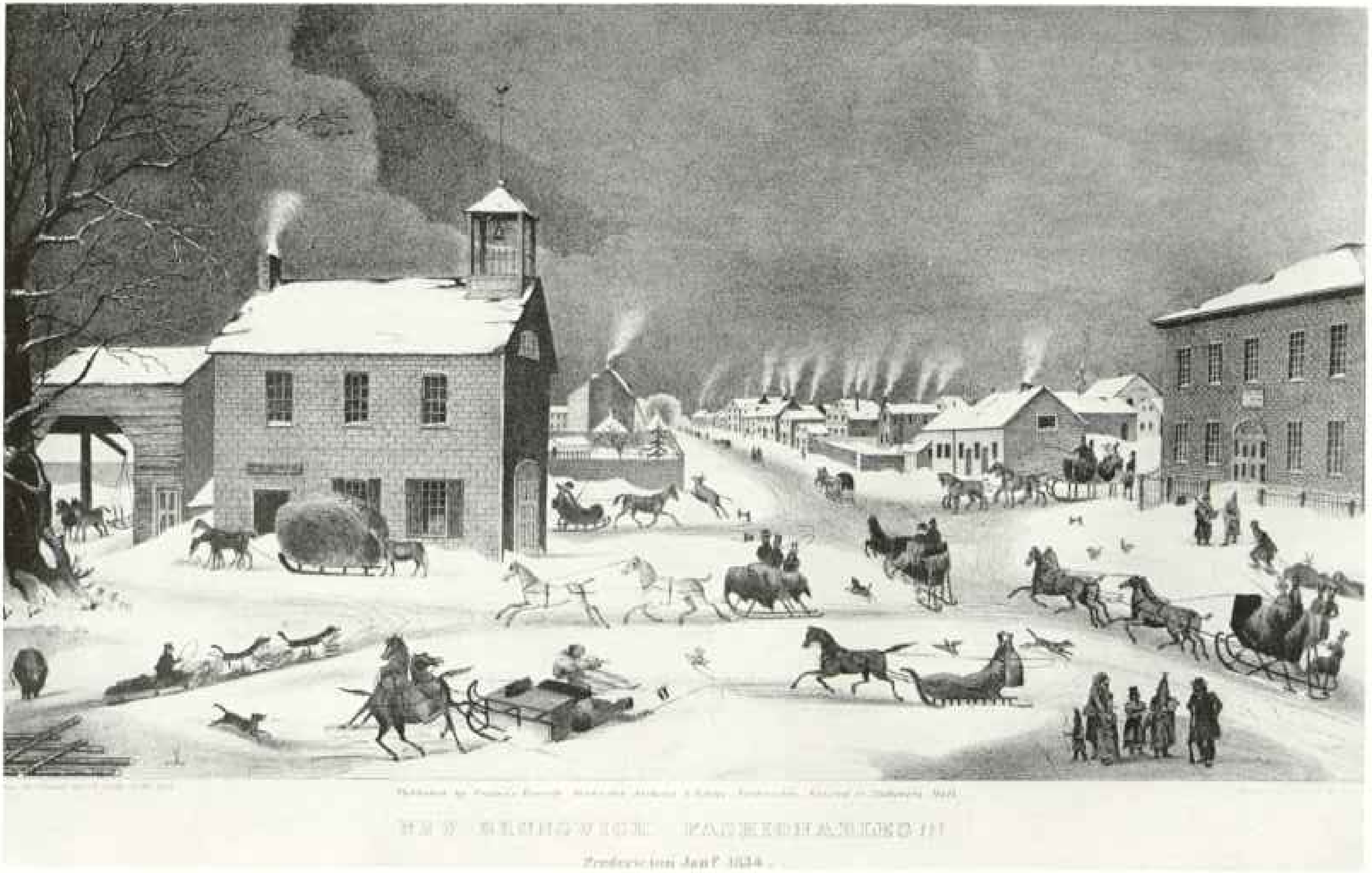
When ice closes the St. Lawrence River for several months each year, the ice-free ports of the Maritime Provinces enjoy a shipping boom. Saint John, New Brunswick's chief port and largest city, spreads over a rocky peninsula rising from the elbow-shaped harbor, which is really the mouth of the St. John River, seen winding through the hills in the background. Docks and huge grain elevators rise in West Saint John, at the left. Beyond the sugar refinery with its tall chimney, the exhibition buildings, and the armory (right foreground), other wharves line the shore of the city proper (page 595).



Photograph by R. J. Hayward

When the Fundy Tide Goes Out, Fishing Boats Are Left High and Dry at Saint John

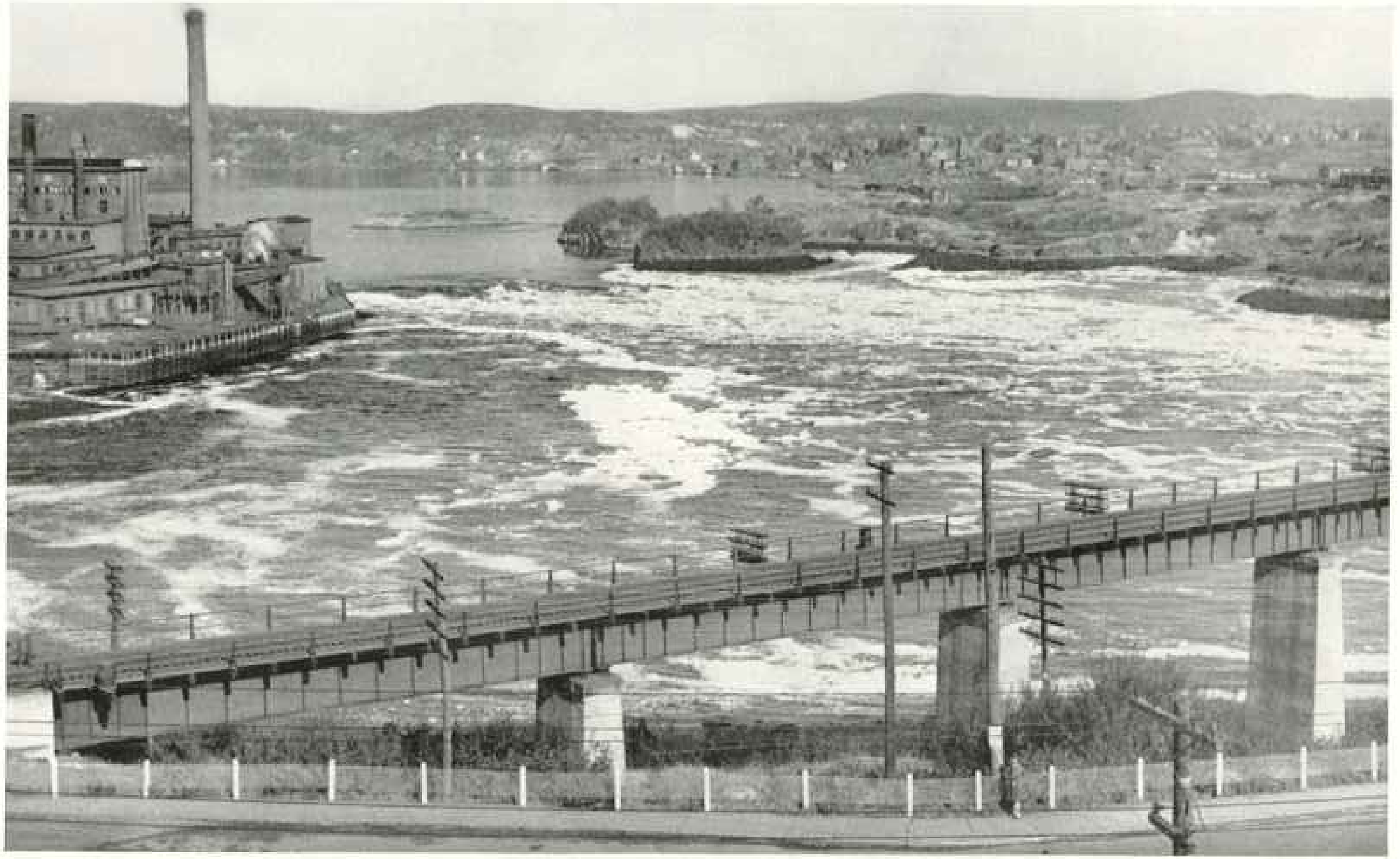
At the head of Market Slip, a big boulder (left) bears a bronze plaque marking the place where 3,000 United Empire Loyalists, or Tories, from the American Colonies landed in May, 1783, to transform the tiny hamlet into a busy town. Tradition has it that Champlain and De Monts landed at this spot in 1604 when they visited the harbor. King Street, the city's "Main Street," runs up the hill to shaded King Square (page 595).



Photograph from Public Archives of Canada

On a Winter's Day in Fredericton More Than a Hundred Years Ago, Hurrying Sleighs Jammed the Streets

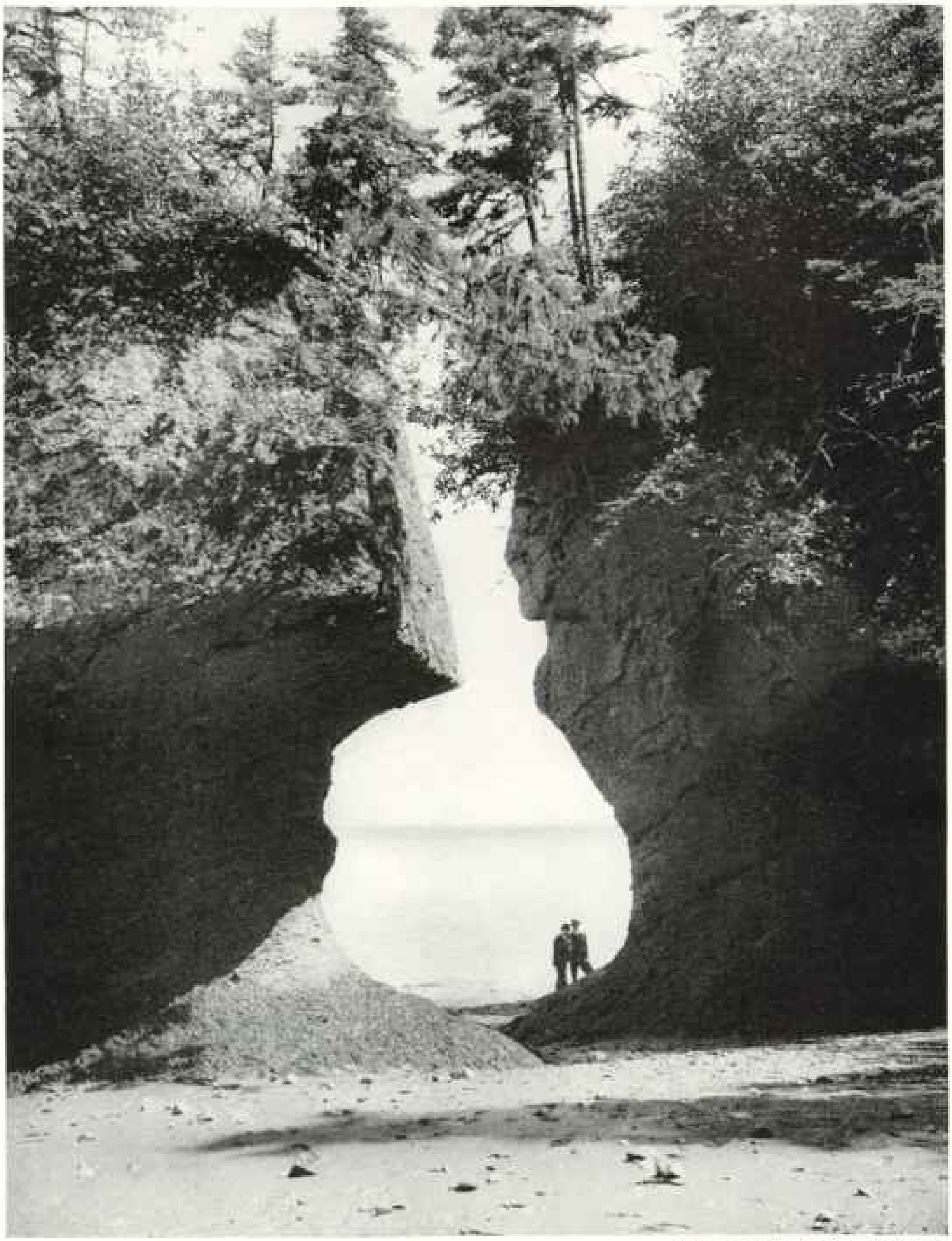
A sleigh has spilled its occupants and flung a silk "topper" and bonnet on the snow. At left, above a dog-drawn sled, a steer snatches hay while the team halts for lunch. A cow plunges out of a sleigh's path (center background); extreme right, antlers projecting from a sledge hold promise of venison for dinner (page 608). The sign on the building behind the load of hay is that of the great-grandfather of the author, whose family settled on the St. John River before the American Revolution.



Photograph by Canadian Pacific Railway

Saint John's Reversing Falls, Tumbling Foam-flecked Toward the Sea, Soon Will Be Pouring Back Upstream

The paradox of a stream falling downstream twice a day and upriver between times is caused by the tremendous tides at the mouth of the St. John River surging in and out through the narrow, rocky gorge which constricts the stream where it empties into the sea. At low tide the river falls about 15 feet into the harbor; high tide reverses the flow, sending a cataract roaring upstream. Near half tide the river is level and navigable (page 613).



Photograph by Canadian National Railways

No Spying Through This Keyhole When the Tide Is In!

Keyhole Rock is one of many fantastic monuments carved by wind and the surging Bay of Fundy tides along the beach near Hopewell Cape at the mouth of the Petitcodiac River. Up this estuary near Moncton roars the famous tidal wave, known as the "bore." The flooding tide rushes upstream as a wall of water, which varies in height from a few inches to five or six feet (page 613).

country moose and deer are abundant, and in many salmon and trout rivers the fly fisherman can drown his business sorrows.

If you happen to be a hunter of big game or an angler, these forested hills and sparkling streams with their wild inhabitants are New Brunswick's chief claim to fame. But then, we are not all hunters or fishermen, and to those whose thoughts are otherwise New Brunswick offers many points of interest.

"The Land of the Saints"

On a morning when the very thought of fog seemed absurd, we took our temporary leave of Saint John and traveled by motorbus to St. Andrews, on Passamaquoddy Bay. This part of New Brunswick is sometimes called the "Land of the Saints"—St. Andrews, St. Stephen, St. George, and Saint John. That musical Micmac name Passamaquoddy—it is disheartening to be told that it means "the place where pollack are found"—suggests many matters connected with this borderland between Maine and New Brunswick.

The St. Croix River, which empties into the Bay and forms the international boundary between the State and the Province, was discovered by Champlain and De Monts in 1604, shortly after their visit to the harbor of Saint John.

On a very small island, also named by them St. Croix, near the mouth of the river, the explorers attempted to found a settlement, three years before the founding of Jamestown.

De Monts, Champlain, and their companions wintered on the island, but, discouraged by the severe winter and by illness, they abandoned the place in 1605 and crossed the Bay of Fundy to Annapolis Basin, where they laid the foundations of Port Royal, today the town of Annapolis Royal.*

St. Croix Island, now known as Dochet, became territory of the United States when the international boundary was finally determined.

Boundary disputes have everywhere been fruitful causes of misunderstanding and bitterness between neighboring peoples, and the long controversy over the line between New Brunswick and Maine was no exception to the rule.†

The controversy between New Brunswick and Maine arose over the identity of the St. Croix River, and later, when that had been decided, as to which branch of the river should be followed north to the height of land. And even when that point had been settled, it took many years to decide which of the many islands in Passamaquoddy Bay should be given to each country.

Three rivers empty into Passamaquoddy Bay—the St. Croix, Digdeguash, and Magaguadavic, as they are called today—but, although Champlain discovered and named the St. Croix, the name was forgotten and the river was known for many years as the Scoodic and its upper waters as the Chiputneticook.

At various times, and by various authorities, American and Canadian, the Scoodic-Chiputneticook, Digdeguash, and Magaguadavic have each been positively identified as the St. Croix of Champlain.

Chartering a small motorboat, we cruised about Passamaquoddy Bay. Among other things, we had a look at the three rivers whose champions had spent so much skill and scholarship in proving that it and no other was the true stream discovered by Champlain. We wondered why no one had upheld the claims of a fourth little river, the Bocabec, which also contributes its waters to Passamaquoddy.

We were reminded of some lines in James De Mille's verses to the "Maiden of Quoddy":

> Think not, though the Magaguadavic,
> Or Bocabec, pleases the eye;
> Though Chiputneticook is lovely,
> That to any of these we will fly.
>
> * * *
>
> We'll reck not of Digdeguash beauties,
> We'll care not for Popelogan's charms,
> But as emblems of union forever
> Upon two fair rivers we'll look;
> While you'll be the Skoodawabskooksis
> I'll be the Skoodawabskook.

It cannot be proved that the New Brunswick poet had the Maine-New Brunswick boundary question in mind when he wrote these amusing lines. Indeed, he never confessed to any serious purpose; yet one might almost suppose that he had seen with a prophetic eye the happy day when citizens of Maine and sons of New Brunswick would sink all their differences in the nut-brown waters of the Skoodawabskooksis and the Skoodawabskook. These are old Indian names of rivers of New Brunswick, near Fredericton, now the Longs and Eddys Creeks.

Campobello's Name and Nationality

When the British and American commissioners had brought the boundary down to the mouth of the St. Croix, it still remained to carry the line out through Passamaquoddy Bay into the Bay of Fundy. And thereby hangs a tale told by an eminent American statesman, who enjoys among other qualities a keen sense of humor.

Something had been said about Campo-

* See "Salty Nova Scotia," by Andrew H. Brown, NATIONAL GEOGRAPHIC MAGAZINE, May, 1940.

† See "Maine, the Outpost State," by George Otis Smith, NATIONAL GEOGRAPHIC MAGAZINE, May, 1935.

bello, the beautiful island in Passamaquoddy Bay which as long ago as 1770 had been granted by the then governor of Nova Scotia, Lord William Campbell, to Captain William Owen. The latter named it partly as a complimentary punning on the name of the governor and partly because it seemed to him to express its unusual charm. This charm has appealed to many later visitors, including the present President of the United States and his mother, both of whom have summer homes there (page 599).

"Perhaps," remarked the statesman with a mischievous smile, "you may not have heard the story of how Campobello became part of New Brunswick. Remember, I do not vouch for its accuracy.

"It is said that Webster and Ashburton had come down the river in a British gunboat, having settled the problem of the disputed territory, and were now going to deal with the matter of the islands in the bay. Ashburton had taken the captain of the gunboat aside before dinner, and asked him if it was possible to get through the narrow channel between Campobello and the Maine shore. The captain said he could do it at high tide.

"'Very well,' said Ashburton, 'take her through that channel.'"

"As you may have heard," continued the statesman, with another grin, "Webster thoroughly enjoyed a glass or two of wine at dinner, and Lord Ashburton, who was the soul of hospitality, saw to it that he was not denied that simple pleasure. When they returned to the deck after dinner, the gunboat was slowly feeling her way around Campobello.

"Ashburton, turning to Webster, said, 'Well, Mr. Webster, how does this channel suit you for the boundary?'"

"And Webster, who was at the moment seeing two if not three Campobellos, and as many channels, thought that the only safe answer was 'Yes.' And that's the way you Canadians got Campobello.

"And they do say," he added, "that the reason why Grand Manan became British rather than American was because it was overlooked by Mr. Webster in the fog!"

Lure and Lore of Grand Manan

But, however Grand Manan became part of New Brunswick—and it was not, of course, remotely in the way suggested by this apocryphal anecdote—there can be no question as to its compelling appeal to those who enjoy unusually picturesque rock scenery.

For many years the island was a mecca for American and Canadian artists, so that hundreds of people who have never even heard of Grand Manan are familiar with such characteristic features as the mighty varicolored wall known as the Seven Days' Work; the Hole in the Wall, which reminds one of a natural arch in the island of Sark and another in the Canadian Rockies; Money Cove, with its not very original tradition of Captain Kidd and his treasure; Indian Beach, the last stronghold of the Passamaquoddy Indians; the majestic natural monument known as the Southern Cross; Dark Harbour, where the dulse gatherers follow their curious occupation (page 608); Deep Cove, where in 1842 the keeper of Gannet Light found the remains of an old anchor thought to be the one lost by Champlain 238 years before.

Here is Champlain's account of the incident:

"The south wind increased during the night to such impetuosity that we could not stand by our anchor, and were compelled without choice to go ashore, at the mercy of God and the waves. The latter were so heavy and furious that while we were attaching the buoy to the anchor, so as to cut the cable at the hawsehole, it did not give us time, but broke straight away of itself.

"The wind and the sea cast us, as the wave receded, upon a little rock, and we waited only the moment to see our bark break up, and to save ourselves, if possible, upon its fragments. In these desperate straits, after we had received several waves, came one so large and fortunate for us that it carried us over the rock, and threw us on a sandy beach, which insured us this time from shipwreck."

And the Grand Mananers will show you the very beach.

Before leaving Passamaquoddy, we drove over to see the interesting project for developing water power from the phenomenal Fundy tides. When this idea was first proposed some years ago, it took the ambitious form of an international scheme involving dams connecting the American and Canadian shores with various islands, so as to create two huge basins which by means of gates could be manipulated to develop power from the tides.

The United States Army Engineers, who had been in charge of the modified project before work was discontinued, showed us a large working model which made the problem reasonably clear even to a layman.

When it became a matter of using U. S. Government funds, and because of the possible effect on the sardine fisheries in the Bay, the international scheme was abandoned for a less ambitious project entirely on the American side.

That, too, was shelved in 1936, after a certain amount of work had been done upon it,

Photograph by Canadian National Railways

The Full-rigged Ship *Grace Harwar*, at Campbellton, Recalls Colorful Windship Days

This Finnish three-master was the "heroine" of A. J. Villiers' story, *Rounding the Horn in a Windjammer*, in the National Geographic Magazine for February, 1931. The *Harwar* was broken up at Rosyth, Scotland, in 1935 after 46 years at sea. New Brunswick yards launched hundreds of wooden sailing vessels during the rapid growth of merchant shipping throughout the 19th century.

Photograph by R. H. Smith

Fredericton's Lofty Christchurch Cathedral Was Copied from a Church in Norfolk, England

One of the finest examples of Gothic architecture in America, it was built through the efforts of Bishop Medley in 1845-1853. Trinity Church, New York, contributed to the cost of the beautiful stained-glass east window.

for the quite sufficient reason that Congress had refused to vote the necessary funds.

A somewhat similar plan for obtaining power from the tides was attempted at the mouth of the Severn, in England, some time ago, but was not found economically practicable.

Dulse, Bluenose Delicacy

We traveled back to Saint John on a little coasting steamer, which evidently carried as part of its cargo a quantity of Grand Manan dulse, for which Saint John is the recognized market. You find it offered for sale there in scores of shops, and it is shipped in small packages to Bluenoses all over the world, whose nostalgia for the shores of Fundy is fed by this delicate little edible seaweed, with its pungent smell and its taste of the sea.

To a New Brunswicker it is a precious delicacy. To others, when you have persuaded them to taste it, dulse becomes an ill-considered practical joke.

From Saint John there are three methods of reaching the Provincial capital, Fredericton—by road, rail, or steamer. All are worth while, because they use or follow the picturesque stream that flows down through the heart of the Province.

The story is told that, about half a century ago, competition between two rival steamboat companies on the St. John River became so intense that, after fiercely underselling each other until the tariff had been brought down to the vanishing point, one line offered a trip from Fredericton to Saint John free with a luncheon thrown in. It must have been about that time that river transportation for passengers became a thing of the past.

Fredericton is not a big industrial city like Toronto, the capital of Ontario, nor an important seaport like Halifax, the capital of Nova Scotia. It is essentially the seat of government, the official home of the Lieutenant Governor, legislature, and Supreme Court; also, incidentally, of the University of New Brunswick. Its atmosphere is therefore political and intellectual, rather than commercial. It is a small town in population, but not in dignity.

According to the last Dominion census in 1931, it had only 8,830 inhabitants, as against Saint John's 47,514 and Moncton's 20,689. But if it lacks numbers it boasts no mean tradition, for it was

founded by Sir Guy Carleton in 1785, on the site of an Acadian settlement named Ste. Anne's, dating from about 1731. It has a rich setting of trees and is encircled by sparkling river and green hills. Its perfectly proportioned cathedral is one of the finest examples of Gothic architecture on this continent (opposite page).

The university, founded in 1800 and granted a Royal Charter in 1829, although small has always enjoyed a high reputation and has contributed men of unusual ability to the political, professional, and intellectual life of the Empire. Its legislature is the Dominion Parliament in miniature, even to the press gallery.

A Fredericton woman wrote and published one of the earliest of Canadian novels in 1824, and for a while this was the home of Juliana Horatio Ewing, author of *Jackanapes*, *A Flat Iron for a Farthing*, *The Story of a Short Life*, and a number of other delightful books for children, which today unfortunately are pretty well forgotten. It was also the birthplace of those literary cousins, Bliss Carman and Sir Charles Roberts.

Descendants of Pre-Loyalists

Something has been said about the founding of Saint John by United Empire Loyalists—those who differed so radically from their fellow-colonists at the time of the American Revolution that they abandoned their homes along the Atlantic seaboard and emigrated to the British colonies around the Bay of Fundy.

Even before the Revolution, however, there was a considerable movement of people (of the same adventurous type that later pioneered in the American West) to the Maritimes, and a number of these Pre-Loyalists, as they have been called, settled in the valley of the St. John even before the founding of Fredericton. Many of their descendants are there today.

Fredericton is one of the principal outfitting points for hunters and anglers in the interior of New Brunswick.

This Province of 28,000 square miles has a population of only 408,000, a little more than Vermont and a little less than New Hampshire, approximately fourteen individuals to the square mile; and these 408,000 are for the most part confined to a comparatively narrow belt of land along the Fundy shore and the Gulf of St. Lawrence, and in the valley of the St. John.

If you will look at the map again (page 597), you will see that a line of the Canadian National Railways runs from Bathurst, on Chaleur Bay, south to Moncton, and another branch of the same railway from Moncton west to Fredericton, while one of the Canadian Pacific Railway lines runs roughly north from Fredericton to Edmundston, in the extreme northwestern corner of the Province.

