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THE MEDITERRANEAN SUN slanted its early-morning rays on the Vieux Port of Marseille. It reflected from the shiny tangle of painted hulls and varnished masts—yachts and fishing boats tied thickly to finger piers, their fenders rubbing together as they moved constantly on the tide.

Aboard our new *Yankee*, we cast off stern lines. Irving went forward hoping for the best, but found the anchor snagged. Vieux Port has had so many hooks dropped into it that ours might have been fouled on one a hundred years old. The orders flew.

"Hard astarboard and ahead half speed. Back full... Stop her. Slow ahead... Stop!"

And much more of the same, as Irving tried to unhook the anchor by guesswork. Finally we pulled free of the unseen snag. Within minutes *Yankee* was curling a pretty bow wave out between the two old forts where fagots once were burned to guide ships into the harbor.

Third *Yankee* Forsakes the Sea

We Johnsons were off on another cruise—but one far different from the deep-sea voyages many of you know from stories about our earlier *Yankees*.*

We had spent 25 years—except for Irving's war years in the Navy—making seven trips around the world, taking crews of young people to primitive islands of the South Pacific, fascinating ports of Southeast Asia, and around the Cape of Good Hope. We had brought up two sons on board, and time had moved us along from the age of our crews to the age of their parents.

Often we had wondered where it all would end. And so over the years we laid plans for just such a venture as this—an inland cruise.

"After all," Irving said, "we aren't going to do anything silly like moving ashore."

Our project went back to an idea we had before we were married: After sailing the seas, we would cruise Europe's rivers and canals.

"Take Irving away from deep-sea sailing?" friends had exclaimed, aghast, when we mentioned our idea. But I had no misgivings. Perhaps because Irving grew up on the banks of the Connecticut River, he had always been intrigued by rivers—the wonder of what is around the next bend, the unexpected backwaters to explore, the challenging shallow channels, the narrow openings.

*See, in NATIONAL GEOGRAPHIC, "New Guinea to Bali in *Yankee*," December, 1959; "Lost World of the Galapagos," May, 1959; "*Yankee* Roams the Orient," March, 1951; "The *Yankee's* Wander-world," January, 1949; "Westward Bound in the *Yankee*," January, 1942.



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*World-wandering couple
takes a 50-foot sailboat,
third in an adventurous line,
through thousands of miles
of scenic inland waterways*

Inside Europe Aboard *Yankee*

By IRVING and ELECTA
JOHNSON

*Illustrations by
National Geographic photographer
JOSEPH J. SCHERSCHEL*

And in Europe, thousands of miles of such waterways beckoned: the network of canals crisscrossing the Netherlands, Belgium, and France; the great rivers Rhine, Rhône, and (someday, we hoped) the Danube; to the north the Baltic, and to the south the seas of ancient history—Mediterranean, Ionian, Adriatic, Aegean. There was more to see and do with a boat than a lifetime would allow.

Wanted: a Boat to Climb Mountains

But it would take a special kind of boat—one that “could both cross the seas and climb mountains,” as Irving put it.

“Fortunately the locks in France are of a standardized width,” he informed me after long investigation. “We’ll plan the *Yankee*’s beam accordingly, and then she can climb the waterways to Switzerland. Of course she’ll also need shallow draft with centerboard raised, folding masts for immovable bridges, and quick turning ability under power.”

She would have to be a sturdy ship, able to come off unharmed if grounded—Irving likes taking a vessel places she shouldn’t go. Extra-strong steel was part of the answer.

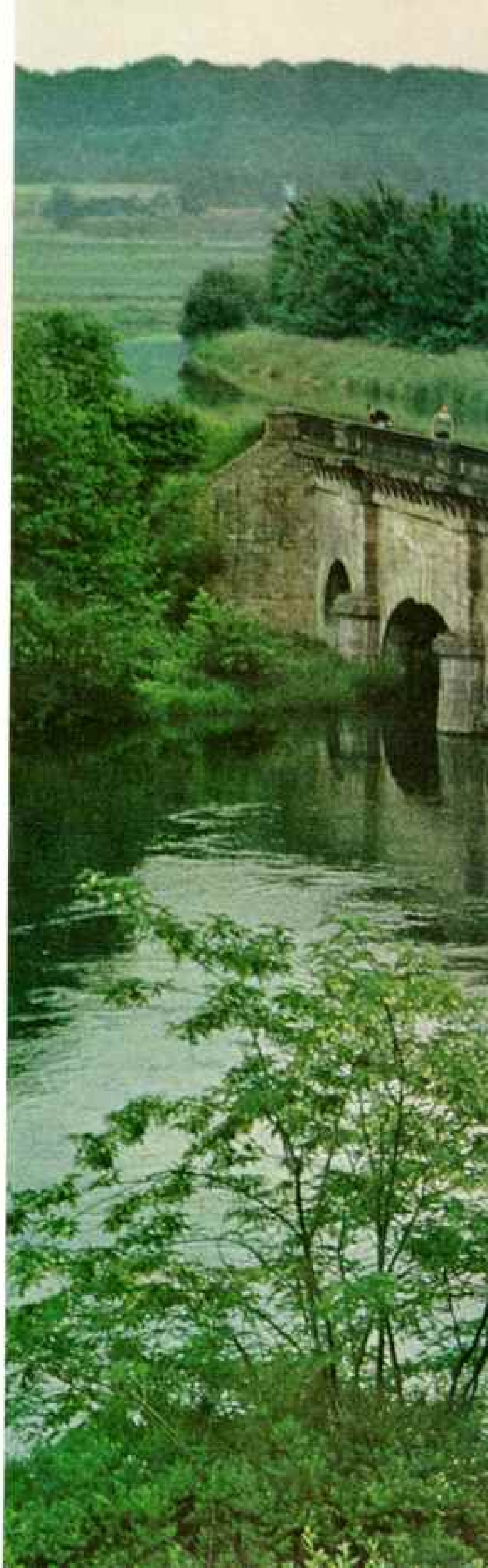
“But,” Irving explained, “that won’t be enough. If she runs aground in a fast river, the current will slew her sideways; her hull design must keep her from rolling over.”

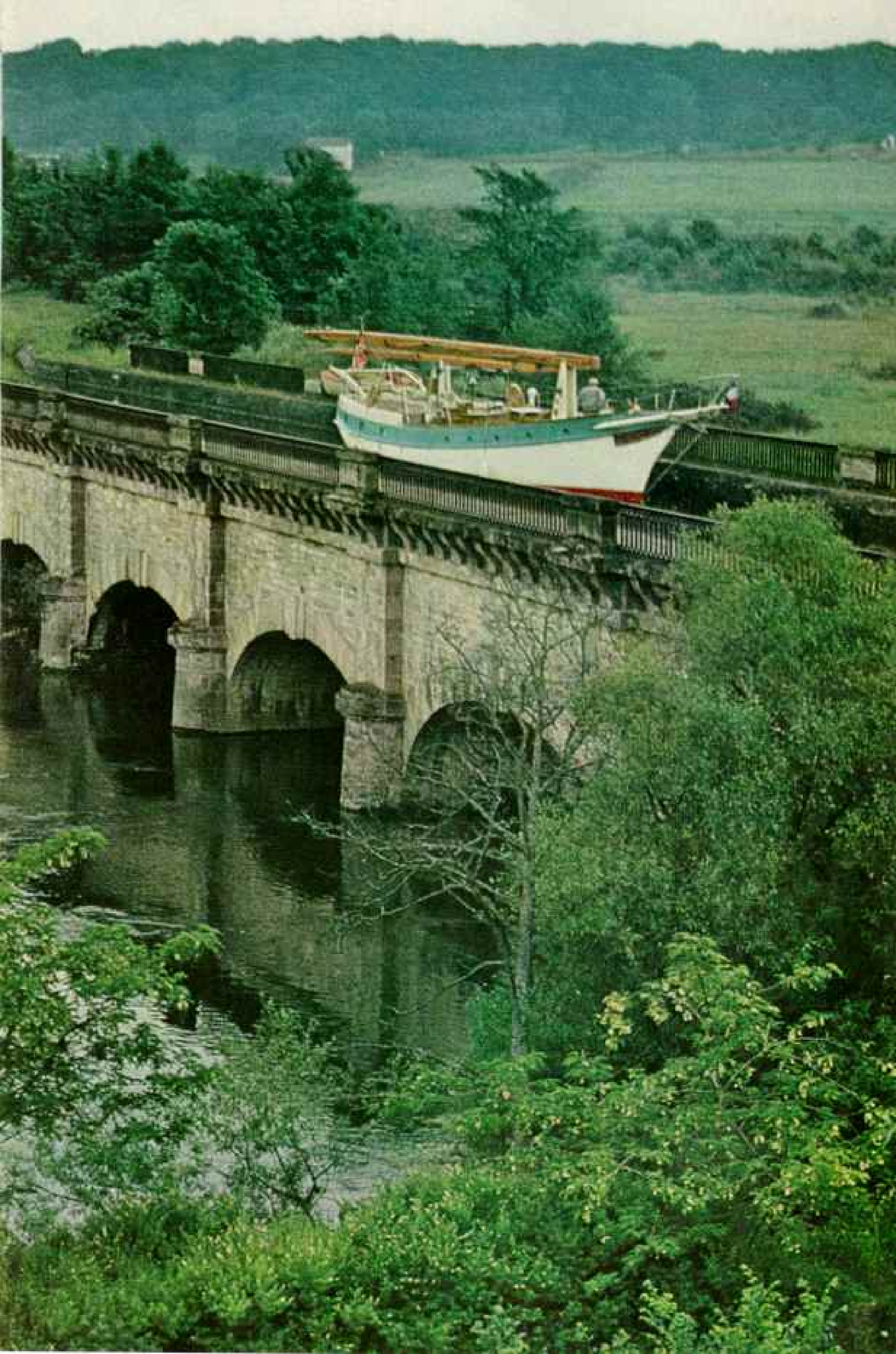
Finally, she had to be a real home for us, with quarters for expense-sharing guests forward of a center cockpit, and a great after-cabin with windows across the stern; Irving had sailed *Mayflower II* and had fallen in love with her 17th-century roominess. The only problem was adapting it to a 20th-century 50-footer.

For nearly five years he measured boats, trailers, motel rooms, and kitchens all around the world. He talked design, construction, and canal travel with more than 500 persons. And then the noted yacht designer Olin Stephens, of Sparkman and Stephens, Inc., New York City, drew up the final plans.