From Costumes Français depuis Clovis, 1824

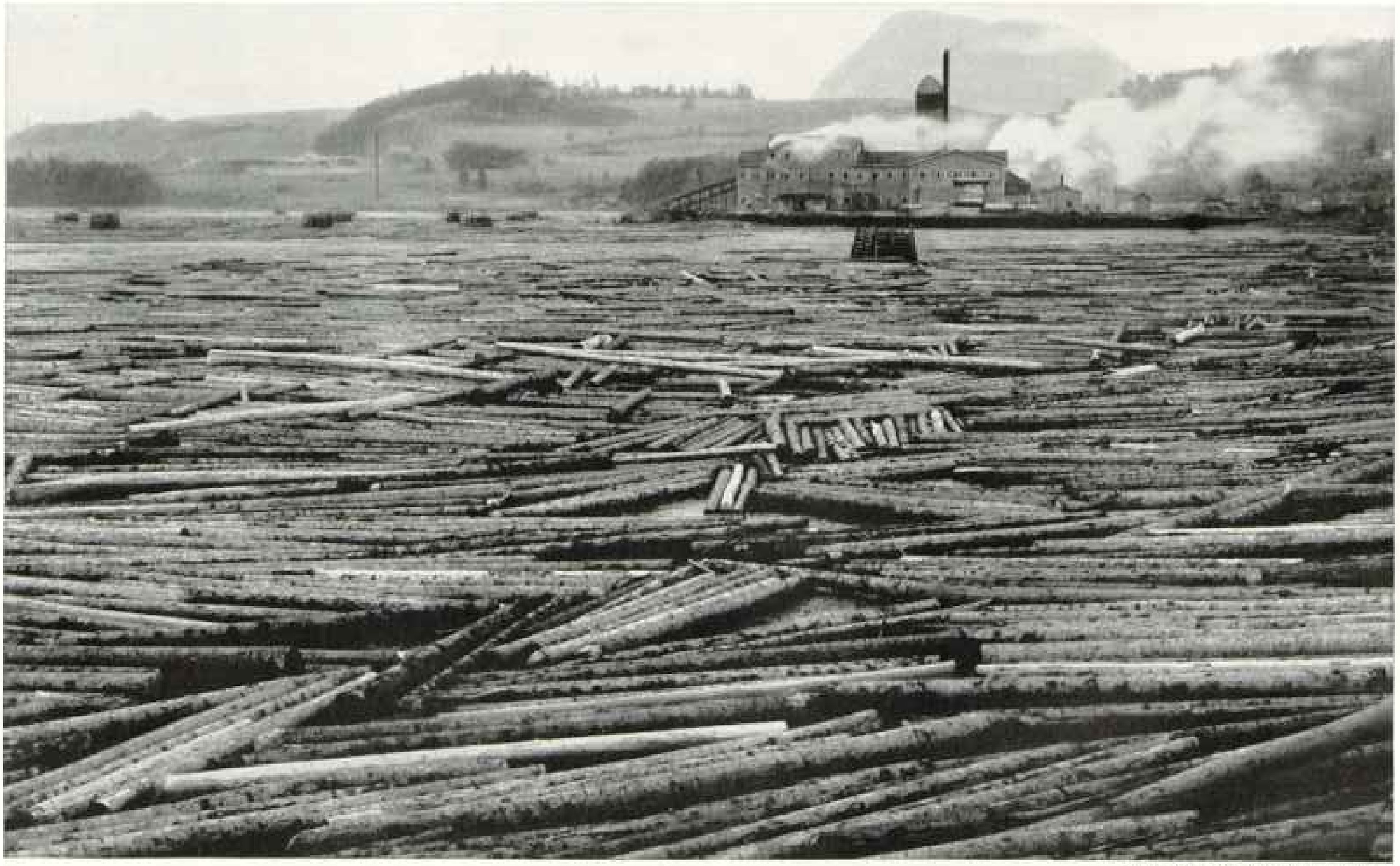
Jacques Cartier Discovered New Brunswick in 1534

Sailing from St. Malo, France, in April of that year, the bold Breton voyager entered the Gulf of St. Lawrence through the Strait of Belle Isle, skirted the Magdalen Islands and Prince Edward Island, and cruised along the eastern shore of what was later to become New Brunswick. Sailing northward, Cartier found and named the Bay of Chaleur (Bay of Heat), because of the warm weather which prevailed at the time (page 614).

Photograph from the Dept. of the Interior, Canada

Fishermen Make Ready to Transfer the Catch from the Trap of a Sardine Weir to a Cork-buoyed Seine

Nets rise high above the surface when the tide is out near St. Andrews on Passamaquoddy Bay. Following along the barrier of poles and nets, the fish enter the staked trap (left). When the net inside is hauled, the sardines are forced into the seine (foreground). This is then partially pulled into the small boats, crowding the fish into a "pocket" from which they are scooped into the rowboats.



Photograph by Canadian National Railways

Puffing Steam and Smoke, a Campbellton Pulp Mill Chews Up Logs by the Riverful

Grindstones (pulpstones) transform the barked logs into groundwood, which is combined with sulphite pulp (chemically treated wood) to make newsprint. New Brunswick's forests rank next to agriculture as its greatest source of wealth. At Dalhousie is the largest paper mill in the Maritimes. The Province's timberlands also yield lumber by the million feet, and wood for spools, brushes, boats and canoes, and veneer.

Photograph by George Shiras 3d

Heads Up!—Morning Mist Forms a Backdrop for a Cow Moose Silhouette

George Shiras 3d, the great wild life photographer, startled this feeding lady as he set out trout fishing at dawn. The picture was taken at Nictor Lake in northern New Brunswick, where, in a wilderness region with few towns or roads, moose, deer, and bears are common. At present there is no open season for hunting moose. (See *Hunting Wild Life with Camera and Flashlight*, by George Shiras 3d, in two volumes, published by the National Geographic Society; $5).

The area included between these lines and the Quebec boundary, about two-thirds of the Province, is for the most part wild land, a rolling country of hill and plain. Much of it is still heavily timbered, and it is drained by such world-famous salmon streams as the Restigouche, Miramichi, Nipisiguit, Tobique, Upsalquitch and St. John, and other rivers almost equally renowned for brook trout (p. 596).

Throughout the wide reaches of woodland, big-game hunters find moose, deer, and bear, while woodcock and wild duck are plentiful, and wild goose and brant fall occasionally to the lucky gun.

The Provincial government has wisely conserved its valuable game resources. It has set apart several game sanctuaries, and now protects the moose with a closed season. There is a widespread but mistaken belief that all the salmon streams of New Brunswick are leased to fishing clubs and rich anglers. As a matter of fact, many of the salmon waters are open to public fishing, including the St. John, and pools on such famous rivers as the Tobique, Upsalquitch, Miramichi, Nipisiguit, Jacquet, Kouchibouguac, and even a stretch of the Restigouche.

"All-out Effort" to Win War

Today, in the middle of another world war, in some respects more terrible than that of a quarter of a century ago, the thoughts of the people of New Brunswick are turned, to the practical exclusion of all nonessential matters, to ways and means of winning the war. These activities range from shipbuilding, the making of munitions, and the provision and training of men for the Army, Navy, and Air services, to contributions to the Canadian Red Cross, libraries for military camps, and the buying of War Savings Certificates.

Returning down the river to Saint John, we traveled east to Moncton, on the Petitcodiac, one of those curious tidal streams that empty into the Bay of Fundy. There you will find a schooner floating serenely beside a dock at high tide, and, a few hours later, sitting dejectedly on a bed of rich red mud 50 or 60 feet below. But this is not the only eccentricity for which the tides of Fundy are responsible. At Saint John there is a ledge of rock across the river where it enters the harbor.

When the tide is out, the water pours over the ledge downstream; when the tide is in, the water absurdly falls upstream. This is what is known as the Reversing Falls (page 603).

At Moncton the tide sweeps up the Petitcodiac in the form of a great wave or bore, from a few inches to six feet high, an impressive thing to watch from the shore, but not at all a pleasant thing to meet in a small boat.

The salt marshlands, such as Tantramar, around the head of the Bay of Fundy, reclaimed from the sea so many years ago by those industrious Acadians whose pathetic story awakened the sympathy of Longfellow, possess an odd but compelling charm.

The wind ripples over fields of hay where the sea once reigned, and one thinks of all that has happened here since the sturdy Breton and Norman settlers built their dikes and shut out the sea, more than three centuries ago. To one who is both a New Brunswicker and a poet, like Sir Charles Roberts, this borderland between land and sea has a particular appeal. In "Tantramar Revisited" he says:

> Ah! how well I remember those wide red flats, above tide-mark,
> Pale with scurf of the salt, seamed and baked in the sun!
> Well I remember the piles of blocks and ropes, and the net-reels
> Wound with the beaded nets, dripping and dark with the sea.

Turning our backs on the Bay of Fundy, we crossed the isthmus of Chignecto, by a diminutive train pulled by a fussy little locomotive, to Shediac on Northumberland Strait. Here one is still in Acadian country. Indeed, the Acadian settlements are scattered along this east coast of the Province until they practically meet the French population of the neighboring Province of Quebec. And yet there is a very real difference between the French of Quebec and the French of the Maritime Provinces.

Although the original settlers that made homes on the shores of the Bay of Fundy and along the St. Lawrence came from the same French provinces, Brittany and Normandy, there was little communication between French Canada and French Acadie until comparatively recent times. They were kinsmen, of course, but not on very intimate terms. An incident told to me by an Acadian parish priest throws a certain light on the situation.

A year or two ago there was a big reunion in Louisiana of French from different parts of North America. At the time of the expulsion of the Acadians from Nova Scotia—which then included what is now New Brunswick—many drifted down to Louisiana, and their descendants took an active part in the reunion.

This parish priest, who went with a group from the Northumberland side of New Brunswick, said that it was curious to note the difference between the reception these former Acadians gave to the French from Quebec and to the Acadians from the Maritime Provinces.

To the former they were polite but not at

all demonstrative, but when a Louisiana Acadian met a New Brunswick Acadian, he simply threw his arms around him and wept.

There is a peculiarity about the Acadians of New Brunswick, which may be due to their closer contact with English Canadians than is the case in the Province of Quebec, or may be the result of living for a time in New England, where there is of course a large French-Canadian population. In Acadian villages along the Northumberland shore you will frequently meet a man who calls himself Jack King, but whose real name is Jacques Le Roy; or Pete White, whereas the parish register shows he is Pierre Leblanc.

The Canadian poet William Henry Drummond, in one of his well-known *Habitant* poems, describes the experiences of a French Canadian who went to the "States" to make his fortune. He found that you had to work hard for a living there as in Quebec, and that hard times were not confined to his own country. However, in the pride of his new American citizenship he said: "My name's Jean Baptiste Trudeau no more, but J. B. Waterhole."

Shediac itself, while more or less surrounded by Acadian villages, is definitely English in its origins, although the name is Micmac. The first English-speaking settler was William Hanington, who bought 3,000 acres in 1784, brought out a number of settlers from his part of England, and laid the foundations of the town, which was incorporated as a village in 1827 and as a town in 1903. Today it is one of the largest lobster-shipping centers in the world.

For a hundred years or more a sleepy little community, Shediac is now very much in the limelight. A few years ago General Italo Balbo brought down his flying armada on Shediac's harbor on his way to Chicago. Since then Pan-American engineers have completed a marine air base at Shediac, with landing floats, floating walkway, and other facilities, all of which, however, are out of commission until after the war. The Canadian Government provided a radio station.

Returning to Moncton, we traveled north by what was once the Intercolonial Railway connecting the Maritime Provinces with Montreal, now a part of the Canadian National Railway system. The Intercolonial, one of the transportation links that made practicable the confederation of the scattered provinces of British North America into one Dominion, was the work of a far-sighted engineer, Sir Sandford Fleming, who later carried out the surveys for Canada's first transcontinental railway, the Canadian Pacific.

The Ocean Limited roars away into the north. It crosses the upper waters—where shy brook trout are found—of the Richibucto and Kouchibouguacis and Kouchibouguac, and on the other side of the Miramichi pauses for breath at Newcastle, a busy little lumbering town with a large wireless station built during the first Great War. From there we go on to Bathurst, on Chaleur Bay, where we touch memories of an even earlier explorer than Champlain.

Every Prospect Pleased Cartier

It is now more than four hundred years since that enterprising sea captain of St. Malo, Jacques Cartier, sailed into and named Chaleur Bay, thus becoming the original discoverer of New Brunswick (page 609). And there can be no doubt that what he saw of the Province pleased him well, for he wrote:

"The land along the south side of it (Chaleur Bay) is as fine and as good land, as arable and as full of beautiful fields and meadows, as any we have ever seen, and it is as level as the surface of a pond."

It was also on Chaleur Bay that Cartier, first of white men, traded for furs with the Micmac Indians. In his lively narrative he said:

"As soon as these Indians saw us they began to run away, making signs to us that they had come to barter with us, and held up some furs of small value with which they clothe themselves. We likewise made signs to them that we wished them no harm, and sent two men on shore to offer them some knives and other iron goods and a red cap to give to their chief. Seeing this, they sent on shore some part of their people with some of their furs, and the two parties traded together.

"The savages showed a marvelously great pleasure in obtaining these iron wares and other commodities, dancing and going through many ceremonies, and throwing salt water over their heads with their hands. They bartered all they had to such an extent that all went back naked, and they made signs to us that they would return on the morrow with more furs."

The railway winds its way deliberately around the coast of Chaleur, close to the shore, past the homes of a simple-living, kindly fishing folk; past gleaming beaches that each summer draw flocks of inlanders down to the sea.

And so we come to the jumping-off place, the place of farewell, and as we cross the Restigouche into Quebec and climb up into the rarely beautiful valley of the Matapédia, we cry, and surely with regret, "Good-bye, New Brunswick, good-bye!"

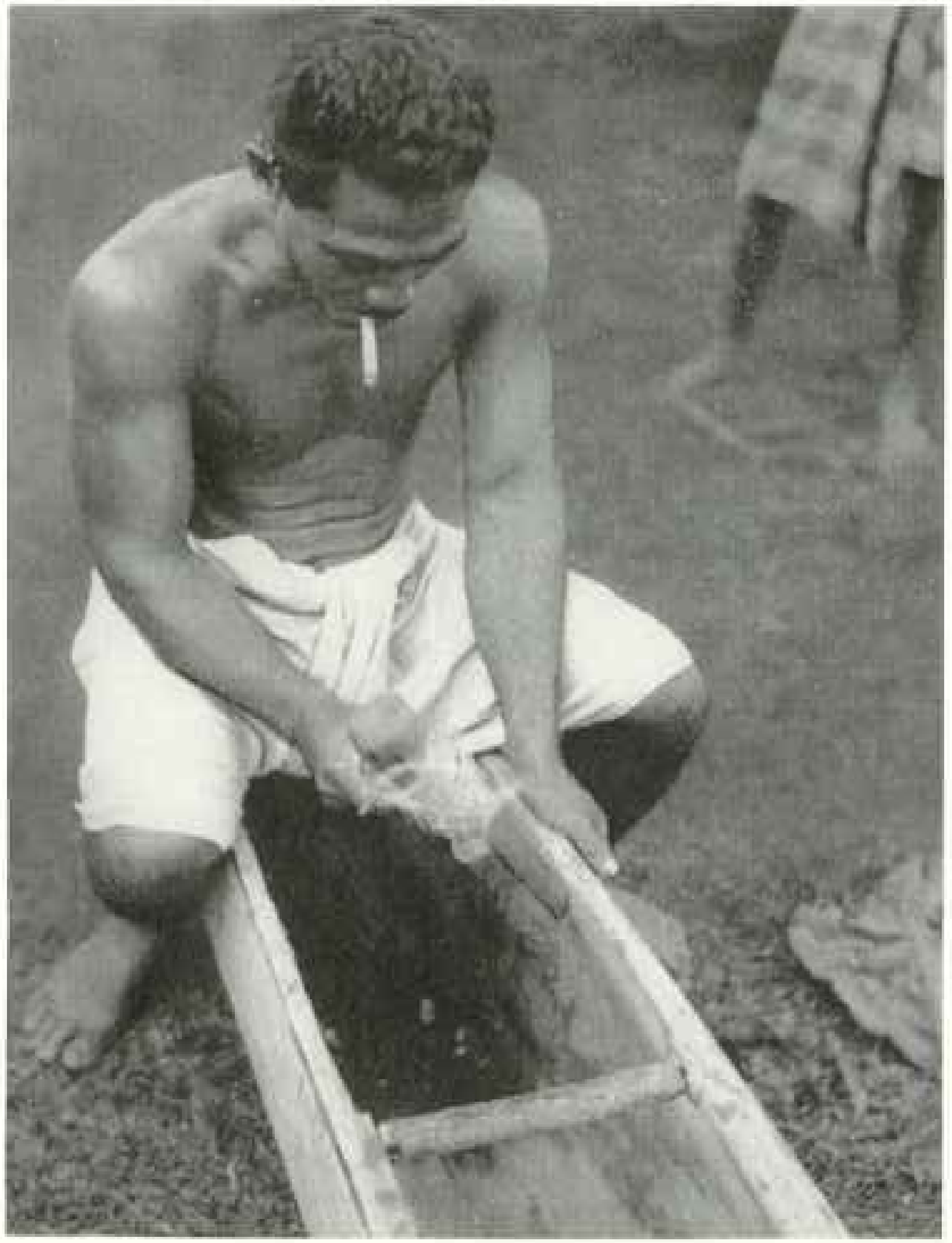
Photograph by Truman Bailey from Three Lions

Uncle Sam's Samoan Niece Wears a Gay Lava-lava, but Saves Up for a Silk Dress!

On the American Samoa Islands the United States has maintained a naval base since 1872. The strategic group, near the International Date Line, lies astride air and ocean routes. An $8,000,000 defense project is under way on Tutuila. The former German Samoas, now the Territory of Western Samoa, are governed by New Zealand.

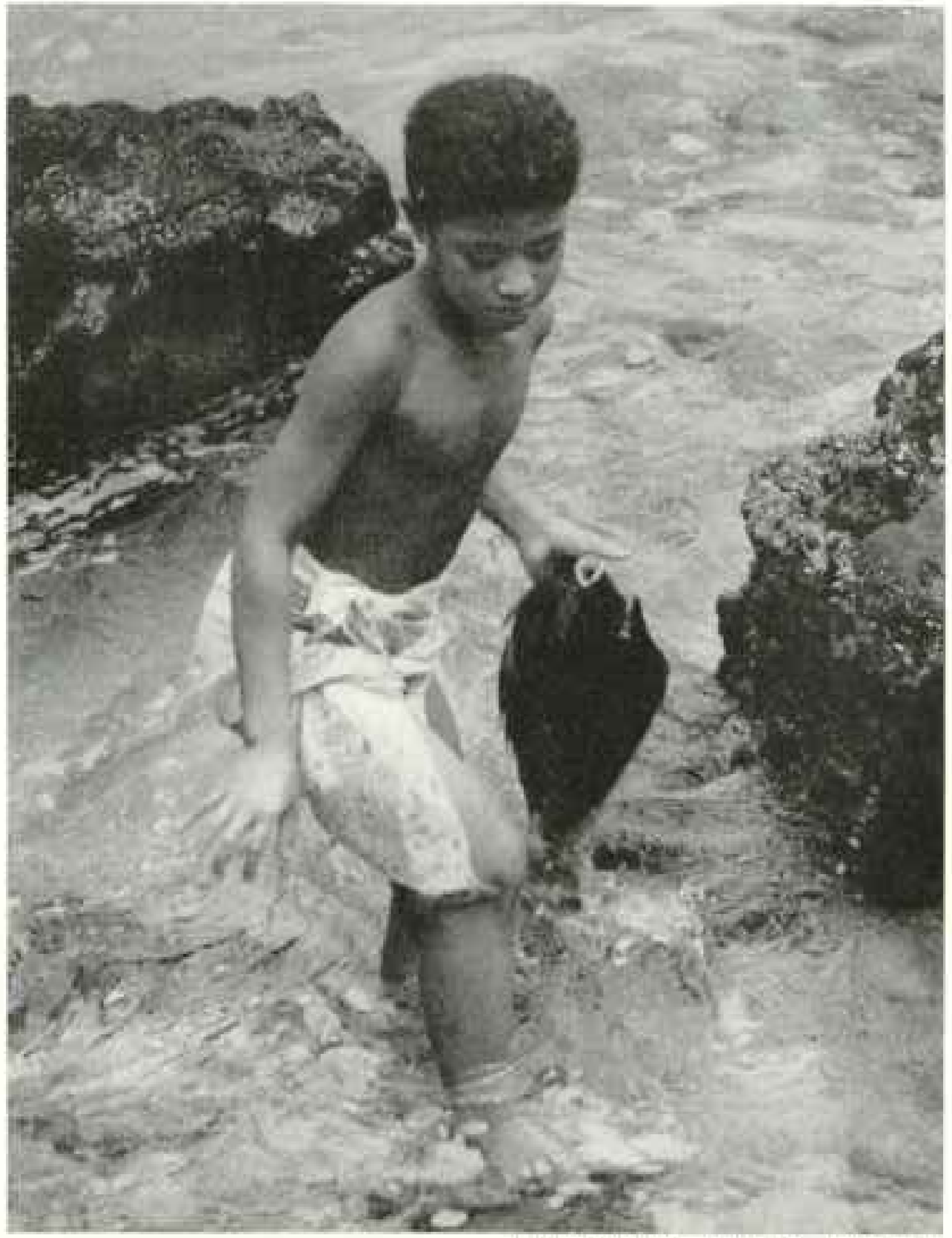
Photograph by Thomas Bailey from Three Lions

Like a Giant Spider Web, the Samoan Fisherman's Net Unfurls to Fall Upon the Sea



With a Sharp Adz, He Hollows Out a Canoe

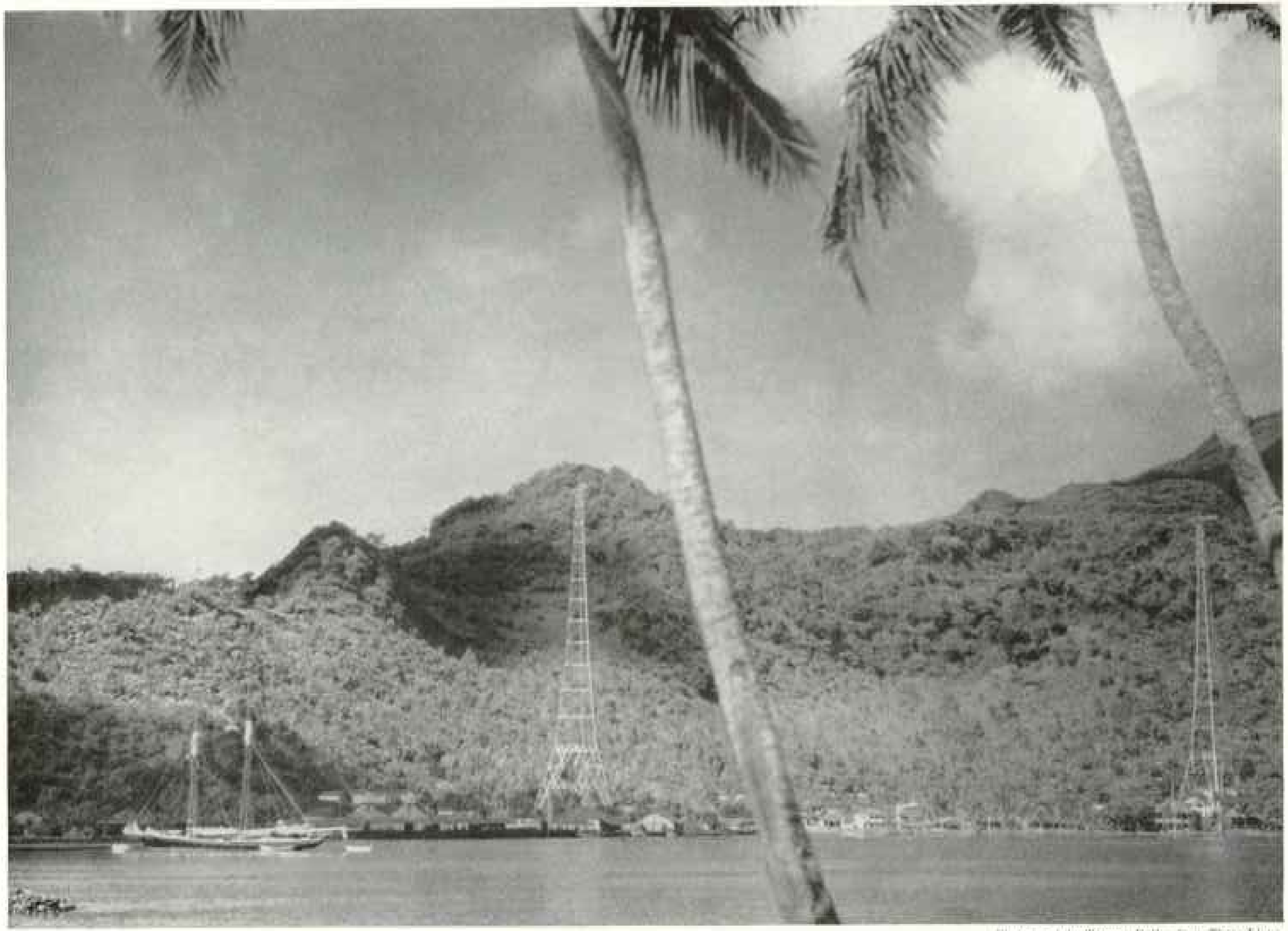
To speed the work, part of the log often is burned out. Such small outriggers are not for the open sea, but are used in fishing expeditions off the coral reefs and for short coastwise trips.