We lived in a trailer in a shipyard at Zaan-

Like a train on a trestle, *Yankee* glides across the rain-swollen Moselle River on an aqueduct near Epinal, France. Capt. Irving Johnson and his wife Electa, veterans of many a salt-water voyage, discovered new delights in cruising the rivers and canals that web the face of Western Europe. Fold-down masts, shallow draft, and a reinforced hull enable the 50-foot ketch to explore waterways denied to most sailing ships.







dam, the Netherlands, while the new *Yankee* took shape in 1959. She was of radical design, clipper-bowed to balance her great cabin and raised poop, her tough steel hull drawing only 4½ feet of water with centerboards raised, narrow-beamed for locks, and ketch-rigged for easy handling by two hands.

Travel While Staying at Home

Since then we have lived a life that Robert Louis Stevenson in *An Inland Voyage* termed "both to travel and to stay at home," one where a man "may take his afternoon walk in some foreign country on the banks of the canal, and then come home to dinner at his own fireside. . . ."

For us no packing or unpacking, no buying tickets, making reservations, catching trains or planes, ordering too-rich meals. We lost ourselves in the remote countryside; every day we felt closer to the people with whom we mingled at back doors and beside fields and orchards. We could almost tell time by the activities we observed as we cruised along at only four miles an hour: children starting for school, horses plowing, women washing, cows crossing bridges over our heads.

Sometimes we did the same things ashore that other tourists do. A couple of motor-powered bicycles carried aboard *Yankee* let us travel to nearby sights or zip to markets for shopping. Sometimes we missed things tourists would not dream of ignoring—either because a waterway would not float us there or because at the end of a long outdoor day we were content to stay at home.

Bikinis Bring a Yachtsman's Quip

Yankee's masts were folded and lashed as we motored out between Marseille's old forts and through the big commercial harbor full of all kinds of ships from everywhere. Out to sea, two miles from the mainland, appeared the chalky cliffs of the Ile d'If and the grim walls of the chateau crowning them—a fortress prison made famous in Alexandre Dumas' *The Count of Monte Cristo*.

Along the beaches, the sight of sun-tanned bodies recalled a remark made by one of our cruise guests in his Virginia drawl: "Ovah

heah they spell bikini with a verah small 'b'."

Ahead of us beckoned the Rhône River—gateway of our summer's cruise to Belgium, the Netherlands, England, and back through France again (map, page 163). We could have sailed by open sea to the mouth of the river, some 25 miles west of Marseille. We chose instead to plunge directly inland, taking the Tunnel du Rove through the hills to the northwest of Marseille, and then a canal that meets the Rhône at Arles.

We used to have qualms about tunnels. The first we went through was the worst: the arched darkness closing in, the narrow clearance between rocky walls, the fear of a loosened boulder dropping on us.

But repeated trips through tunnels had eased our fears. We remembered our first experience inside a French mountain in total darkness. Eleanor Barney or her husband Ken sat at one side of the ship, I at the other, with Irving at the wheel. Holding flashlights down toward the black water, we would call out the inches to spare on each side, and Irving would steady her. Thus we evolved a system of chanting through the tunnels, "ten inches, eight inches, seven inches, five inches," and sometimes "two, one . . . whoops!"

Tunnel Cave-in Jolts Complacency

Here in the Tunnel du Rove our sidelights were bright dots in the inkiness. As our eyes grew accustomed to the dark, we found we could turn off our flashlights and Irving could steer without the inch-calling. At last a tiny circle of daylight glimmered, grew larger, and we were through.

A week later, we learned, part of the tunnel roof caved in. We were never quite so complacent about tunnels after that.

The inland waterway to Arles is one of the quietest in Europe. Most craft go the fastest way, by the Rhône itself. All day we met no other vessel as we made peaceful progress along the edge of the Camargue, the region of the Rhône delta where genuine French cowboys ride herd over wiry black cattle.*

* This unique region of France was described in "The Camargue, Land of Cowboys and Gypsies," by Eugene L. Kammerman, NATIONAL GEOGRAPHIC, May, 1956.

Nimble fingers—and a few toes—aid in mending nets at Marseille's Vieux Port. Basilica of Notre Dame de la Garde, crowning the hilltop, supports a 30-foot statue of the Virgin. From the height, visitors survey the largest seaport and oldest city in France—the ancient Greeks knew it as Massalia—where the centuries have witnessed a fiery parade of navies across the Mediterranean. Here *Yankee's* cruise began and ended.



HE EXTRAORDINARY AND RISKY TRIP (OPPOSITE) © A.S.A.

Navigator's nightmare: *Yankee* gropes through a two-mile tunnel between Pouilly en Auxois and La Lochère on the Canal de Bourgogne. Holding flashlights, Mrs. Johnson (left) and a passenger call out clearances, never more than 32 inches. Nerve-racking passage took nearly two hours. Steel grating of *Yankee's* bowsprit juts into foreground.

We came to one broken-down lock that required the pushing and prying of one American and two Frenchmen to swing its gates.

Locks can be fascinating or frustrating, depending upon your point of view. Before starting our European cruise, Irving decided he was not going to succumb to the lock-hatred that afflicts most yachtsmen. Not only was *Yankee* built for canals, but ship handling is always a challenge to Irving, and each lock's peculiarities add interest.

We had to learn lock techniques, though. How fast would the water come in? If the sides towered above our heads, would the lock keeper be handy to reach down with his gaff, pick up our forward line, and secure it? If not, would there be a ladder to scramble up so that we could loop the line over a bollard in time?

I remember once when *Yankee* lay sandwiched in a great Dutch lock between giant barges (page 179). Their huge engines churned the waters into a turmoil as the big gates swung open. Suddenly, a blast of prop wash

caught *Yankee's* bow, shooting her backward.

Irving gunned the engine full ahead and whirled the wheel hard over to keep our lowered mastheads out of a tug's pilothouse astern. Then back full, or the bowsprit would crash the lock side.

Yankee danced and whirled in the waves and crosscurrents.

Full ahead! Back full! Hard astarboard! Hard aport!

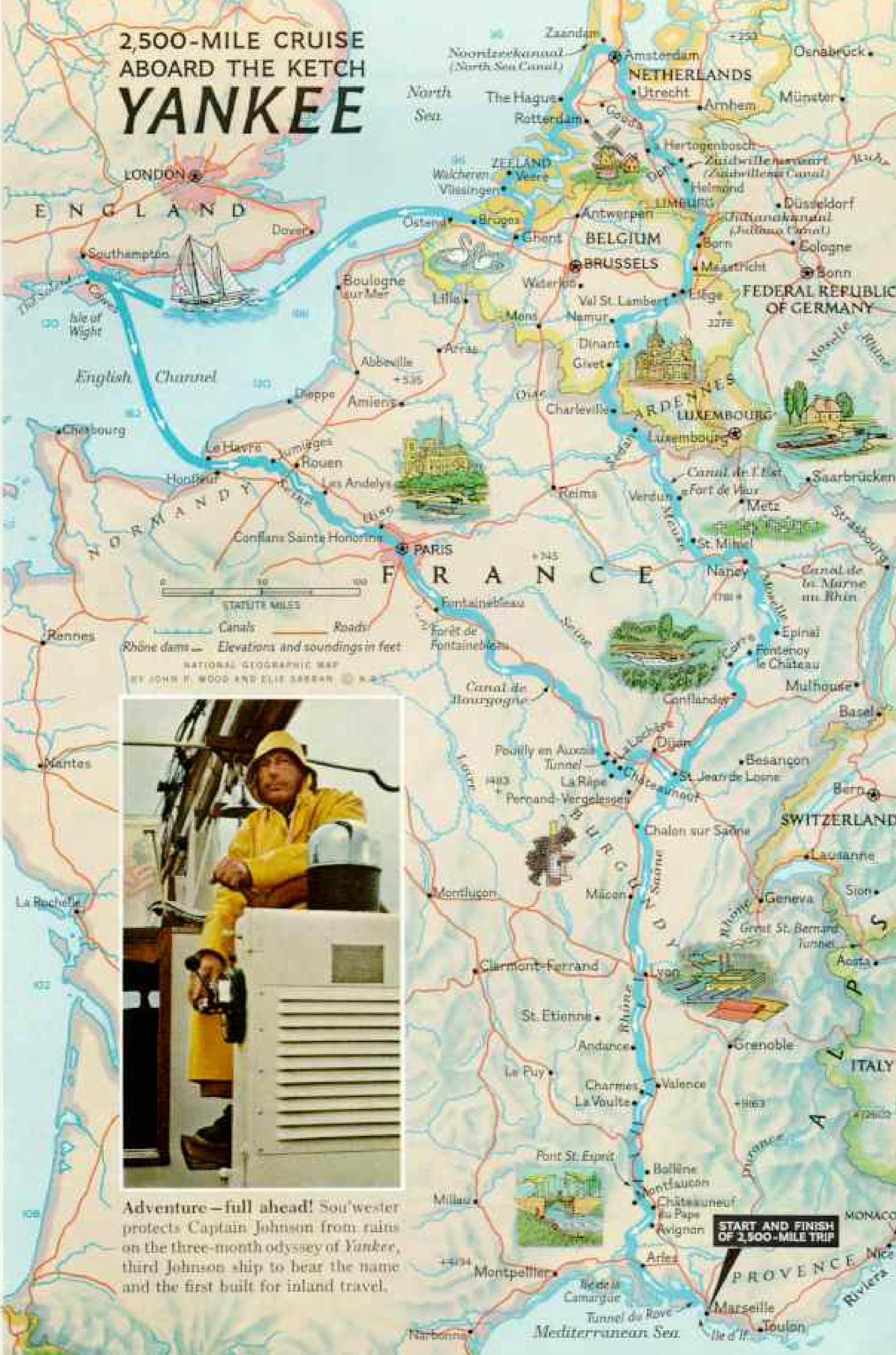
"Now, don't tell me that isn't fun," Irving said as we settled into the quiet canal beyond. And he meant it.

Barge Tow Poses Unforeseen Perils

As we approached Arles, something seemed strangely familiar in the lines of a yellowish wooden lift bridge that breaks in the center. One of the friendliest lady lock keepers in France works here, and noticed our interest.