Photograph by Truman Bailey from Three Lives

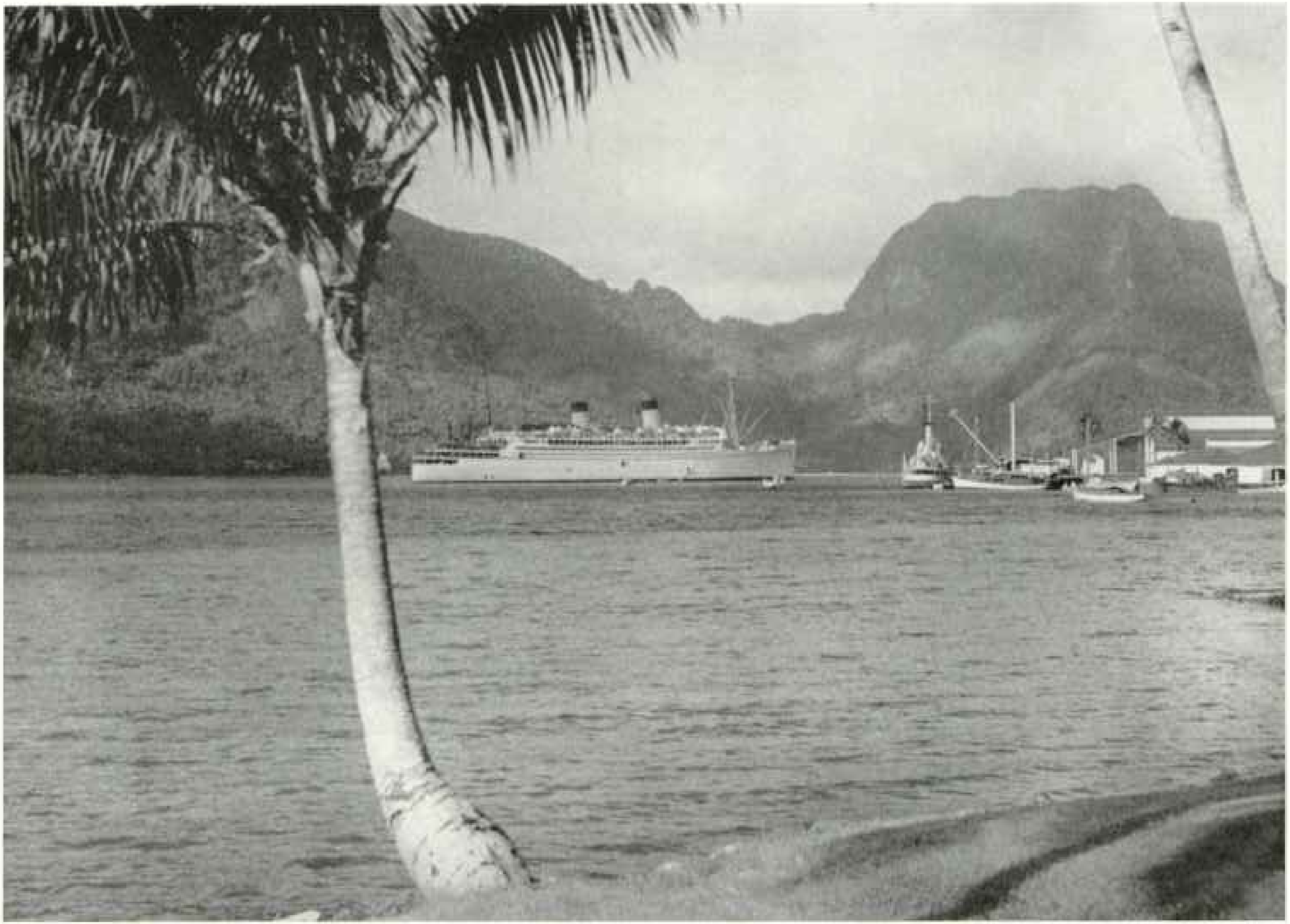
Fa'atoia Proudly Brings His Tang Ashore

Samoans catch many small fish on lines and in nets. They trap eels and lobsters on the coral reefs, spear mullet, and troll from specially made craft for bonito. Sharks are maneuvered alongside, then noosed and towed ashore.



Photograph by Truman Butler from Three Lions

In Sheltered Pago Pago Harbor Stands the U. S. Navy Radio Station, Linking America with New Zealand and Australia



Photograph by Truman Bailey from Tyrrell Lines

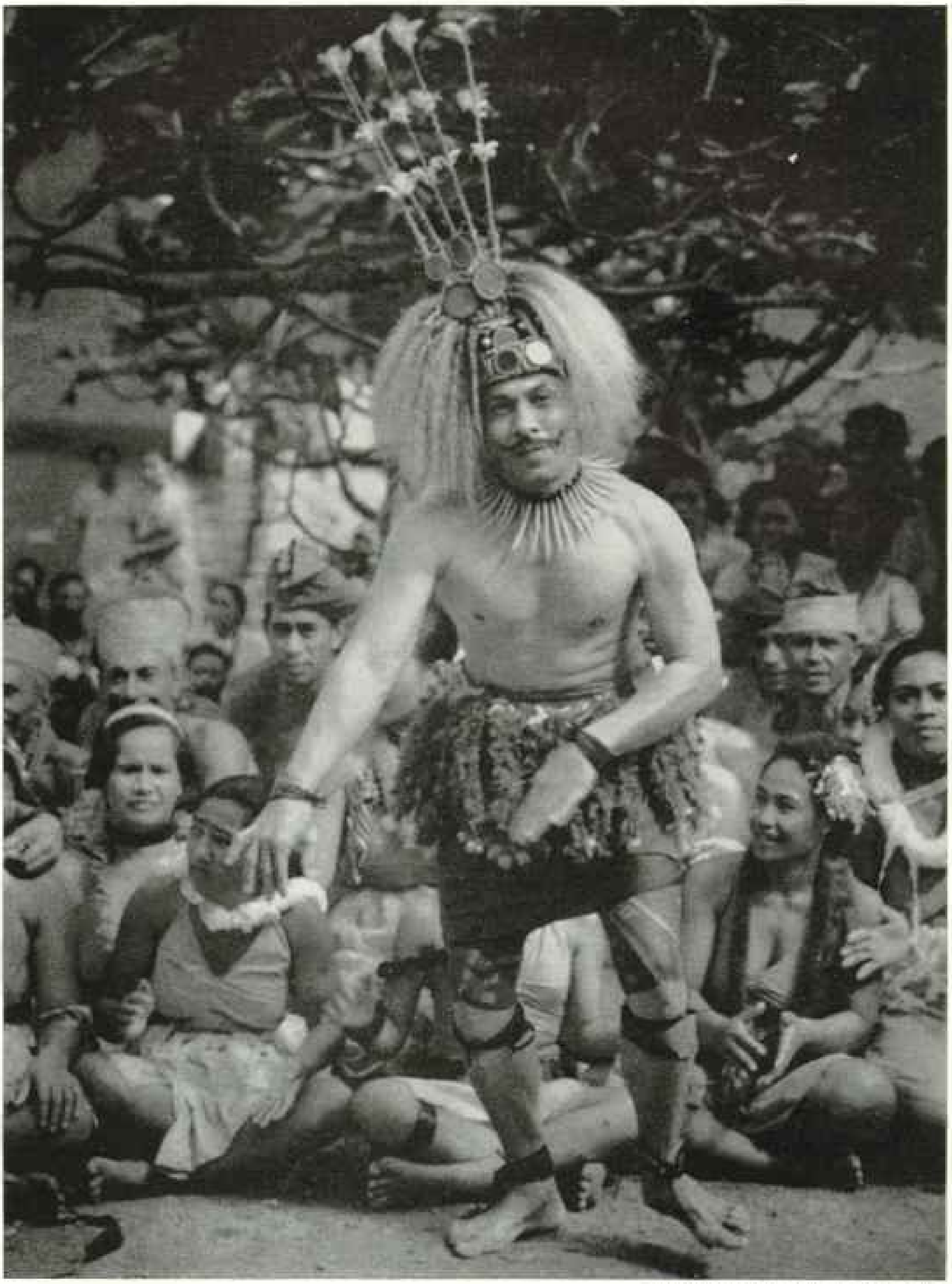
A Matson Liner Makes Her Monthly Call at Pago Pago's Deep-water Harbor, Cradled in the Crater of an Extinct Volcano

The Governor's Wife Greets the Maunga, Newly Elected Native Ruler

With her husband, Commander (now Captain) E. W. Hanson, U. S. N., she attends Inaugural Day festivities. Captain L. Wild recently succeeded Captain Hanson as Governor.

Photographs by Truman Bailey from Three Lions

The Chieftain and His Wife Make Their Debut



Photograph by Truman Bailey from Three Lions

Maunga, High Chief of Pago Pago, Dances at His Inauguration Ceremony

Fine tattooing covers his legs above the knees. When the Polynesian leader took office, a five-year dispute over the title among members of the former Maunga's family ended. Relatives came from Hawaii and other islands for consultation. Supported by the U. S. Navy, the islanders make their own town and county laws.

Photograph by Truman Bailey from Three Lions

Island Leaders Gather in a Thatch-roofed Community House to Hear Long Orations Lauding Their New Chief

Photograph by Truman Bailey from Three Lions

Under the Breadfruit Trees of Pago Pago, Samoans Gather to Feast, Make Speeches, and Watch Their Maunga Perform

At the inauguration banquet of the High Chief, roast pig (lower right) is on the menu. Other South Sea delicacies were brought in large woven baskets. Breadfruit and bananas, everyday food, may be had for the picking.

Photograph by Truman Bailey from Three Lions

Devout Samoans Contributed Many Months of Their Own Labor to Build This Church

Since 1830 missionaries have taught in the islands. The Samoan language was unwritten, so London Missionary Society workers translated the Bible and printed it in the English alphabet. The first Samoan dictionary was compiled by the Reverend George Pratt 80 years ago.

Photograph by Thomas Bailey from Three Lions

Brave Deeds of Their Ancestors Are Recalled by Tutuila Belles in a Samoan "Siva"

Seated in rows on the mat-covered floor of a chief's large house, the dancers first clap their hands. After a few moments they begin a series of undulating motions with their arms. As the tempo increases, the performers rise and go through varied steps. Faster and faster they whirl until all are exhausted.

Toa Gouges Out Fresh Coconut Meat on the Sharp End of a Stake

Photographs by Truman Ballet from Three Lions

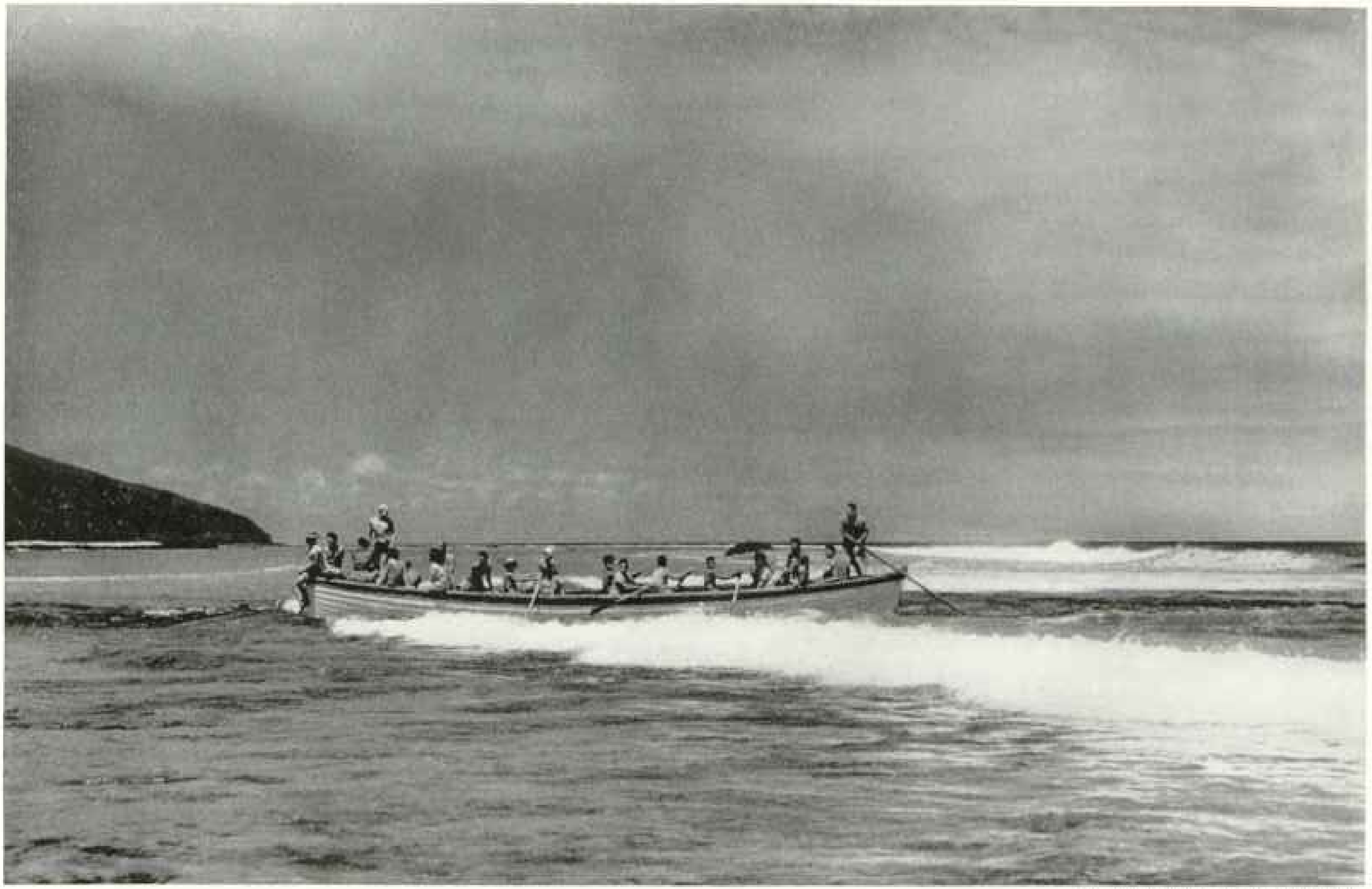
From a Boxwood Design, They Print Bright Patterns on Tapa Bark Cloth

The girls first apply a sticky color to the carved sign. Then the tapa sheet, pressed down tight, is soaked with wet paste. The color seeps into the sheet, printing the pattern through on both sides.

Photograph by Truman Bailey from Three Lions

A Samoan Family Feast—Ripe Fruits Piled High on Cool Banana Leaves

Coconuts, bananas, papayas, mangoes, and avocados grow in profusion. Among the vegetables are breadfruit, taro, and yams. Most important crop is the coconut. Samoa's only export is copra, dried kernel of the ripe coconut. From it oil is extracted for soap and salad oil, and for glycerin, used in dynamite and smokeless powder.



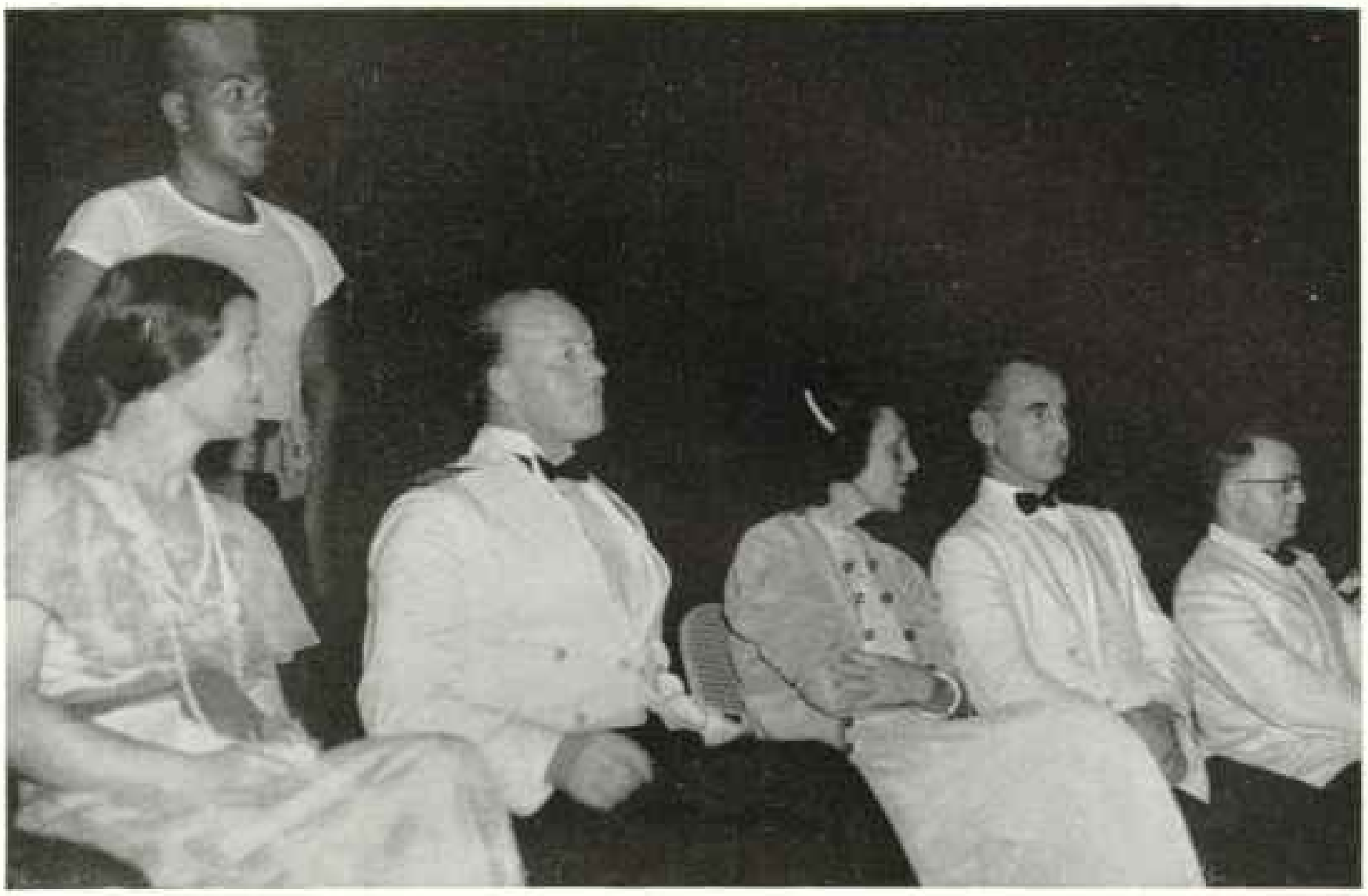
Photograph by Thomas Bailey from Three Lions

In Their Slender, Fast *Fautasis*, Sometimes Mounting 40 or More Oars, Samoans Take to the Open Sea

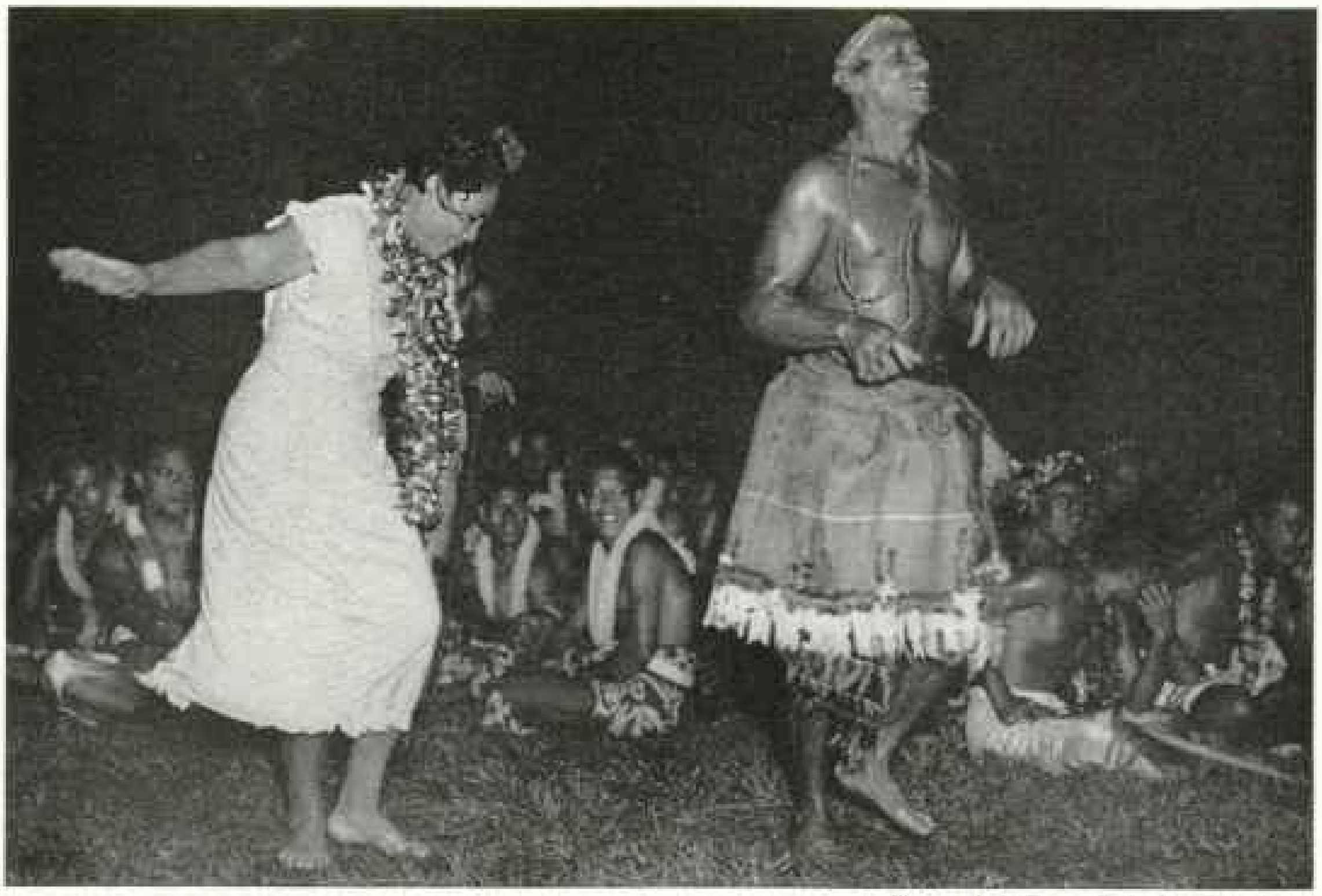
The islanders are going on a visit to a neighboring village. The women aboard are spared the heavy work of pulling an oar. One of them relaxes under a parasol. When the men resume rowing, they will chant the stroke for the oars.

Photograph by Truman Butler from Three Lions

"Hold Fast! That Breaker Nearly Capsized Her"—Samoan Whaleboats



United States Naval Officers and Their Wives Watch a Dancing Contest
Standing is a Fita, a Samoan who has enlisted in the U. S. Navy for home service.



Photographs by Truman Bailey from Three Lions

In Samoa, Robert Louis Stevenson Found "Perpetual Song and Dance"

Timbuktu and Beyond

Desert City of Romantic Savor and Salt Emerges into World Life Again as Trading Post of France's Vast African Empire

By Laura C. Boulton

TIMBUKTU always had been to me a name of mystery and romance, to be used in limericks and parodies—a place too far removed from anywhere to have reality except in dreams.

Nor did I suspect, as our expedition pushed across French West Africa on the way to Timbuktu, that soon the fortunes of a new war would throw this obscure region into sudden world prominence; that little-known Dakar, where we landed, was to be the scene of an important naval battle; that the destiny of France's vast African empire might suddenly become of grave concern not only to Europe, but to North and South America.

With war raging on far-flung fronts in Africa as I write, even Timbuktu itself soon may flash into headlines, but at the time of our visit it still seemed as poetically remote as when Thackeray wrote:

> In Africa (a portion of the world)
> Men's skins are black, their hair is crisp and curled;
> And somewhere there, unknown to public view,
> A mighty city lies, called Timbuctoo.

He then describes the "stalking tigers" (of course there are no tigers in Africa, but he doubtless meant leopards), and the roaring lions, and a helpful footnote adds, "The site of Timbuctoo is doubtful."

To some, the site of Timbuktu is still doubtful; the present official French spelling, Tombouctou, adds to the confusion (map, pages 636-7). A young woman graduate of an eastern college asked me just the other day, "On what continent is Timbuktu?" However, even in Africa itself there are still many people who are uncertain about its exact location.

About 800 miles inland from the nearest coast, as far as Chicago is from Boston, Timbuktu thrives as a busy, colorful crossroads of the vast commerce that moves through inland Africa.

With all its fascination, however, Timbuktu to me was only the beginning of several months of adventures.

Our expedition traveled 8,000 miles, visiting the hot, dry Sahara and the dank, wooded Cameroons with almost the highest rainfall on earth. We studied the highly developed kingdoms of the Sudanese peoples and the simpler life of the small Cameroon Bantu tribes; we worked among the huts of the cliff dwellers of Sangha and in the spacious palace of the black king of Benin.

This expedition, our fourth in Africa, had a threefold purpose—to collect specimens for the new hall of exotic birds in Field Museum of Natural History, Chicago (where Rudyerd Boulton, our expedition leader, is in charge of ornithology); to take motion pictures of the customs and ceremonies of tribal life; and to make records of the varied vocal and instrumental music of West Africa.

Dakar, Springboard to Brazil

We started our African journey at Dakar, the port of Senegal, French West Africa. On the edge of the continent's westward bulge, its good harbor and fine airport attract African sea traffic and make a jumping-off point for airplanes crossing to South America (pages 632, 634).

When we landed there, Dakar seemed like a bit of Paris transplanted to the Tropics. There is a sizable garden in the heart of the city, with statues honoring famous citizens. However, no artists sit about sketching in that tropical sun, nor do lovers wander hand in hand.

Dakar's night life when we were there was very gay, centering around a café where the French soldiers, settlers, and traders found amusement. The French take gaiety with them wherever they go, even into the Sahara!

By daylight, too, the city is colorful with its clean streets and shining white or blue or pink houses, often with flower-bedecked balconies. Pleasant gardens are surrounded by bougainvillea-trimmed walls.

The native quarter, some distance from the center of town, is noisy and pungent, especially in the markets when morning bargaining is at its height.

The French first came to this part of Africa in 1364, but not until much later was a permanent settlement formed. Undoubtedly Cardinal Richelieu never dreamed, when he founded the Compagnie Normande in the early seventeenth century, that this small trading colony at Dakar was to be the forerunner of a spacious French empire in the heart of Africa, larger than the United States of America.