"No doubt you have seen Van Gogh's famous painting, 'The Drawbridge at Arles,'" she announced with proprietary pride. It was in Arles that Van Gogh and Gauguin, living

2,500-MILE CRUISE ABOARD THE KETCH YANKEE



Adventure—full ahead! Sou'wester protects Captain Johnson from rains on the three-month odyssey of *Yankee*, third Johnson ship to bear the name and the first built for inland travel.

**START AND FINISH
OF 2,500-MILE TRIP**

Where gladiators battled, bullfighters stride in proud parade before aficionados at Arles, France.





together in stormy friendship, discovered the strong light and color of Provence.

Greeks settled in Arles, but its greatest sights are the Roman ruins: a theater that seated 16,000, and an amphitheater for 26,000. Two tiers of 60 arches each form the arena's outer walls; today bullfights are held here (pages 164-5 and below).

166 At Arles we pointed *Yankee's* bow up the Rhône toward Lyon, past ruined castles on the heights, remains of medieval town walls,

and lush countryside. From glacial origins in the Swiss Alps, the Rhône gathers volume and power and races to the sea. New dams now are taming its lustiness, and on this trip *Yankee* could manage the currents under her own power. She carried us past Avignon with its stone bridge celebrated in song, and by such famed vineyards as those of Châteauneuf du Pape (page 168). But on our first trip up in 1960, we were glad to have a tow from a big oil-company barge.



I say glad. Actually, it proved one of the most harrowing experiences of our European voyaging. Everyone advised us to be towed from Arles to Lyon. We envisioned idle days without steering or care, tied to a barge's side. Instead, we found ourselves at the end of a line dragged 250 feet astern of *Ampère*, whose 350 horsepower occasionally needed the help of *Yankee's* diesel to keep us making even one mile an hour against the current.

At seven on our first evening, *Ampère's*

skipper signaled she was going to tie up to some trees for the night. We hung astern, our engine just holding *Yankee* in the stream. Then *Ampère's* boy, without warning, threw off our line from the barge's stern. Irving immediately put the engine in neutral, hoping the line would not foul the propeller, still turning in the current. His brother Rog ran forward to pull in 250 feet of nylon as fast as he could.

With two-thirds of the line on deck, Rog suddenly shouted that it was caught. Meanwhile, *Yankee* was drifting helplessly. Only the engine could stop that drift, so Irving took a desperate gamble. There was a chance that the line had hooked only on the centerboard. He put the engine in gear.

"Stop! It's in the propeller!" Rog shouted.

"Oh, no," Irving groaned. "That's bad!"

Chilling Dives Free Propeller

Yankee had slipped out of the quiet water near the bank and was drifting backward faster and faster, toward the great stone piers of the old bridge at Montfaucon.

My agonized thought was, "Here goes our lovely little boat."

But somehow, like a croquet ball diverted by a blade of grass, *Yankee* encountered a fling of current that sent us between the piers.

Irving had the anchor over in no time, but it held only spasmodically on the scoured stone bottom. We rushed up our 60-pound anchor from below, and with the fitful control the two anchors gave, Irving worked the ship to a crashing stop in stony shallows.

Donning swimming trunks and face mask, he went into the cold, swirling, silted water to free the propeller. Working by feel, he gasped his progress to us whenever he surfaced for air. The job took 20 minutes.

Now *Ampère* appeared, backing downstream, her mate sounding cautiously with a long pole. We started *Yankee's* engine and moved ourselves off the ground. We were in a mood to motor our own way upstream, but *Ampère's* mate shouted, "You'll never make it through the current under the bridge."

Dance of death at Arles: Venezuela-born Efraín Girón leads a bull in the *gaonera*, a stylized pass with the cape. The matador sees how close he can shave his margin of safety—and survive—in the *Corrida des Vendanges*, the bullfight of the wine-harvest festival. The bull must die, in contrast to popular *courtes libres*, also held here, in which fleet young men win glory by snatching cockades and other prizes from a bull's horns.



Reluctantly we tossed over a line and were towed back to the spot where our troubles had begun.

This time the boy walked the line forward, as he should have done in the beginning, and brought us alongside to make fast for the night. We sat down to eat, everyone talking at once with the release from tension. It was, Irving assured Rog's wife Elsie, a "once-in-a-lifetime occurrence."

Next day's tow passed without incident. But the day after, *Yankee* faced the wildest water we have found in any river. Work on a new dam at Charmes forced the Rhône into a constricted passage. With help from shore, *Ampère* struggled through, then exerted a strong fresh pull on her tow. *Yankee* crashed into a wall of water, and with the sound of a cannon shot the towline parted. Like a great rubber band it snapped back at us, all 250 feet of it.

Irving, who had been filming the torrent while I steered, raced back to the wheel; Rog and I began pulling the line over the bow. But only a few feet came in. Horror-stricken, we realized that we were in the same predicament as two days before, only worse.

Orders in Two Languages Equal Bedlam

The rapids shot us backward out of control at 14 or 15 miles an hour. Both anchors went over again—for what they were worth. Then, upstream, we saw a great white V of water coming toward us. It was a high-powered boat used by dam workers. It held two men in life jackets and *Ampère's* skipper.

Irving saw that its occupants did not realize our anchors were down; they risked fouling their own propeller. He shouted at them to stay clear. As interpreter, I gave a full yell. But *Ampère's* captain was screaming rescue ideas in French, and the life-jacketed man at the controls was bellowing his own intentions.

Irving grabbed the initiative. He jumped up and down, waving his arms, shaking his fists, shouting. Startled, our "rescuers" halted long enough for us to tell them of their own danger. After that, the drifting and towing and pushing and shouting became comparatively sane.

With the help of the work boat, we got to shore and made fast to a tree. Again Irving put on swimming trunks and diving mask and disappeared into the Rhône. Loops of line had festooned themselves around the propeller and shaft into a ball bigger than a bushel basket. Irving would surface and blow, gasp in a lungful of air, mutter a few

words, and disappear again. After almost an hour he asked us to pull him up, exhausted.

We got him on deck, shaking with cold. We wrapped him in blankets and rubbed him till he complained his skin hurt. At last he said, "I'm all right. I'll go down again." Slowly he put on long woollies I got for him. "These feel great," he said with a small smile.

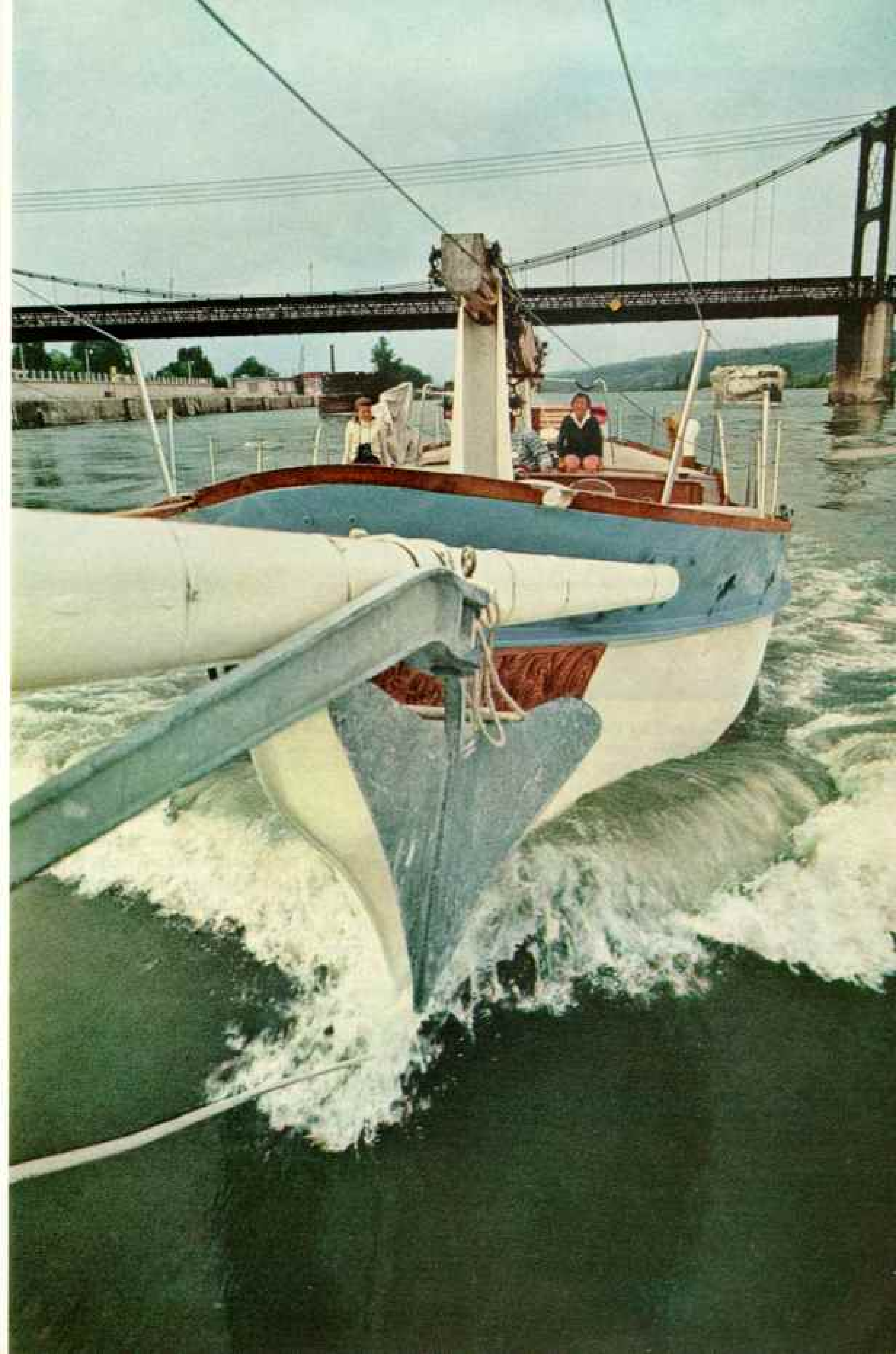
How he made himself get back into the icy Rhône, I cannot say. Aware of his fatigue, we watched anxiously. The same surfacings, haulings of the line, mutterings, gasps, disappearances. Finally, it was done. We hauled him aboard.



PHOTOGRAPHED BY N.E.S.