As we entered the harbor, we saw huge yellow mounds about 40 feet high lined up in

Photograph from Amso

World War II Shells Fell Close to Dakar's World War I Memorial

The monument was erected in honor of the city's men who fell in France from 1914 to 1918. When British and "Free French" forces fired on the capital of French West Africa in September, 1940, missiles struck the Governor General's residence, the radio station, and Wakham airport. Fifteen-inch guns from the damaged French battleship *Richelieu*, in the harbor for repairs, joined those from the four modern forts in repelling the attack.

regular formation along the shore (page 635). They were not sand or rock, but peanuts—or "groundnuts" as they are called almost everywhere outside America. Peanuts form the principal export of French West Africa in normal times. The half million tons shipped annually to European and even American ports before the war were made into oil for the manufacture of soap and numerous other products.

The Importance of Peanuts

What cotton is to our Deep South, the peanut is to Senegal. Each native harvests his own crop and carries it in sacks on his head or on a donkey, if he is prosperous enough to have one, to the nearest trader. Eventually these big sacks of peanuts reach the coast by rail, truck, or boat from the interior.

As soon as it was known in Dakar that we were Americans, with enough guns and ammunition to start a small revolution, we were viewed with curiosity and not a little distrust.

Suspicions were dispelled when the word was spread by grapevine that we had come to the Governor General of French West Africa armed not only with bullets but with letters from the American Secretary of State, from the French Colonial Office, and from the late Jesse Straus, American Ambassador to France and nephew of the sponsor of our expedition, Mrs. Oscar Straus.* Through the efficient aid of government officials we were able to prepare for the inland journey in a few days.

An important task of a woman on an expedition, just as at home, is hiring a good cook.

* The expedition was made possible by the kindness of Mrs. Straus, who accompanied us part way. The Carnegie Corporation of New York generously provided excellent recording equipment for my musical research, carried on under the auspices of the Anthropological Department, University of Chicago.

Photograph by Dr. Arnold Hahn from Andreas

An Extra-thick Roof Keeps This Sangha Community Center Cool

Short stone pillars support the heavy layer of timbers, fagots, peat, and straw, which shelter the ground floor from the heat of the sun. In this council house the elders of the tribe gather. The Habbés built their homes on steep slopes at the edge of the desert centuries ago, to be safe from their enemies. They have lived there ever since (page 638).

Then comes the marketing with the cook's assistance. In Dakar we bought our groceries in little French shops—such staples as flour, sugar, oatmeal, rice, beans, tea, and coffee.

But even in the bush where the open air sharpens the appetite, one craves a few delicacies, and these we had brought from New York—jam, wafers, and canned goods, including such American stand-bys as spinach, tomato juice, and pork and beans.

Here Chickens Are "on Their Own"

In the bush we shot game birds and antelope for fresh meat, and native chicken was always a possible last resort. One has to live in Africa to realize how tedious a chicken diet can become, especially when the chicken tastes like cooked string.

The unfortunate African chicken has no kindly farmer's wife to scatter corn for him—he must go out and scratch for his living, and it is a poor living that he usually gets (p. 665).

In certain regions we feasted on fresh tropical fruits such as mango and the melonlike papaya, which were often to be had for the picking provided we paid the owner of the trees a few cents. Near the towns we occasionally got fresh vegetables such as native sweet potatoes and beans.

Organizing a safari for penetrating the interior of Africa is like getting together a small circus. The comfort and the health of the party depend on the black boys, because an expedition, like an army, "travels on its stomach."

It seemed as if half the 93,000 souls who inhabit Dakar were on the dock to greet the ship, and most of the blacks wanted jobs as our personal attendants, or at least to pounce upon our baggage and demand porters' fees. We extricated ourselves from the scrimmage and our retinue began to take shape, with nine

A French Navy Plane Taxies into Dakar's Harbor, Take-off Point for Seaplanes Crossing to Brazil, Only 1,860 Miles Away

Photographs by Lucile Q. Mann

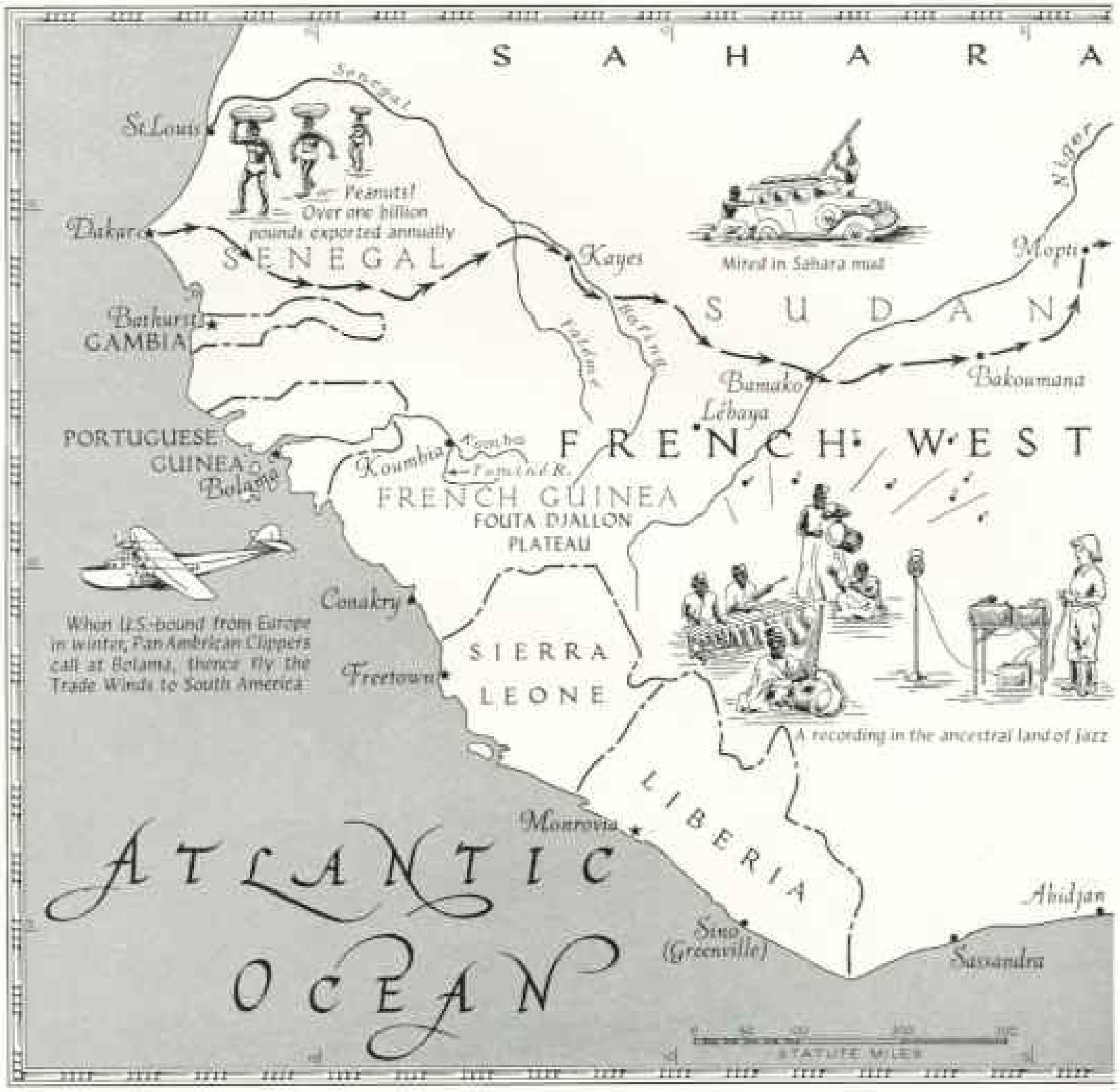
British and "Free French" Forces Failed to Destroy Dakar's Submarine Net and Other Harbor Defenses

Floating buoys support the mile of steel-cable net which closes the mouth of the harbor. The photograph was made in August, 1940, a month before two British battleships, several destroyers, and troops from transports attacked the port. The invaders were repulsed by 10,000 French and Senegalese defenders.

Photograph by Burton Holmes from Galloway

How Many Five-cent Bags Could Be Sold from These Peanut Mountains in Dakar?

Like sandbag ramparts, sacks of peanuts and grain await shipment from this strategic capital of French West Africa, which sprawls at the edge of the continent's western bulge. The port commands the sea lanes through which Argentine meat and grain, Venezuelan oil, and Brazilian cotton move to Europe in normal times. Through this city of some 86,000 Senegalese, and 6,500 French and other Europeans, passes most of the trade of the vast colony (page 632).



Into the Birthplace of Jazz Went the Author, to Record Primitive Music

From Dakar, peanut capital of the continent, eastward to Timbuktu, Mrs. Boulton held "auditions" for Senegalese, Moors, and Tuaregs. Turning southward, she visited the negro tribes of Nigeria, then skirted the coast of the Gulf of Guinea to see Cameroons Mountain.

personal servants, including a head boy, camp boys, car boys, and the cook and his assistant.

A Thief Hunt in Pajamas

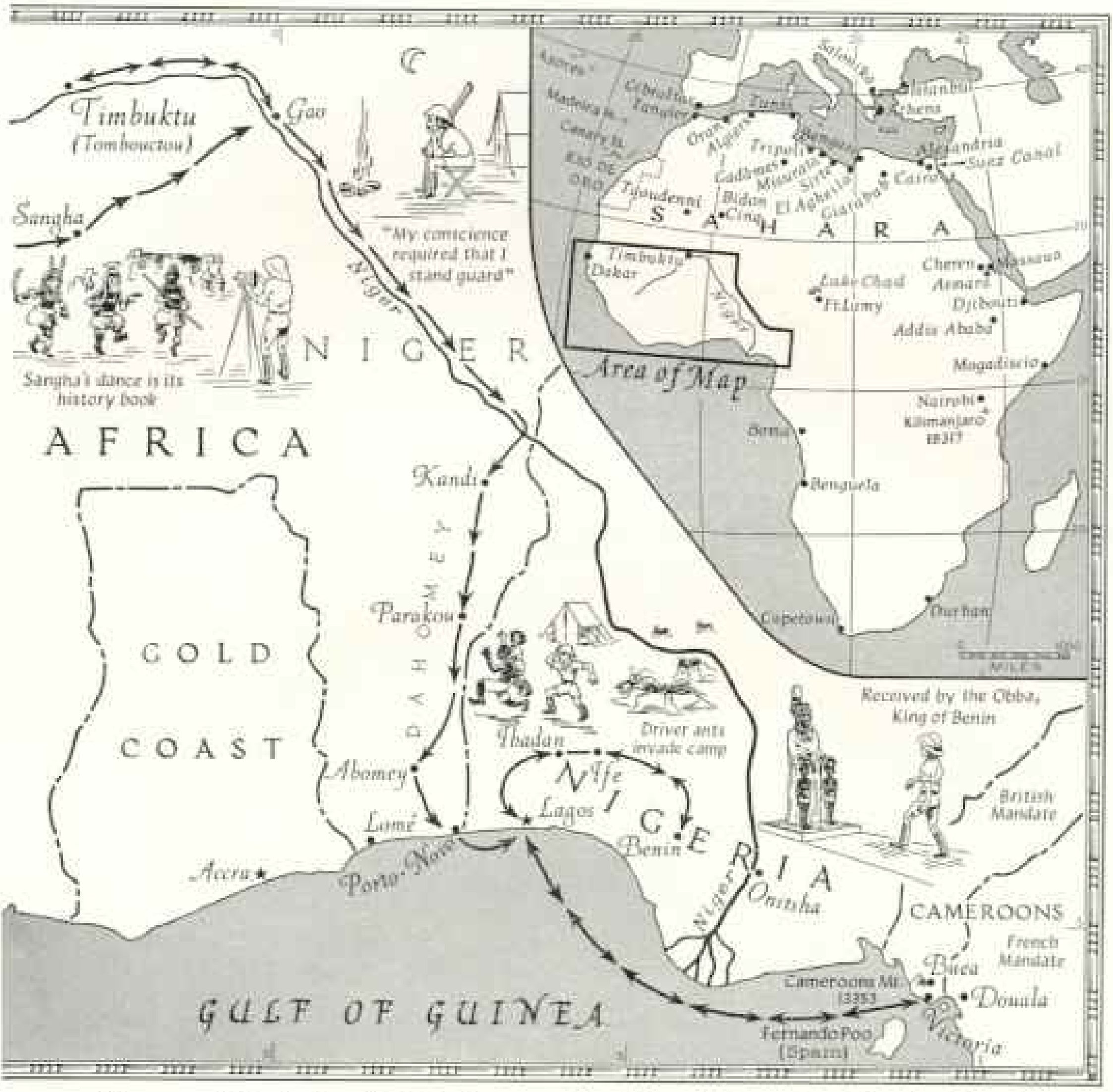
The night before we left the coast a boy from a British colony suddenly appeared, bearing excellent recommendations from a former expedition. As all the others were town boys, knowing nothing about camp life, this chap seemed a real find.

But our joy was short-lived. One hot, breathless night not long after, he decamped into the desert with a fair amount of our money and valuables.

The entire expedition turned out in pajamas for a frantic search through the village—a sight that would have been laughable at any other time. Fortunately the culprit was caught with his loot intact.

In our caravan of one sedan and two trucks brought from America, we left the damp coast bound for the interior. As we approached Timbuktu, traveling over roads that were mostly rock and sand, the boys often had to jump out and extricate us from deep ruts and sand beds. Over some of these stretches a good day's run was 50 miles.

Leaving the coast, we drove two or three hundred miles each day, making camp at night as near a river as possible in this waterless



Rivers and Roads Leading South from the Sahara Plunge into Tropical Jungle

On all sides are fertile fields, brought under cultivation in recent years to make French West Africa a colony of tremendous agricultural wealth. Each year before the war, exports of peanuts, palm oil, coffee, bananas, cotton, and cabinet woods steadily increased.

country. Four tents and a shelter for the boys had to be pitched every evening, except for a few memorable nights when we drove until sundown and chose to sleep under the stars. But even when we dispensed with tents, our six folding beds had to be set up and prepared for the night, complete with blankets, sheets, pillows, and mosquito nets.

The mosquitoes were never too serious, but one night we were routed out by driver ants, which invaded camp and had to be fought off by burning a circle in the forest floor around the camp.

While some boys set up the tents and others made the beds, the cook and his assistant were making fires, boiling water for drinking and bathing, and preparing the evening meal.

Once the men were detained for several days and nights repairing a truck which got into difficulty many miles back from camp. The task of keeping the "expedition family" supplied with water, firewood, and food—not an easy job in this barren land—fell on me. The region was so thickly populated by hyenas that at night my conscience required that I stand guard over the camp.

Our route inland took us across the Falémé and Bafing Rivers. As there were no bridges in this region, we were ferried across on small rafts which carried one car at a time, and we

just barely managed to get the biggest truck on board. These rafts were propelled by human power, the natives pulling us across by cables, chanting the while in rhythm with their work.

Along the way we saw thousands of acacia trees from which is produced much of the gum arabic which goes into medicines and confectionery. It is also used in calico printing. These trees grow wild and require no care.

"Stuck in the Mud"—in the Desert!

As one nears the Sahara, the trees become fewer and more dwarfed until finally vegetation ceases, except for occasional low, scrubby thorn bushes. The rainfall gradually becomes scantier, and at Timbuktu, where the Niger River makes its most northerly bend and encroaches on the desert, it seldom rains.

We had only one rain during our entire sojourn in the arid regions of French West Africa, and our expedition had the novel experience of being stuck in the mud in the Sahara!

One day, about 150 miles south of Timbuktu, after a long climb through rocky, eroded badlands, we seemed suddenly to be at the end of the world—the jumping-off place, literally. We were on the edge of a precipice, and to go farther meant descending by ropes.

The scene was like a fantastic stage set, with cliffs, caves, gorges, tunnels, and palisades, and a cluster of small villages, collectively known as Sangha. Built seemingly on the perpendicular, they clung precariously and looked like a stronghold of the Middle Ages. They reminded us somewhat of the homes of the cliff dwellers of our American Southwest, in striking contrast to the thatched huts of many African tribes (page 633).

On the roofs of the houses near the entrance to the central village were big rocks, which, we discovered, served as doorbells. Travelers approaching the town at night must throw stones against these rocks to attract attention, and then satisfy the inhabitants of their intentions before they are allowed to enter.

Sacrificial Blood for the Altar

The chief's house, in the center of the town, was a mud structure two stories high. He had stables for his horses, granaries, gardens, and slaves to do his bidding. The chiefs and nobles were impressive in long, flowing, cotton robes, while the slaves wore short smocks of hand-woven fabric. Here the ruler lived in modest affluence, surrounded by loyal subjects.

On the rocks about the village are altars where the boys offer sacrifices when they reach adulthood and are initiated into the mysteries of adult society. At the end of the initiation period, the boys, without the assistance of their elders, pound millet into flour and mix it with warm water, making a paste which they pour on the shrines sculptured in clay. Then each boy must kill some wild thing and sprinkle its blood on the altar.

In this barren land life is not easy. A few beans and onions are grown in tiny patches where a bit of soil can be found. The beans are taken to "pounding rocks," where they are ground by the women into a fine flour which is used in making a sort of porridge.

The onions, too, are beaten into a soft pulp. This pulp is formed into huge white masses resembling popcorn balls to be sold or exchanged in the market place for tooled-leather bracelets or cowrie shells, a bit of cloth or a medicine man's charm.

Once a week comes market day, and nobody misses it, for that is the time not only for trading but for all the latest gossip to be passed around.

At the Sangha market cowrie shells, which have been money since the time of the Phoenicians, are still used as currency. All over West Africa this little shell, which has come some 3,000 miles from its native Indian Ocean, is used in magic rituals and, in addition to its value as a charm, has real monetary worth. In Sangha a large handful of cowrie shells was the equivalent of one cent in our money—enough to purchase about a peck of meal.

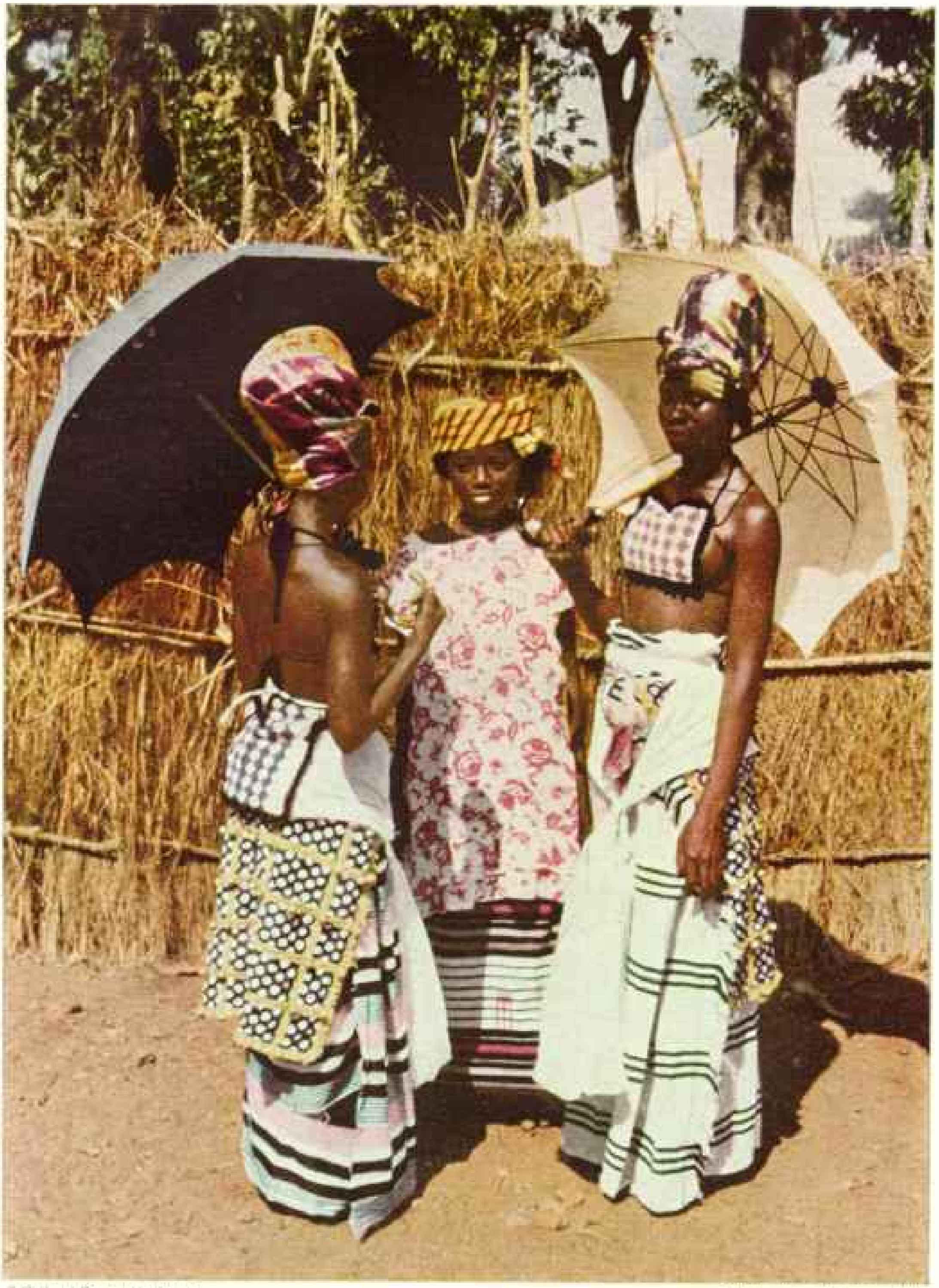
Before the harvest a cowrie shell will buy more than after; even among primitive people money fluctuates.

The Habbé (Tombo) people living here have a tradition that they wandered from their original home to their present rocky stronghold, directed by their fetishes or gods and pursued by their ancient enemies, the Peuhl (Fulani) tribe.

In their wanderings they came to the Niger River and were carried across on the back of a friendly crocodile. Miracles performed by their witch doctors and fetishes saved them from their pursuers and from the hunger and thirst they had to endure before they finally reached their mountain home.

They found the caves occupied by a quiet, friendly people, whose religion the Habbé combined with their own fetish worship. The migrating tribe intermarried with the cave dwellers, and they now have become one people.

While we visited Sangha, an important celebration in honor of a dead chief was in progress, the ceremonies depicting the history of the tribe (page 649).



 Kodachrome by Dan de Chabrak

When "That Evening Sun Goes Down," Parasols Vanish and the Dance Begins

Gaily clad Susu girls of coastal French Guinea wait with their teacher (center) to take part in tribal ritual. At the end of the dry season, Susu girls between the ages of 12 and 16 learn ancestral lore from special instructors. Although most members of the tribe now are Moslems, they still cling to ancient customs. French Guinea is one of the colonies which make up French West Africa, more than eight times larger in area than France. This region is now a focus of colonial rivalry among European Powers.

Mango-time, and the Livin' Is Easy

To fill her bowl the Susu girl picks the fruit from the nearest tree. At the height of the season, mangoes are so abundant in French Guinea they cost less than a cent a dozen.

Essence of Orange Drips from the Scraping Spoons of Fulah Tribesmen

Before the present war French Guinea exported annually 200 tons of the concentrate, valuable as a perfume in toilet waters. The orange tree was introduced in French West Africa during the 17th century.

Red Lipstick Adds to a Modern Susu Girl's Make-up

Styles in initiation costumes (Plate I) vary in different villages and change each year. Boys learn the secrets of old tribal spirit worship and fetishes in a separate group.

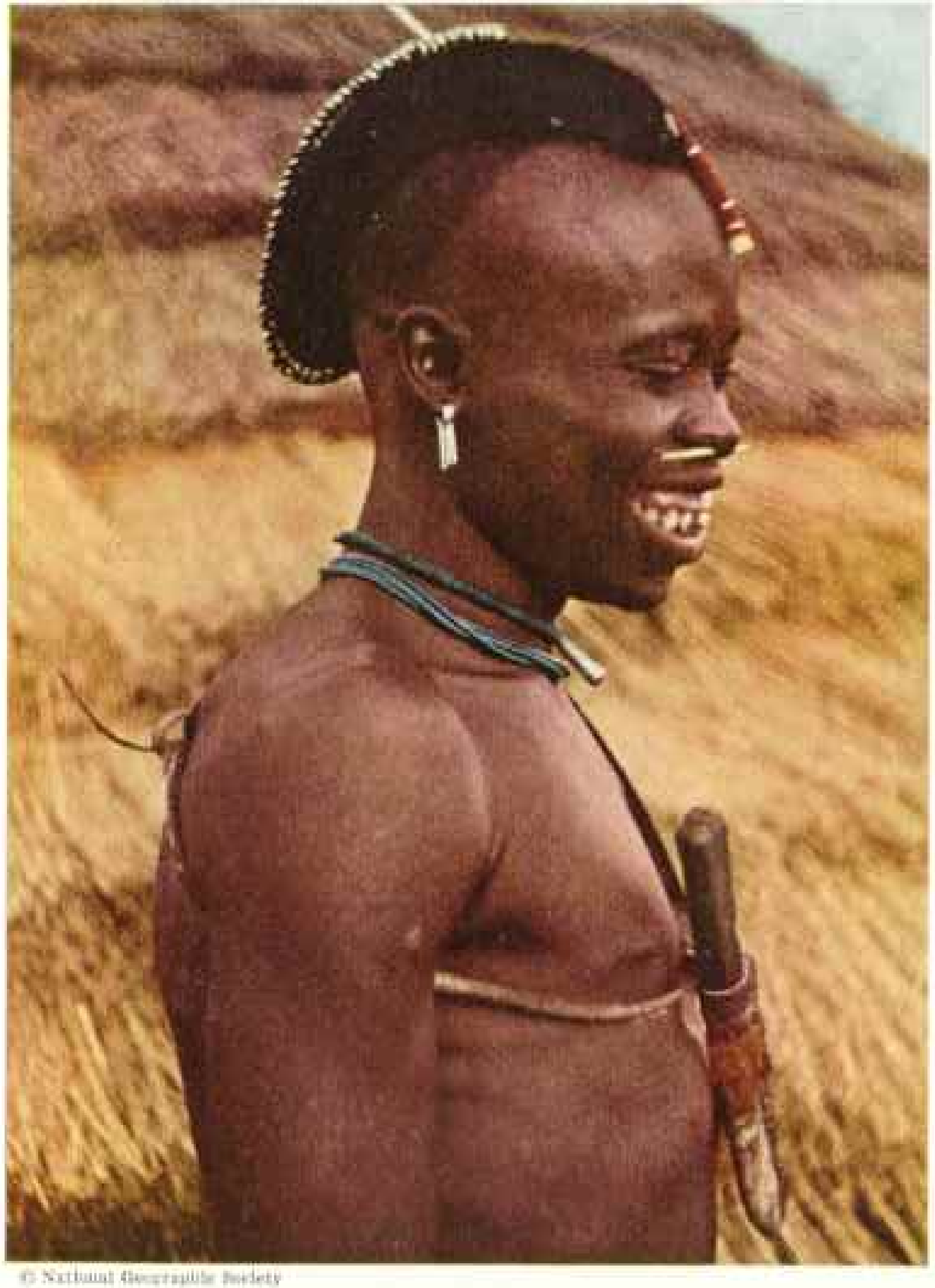
Bassari Dancers Pierce Their Nostrils with Ivory "Knitting Needles"

The bead-bedecked warriors have just refreshed themselves with palm wine, following a frenzied dance. Bassaris make fermented drinks from palm sap, millet, and wild honey.