Sun-ripened grapes cascade from a picker's bucket at Châteauneuf du Pape, home of one of the Rhône Valley's most celebrated wines. Avignon Popes in the 14th century established the vineyards.

Pushed to full power, diesel-driven *Yankee* battles a stiff Rhône current at Valence. Steel bowsprit, to which the vessel's 60-pound anchor has been lashed, provided a perch for the photographer. On an earlier trip past this point, the Johnsons were forced to accept a tow. Now dams slow the river's flow.





RODOLPHINE © R.S.S.

Guawed by time, stone crosses overlooking the Rhône at Andance pay tribute to a legendary tragedy. Three maidens, grieving for lovers lost in the Crusades, drowned themselves in the waters below. The monument commemorates their sacrifice.

"Those woollies really made a difference," he said. "I should have known enough to put them on in the beginning. I'll bet I could have done it all in one try if I had."

The rapids at Charmes were but a memory when *Yankee* motored up a dam-tamed Rhône in 1963. Now we could sample at leisure the points of interest along the way: Pont Saint Esprit, the Bridge of the Holy Spirit, begun in 1265; the lock at Bollène, France's tallest, 85 feet high, 40 wide, and 640 long, but a lock that fills in six minutes; the grand old fort at La Voulte; Valence, farther upstream, where Vikings plundered; and, at last, Lyon, city of enterprise and vitality.

There is a feeling of accomplishment, almost of triumph, aboard when *Yankee* reaches Lyon, even when the Rhône passage goes fairly smoothly. This time, as on previous trips, we tied up alongside some barges at the Quai Tilsitt and celebrated by sampling one of the city's famous restaurants.

Located at the confluence of the Rhône and Saône, Lyon brims with inventiveness. Here the world's first steamship, the "pyroscaphe" of Jouffroy d'Abbans, made her trial run on July 15, 1783. Here Olivier de Serres helped to make Lyon the silk capital of the world by introducing the mulberry tree to France; the city still is one of the great textile centers. Here Jacquard invented his loom. Ampère—for whom the unworthy barge was named—worked here on laws of electro-dynamics that showed the way for Faraday and the great hydroelectric works of today's Rhône. Here the Lumière brothers experimented with the movie camera.

Portly Guest Breaks Language Barrier

At Lyon *Yankee* turned from the Rhône into the Saône for a run upriver to Mâcon, where we picked up guests Ed Holland, an Arlington, Virginia, banker, and his wife and son. The mellowness of the country reminded

us of Vermont, with farms, pastures, distant mountains, cattle, and trees. Little towns nestled under their church spires. Blue sky, high piles of clouds, and an occasional field of mustard accented the scene.

We climbed through the center of France lock by lock. They were all narrow, usually leaving *Yankee* six inches on either side. Sometimes, as at Conflandey, currents and wind made navigation extra-tricky, with all hands needed to maneuver fenders so that lock sides would not mar the ship's painted hull.

Giving the lock keeper a hand is part of the fun of French canals. The lock keeper is often a woman, who may be any age from 20 to 75, but she knows all her lock's peculiarities, and her muscles have long since adapted to its needs. Conversation usually reveals that she has a number of children, that her husband works in a factory or on canal maintenance, that barge traffic is heavy or light today, and that she has lettuce or honey or eggs for sale.

But conversation is not in English. One jovial guest of ours, who did not speak French, was eager to lend a hand. But because of his gray hair and Santa Claus tummy, the lady lock keepers were always offering to do his share too.

"How can I tell them I want to work because I need the exercise?" he asked.

The rest of us taught him to say "*ventre trop gros*"—stomach too big. He would amplify that statement with dramatic gestures. It was an immediate success and established cordial relations at all locks.

Locks often are the center of a region's social life. At some, especially on Sundays, a big family group would come to look us over. And they are news centers, too—information of all kinds travels from lock to lock and boat to boat. Some Dutch friends, driving home from

Italy, followed *Yankee's* progress and located us simply by inquiring at locks and showing a picture of the ketch.

Locks serve also as makeshift post offices. Propped in the windows of the occasional little offices of lock keepers were letters addressed to canal vessels. I thought it would be nice to receive a letter at a lock, but we never saw any addressed to us.

I loved to take short side trips on my motorbike. Irving would roll it ashore while *Yankee* lay high in a lock, her deck even with the paving. It would be only a few minutes to some

Yankee attracts an audience at Fontenoy le Château on the Canal de l'Est. Ed Holland, upper right, one of the ship's passengers, closes a lock gate before water is let in. PHOTOGRAPH BY JEREMY A. SCHWARTZ © N.Y.C.



little village to buy bread, fresh vegetables, and fruit.

In the village would stand the town hall with its mansard roof, and the statue which might be a war memorial, a native son, or just a pretty stone swan at the watering trough. The bakery could be found by its fragrant odors; butcher shops and groceries reminded me of the small corner stores of my childhood.

I would stuff my purchases into the bicycle's carrying bags and follow the signs back to a lock Irving and I had agreed on. I might even pass *Yankee* and have the next lock gates open for her.

But local produce brought by bicycle to our table in the great cabin didn't supply all our meals. "Shall we stop for lunch?" Irving might ask.

On one such occasion *Yankee*, in the Canal de la Marne au Rhin near Nancy, was above the level of a nearby macadam road. Beside the road we could see the inviting little Restaurant du Menil Rouge, its tables set under a grape arbor. Fishermen, their gear left at the stream behind the restaurant, were putting away an appetizing meal.

"Yes," the Hollands and I chorused.

It was easy to tie *Yankee* to the trees. In France, trees often border the canals as they do the roads. Soon we were breaking crusty French bread while the solicitous waiter-proprietor hurried to the kitchen to give the chef—his mother—our order.

"I like this better than the famous Paris restaurants," Ed Holland said happily. "And we don't have to dress up."

Verdun Honors 500,000 Dead

Saint Mihiel! Memories of World War I met us here and lent a somber note to the beautiful countryside. Along the Meuse Valley, all the way to Verdun, were reminders of 1914-18. By chance we arrived on one of Verdun's most important days, June 23. On this date in 1916 the French, crying "They shall not pass," turned back the Germans' final thrust just outside the city.

Commemorative ceremonies started close by *Yankee*, snugly tied up in the center of town. There, at the end of the bridge by the city gate, with its rugged 14th-century towers, gathered veterans of Verdun's ghastly battles. Of almost two million men engaged, half a million were killed; French dead alone numbered 150,000 in the months of fighting in this sector; half were never identified.

At the battlefield a proud old fighter de-

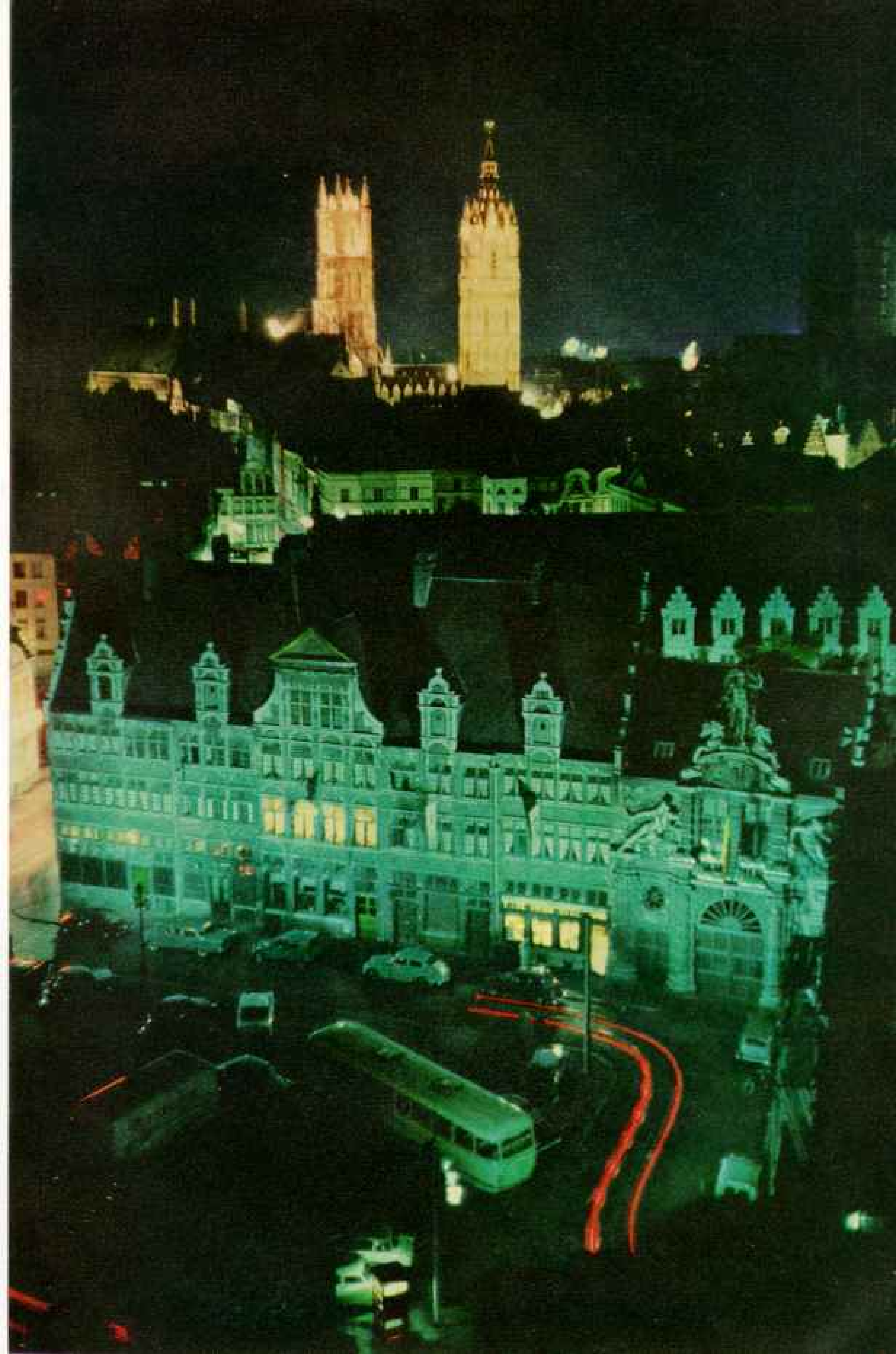


Traveling in tandem, Dutch girls of Maastricht set out for market on a motorbike.

Like candles on a cake, Cathedral of St. Bavon (left) and the bell tower of Ghent, Belgium, blaze above buildings frosted with blue light. Statue of Neptune stands above the arched gate of the Fish Market.

Giant teardrop of a glass vase elongates face of a worker at the Cristalleries du Val Saint Lambert, near Liège. Belgium's glass industry dates from the 15th century.







Full sails transform the canal duckling into a seaborne swan. Candy-striped genoa strains forward of mainsail, mule, and mizzen as *Yan-kee's* alert helmsman skims past the jetty at Veere, the Netherlands.

Sturdy as wooden shoes, old-style boats at Veere salute their commodore in the annual sail-by. When lowered, hull-hugging leeboards prevent the keelless craft from slipping sideways.

Decorative deckhand sails in parade.



scribed the siege of Fort de Vaux. "We were bottled up inside this underground fort nearly six months, like rats in holes. We were barely living, with smoke and gas and the dead in there with us. All this time the enemy were in another part of this same big fort trying to finish us off."

Many American servicemen and their families, stationed nearby, were touring the Verdun battlefields that day. Children in dungarees, wives, servicemen of another generation from every part of the United States—all of us felt the same: Let's work for peace. What a day to be in Verdun!

From here we traveled down the Meuse River and the Canal de l'Est—past Sedan and Charleville, and into the Ardennes, familiar to veterans of both World Wars who



fought in this forested region. Wild, almost mountainous terrain surrounded us. The Meuse was shut in by rocky shores sometimes broken by quarries. Villages were far apart and occupied with mining or metallurgy.

Railway Express Delivers Laundry

Lock by lock we descended steadily until we came to Givet at the Franco-Belgian border. It was here, when entering France from the north on an earlier cruise, that I first employed the laundry system used in *Yankee's* travels. There is a multivolume Bottin publication available in French post offices and in many hotels and cafes. It lists businesses in all French cities. I would look up a city about ten days ahead and pick out a laundry with a nice-sounding name. Then I would send a

large package of laundry by railway express, along with a letter saying that I'd pick up my finished laundry later.

I had qualms when I sent off my first bundle of 16 sheets from Givet. But the system was a good one; it worked throughout France.

Cruising the Meuse in Belgium was everything a river trip should be. We passed charming little islands, sometimes taking *Yankee* on the "wrong" side—safe channels usually are marked—to the consternation of fishermen who excitedly pointed to rocky shoals. They could not know that our big ship drew only 4½ feet of water and would not be bothered by a bit of grounding.

From wooded slopes and gay modern "campings"—areas set aside for pitching a tent and living outdoors—the scene shifted





to green fields and distant chateaus. We cruised through Dinant with its striking citadel, Namur with its baroque churches, and industrial Liège with its traditions of metalworking since the Middle Ages. We would have liked to spend more time in each—but then, we felt that way about all the places we went through.

Half an hour before reaching Maastricht, we crossed the border from Belgium into the Netherlands. Compliments to the *Yankee* changed from “*joli bateau*” to “*mooi jacht*” as people along the waterway approvingly looked us over.

Maastricht’s medieval walls and ramparts charmed us. So did the ancient moats disappearing under mossy arches, and the Coin des Bons Enfants, a fine restaurant on the Ezelmarkt (Donkey Market). We had two “bons enfants” with us, Chip and Paul Johnson, whose parents, Charlie and Dottie, are our nephew and niece. The boys, 9 and 11, deserved a treat for being good shipmates and promising sailors, who could put a bowline in a mooring line quickly and toss it ashore.

The Coin des Bons Enfants fascinated them; its old stone walls were hung with copper and weapons, and there were intriguing novelties about the food. Onion soup came in fluted ramekins with the floating biscuit an exact fit. Coffee finished brewing itself at the table in individual drip sets. Crepes suzette deftly flipped and set to flame right at one’s elbow made an exciting new experience. Then a whiff of limburg cheese went by, quite justified here in Limburg Province.

We glided along the Juliana Canal from Maastricht through a fairyland setting. On either side willowy trees seemed to lead the canal through a great park, so smooth and soft were the green lawns. Castle walls peeked through the foliage.

Elegance of the 17th century distinguishes an usher at the Weigh House in Gouda, near Utrecht. He watches wheels of world-famous cheese change hands. Manufacture of clay pipes, similar to this one, occupied half the Dutch city’s population in the 1700’s.

Clouds of spun gold billow about a maid at the “Maria, Star of the Sea” Procession in Maastricht. Here Servatius, a 4th-century Roman priest, founded the first Christian community in the Low Countries.

In the crisscrossing waterways of the Netherlands—past Helmond, ’s Hertogenbosch, Utrecht, and on to Amsterdam—we became a part of the nation’s heavy barge traffic. Some of the black-hulled craft were 225 feet in length, carrying 3,000 tons of cargo.

The standard crew was man and wife, children and dog, with an extra hand or two on the biggest barges. As often as not the wife steered, twirling the enormous wheel in the pilothouse aft, but sometimes she worked the cables and threw loops at lock bollards.

Small children watched the passing scene from playpens atop the cargo hold. Children big enough to run about the narrow walk alongside the hold were big enough to help. Sometimes a very small boy would be pushing with all his might against the end of the barge’s heavy pole to help pivot the craft around a turn.

I was delighted with the *vuarende winkel*—the floating stores of Dutch canals. They come alongside, toss a grappling hook over a barge’s low iron rail, and make their sales while under way.

“You must buy something, Exy,” said Doro-



thy Keith, another of our guests. "Don't we need some fresh fruit?"

We could always use more of that. I often bought a fresh vegetable or two, or at least some canned milk, soft drinks, or flour and sugar. These boating grocers also carry notions and dry goods—even sea boots and wooden shoes. With a *vaarende winkel* made fast alongside, barge people don't lose a kilometer while shopping. The *winkelier* doesn't seem to mind how far he tows along in any direction, so long as he does business.

Yankee Belits Where Tsar Worked

Zaandam, ten minutes from Amsterdam by train, has been neglected by the guidebooks and tourists but is well known to sailors. Ships that come to Amsterdam by the big North Sea Canal pass Zaandam on the way.

Here Russia's Peter the Great worked incognito in a shipyard to learn how the Dutch built vessels that would sail nearly into the wind. The humble hut in which he lived in 1697 is preserved as the Tsaar Peter Huisje.

At Zaandam, where *Yankee* customarily underwent her yearly overhaul, Irving's sailing friend Jan Dutilh admired her colorful new paint job and said: "Why don't you sail down to Veere next weekend? They would enjoy seeing you at the parade of old-style ships."

Veere, he told us, is on Walcheren, a low-lying island in the Netherlands' southwest corner. Allied bombers breached its dikes during World War II to dislodge a stubborn Nazi garrison; for more than a year its fields lay at the mercy of swift Atlantic tides. But now Walcheren had been reclaimed from the sea to blossom anew as the "garden of Zeeland."

Southward we sailed through Zeeland's estuaries, now protected from North Sea floods by high new dikes. Nearing Veere with us was a fascinating fleet of old-style craft (pages 174-5). We gazed in delight at various types—*hoogaars*, *tjalk*, *boeier*, *botter*, and *staverse jol*, to name a few.

Some of them had sailed these waters as far back as 1870. They used varnished leeboards instead of centerboards to keep shallow hulls from sliding sideways. Many had beautifully carved lions on rudder posts. Others sported mermaids or gold-leaf bears.

At Veere the proud old Dutch craft staged a fleet parade. *Yankee* did not take part, but

the Dutch yachtsmen seemed to think our lovely clipper bow and our great cabin with five windows across the stern fitted in with their dreams of old-time ships.

From Veere, *Yankee* took us quickly through canals to the shipbuilding port of Vlissingen, then to venerable Ghent in Belgium with its famed belfry topped by a gilded dragon glinting in the sun, and on to Bruges. Steeply gabled roofs, churches chiming out carillon music, and swan-graced canals mirroring ancient bridges give Bruges a medieval character.*

Legend has it that the swans have swum here since 1488. That year the townspeople, angered at Pieter Langhals, a cruel henchman of Maximilian of Austria, beheaded him in the town square. Maximilian, the story goes, ordered the people to atone by keeping "long-necks" (*langhals*) on city canals at public expense forever. We added our bit from *Yankee's* breadbox, then left this once-dazzling center of Flemish commerce and painting for Ostend. There open water beckoned us: the North Sea and soon the English Channel.

Fastnet Race Tests Sailing Skill

Cowes, on the Isle of Wight, with its nine-day regatta "week," was the magnet that drew us to England. Never have I seen such concentrated yachting or heard so much yachting talk. Some 300 yachts competed each day in races staged by local sailing clubs.

Boats and impressions crowded in bewildering variety: 12-meter cup challengers shooting past with full spinnakers of all colors; ocean-goers prepping for the grueling Fastnet Race, 600 nautical miles to Fastnet Rock off Ireland's southwest tip and back to Plymouth; French yachts with stacks of bread on deck; naval vessels on display; colorful oilskins—but no fashions worth looking at, as the women take second place to men!

Then there is the fun of the trots—the British name for strings of boats tied to big drum-like mooring buoys. We counted a line of 20 boats in one trot. When the wind freshens or a boat pulls out, there can be wild confusion—especially in the dark of night, or when the departing craft neglects to arrange for the other boats to tie together again.

(Continued on page 184)

*See "Bruges, the City the Sea Forgot," by Luis Marden, NATIONAL GEOGRAPHIC, May, 1955.

Like sardines in a can, close-packed traffic on the Juliana Canal awaits a 37-foot lift at Born, the Netherlands. Cigar-shaped barges, black as the coal they carry, bracket *Yankee*. They tie to bollards that move up tracks in the wall as the water rises.



DECK AWASH in a dim-colored sea, the yawl
Guinevere beats to windward in the punishing
600-nautical-mile Fastnet Race to Ireland and back.
Here, near the start at Cowes, England, crewmen
in the cockpit struggle to close-haul the jib
while those at the port rail, wearing safety harnesses,
await the order to come about. Plastic
bottom on the upturned dinghy amidships passes
light to the skylight of the cabin below.