Kodachrome by Enno de Cheulat

Susu Syncopators Swing "The Marseillaise" in Jitterbug Rhythm

Nearly every town in coastal French Guinea and neighboring Sierra Leone has a xylophone, one of the few native instruments which is not only used for tempo, but also carries a tune. This small village orchestra has two of the popular music makers. Mrs. Laura C. Boulton in her African travels described in "Timbuktu and Beyond" made recordings of the varied vocal and instrumental music of many tribes.



© National Geographic Society

Crested Hairdo and Filed Teeth Mark Him as a Well-groomed Bassari Warrior

Kodachrome by Jean de Clercq

A Susu Girl Takes to the Tominé River to Escape the Spring Heat Wave

A Hammock Is a Jungle Taxi When Roads End in the Steaming Interior

The photographer and his carriers pause on a trip into a remote section of West Africa, as yet untouched by motor highways. Here tsetse flies prevent the use of horses.

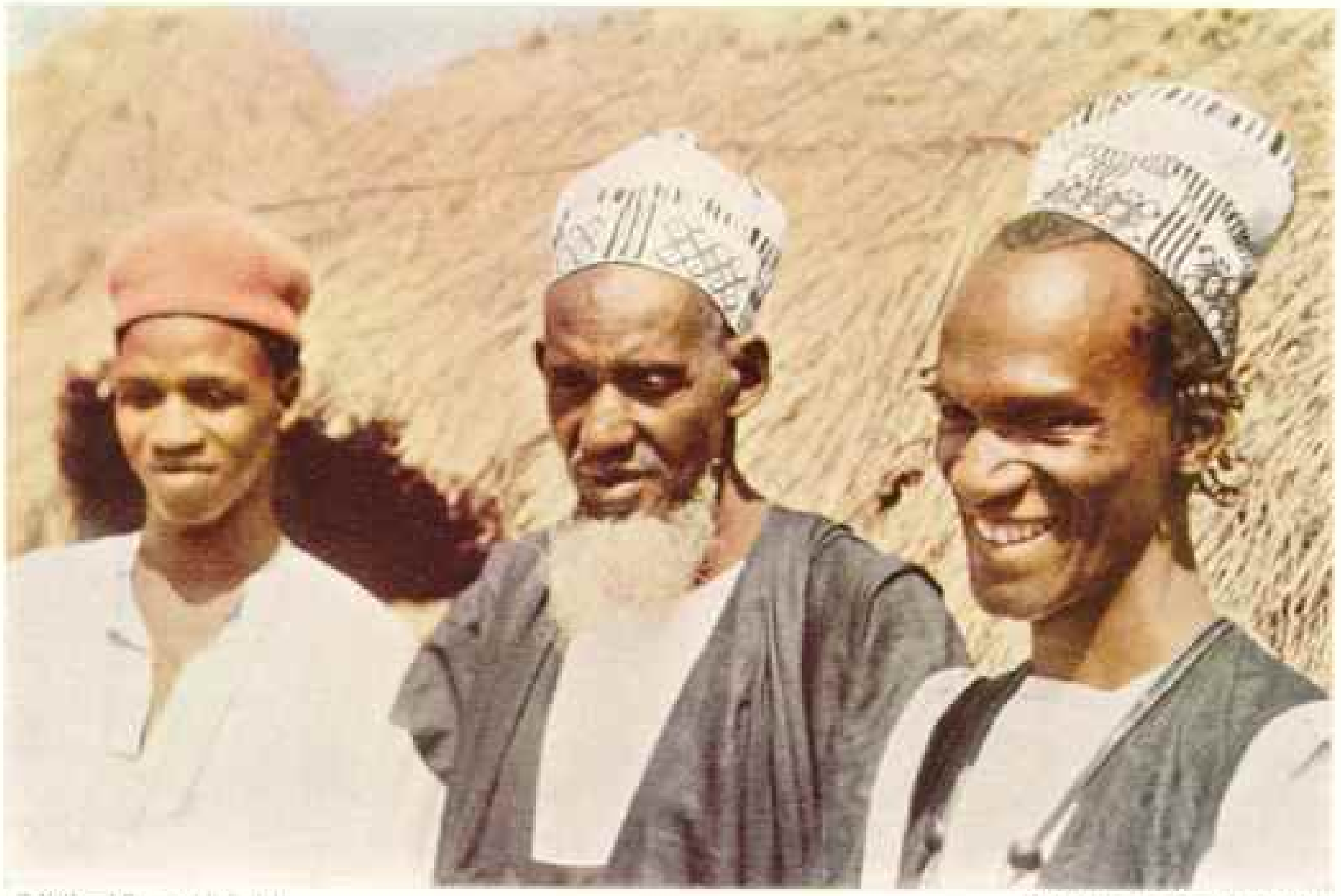
 Kodachromes by Emil de Cleterlat

A Fulah Chief and His Wife Wear Ornaments Made by Tribal Craftsmen

Existence of the old art is threatened in French Guinea. Large quantities of plastic finery, imported in recent years, are replacing delicate hand-wrought silver jewelry.

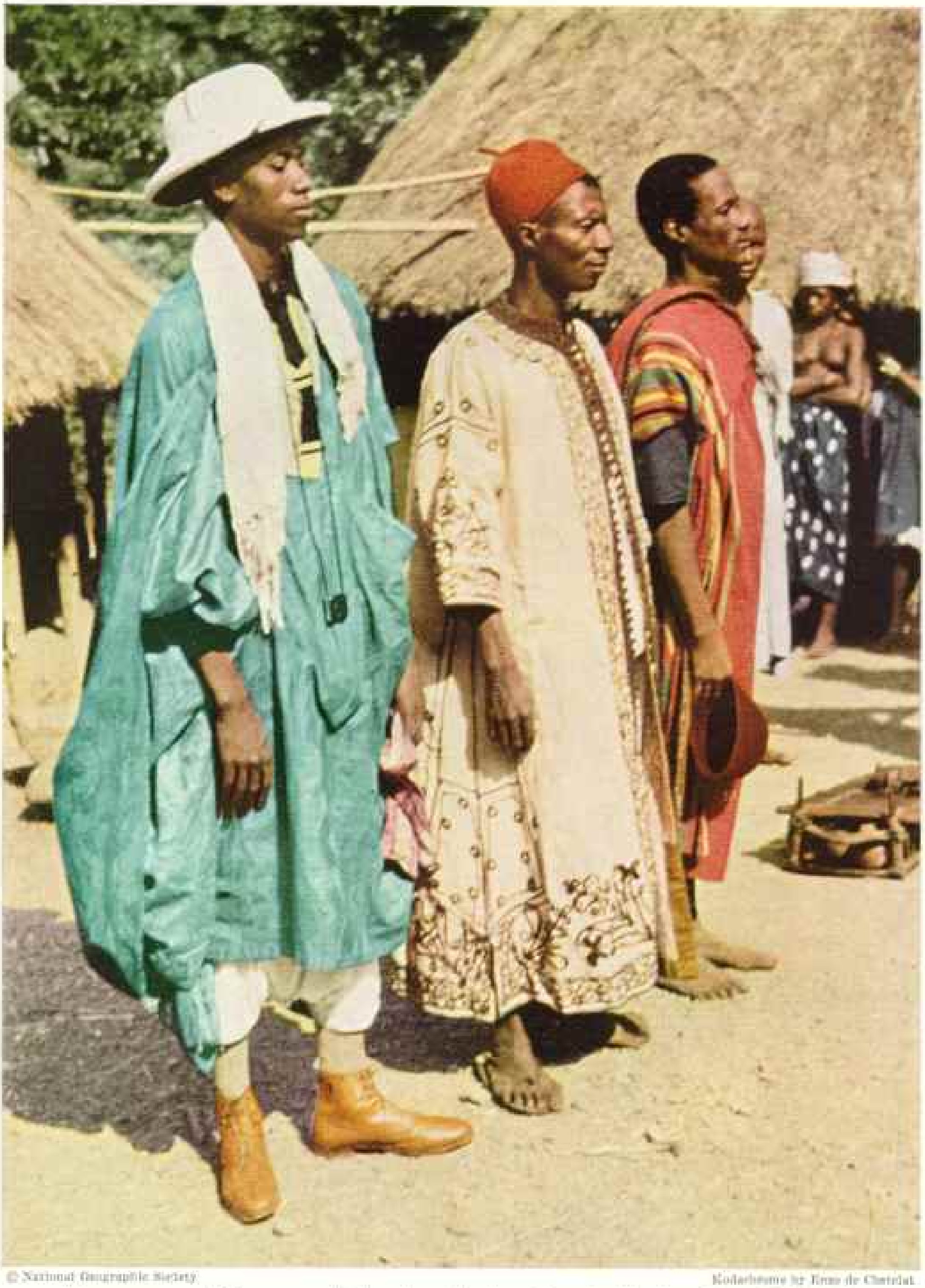
From the Silk-cotton Tree the Baga Fisherman Builds His Flimsy Dugout

The anchor he holds is made of hardwood, stone, and rattan. The Bagas live on the flats and along the mangrove-bordered inlets on the coast of French Guinea.



Fulah Tribesmen Trace Their Ancestry Back to Egypt

These nomadic tribesmen swept down to the Fouta Djallon plateau of French Guinea in the 18th century. They settled there and enslaved or drove out negro tribes.



 Kodachrome by Rene de Chetelat

European and Moroccan Styles Invade the Household of a Susu Chieftain

The ruler (center) of a village near Lébaya, French Guinea, adopts the north African costume, complete with fez and sandals. His son (left) has just returned from a near-by trading post, where he has bought the pith helmet and European shoes. Income to purchase such finery comes chiefly from palm oil and peanuts. The Susu once dwelt in the interior of French West Africa but migrated to the coast about two centuries ago, driving the tribes there southward into Sierra Leone.

Surprisingly, and unlike the practice in most African tribes, the dancing took place in the daytime, accompanied by singing and drumming and the violent explosion of native "gunpowder" made from natural sulphur or phosphate deposits in the caves.

The dances, highly dignified and formal, telling the story of the tribe, were different from the frenzied performances typical of many peoples in central Africa.

Some dancers wore huge wooden headdresses with tall swastikalike crosses representing the crocodiles who befriended the Habbé in their wanderings and who are now revered as ancestors. Others wore fantastic masks with cowrie shells woven into fiber headdresses or hoods, and skirts, anklets, and armlets of grass. These wierd-looking performers represented the Peuhl tribe.

"Smelling Out" a Culprit

In Sangha, where life is very precarious, theft was formerly punishable by death. When a theft was discovered, the old medicine men assembled to "smell out" the thief. They performed a dance in which each dancer carried a dancing stick representing the head of an antelope. Then they all threw themselves to the ground and listened intently. The spirits were supposed to whisper to them the name of the evildoer, after which, of course, he was properly dealt with.

When I first gazed on Timbuktu I had the sensation of a former expedition when I first saw the "great, grey-green, greasy Limpopo River, all set about with fever trees," made famous by Kipling in his *Elephant's Child*.

Seen from afar, Timbuktu looks colorless and unprepossessing. But, as in the case of the Limpopo, there is the thrill of seeing something that has always seemed to be unreal. The reality is a busy, live native city where about 6,600 people live permanently. This population is greatly increased when a caravan arrives (pages 648 and 654).*

As we drew near, Timbuktu rose out of the desert—a straggling, gray, mud-brick city set in the midst of the hot, shimmering plain, with a skyline of flat mud roofs and a few mosque towers beyond. Entering the town, we found a maze of narrow, winding alleys lined with neat, square mud houses.

The alleys and connecting passageways make such a confusing labyrinth that we did not dream of venturing out after dark for fear of getting lost. There are, of course, no street lights. The narrow thoroughfares lead to an open market place in the heart of the city, crowded on market days with camels, donkeys, horses, veiled Tuaregs, proud Moors, black Sudanese, and crafty-eyed Syrian traders.

Shopping there is even more exciting than Christmas shopping in an American department store. One can buy everything from mangy camels to bracelets of gaily colored tooled leather. But the bracelets of native hammered silver caught our eye. We had to resist the temptation to have some made to order on the spot by a native silversmith, but beautiful antique ones pleased us even more.

Suddenly we came upon some huge, tempting green desert melons, and hoping, in this thirsty land, to find them refreshing and sweet, we bought large quantities. Imagine our disappointment when we found them completely tasteless. Each one seemed worse than the last. The blacks, however, devoured them with a gusto that reminded us of American pickaninnies back home attacking their beloved watermelon.

Timbuktu is not wholly a city of negroes. There many African cultures meet—Moors and Tuaregs of Arabic and Berber stock from the north; Sudanese, among the most highly developed of all African negroids; and the more primitive blacks, the Bellah from the south, who have been enslaved for centuries by the Tuaregs.

Slaves, however, are not badly treated in most African communities; they are simply members of the family group who are expected to perform certain tasks. In many tribes they may purchase their freedom, but rarely do so.

Desert City Once a University Town

Timbuktu, so far from what we think of as "civilization," and in the heart of the desert, was once a university town. From the 15th to the 17th centuries the city's fame as a center of learning was so great that it was said, "We shall one day correct our Greek and Latin classics by the manuscripts preserved there."

Here was a highly important cultural center of the black Islamic Empire, which covered a large part of north Africa. Learned men came to the "University of Sankoré" and brought their manuscripts (one, or a dozen, or as many as they possessed) to study and compare them.

In those days one of the foremost collections of Arabic classic manuscripts in existence was assembled at Timbuktu. After the decline of the city many of these manuscripts were carried by their owners across the desert to widely scattered regions, but those which remained form today a valuable part of its treasure.

Moslem scholars told of its great wealth in gold and ostrich plumes and pictured it to the

* See "Timbuktu, in the Sands of the Sahara," by Capt. Cecil D. Priest, NATIONAL GEOGRAPHIC MAGAZINE, January, 1924.

Courtesy Field Museum

Versatile Malinké Musicians Combine Strings and Drums

The instruments are called "war drums" because in time of battle the players beat loudly on the gourd resonators as they march ahead of the chief and tribal warriors. On peaceful days they pluck the strings. These music makers sing, dance, and play all at the same time.

outside world as such a brilliant and wealthy city that Louis XIV of France planned an expedition to it, but it did not materialize.

In 1591 a French sailor was taken captive and died a slave there. At the beginning of the 19th century the Frenchman René Caillé spent two months in the city, disguised as a Moor. He was the first European to get out alive. In 1825 the English sent Major Gordon Laing. In less than a year he was killed and his volumes of notes destroyed because, according to local tradition, this mecca for Mohammedans could not be desecrated by the presence of a Christian.

In 1894 a French expedition took over Timbuktu, and the Sudanese inhabitants welcomed the Frenchmen as saviors from their Tuareg oppressors.

The White Fathers (Augustinian monks) then entered the Sudan, and at this time Père Yakouba came to establish a Catholic mission. He was the first permanent white resident, and, after 40 years, was still the most famous citizen. His services to the French Government as a diplomat in dealing with native affairs, and as a teacher of French policies in the schools for the native population, won for him high honors.

The walls of Timbuktu and the closed, heavy, metal-studded doors are bleak and forbidding. But, entering the portals, one immediately realizes that the city is teeming with fascinating life. The image of the great and wealthy Timbuktu of the legends comes to mind—"Timbuktu, Queen of the Sudan," "the holy Mecca," "the great center of learning," "the light of the Niger River Valley."

4,000 Camel-loads of Salt

There was unusual activity in the city at the time of our visit, because of the recent arrival of a large caravan made up of 4,000 camels and their leaders. They had come 425 miles from the Taoudenni (Taudeni) salt

Courtesy Field Museum

Cross-shaped Headdress of Habbé Dancers Honors Their Crocodile Ancestors

The dance tells of the tribe's wanderings, during which the Habbés believe they were carried across the Niger River on the back of a friendly crocodile, who thus saved them from pursuing enemies (page 638). Skirts, armlets, and bracelets are made of grass.

Courtesy Field Museum

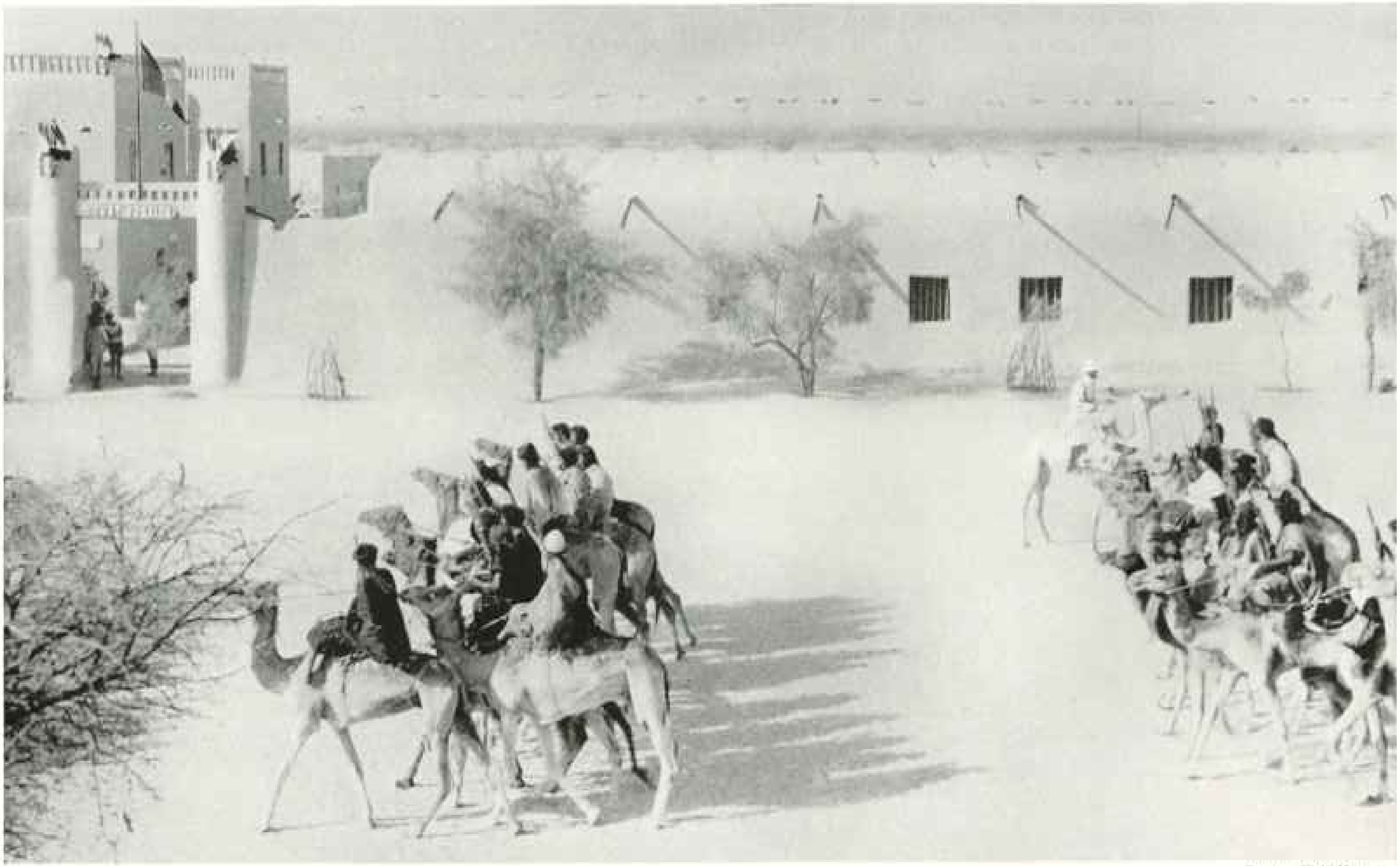
Mrs. Boulton, on a Trained Racing Camel, Rides with the Sahara's "Mounted Police"

The jaunt outside Timbuktu was especially exciting for the author because she did not know how to steer her "ship of the desert" with her feet (page 654). Each patrol is made up of a French officer and Moorish soldiers. They pursue bandits and maintain law and order in the desert.

Courtesy Field Museum

Tuaregs, Moors, and Sudanese Crowd Around the Author in Timbuktu to Hear the Music They Have Recorded

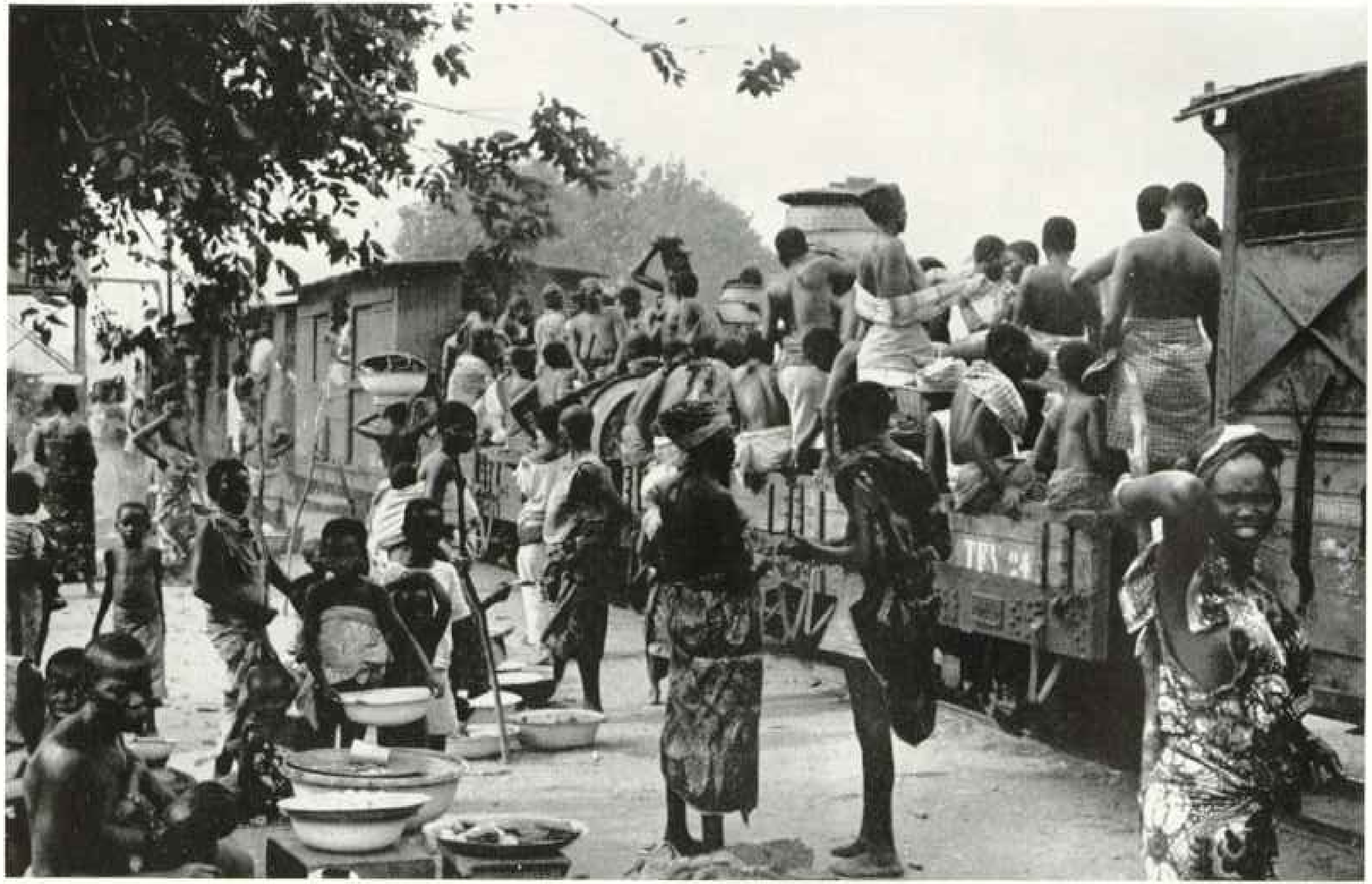
"Here, just as everywhere," writes Mrs. Boulton, "their shyness and bewilderment soon gave way to the joy of the game of recording, and I needed strong guards to keep the crowds back. They sang songs of war, of herding the flocks, of trading caravans, and of love."



Courtesy Field Museum

Platoons of the Racing Camel Corps of the French Sudan Parade Before Fort Bonnier in Timbuktu

"Meharists," they are called, from an Arabic word meaning "racing camel." The fort is named for Colonel T. P. E. Bonnier, who occupied Timbuktu in 1894 and was ambushed and slain by the Tuaregs soon after. The officer of Bonnier's supporting column was Major Joseph Jacques Césaire Joffre, who later became Commander in Chief of the French Army and won the memorable first Battle of the Marne, which turned the Germans back from Paris in September, 1914.



© Kurt Lothrop

In Sweltering Dahomey, Native Travelers Prefer Open-air Railway "Coaches"

The tribesmen are on their way to market. Food venders offer refreshments as the train pulls into a way station. Most natives in this French West Africa province help to raise its principal crops of corn, coffee, cacao, cotton, and palm products.

mines in the center of the Sahara, a journey of about ten days from Timbuktu. Each camel was carrying, carefully balanced and strapped to its sides, two or more blocks of salt resembling slabs of marble, about 4 feet long, 2 feet wide, and perhaps 6 inches thick.

Twice a year, in spring and fall, the arrival of the salt caravans is the occasion for combined business and carnival. Traders from far and near assemble to spend their days in bargaining and their nights in reveling like sailors on shore leave. A few days or weeks of gaiety provide a welcome release after months spent in some tiny native village down the river, where life flows on as quietly as the river itself.

Timbuktu still thrives, because it is the "meeting place of the camel and the canoe." Salt, coming by camel caravans across the desert, and dried fish, grain, rice, and other produce coming by canoe up the Niger River, are transshipped there. From the city small camel caravans are sent out to villages on the fringes of the desert, and canoes are loaded with goods for the villages downstream.

A good percentage of the salt supply for the whole of West Africa is distributed from this spot, and is much more prized than the commercial variety imported from Europe. It is the favorite salt for use in rituals throughout West Africa.

This ancient city furnished rich material for my research in native music. Many singers were eager to perform for a few francs or for a general feast. Here, just as everywhere, the natives, at first fearful and amazed at my recording apparatus, finally considered it a grand game. Then they all wanted to perform at the same time, and I had to have a guard to keep the crowd back. It was like amateur night on the radio, with all the performers trying to get before the microphone at once.

The Magic of One's Own Voice

First, to demonstrate the idea, I made a record of my voice, usually singing English or French folk songs. This did not seem so remarkable, because to the natives white people "can do anything"—they can even fly in the air like birds. But when they heard records of their own music played back to them, they were astonished. They could hear their own voices, their own language which they could understand—this must be pure magic!

The famous camel patrol, the Sahara's own "mounted police"—called the "Meharists" from *mehara*, the Arabic for racing camel—was also in Timbuktu at the time (page 652). One French officer with a small group of handsome Moorish soldiers made up a patrol, and these units went forth to pursue bandits through the desert.

We were amazed to see the French officer, cultured gentleman that he was, sitting on his camel with bare feet and a monocle. Never was the monocle dislodged, even when his spirited racing camel was dashing at full speed across the desert. The bare feet were not for comfort in the hot climate, but for directing the camel, because one drives a camel, like an automobile, partly by pressure with the feet.

Often in prewar days this intrepid camel cavalry was away from its base of supplies for as long as six months at a time. During this entire period the white officer might never see another European. These hardy troopers can go for days in the saddle with nothing to sustain them but a meager supply of dates and nuts and a limited amount of water.

The captain and his Moors took me for an exciting camel ride in the desert—exciting for me, at least, because I was unaccustomed to the necessary foot motion involved in directing a camel (page 650). It was rather like riding in a large animated rocking chair, without the faintest idea of what the chair was going to do next.

The troopers escorted me to our camp, where they all, including the camels, recorded songs and sounds of many types, among them songs sung on the march recounting the great deeds of the soldiers' ancestors. Incidentally, the records of the camel noises resemble nothing so much as the roaring of lions.

Camouflaging Stolen Camels

One morning while we were in this region it was discovered that 200 camels had disappeared in the night from a camp 40 miles away. Government airplanes were sent out to find them, but saw no trace of the missing camels in a land where there was not one tree or bush large enough to hide even a jackal.

Tuareg bandits had stolen them, traveling all night by forced march under cover of darkness. When daylight came, the camels were weary and anxious to rest. A little sand thrown over each camel made it look like just another sand dune.

In this way the caravan reached the border of Rio de Oro, the Spanish colony on the coast, about 750 miles across the desert. Once across the line, like stolen-car racketeers, they branded the camels with new "chassis numbers" and sold them for fancy prices.

The Tuareg nomads of the desert are called "People of the Veil" because the men wrap their heads in a deep-blue veil. Apparently

Kodachrome by Elsie du Chaillu

Flowering Red Combretum Vines Brighten Fouta Djallon Plateau in Dry Season

On this interior tableland grow many varieties of fruit and gum-producing trees. Banana plantations surround the villages, peopled mostly by Fulahs (Plates II, VI, VII). Large herds of cattle and sheep are raised. Once big game was abundant, but today lions are found only in the extreme northern part. Leopards, hyenas, and wild cats are more common. Among the birds, egrets, marabous, pelicans, touracos, and parrots are numerous.

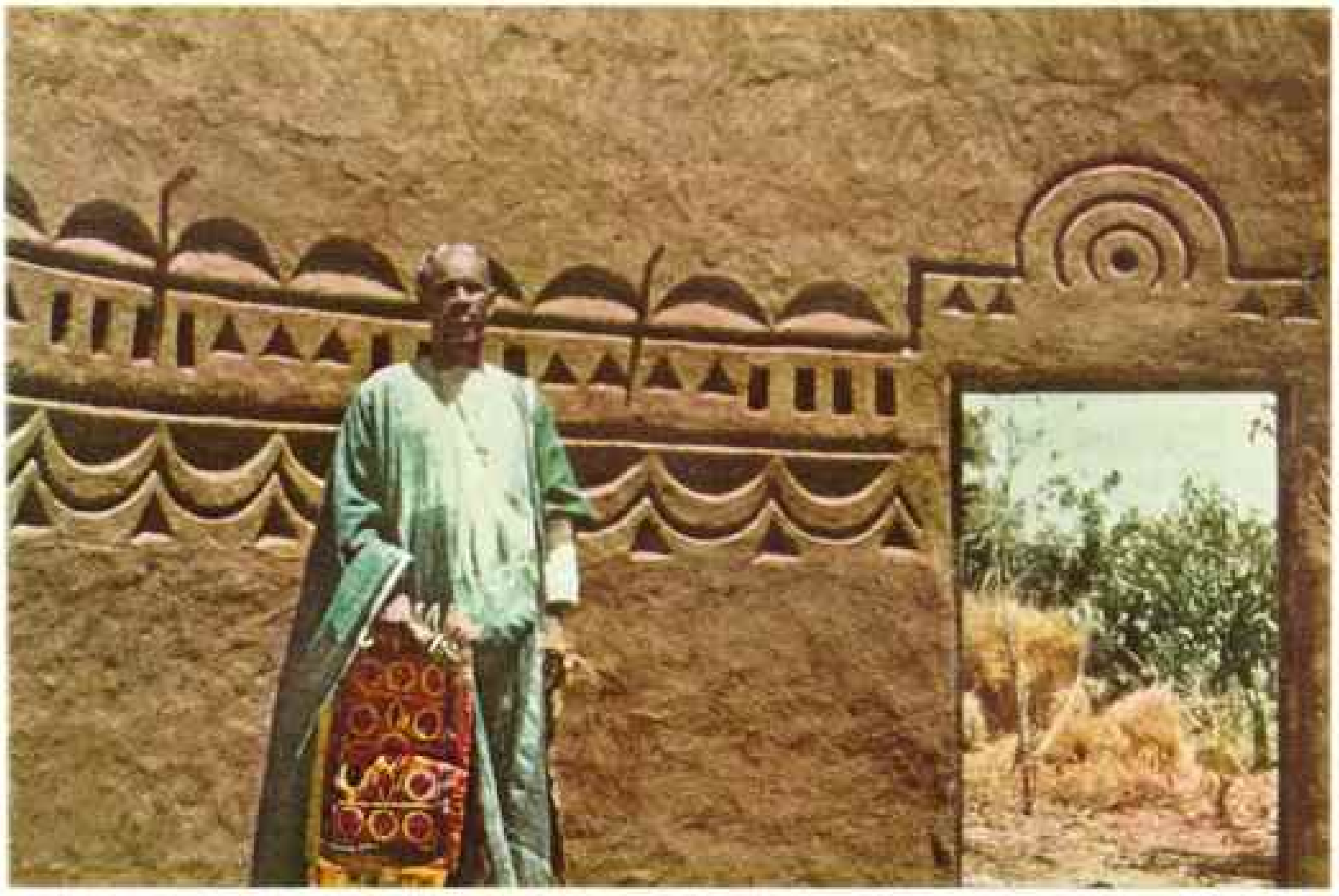
To Avoid Crocodiles, Susu Girls Bathe Only in Swift, Shallow Water

The Tominé River, like other streams in West Africa, is infested with the dangerous reptiles, but they obligingly stay in the deep, calm sections.

Kodachromes by Kate de Osterlad

Sticks and Strings, Wooden Pulleys, and Two Combs Make a Senegalese Loom

Craftsmen of Dakar, capital of French West Africa, weave narrow bands of cotton. When these are sewn together, they become the common garment of African tribes, called a *baba*.



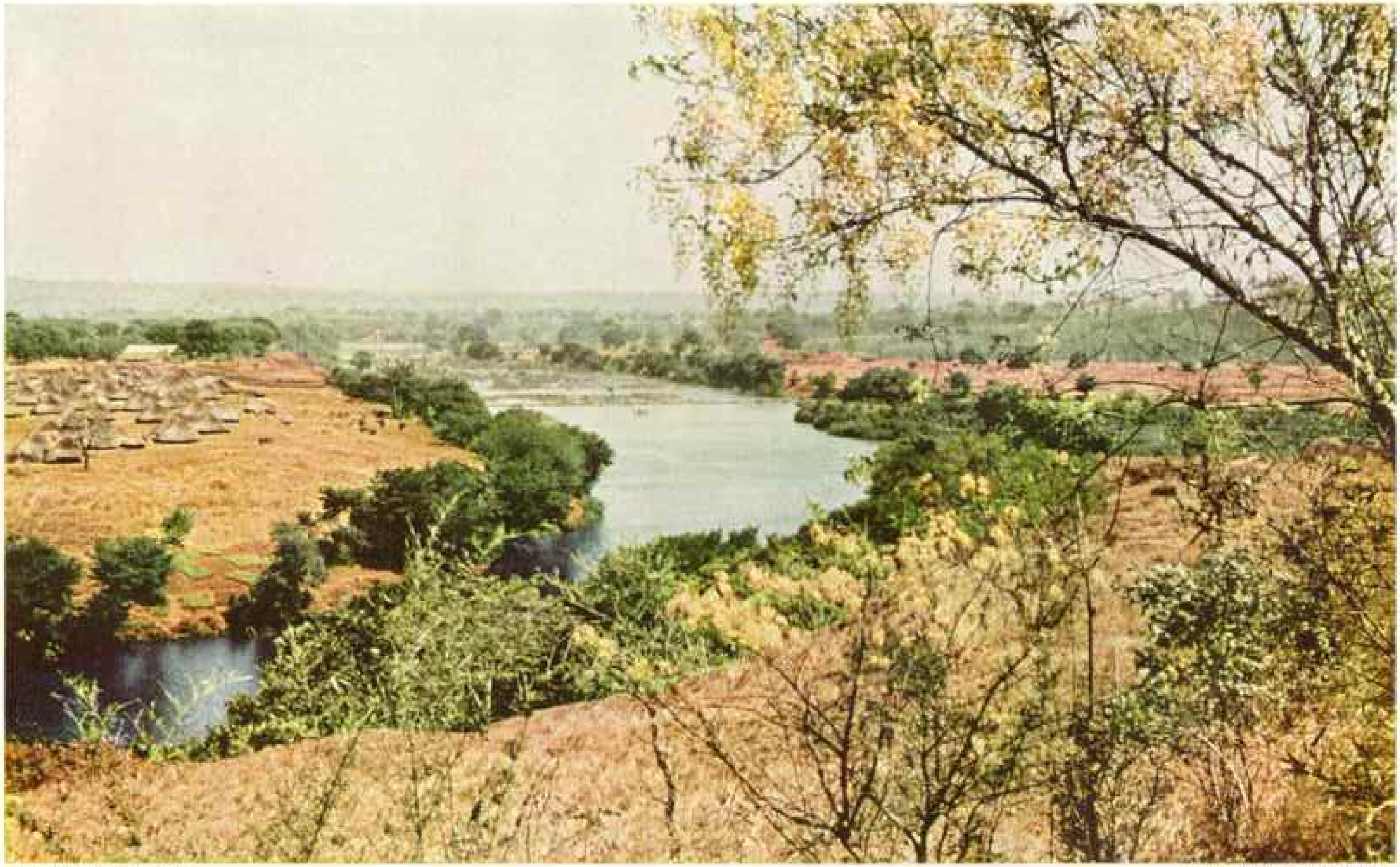
Interior Decoration of a Fulah Hut Is Simple and Artistic

The photograph was made when the straw roof had been removed. Roofs must be replaced every three years because of damage caused by termites.

Kodachromes by Jean de Clerjat

He Will Make You a Shirt for 25 Cents, or Pants for 50!

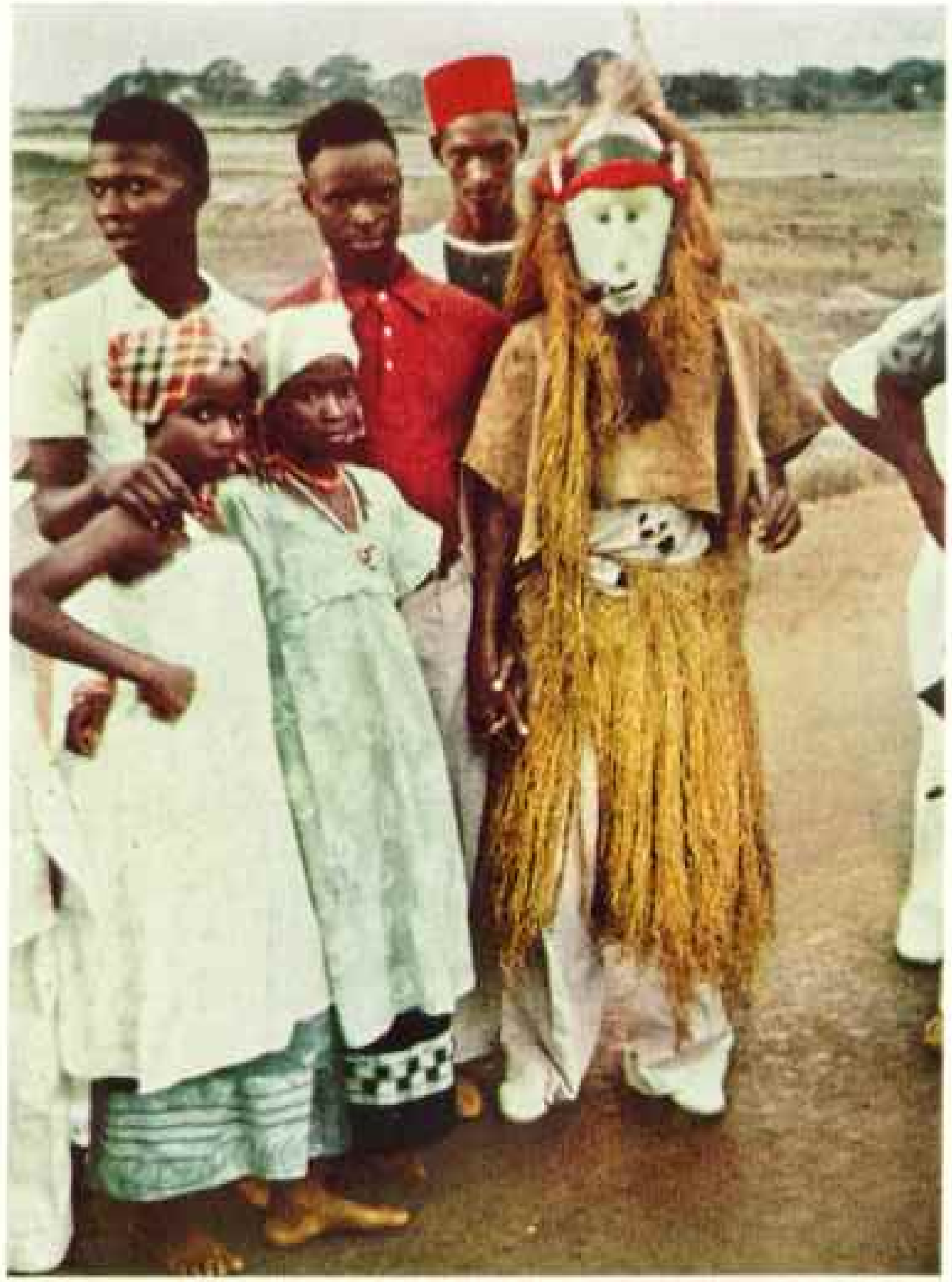
Close to every West African trading post is a man with a sewing machine. To him the tribesmen bring fabrics which they have bought at the post. Quickly he sews up their costumes.



Where the Komba and Tominé Rivers Meet Stands the French Outpost of Koumbia

Here resides the district commissioner, who supervises a territory larger than Connecticut. From a similar outpost, Fort Lamy, in French Equatorial Africa two thousand miles due east, a "Free French" army set out last January to raid and burn Mürzuch, in Italian Libia. The tree in foreground is a wild flowering cassia. The bloom resembles wistaria in shape, but is bright yellow.

Susu Palm Nut Pickers Sell the Oil-yielding Kernels to the Trading Posts for Export



Droll Dances and Jokes Are the Stock in Trade of the Masked Clown of Conakry

Bassari Drummers Shuffle to the Compelling Rhythm of Their Own Tom-toms

Most of this tribe's dances start in late afternoon. An elder gives the signal by beating a drum, and the villagers gather. Some dances last until dawn, or even longer.

 Kodachromes by Enzo de Chirolat

Round and Round the Bassari Girls Dance to the Tom-tom's Throbbing Beat

Hard work in the fields of northern French Guinea accounts for their sturdy muscles. Men and women never dance in couples, but in separate groups.

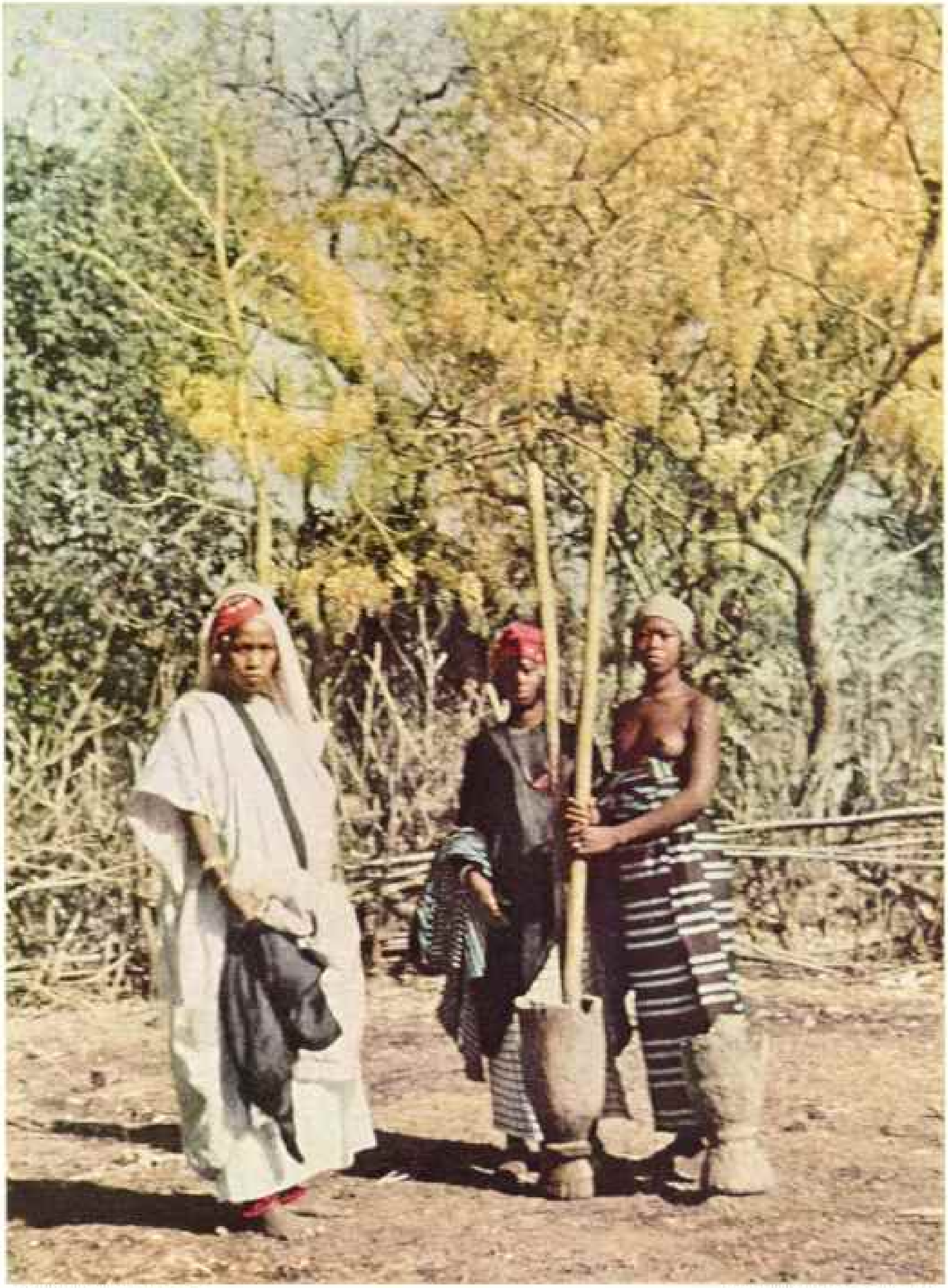
The Photographer's Escorts in French West Africa

Fodé (left), Susu guard and former Senegalese sharpshooter, saw service in Syria and Morocco. Coline, Koniagui tribesman, was Mr. De Chetelat's interpreter on many expeditions.

Kodachromes by Enas de Chetelat

Senegalese Buglers Stroll to Their Barracks in Conakry

France recruits negro troops in both West and Equatorial Africa. They are called Senegalese Sharpshooters, although only a minority comes from Senegal.



 Reduction by Elsie du Chenelat

Fulah Women Keep Their Figures Trim by Pounding Millet in Wooden Mortars

Here in the Tomine Valley of French Guinea, wives spend several hours each day separating chaff from the grains of millet or rice. Chief cereal of West Africa is millet, staple food of all tribes. Once gum, rubber, and ivory—jungle products—were the only important exports in the colony. Today an agricultural era has set in, and crops in prospect are coffee, cocoa, cotton, pineapples, and bananas.

its original purpose was protection against sand, sun, and flies, for anyone who does not wear it is called "mouth for flies."

The veil is never removed; it is said that the Tuaregs could not recognize their nearest friends and relatives without it. It is not even taken off for eating, and consequently a special spoon with a curved handle has been developed in the region.

These people are despised by other Sudanese groups, who call them "thieves, hyenas, and the abandoned of God." Such critics say that theft with the Tuaregs is not only a natural industry but might be considered a branch of education.

Their religion is now chiefly a belief in talismans, and wealthy Tuaregs wear around their necks from 20 to 40 charms in tooled-leather cases of great beauty. They have a caste system which is less elaborate than that of India.

Their Sudanese enemies say of them, "Nobles, serfs, and slaves they have, but nobility none"; and for emphasis they add, "The word of a Tuareg, like water fallen on the sand, is never to be found again."

Once-proud Capital Now Airport

Some 200 miles down the Niger River from Timbuktu is Gao (pronounced Gow), chiefly important at the time of our visit as a French military air base and a station on the air route across the Sahara. Once it was the proud capital of the powerful Songhai nation.

The ancient kings of the Songhai were great potentates, ruling over thousands of Sudanese subjects occupying a huge territory in the region now known as the French Sudan. In Gao these powerful kings were buried, and their resting place has become a shrine, so important to the Mohammedans of West Africa that three visits there are the equivalent of one pilgrimage to Mecca. The Songhai are still considered an important tribe in the region, but their former glory has passed.

The road to Gao was hardly a boulevard. Our cars labored through rocky ruts and heavy sand, and once we covered 65 yards in seven hours—this in a sun temperature which we were never able to record accurately because our thermometer, exposed to the sun, was capable of climbing only to 157°!

At Gao Mr. Boulton left us to make the 1,500-mile crossing of the Sahara to the Mediterranean, a trip which we had been told was not unduly difficult, but which developed into the most hazardous and exhausting phase of the entire expedition. The time which Mrs. Straus, the patron of the expedition, was able to spend with us had expired, so it was decided that the route across the desert was the most feasible way for her to reach Europe.

Loading three quarters of a ton of gasoline, oil, water, repair parts, food, and baggage, in addition to four persons, onto our small sedan, they set out on this 1,500-mile journey, hundreds of miles of which were a stretch of absolutely barren desert where there was neither human habitation nor drop of water.

Planks were carried to help the car through deep sand, and there were places where it could advance only the length of the planks before sinking hub-deep again. Then would come the strenuous task of getting it onto the planks once more.

A Wild Dove Hitchhikes

While the party was passing through a particularly difficult region where loose sand made frequent stops necessary, a small wild dove found the shelter of the car and followed it for many hours, resting in the shadow of the vehicle whenever it stopped. So weary was the bird from its precarious travels in the desert that it even welcomed human companionship to the extent of coming to drink water from the travelers' hands.

At Bidon Cinq (Tank Number Five), in the middle of this barren stretch where there is no blade of grass or tree or seldom a human being, tanks of gasoline had been buried by the French Government. There were two old motorbus bodies placed here for shelter by the trans-Sahara service. One solitary native was employed to dole out the gasoline during the months when cars were permitted through this lonely spot.

While Mr. Boulton was crossing the Sahara, I remained at Gao to record music and collect birds and materials. The weaverbirds, taking advantage of the acacias which had been brought in and planted here by the French along the river, inhabited these trees in huge colonies. Their name connotes their habit of weaving straws and grasses in and out, making a firm home. Both male and female assist in building this nest.

Gao is for the weaverbirds a sort of oasis in the desert, because it is the only region for many miles where they can find trees. Abdim storks and spoonbills had also come to nest in the acacias.

The Egrets' "Shadow Fishing"

Among the most interesting birds of Africa are the tickbirds. They have learned that ticks can be found not only on the hides of such wild creatures as the rhinos and giraffes, but also on ordinary cattle. The cattle seem to welcome them. As do woodpeckers, tickbirds

Courtesy Field Museum

Flowing Robes Mark the Habbé Drummer as a Noble

Poor men of the tribe wear short "smocks." The huge hat, of woven grasses bound with gaily colored leather, protects him from the desert sun. The Habbé tribe dwells in a cluster of small villages, known as Sangha, in rugged country about 150 miles south of Timbuktu (page 658).

use their tails as props. They hold themselves on perpendicular surfaces by this stiff support.