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PHOTOGRAPH BY GUY A. LAWRENCE







Good life afloat

“OF ALL THE CREATURES of commercial enterprise, a canal barge is by far the most delightful to consider,” wrote Robert Louis Stevenson in *An Inland Voyage*. Generation follows generation aboard the barges, and descendants of some of the boatmen who inspired this observation still wander Europe’s waterways. Families spend their whole lives afloat, venturing on land only when necessity dictates.

Canal wife (above) near Donk, in the Netherlands, pushes the prow of her barge-home toward midstream to enter a lock. Painted anchor winch looks like a pinwheel.

Horizontal wheel and seated skipper enable the barge (left), here traveling the Zuidwillems Canal, to pass under extremely low bridges. Contented captain of this coal carrier wears *klompen*, the Dutch wooden shoes.



APPEAL OF THE BARGEMAN'S LIFE inspires envy in many a landlubber. Few pressures plague his quiet, low-keyed existence, and few occasions need separate him from his family. Yet he fills a vital role in the economy of Western Europe, where much of the freight among the canalized countries moves by barge. Even womenfolk voice few complaints—for where else could they keep house, raise children, travel extensively, and serve as first mate on a ship, all at the same time?

Feeling sociable, Mrs. Johannes Fransbergen and her daughter Lutske need only lean out the cabin door to exchange news with the wife of a barge neighbor on the Zuidwillems Canal.

Mustachioed barge boy learns geography on the go.



We stayed on to see the start of the Fastnet (pages 180-81). The weather, marvelous all week, turned blowy. Skies threatened and seas ran choppy even in The Solent, the channel between the Isle of Wight and the British mainland. The wind hit 30 miles an hour. Ships heeled way over, their masts criss-crossed in the distance as vessels took their different tacks.

I thought of the prospects facing the men aboard: cold, rough seas, wind, seasickness, wet clothes, wet bunks, little food, and 600 nautical miles of it. Fastnet has a reputation of being among the toughest of ocean races; today I could believe it to be the toughest. I was glad we were turning back to port for the night.

Next day the wind came round a bit and



PHOTOGRAPH BY NATIONAL GEOGRAPHIC PHOTOGRAPHER JOSEPH J. SCHERER © NATIONAL GEOGRAPHIC SOCIETY

the weather reports indicated we could lay a course for Le Havre. I made some sandwiches before breakfast, so I wouldn't have to worry about preparing a meal while under way in a rough sea. We had 100 nautical miles to go—almost 90 in the open Channel. We made Le Havre in 12 hours, 7:30 to 7:30, all under sail!

Yankee's masts came down again next

Serene cul-de-sac on the Seine halts *Yankee* at the doorstep of this handsome country home near Les Andelys. Ability to poke into such out-of-the-way places adds new pleasures to the Johnsons' way of travel. The Seine's main channel, flowing behind the trees at left, meanders some 240 miles from Paris to the sea. Ship's stern carries the name *Mystic*, *Yankee's* home port in Connecticut.

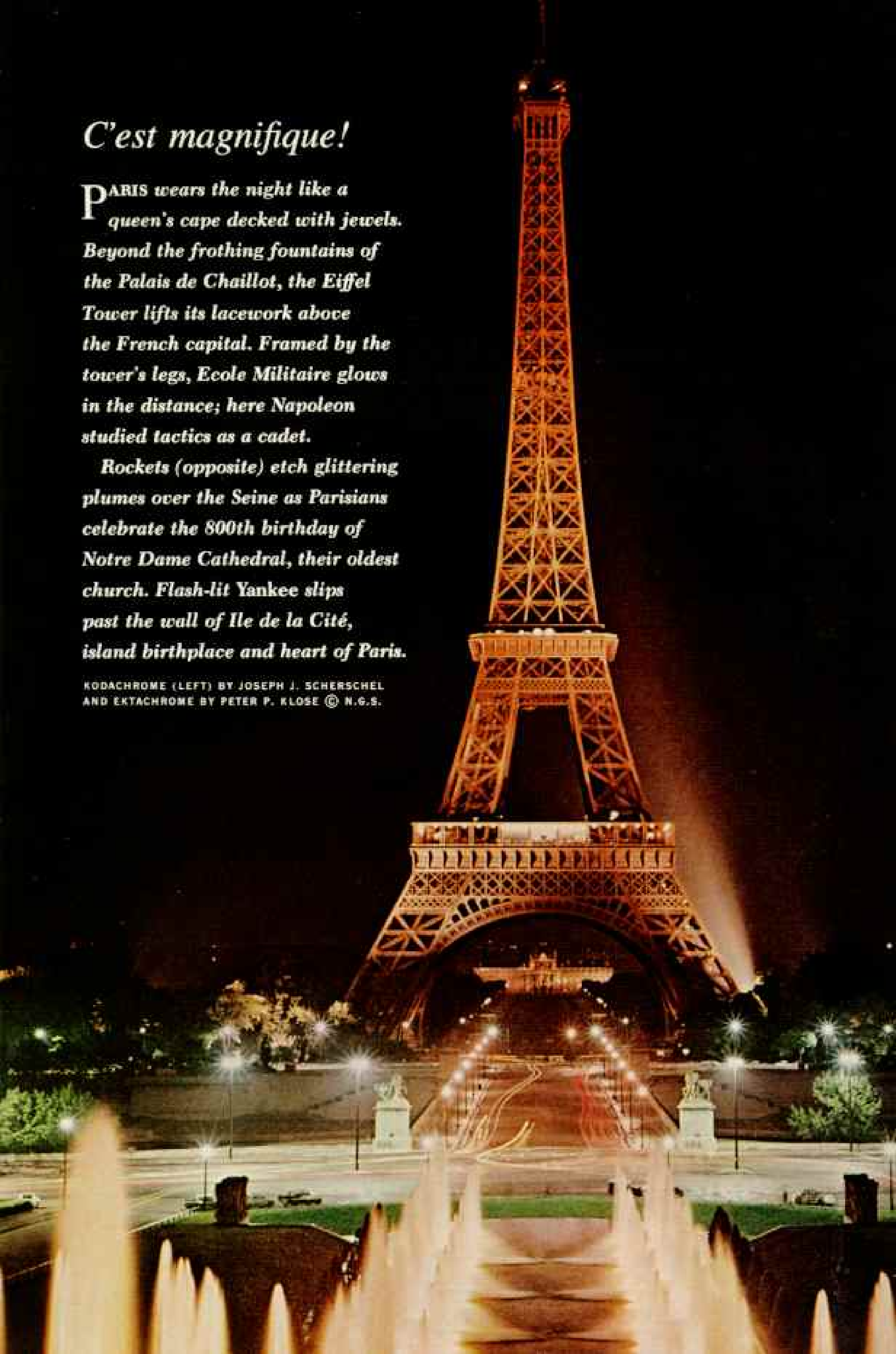


C'est magnifique!

PARIS wears the night like a queen's cape decked with jewels. Beyond the frothing fountains of the Palais de Chaillot, the Eiffel Tower lifts its lacework above the French capital. Framed by the tower's legs, Ecole Militaire glows in the distance; here Napoleon studied tactics as a cadet.

Rockets (opposite) etch glittering plumes over the Seine as Parisians celebrate the 800th birthday of Notre Dame Cathedral, their oldest church. Flash-lit Yankee slips past the wall of Ile de la Cité, island birthplace and heart of Paris.

KODACHROME (LEFT) BY JOSEPH J. SCHERSCHEL
AND EKTACHROME BY PETER P. KLOSE © N.G.S.



morning as we headed up the Seine for Paris and the heart of France once more. We motored past the picturesque little port of Honfleur, and Jumièges with its ruins of an old abbey. In Rouen we walked the marketplace where Joan of Arc was burned at the stake.

Boatmen See a Different Paris

At Conflans, where the Seine and the Oise meet, we learned why the name of this little town—unknown to most tourists—rolls often from the lips of barge people. Here clustered more barges in one port than we had ever seen—four, five, six deep along the bank. Conflans (short for Conflans Sainte Honorine), only 15 miles from Paris, sits at the hub of thousands of miles of inland waterways.

Barge ports are entirely different from sea-ports. Here we saw no waterfront "dives." A barge port has a respectable family atmosphere. Women visit back and forth, enjoying this respite from wandering; children play in groups ashore; men sit under the trees, smoking pipes. Barging is a life families follow for generations.*

From Conflans we wound our way up the Seine to Paris. Paris! Magic name, magic city. But, oh, how different when seen from its waterways!

Yankee looked in again on the houseboat quarter of Paris in Neuilly. Marvelous variety marked the line of floating homes. Some

*See "Paris to Antwerp with the Water Gypsies," by David S. Boyer, NATIONAL GEOGRAPHIC, October, 1955.



were homely little *pot-au-feu* quarters. Others had the elegance of villas. One sported glass-brick walls; another was disguised as a steamer. In a studio-on-a-deck, a sculptor's strange works could be seen through a window. Each houseboat had a dog or a cat, and nearly all had a garden on the bank alongside.

Soon we were steering under familiar bridges, their piers decorated with statuary apparently only for the eyes of boatmen. We moored by the lovely Alexandre III bridge, the Eiffel Tower sharp against the sky beyond (page 187).

We decided to eat aboard early in order to see the "sound and light" show at Notre Dame. The cathedral has wit-

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In dance and dress, the past lives on in Burgundy

EACH SEPTEMBER in the heart of the Burgundy country, talented performers from nations as distant as Israel meet for a wine and folk festival. Last year the United States and Canada entered military bands. Other nations sent spirited dancers wearing the traditional costumes of their native lands to demonstrate intricate steps and patterns that have survived for generations. Capped with a froth of lace, these Breton maidens cast an appraising eye over dance teams during the wine-tasting ceremonies at Pernand-Vergelesses, south of Dijon.

Spinning like a top, Russian dancer twirls to the hand-clapping of onlookers in Place de la République, Dijon.

Bearded Britisher with a bloomin' hat awaits his turn to dance.



nessed 800 years of France's history, and various incidents come to life as narrated by different voices over the loudspeaker. The lights pick out significant parts of the complex building, aspects that the eye overlooks in daylight. We stood on the left river bank, separated from the cathedral by the narrow, dark flowing of the Seine. Quietly a low sight-seeing boat, lights darkened, glided by.

"Couldn't we take *Yankee* past here?" asked Louise Strongman, who had joined us in the Netherlands. "That would be exciting, with all the lights out. Do you think they'd let us?"

"Probably better not ask," answered Terry Glenn in the spirit that took her around the world in the brigantine *Yankee*. "How about it, Skipper?"

So next night *Yankee* hovered in the shadows to let the *bateau mouche*, a sightseeing boat, go first. As we followed, a policeman on a bridge seemed startled, but I don't believe he had specific instructions for a case like ours. *Yankee* kept going past the Ile de la Cité, center of Paris since the days of Roman Gaul. Lights played over the great cathedral walls and the dramatic voice reached the time of Henri IV in France's history.

I doubt if many spectators even saw the little American yacht in this strange situation, but Notre Dame was much more thrilling to us as we floated by than it had been when we stood tamely on the bank (page 186).

We circled the island, drifted to the downstream end, and then saw much activity on what looked like a gunboat ahead—coming in our direction? But the crew was not interested in us. They were the *pompieri*—firemen who sprayed any stray sparks from the fireworks of the finale. *Yankee* returned quietly and innocently to her dock.

189 Locks Between Paris and Saône

Nine trips across France have by no means exhausted possible routes for *Yankee*. On this 1963 "voyage," for the first time we fared eastward from Paris on the Seine. Approaching the Forest of Fontainebleau, we traveled through quite a different setting from that of the canals of the back country.

Here we cruised past attractive houses with well-cut lawns, charming gardens, and docks where power- and sailboats tie up. Not far from Paris, these people enjoy space, privacy, and the pleasure of the river along with the beauty of the forest.

The Seine was taking us to the Canal de Bourgogne, considered the most scenic route

through France. Though a boat must negotiate 189 locks before reaching the Saône at Saint Jean de Losne, any effort is repaid by the experience of cruising the Burgundian countryside at a leisurely six miles an hour (opposite).

I marveled at the mellow beauty of this historic province. Flowers bloomed by farmhouses, dahlias predominating in the September days. Miles of horse chestnuts bordered the canal, making me want to come back to see them flower in May. Old stone barns blended with nature as though they had grown there. Grapes ripened for the famous Burgundy wines.

From the time we entered the Canal de Bourgogne we had heard about the Pouilly en Auxois tunnel ahead. Some skippers told us jagged rocks would rip pieces off our ship.



Garnishing a roast, Mrs. Johnson prepares to serve dinner from her compact galley.

Mirrored at her mooring, *Yankee* finds a peaceful haven on the tree-lined Bourgogne Canal near La Rèpe.

They would take a boat any other route across France just to avoid that tunnel.

It sounded bad. To prepare for it, Irving took down some of the stainless-steel stanchions that held our lifelines; we didn't want to rip them off and tear up the deck too. Then he cut a sapling about four inches in diameter and rigged two six-foot pieces of it—with leaves and bark still on—projecting out slightly beyond our low teak rail where the ship narrows toward the bow. These were to take the shock first if we hit.

Dreaded Tunnel Passage Begins

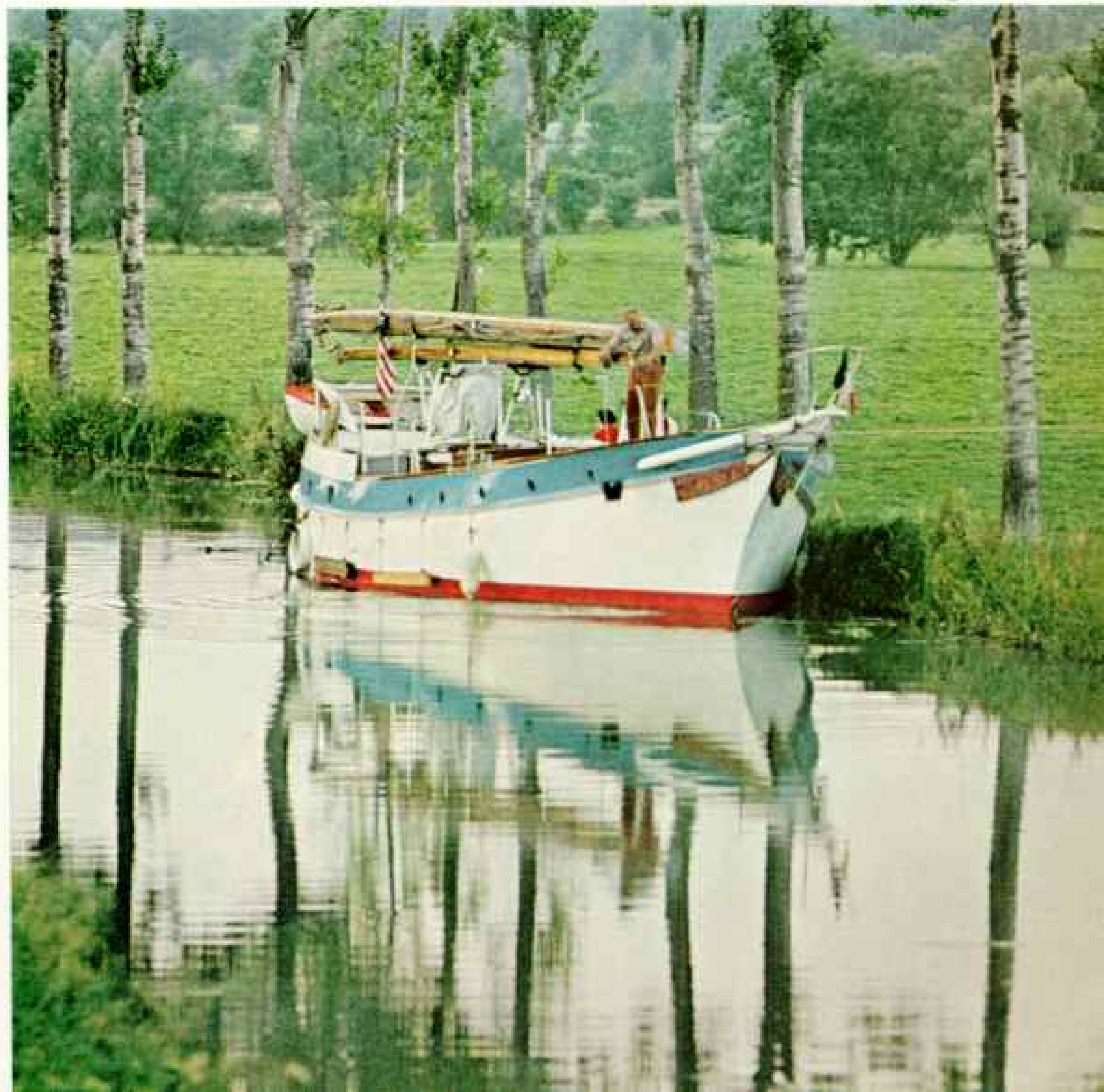
We filled our water tanks, which hold five tons, to put *Yankee* as low in the water as possible. Next morning the Bridges and Highways official tape-measured our greatest height—10 feet, 11 inches—where a bolt

sticks up a bit above the folded-down masts.

"You must move very slowly when you approach some overhead wires near the tunnel," he warned us. If we had any trouble getting underneath, he would lower the water level for a second try. Irving put on dark glasses to adapt his eyes to the tunnel's darkness.

At last, apprehensively, we cast off. We cleared the low-hanging wires with three or four inches to spare. At the entrance the official asked us to wait, because a barge which had preceded us by more than an hour was not yet out.

Finally officials waved us into the long, dark vault, our navigation lights casting a dull, ghostly glow before us. Irving had two miles of the most exacting steering ahead. Our flashlight and inch-calling system soon made it apparent that he had a leeway of 32



inches in which to wander. Not much for two long, slow, dark miles (page 162).

Irving found that the concentration needed to steer *Yankee* so carefully for so long does not even permit one to think, "Now I must concentrate." The thought itself is a diversion. Just steer.

Eyes became accustomed to the darkness. The rounded shape of light where we entered grew gradually smaller. But we could see no

opening ahead! The barge that had entered before us still shut off that light.

Halfway through we began to notice the fumes from her engine. So we stopped, all of us glad of the rest and relief. The barge must have been barely moving, but *Yankee* needed a bit of speed to steer well.

At last a little circle of daylight appeared ahead. The barge was out. We started on once more, feeling pleasantly refreshed. Half the



tunnel lay behind us, and the daylight encouraged us. Finally *Yankee* emerged unscathed from the tunnel of Pouilly en Auxois, "the worst tunnel in France."

Now we were approaching Dijon, the metropolis of the Canal de Bourgogne. The city suffered little damage in the last war; since then, it has grown and modernized without losing the charm of its past.

In the entrance of a medieval church we

Tossing forks of fodder, a farmer fills his rubber-tired hayrack at Châteauneuf, a canalside hamlet southwest of Dijon. Harvested in the shadow of a turreted chateau, the crop will fatten Burgundian cows. "The scene reminds me of my childhood along the Connecticut River Valley," recalls Captain Johnson, whose ancestors wrestled both plows and the wheels of sailing ships.

PHOTOGRAPH © N.E.S.



Sailing a wildflower sea, *Yankee* appears marooned in the fertile valley of the Saône. Summer's blossoms near Corre cover the countryside like a living carpet. From this drive-in florist shop, crew and guests needed only to lean over the ship's side to pick blooms for the table.



Bouquet says welcome to *Yankee* visitors as they cruise southward toward Marseille by way of the Bourgogne Canal. Shy little Christine Raley, encouraged by her aunt, presents the flowers.

read a plan for modernizing its heating system, if sufficient money could be raised. Drifting down from the high cathedral tower of Notre Dame came the sound of the little mechanical figures striking the hour with their hammers as they had been doing for nearly six centuries.

While I absorbed a sense of Burgundy's past, I also shopped in the lively market in the shadow of the cathedral. My taxi was loaded with the produce of the fertile countryside: mushrooms, watercress, and raspberries in addition to vegetables, meat, and milk.



Then I added Dijon's famous specialties: mustard and gingerbread.

The canal from Dijon led us to Saint Jean de Losne, our turning point into the waterway of the Saône River. From here it was a familiar run southward past Chalon sur Saône, Lyon, Arles, and the two old forts at Marseille, the end of our cruise.

The end of a voyage is a time for reflection; this was no exception. We had seen much that attracts visitors by the thousands to Europe, I thought. But we had seen it with different eyes, in a different way.