Most exciting of all the birds were the little black egrets. They have one peculiar and spectacular habit: they spread their wings while fishing to cast a shadow in front of them on the water. It is not certain whether they do this to make a cool shadow where the fish will seek refuge, or whether the shadow helps them to see better under water.

If we had not brought back the proof in motion pictures, probably no one would have believed it when we said that they fished in this fashion, looking like little umbrellas or native huts with thatched roofs. The sacred ibises eating with them are able to find their food without spreading their wings.

While at Gao I made phonograph records of the songs of the Niger boatmen and fishermen, songs which accompany the dances and the hoeing of the gardens; also ancient war and ceremonial songs. There are songs for practically every daily activity. Wandering minstrels in the region played beautiful melodies on their flutes and accompanied their singing with marimbas. The African marimba may be considered the forerunner of our modern marimbas and xylophones.

To an Equatorial Volcano

These itinerant marimba players, though they have no social standing and are considered as beggars, literally "singing for their supper," actually have great power. The leading citizens, even the chiefs, pay them very well for songs of praise, for they realize the importance of having the good will of these traveling musicians, who, by their sharp tongues and words of ridicule, can ruin the powers that be.

Pursuing the rhythms of various tribes, we traveled southward through the Military Territory of the Niger and through Dahomey to the coast capital of Porto-Novo. After a short boat trip to Lagos, we again set sail for Victoria and Cameroons Mountain, a semi-active volcano almost on the Equator. It rises out of the ocean to a height of 13,353 feet.

After the intense heat of the Sahara, where it practically never rains, it was a joy to reach the mountain forest where it is pleasantly cool even so near the Equator and where the rainfall approximates 30 feet a year. After burning sands and glaring sun, which we could

endure only with the aid of very dark glasses, the deep, all but impenetrable forest growth brought immense relief.

At the British Government resthouse in Buea, 3,000 feet up Cameroons Mountain, we assembled additional camp boys and 50 porters to carry our equipment to our next camp at 6,000 feet. Here also we found Nmanga, one of the finest native hunters we have ever had. On Cameroons Mountain the hunter's profession is highly important. Nmanga, our chief hunter, had great prestige in the native community, and by the time we reluctantly left, his stock was very high with us, too.

Through his aid and amazing knowledge of the forest creatures and their ways, we were able to obtain splendid specimens of the Cameroon francolin, a game bird resembling a partridge.

This species was first discovered in 1909. It is one of the rarest and least-known game birds of Africa, and there were no specimens in America up to the time of our expedition. Nmanga knew the francolins and their habits, roosts, favorite paths, and feeding grounds, and set his traps accordingly.

© Kurt Severinski

No Fuss and Feathers Here—You See What You Buy!

In the market of Onitsha, Nigeria, chickens are sold alive, but practically ready for the pot. Yoruba tribesmen are keen merchants with modern sales devices. They sell fowl in this grotesque manner chiefly to attract attention. Mousetraps are displayed with live mice in them, to prove their efficiency.

From our camp at 6,000 feet we climbed through the dense forest tangle 1,000 feet higher, where it ended as though cut off by a gigantic knife. Then came a belt of grassland and growth very much like that found on the higher Alps. The climb from here on to the summit was more difficult than ever, as we had to labor over lava and cinders.

On the very top of the mountain we made weather observations and deposited the records with our names in a bottle in a stone cairn, which undoubtedly other travelers will find on the summit of Cameroons Mountain.

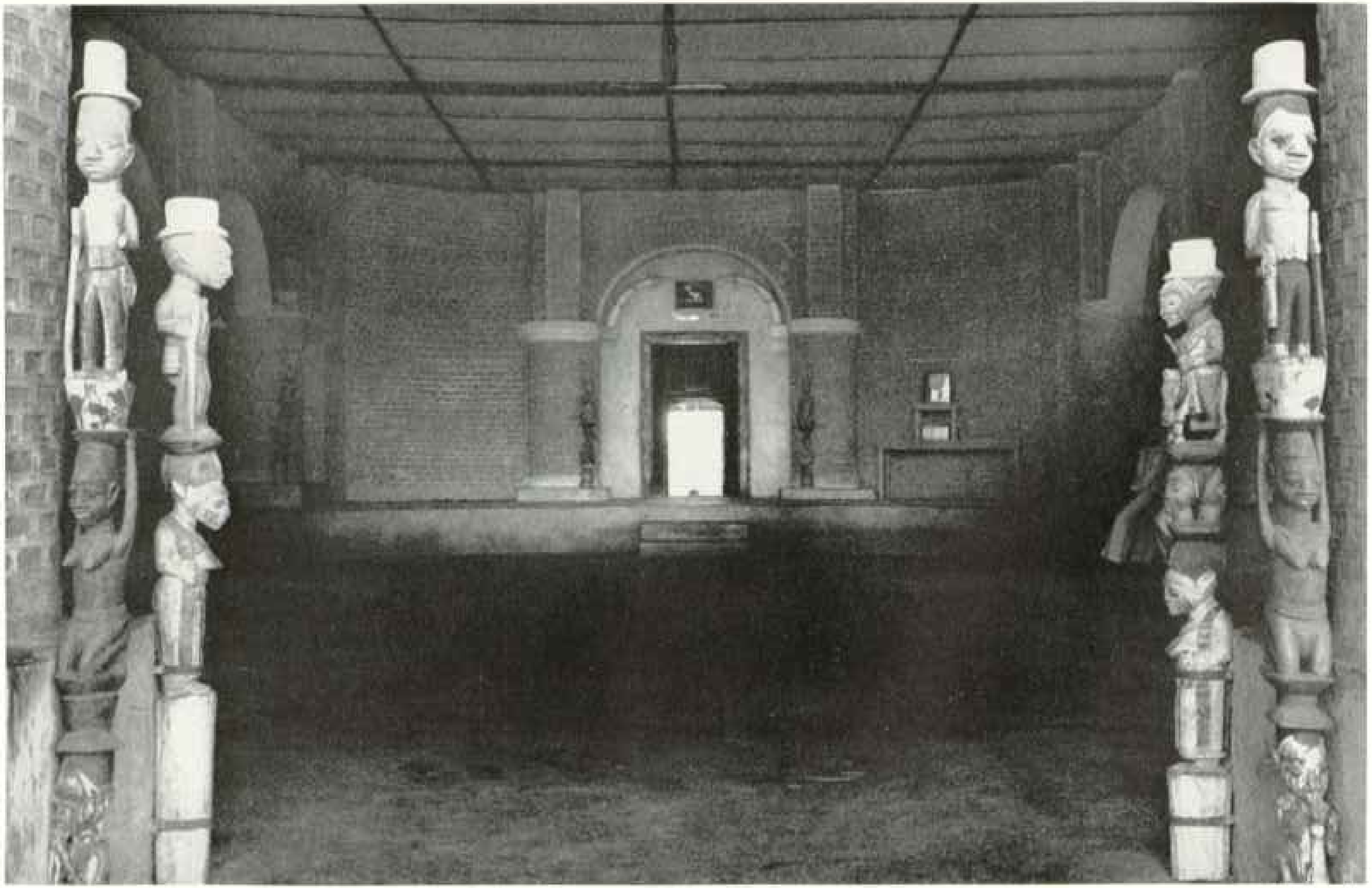
There was either constant rain or a mist that practically amounted to rain all the time that we were in this part of the mountain. Lower, at the camp at 6,000 feet, the climate was more agreeable.

Cameroons Mountain was a very important goal because of its height, and a survey of its bird life was necessary for Mr. Boulton's study of the distribution of birds in the rain forests of African mountains. On three previous expeditions we had already studied birds on mountains in Kenya, Nyasaland, Southern Rhodesia, and Angola, including Kilimanjaro,

Curious Malinké Tribesmen Look On as the Author Sets Up Her Sound-recording Apparatus in Bakoumana's Compound

Photograph courtesy Field Museum

Xylophones Tinkle Music for Scarlet-clad Malinké Boys Dancing Near Bamako, French Sudan



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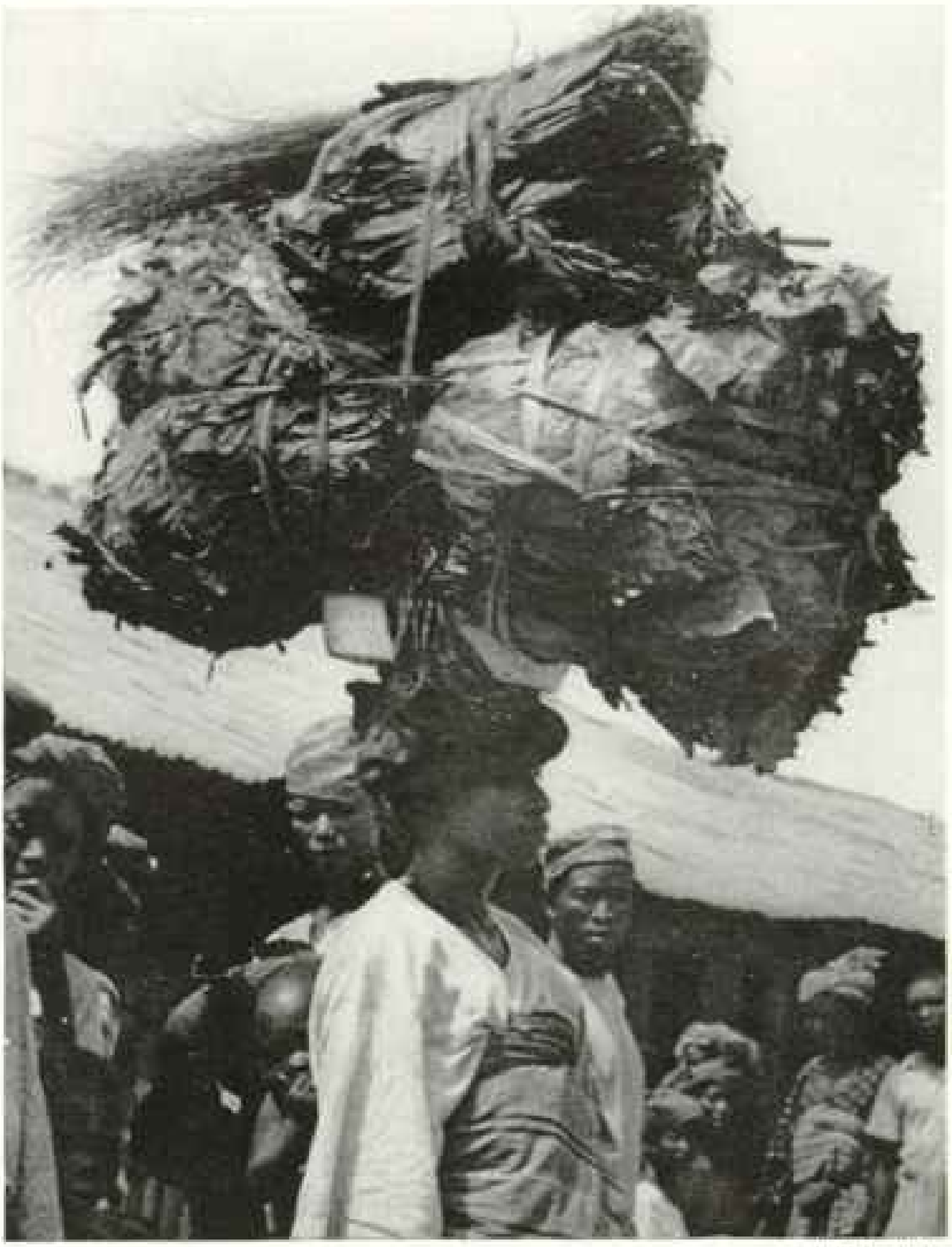
Top-hatted Figures Guard the Entrance to the Palace of the King of Ife, in the Holy City of the Yorubas

Scattered through Nigeria, the Yorubas belong to one of the most advanced tribes in Africa. Favorite subjects of native artists are the white men, residents and visitors. These caricatures, standing on posts suggesting totem poles, depict officials dressed in formal attire, yet the faces have negro characteristics.



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Cash and Carry in a Nigerian Market Place

The Yoruba woman "heads" her produce into Ibadan. No load of vegetables, no live goat, seems too heavy for this form of transport.

in Tanganyika, over 19,000 feet, highest mountain of Africa. We wanted to visit Cameroons Mountain to make the picture complete.

Rising like islands, these tree-clad mountains harbor birds distinct from those of the surrounding sea of hot, steaming lowland forest. On Cameroons Mountain there are 22 kinds which are found nowhere else in the world, and we were fortunate enough to acquire specimens of 19 of the 22.

These birds are, so to speak, "marooned" on Cameroons Mountain. Although they have relatives in the mountain forests of Angola and East Africa, 2,000 miles away, they never fly from one mountain forest to another over the sea of lowland country, where they would be entirely out of their element, just as our land birds do not fly across the Atlantic Ocean to join relatives in Europe.

Here You Climb to Any Climate

Cameroons Mountain is like a cross section of the world's climates, ranging from the tropical at the bottom to the alpine on the summit. As one ascends the mountain, he passes through a succession of definite zones of plant, animal, and bird life corresponding to each climatic belt.

When we reached the summit of Cameroons Mountain, at 13,353 feet, the temperature at high noon was only 45° Fahrenheit, although we were almost on the Equator. However, we could keep our hands warm, for on Cameroons Mountain we were literally "sitting on a volcano." It has a good eruption every few years, and one was then long overdue.

Ten large steam cracks had appeared on the summit, some so wide that we could scarcely jump across them. The steam poured out like a smoke screen. The surface at these cracks was so hot that it was unbearable to touch the ground with the bare hand.

Our camp on the mountain at 6,000 feet was a paradise amid a deep tangle of tropical forest growth. Giant trees towered more than 200 feet, all festooned with lianas and gay with orchids, mosses, and climbing ferns.

A Morsel of Roast Monkey

Birds of beauty and brilliance darted about us constantly. Many birds of the deep forest, such as the thrushes and babblers which live in the impenetrable shade of the forest floor, have unusually large eyes. Although they are active and seek their food in the daytime, their eyes are so large as to enable them to see in the dim twilight which prevails all day long in the deep forest.

Monkeys chattered gaily in the forest and tempted the natives to pursue them. All the native hunts for monkeys and other game were directed by means of a large carved wooden hunting horn, which was often heard resounding through the ravines. After such a clever and spectacular native hunt we had our first taste of roast monkey. It tasted like rather tough roast beef.

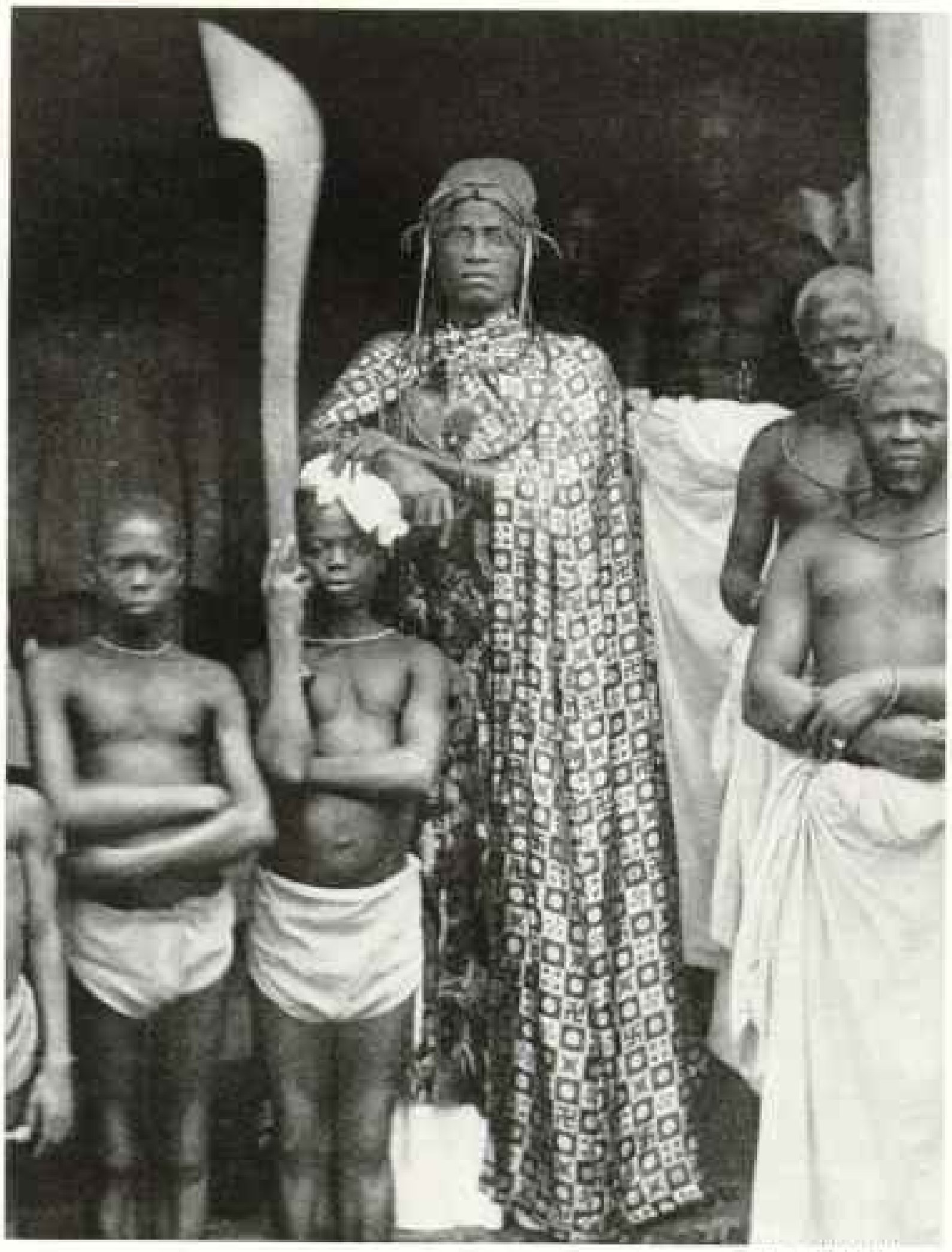
Signals blown on the horn told the hunters which way the animal was moving, and the leader of the hunt would thus guide the pursuers for hours until the quarry was cornered and dispatched with spears and arrows.

We were reluctant to leave the coolness of our Cameroons Mountain camp to return north by boat to Lagos to the heat of the lowland rain forest of southern Nigeria, but even stranger experiences awaited us there. In this British protectorate the Obba, or king of Benin, rules nearly a half million people scattered over a large area and presides over his court in all the ancient splendor of his forefathers. We decided to visit him.

To have a ready-made topic of conversation, we recorded a few Beni (Bini) songs. These we played for the Obba when we called to pay our respects, and he found them most interesting and exciting. But he said, "My court musicians could perform these songs much better. Would you not like to have them sing for you?"

Of course, that was exactly what we wanted, so the matter was quickly arranged.

At the appointed time I arrived with my apparatus at the royal "palace." Like all native houses in this region, it was built of mud, or adobe blocks plastered over with mud, and in this case decorated with fine carved wooden pillars and doors. I was met by an important dignitary and escorted into a hall of the spacious building.



Courtesy Field Museum

The Obba (King) of the Beni, Rests His Weight on an "Arm Bearer"

When this potentate of southern Nigeria takes a stroll, the boys support his arms at wrists and elbows (page 670). The huge wrought-iron knife with ivory handle is his symbol of power, kept near him wherever he goes. The king's palace is in Benin, once called the "City of Blood" because of the many human sacrifices held there.

A Salutation Ceremony

Leaving this hall, we suddenly came into the blackness of a totally dark stairway, and, proceeding by faith and feeling, we finally reached another large hall above, where I was ushered to a huge seat and left to await His Majesty.

Soon I heard excitement outside and hurried to the window just in time to see the

salutation ceremony, whose participants were not aware of an outsider.

The Obba, in ceremonial robes, was emerging from his private quarters in the palace, attended by his retinue. His headdress was a magnificent creation of coral (which represents royalty among the Beni) woven so that the entire head and hair were covered, allowing only the face to be seen.

Necklaces and bracelets, even the coverings for the feet, were of coral—all of this in a land where there is no coral. The flowing garments of the Obba were of beautiful and brilliant brocades.

Among the remarkable following of the Obba were, first in importance, the chiefs who make up the body of elders and who have great authority. There were about 50 of them, all tall, splendid, handsome fellows, with hair shaved into the form of a coronet, coral necklaces which stood out against the black satin of their bodies, and "skirts" drawn about the hips and knotted at the waist.

There were two groups of musicians, one playing flutes, the other playing horns of elephant tusks and gigantic gourd rattles. The sign of office was a huge knife with a blade of native wrought iron and a carved ivory handle. This knife shadowed the Obba constantly; if he advanced a step, the knife with its bearer advanced a step; if he retreated, the knife did likewise.

Two boys were always at the side of the Obba, literally acting as his arm bearers, for each supported an arm at the wrist and elbow while he walked. When he paused, he rested what seemed to be practically his whole weight on the head of one boy (page 669).

While the people were prostrating themselves at the feet of the Obba and chanting their morning salutation, the attendant returned and quickly escorted me back to my seat to be ready for the coming of the king.

When he had arrived and we had exchanged greetings, we progressed slowly to the court amid a cheering throng of several hundred of his subjects.

Here the memorial mounds erected for the previous Obbas were piled high with ivory tusks beautifully carved to depict events in the life of the Obba, and heads, figures, and groups of brass and bronze representing the activities of the Obba. There were also brass bells with exceedingly sweet tones, used to call the spirits of the dead Obbas to come and accept the sacrifice.

These castings are still being made. The same family has carried on the traditional art by the lost-wax process, the same technique used by Italian metalworkers during the Renaissance.

As soon as the Obba was seated on his throne chair, the musicians prepared to perform for my recording machine. They, as well as the Obba and the chiefs, were in ceremonial regalia for the songs of the ceremony to the dead kings.

This ceremony is performed only once a year, and in the old days it lasted three months, day and night, and was an orgy of human sacrifice. Now it continues only a few days, for the sacrifice consists of domestic animals, and these are much more expensive than human beings once were.

50 Wives Buried for Monarch's Harem in the Next World

The cycle of songs for this ceremony began with those for the greater chiefs while they danced; then the songs for the lesser chiefs while they made their contributions to the ceremony; then songs for the Obba's wives, and on and on until the Obba's song.

This ended the dancing and was the signal for the priests to proceed with the sacrifice. The songs and the instrumental music here were often beautiful.

I did not discover the exact number of wives the present Obba has. I was told that his grandfather had 50 of his favorite wives buried with him, to minister to his needs in the next world.

This experience was a fitting climax to a crowded parade of impressions, contrasts, dangers, and delights sufficient to fill a lifetime, instead of being packed into eight short months. Thoroughly content, we returned to Lagos to sail for home.

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On November 11, 1935, in a flight sponsored jointly by the National Geographic Society and the U. S. Army Air Corps, the world's largest balloon, *Explorer II*, ascended to the world altitude record of 72,395 feet. Capt. Albert W. Stevens and Capt. Orvil A. Anderson took aloft in the gondola nearly a ton of scientific instruments and obtained results of extraordinary value.

The National Geographic Society-U. S. Navy Expedition capped an desert Canton Island in mid-Pacific and successfully photographed and observed the solar eclipse of 1937. The Society has taken part in many projects to increase knowledge of the sun.

The Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda, during which a world record depth of 3,028 feet was attained.

The Society granted $25,000, and in addition $75,000 was given by individual members, to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California were thereby saved for the American people.

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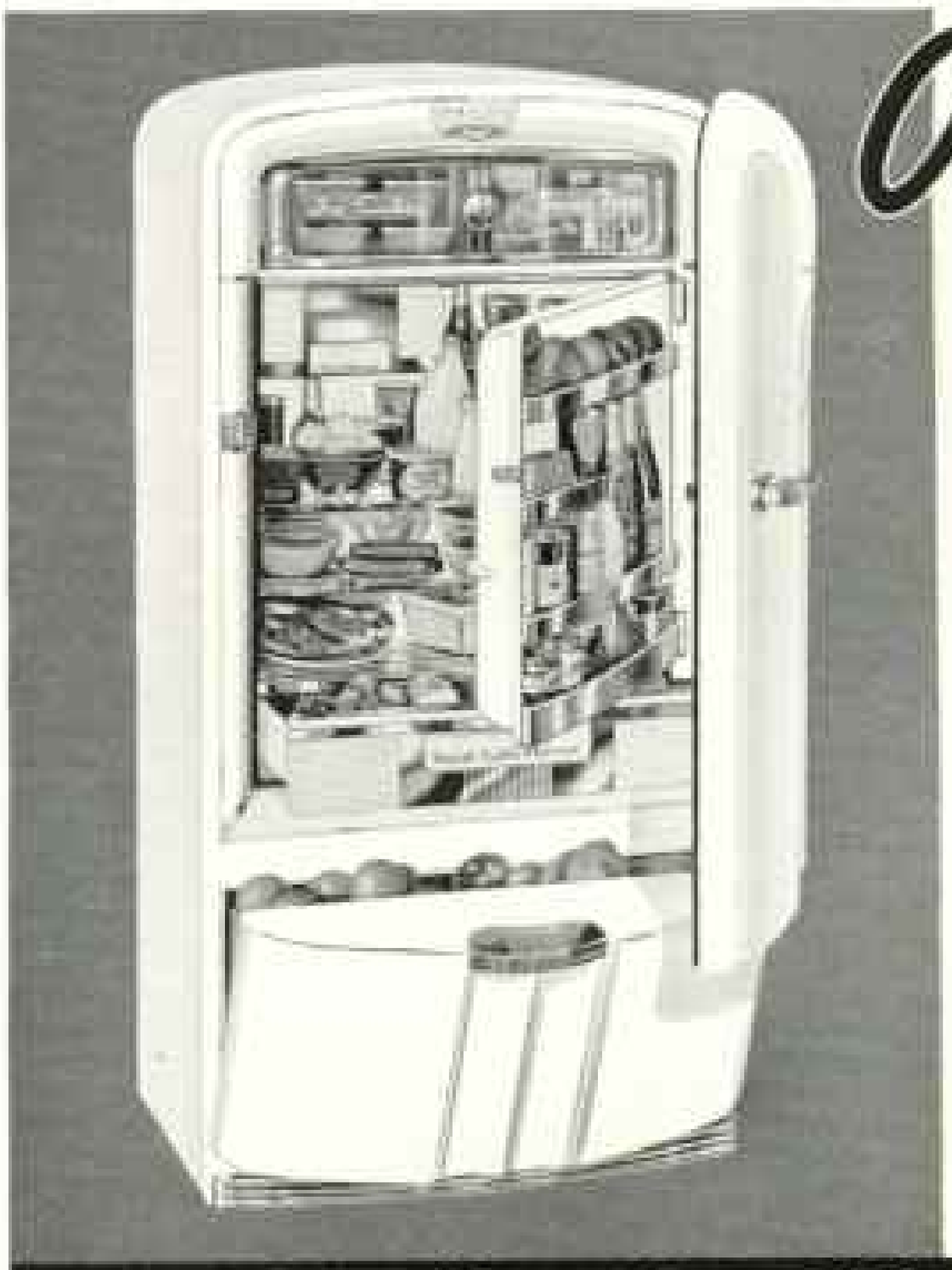

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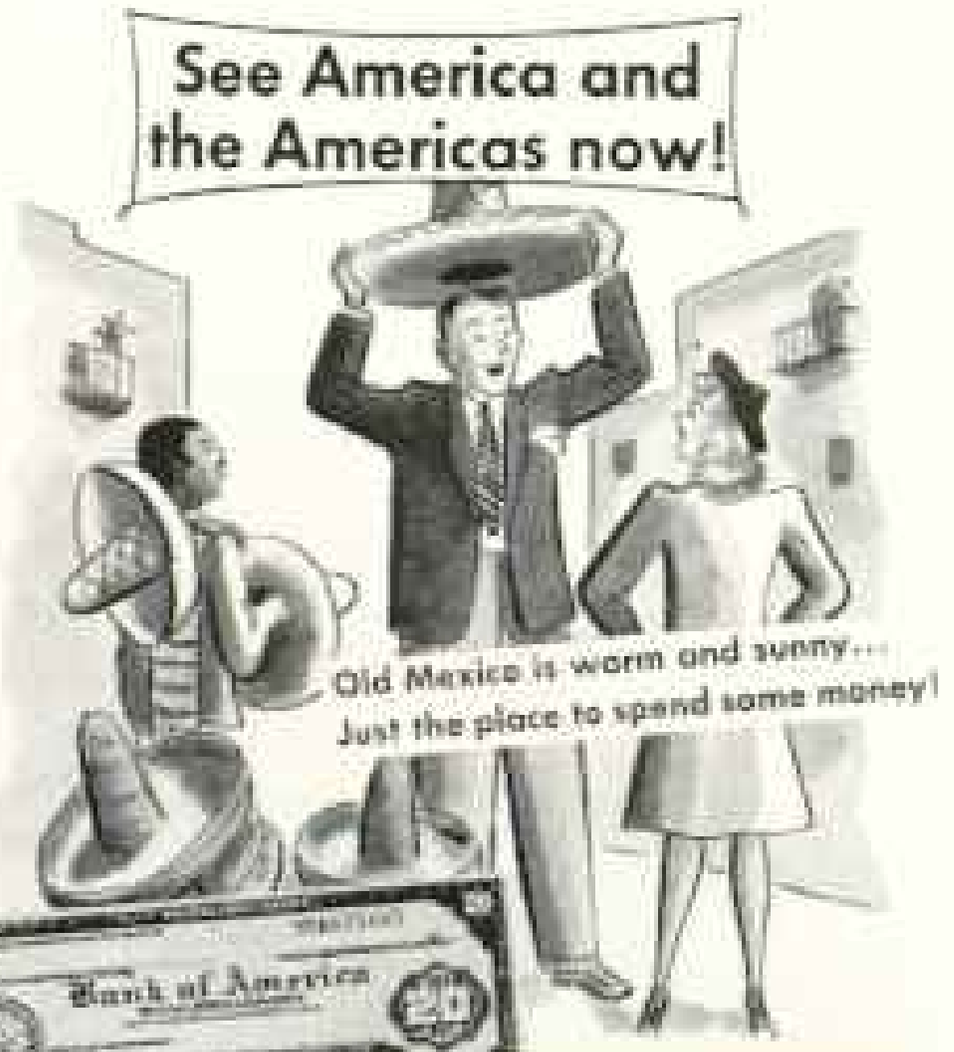

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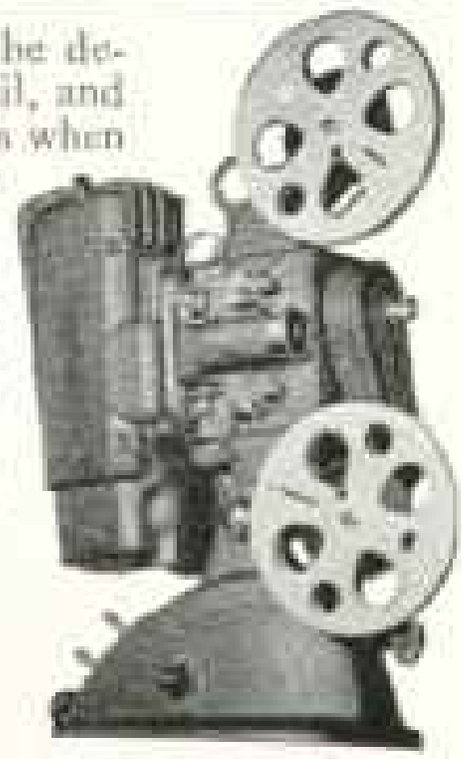

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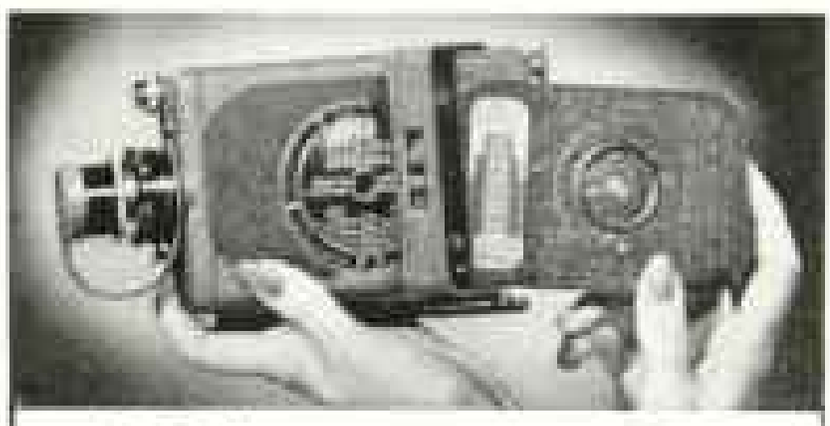

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A. It is a disease of the pancreas, a large gland behind the stomach; in diabetes this gland fails to produce enough of a substance called insulin to permit the body adequately to use or store sugar.

2. Q. Can anybody have diabetes?

A. Yes. People of all ages, sexes, and conditions. But . . . the people it strikes are usually overweight and between the ages of 40 and 60. Also, it occurs most frequently among those who do not lead active lives. A tendency to develop diabetes seems to run in certain families. And the disease is more common among women than among men.

3. Q. Do diabetics live as long as other people?

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4. Q. Is there any way to guard against diabetes?

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5. Q. What are the symptoms of diabetes?

A. The commonest symptoms, which call for immediate medical attention, are: excessive thirst; excessive appetite; unaccountable loss of weight following excessive weight; constant unaccountable weariness and irritability; in older people, boils and carbuncles.

6. Q. When diabetes is discovered, how is it controlled?

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7. Q. How can I find out more about diabetes?

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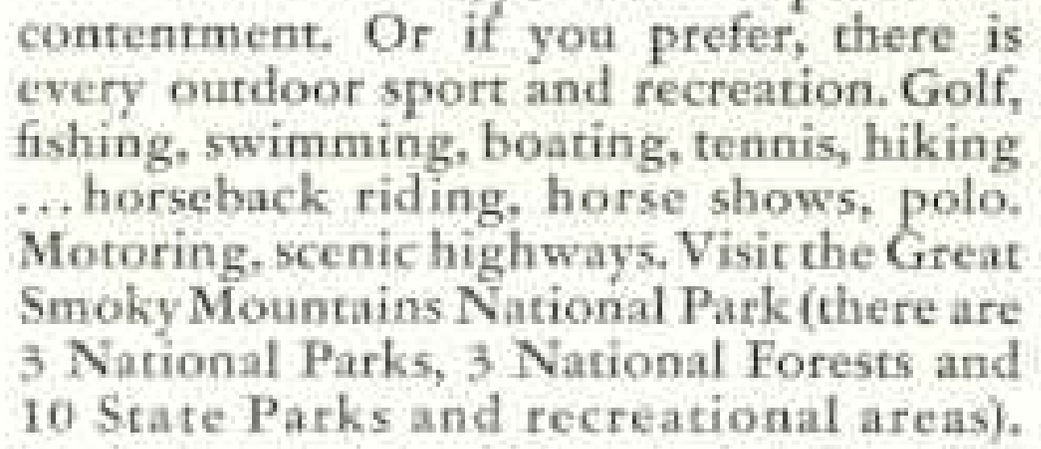

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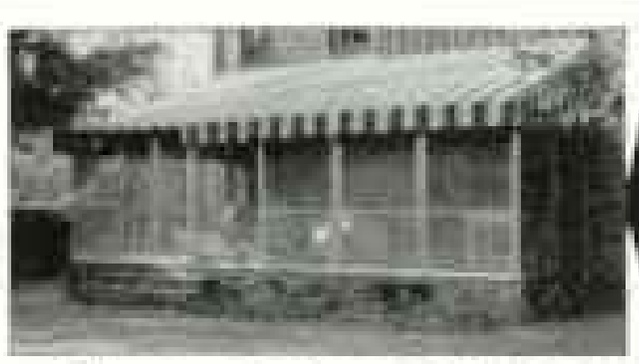

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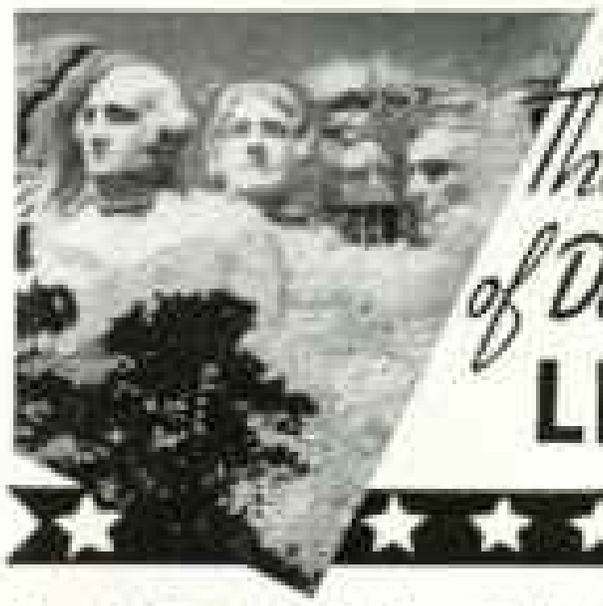

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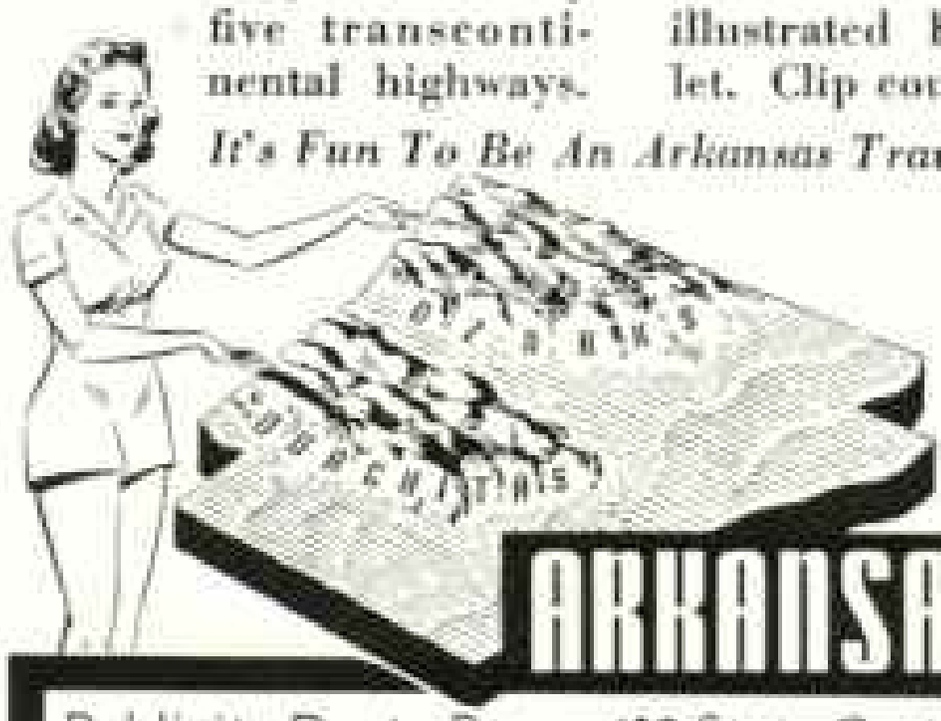

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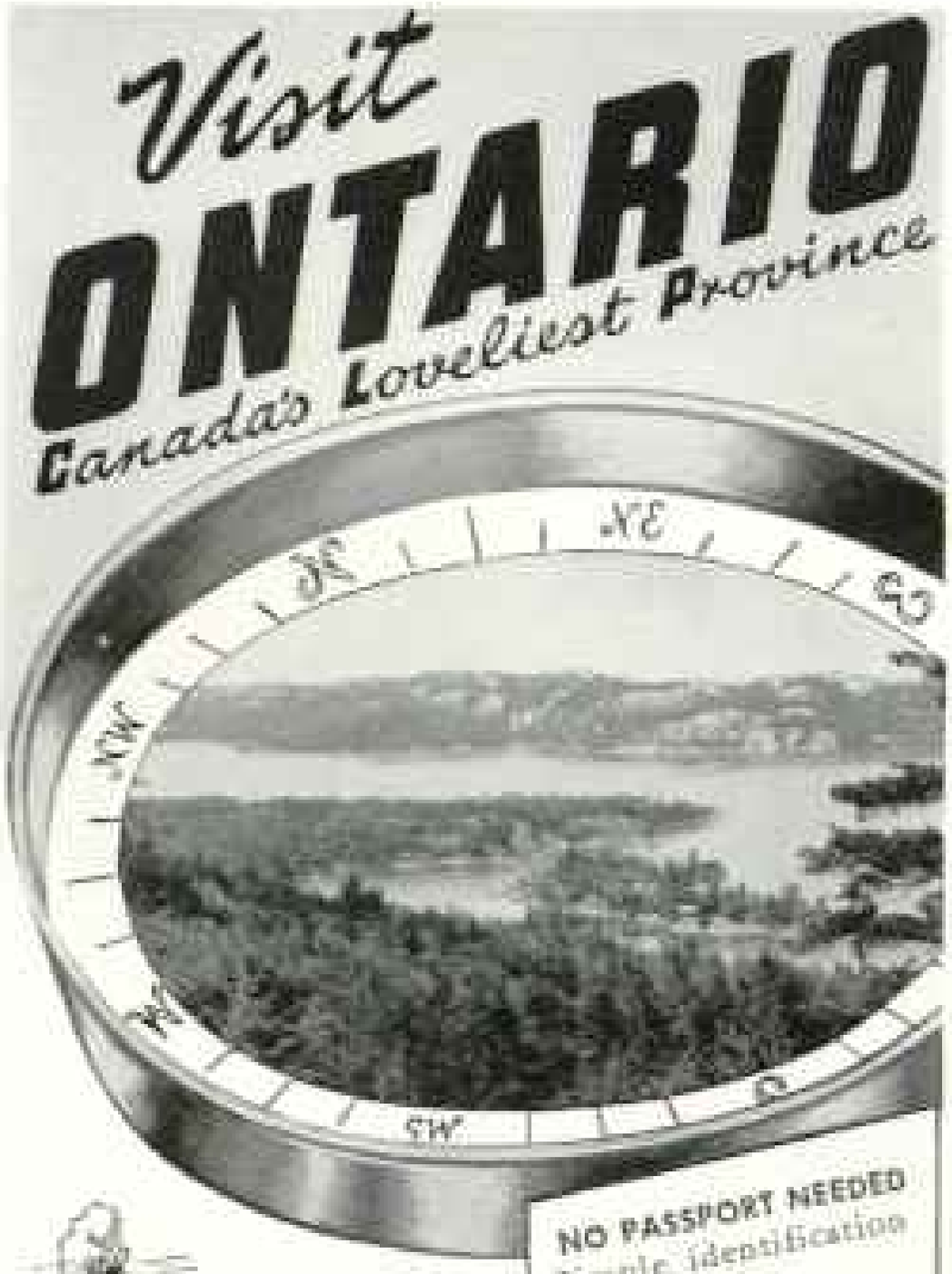

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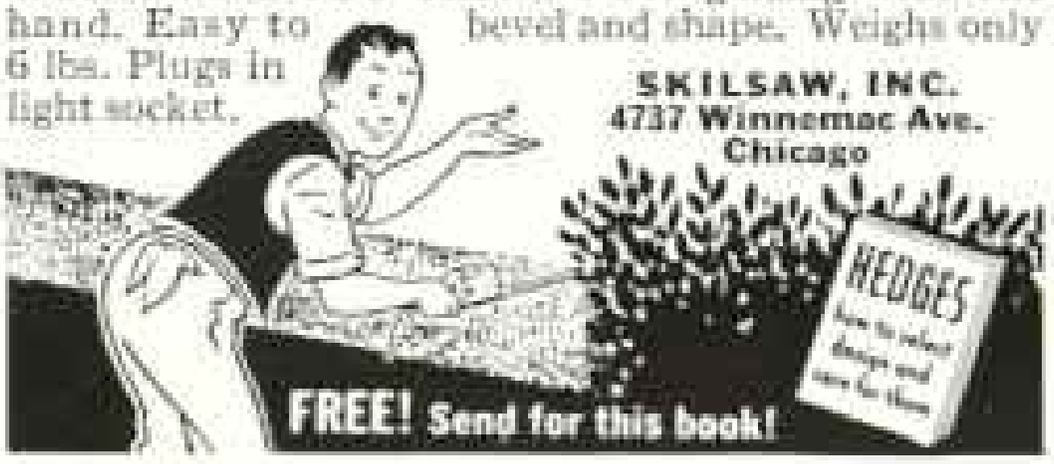

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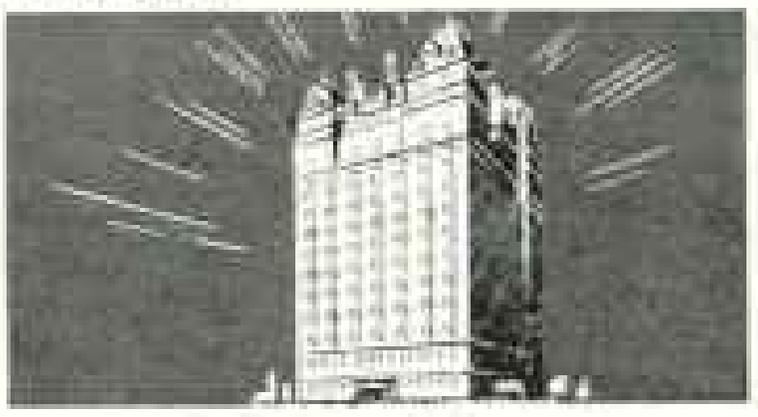

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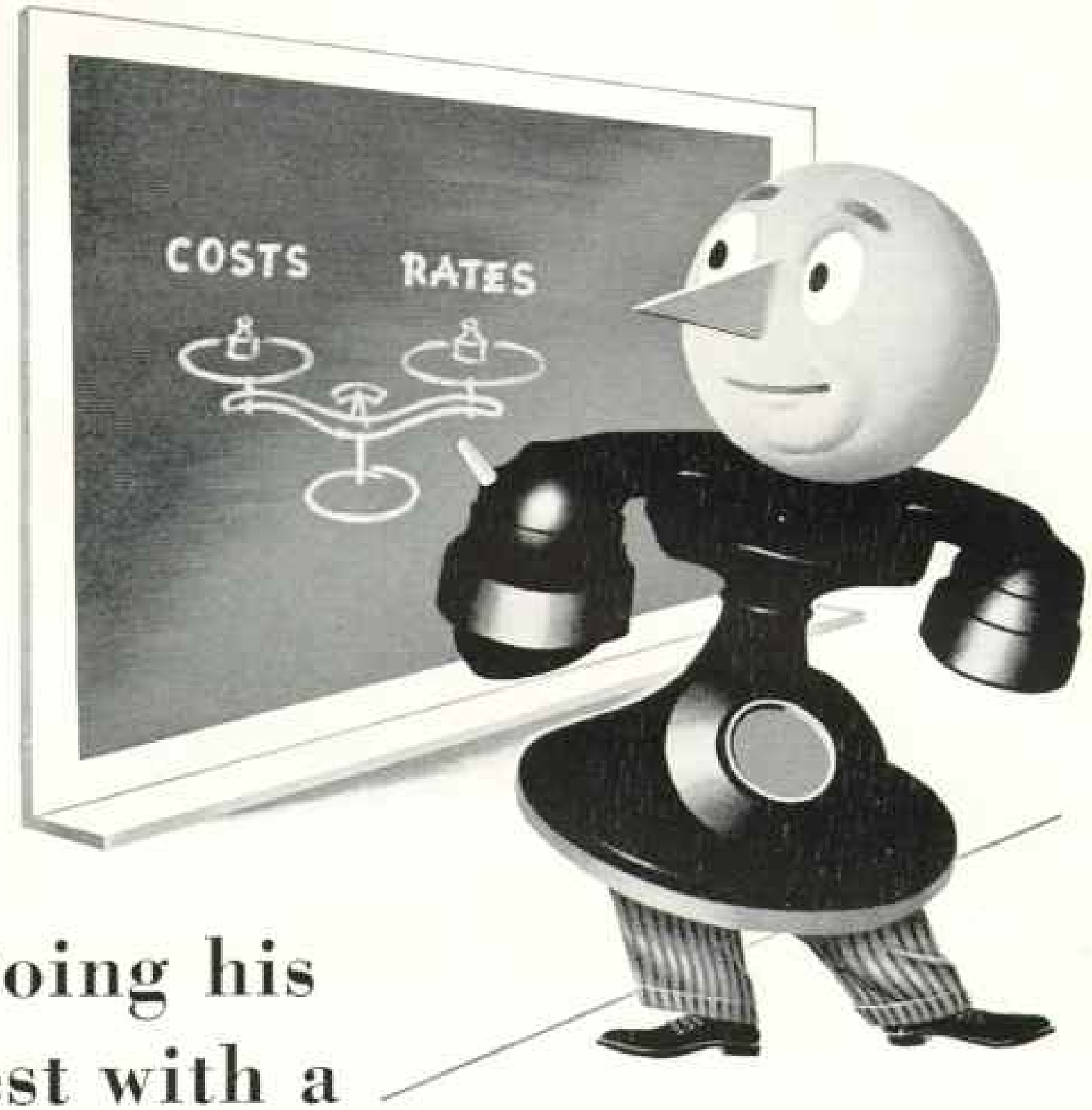

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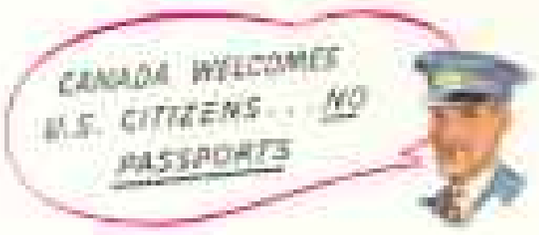

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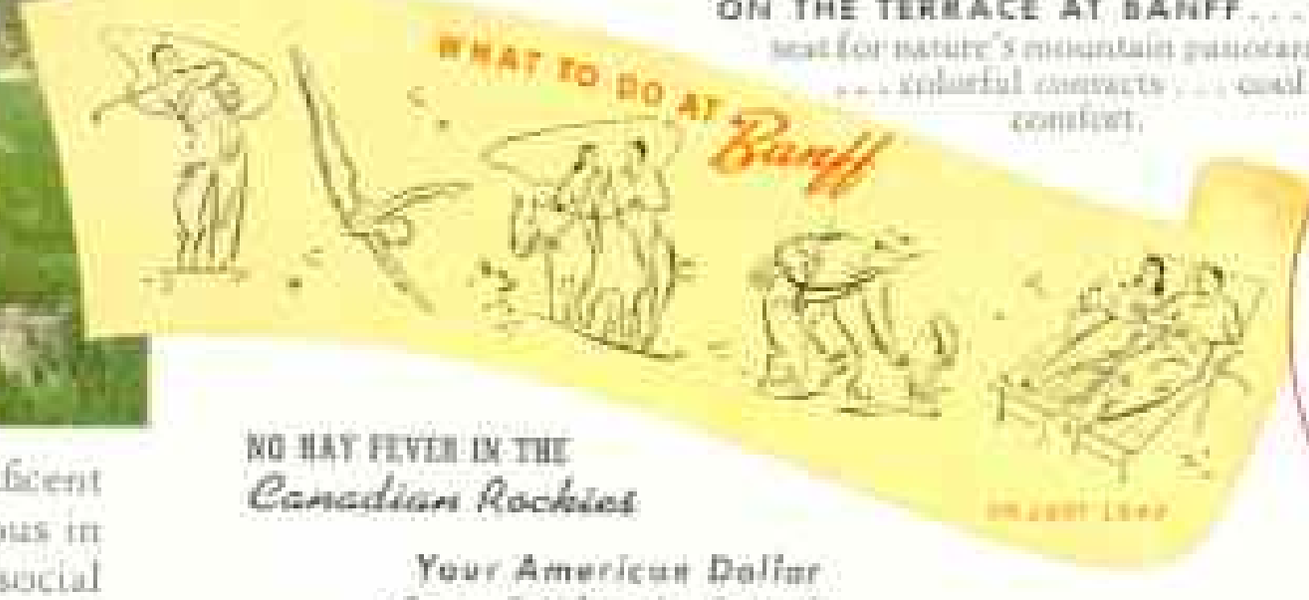

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