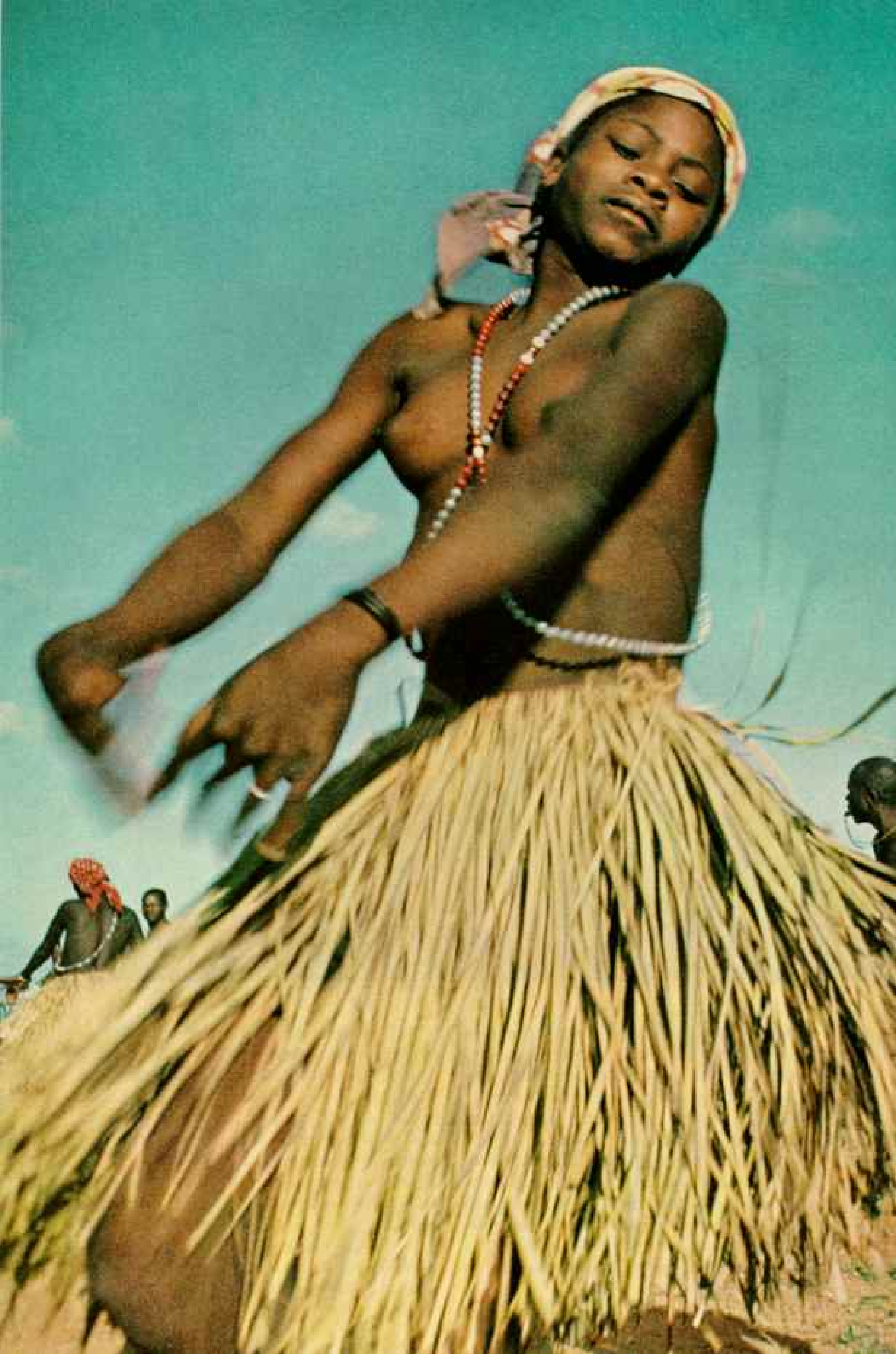
MS. ETACHOURE (OPPOSITE) AND ASSACHROMS BY NATIONAL GEOGRAPHIC PHOTOGRAPHER JOSEPH J. BORERICH. © N.G.S.

Wherever sundown had found us, that was our lodging for the night. Dinners consisted of produce of the country: the freshest, crustiest bread in the world, vegetables and fruits right out of the fields and orchards, meat and poultry farm-fattened and dressed.

Our evening was a pleasant lingering over dinner. At night we slept with the stars shining in the stern windows, down the companionway, or through the open hatch. We could rise early or late with no daily schedule to meet, dress as we chose, welcome visitors, or keep to ourselves.

And touring inland Europe with *Yankee* offered some extra interests: the steering through a narrow bridge; the following of a chart; the search for an anchorage; the difficulties of a stiff current; the special problems of high or low water; the meetings with other craft in troublesome places.

To us these cruising features were basic joys of life on the ketch—and fascinating challenges, too. As our anchor dropped once more in the cluttered harbor of Marseille's Vieux Port, I hoped that those who had sailed with us felt the same. THE END



MOZAMBIQUE

Land of the Good People

ARTICLE AND PHOTOGRAPHS
By VOLKMAR WENTZEL

National Geographic Foreign Staff

CRASHING CHORDS from 24 marimbas set the hundreds of dancers into wild, abandoned motion. Warriors in lion skins ornamented with monkey tails leaped high, arms outflung. Girls whirled grass skirts and their only other attire, strings of beads (left). Dust rose in the brassy African sky and settled on muscular bodies glistening with sweat.

I stood near the dancers on a high bluff overlooking the Indian Ocean beach where, 466 years ago, Vasco da Gama and his weary sailors landed in what is now Mozambique, Portuguese East Africa. Battling fierce storms, the explorers had rounded the Cape of Good Hope in their search for a sea route to India.

Dancers and musicians were Chopi, a tribe scattered throughout the Zandamela area, about 135 miles northeast of Mozambique's capital, Lourenço Marques. Their ancestors had so impressed the Portuguese seafarers that in January, 1498, one of them wrote in his journal:

"We discovered a small river and anchored near the coast. . . . We went close in shore in our boats, and saw a crowd of Negroes. . . . The chief said that we were welcome to anything in his country of which we stood in need. . . . We called the country *Terra da Boa Gente*"—Land of the Good People.

Chopi elders, I learned as I watched the dancing, still cherish the legend of Da Gama and his crew.

"They came on ships like the one on the money," said

Chopi chief's daughter, in beads and raffia skirt, dances between lines of warriors in battle dress under the hot sun of Mozambique. Despite the nationalist ferment that sweeps other parts of Africa, Portugal holds fast to this huge land, which could easily contain the state of Texas.



Chief Felisberto Machatine, showing me a 16th-century caravel on a Portuguese coin.

As the sun descended, the music's tempo quickened and the dancing grew wilder. When the sound reached a crescendo, the dancers surged forward with graceful swaying motions that became fierce, warlike attacks and counterattacks. The men leaped and whirled, brandishing spears and banging oval shields on the ground.

Suddenly the music became hushed, and all sang to the soft tinkle of rubber-tipped sticks on hardwood keys. I asked District Administrator Mario Ferreira Gonçalves what sort of songs they were singing.

"They are topical and sometimes funny," he said, "rather like the West Indian calypso. Often there is biting satire that doesn't spare either the chiefs or me. Most of us know far

too little about the poetry, music, or mind of the African, but we often can gauge his moods and wishes by his latest songs."

Violent Contrasts Mark Mozambique

For me the Chopi dance was the beginning of an eight-month journey traversing the length and breadth of Mozambique. This big Portuguese province stretches along the coast for 1,600 miles, equal to the length of the U. S. Gulf Coast (map, page 205).

I saw masked tribesmen dancing on stilts, cruised among coastal islands, and inspected 16th-century fortresses and churches. Mozambique Island, once pulsing with the India trade, I found to be a living museum of Islamic and Portuguese colonial life.

Aboard a wood-burning steamer I followed Dr. David Livingstone's route up the Zam-



bezi River. In a helicopter I skimmed the wild Cahorabassa Gorge, whose rapids frustrated his search for easy access to interior highlands.

No land offers more violent contrasts. A few hours' drive took me from the untamed domain of the Chopis to Lourenço Marques, a capital that surprises every visitor with its sophisticated elegance.

Certainly, it offered far more than I had reason to expect in eastern Africa—even in a city of 184,000. Strolling along sidewalks paved in wavy mosaic patterns like those of Lisbon and Rio de Janeiro, I marveled at the imaginative designs of the architecture, much of it the work of Amancio d'Alpoim Guedes, better known here as Pancho (page 226).

Pancho has made Lourenço Marques his laboratory, and his concrete cantilever buildings have aroused world-wide comment. On

From the Capital City's White Towers, Portugal Runs an East African Domain

Split-level Lourenço Marques lives on high ground, works on low. Above clay-red bluffs overlooking the harbor stand gleaming apartment buildings and hotels. Stockpiled coal fills open space at center. South Africa and landlocked Southern Rhodesia funnel goods through the port, helping to swell ship dockings to 1,500 a year.

Mozambique, tiny Portugal's second largest overseas realm after Angola, exceeds the area of the mother country eight and a half times. From border mountains as high as 8,000 feet, the land slopes to a 1,600-mile-long coast on the Indian Ocean. Its six and a half million people blend African, Portuguese, and Arab cultures.



apartment houses, long, sharp spines protrude from walls faced with bright mosaic patterns. Chimneys look like mushrooms. Many decorations were inspired by primitive designs.

Wandering through the "old town," near the harbor, I found the teeming Vasco da Gama Market, where farmers sell their produce and fishermen their catch.

Nampula Rises From Swamps

Far to the northeast, inland Nampula—a 20-year-old city of 30,000—was another revelation. From the bell tower of Our Lady of Fatima Cathedral the Negro mayor, Pedro Baessa, showed me new schools, a stadium, a museum, a hospital, a brewery, and a flour mill under construction, and tile-roofed residences among gardens.

"Thirty years ago this was a swamp. Draining it was our first task," said the mayor.

"We are part of a larger scheme," he added. "Three hundred and fifty miles of railway have opened up the hinterlands. Tea, tobacco, cotton, and many other products funnel through here to Nacala, our new harbor.

"Eventually the rails will link us with Vila Cabral and the highlands bordering Lake Nyasa, our best farming country. We will tap deposits of coal and other minerals. Nampula

will become the metropolis of the north."

What impressed me most were Nampula's schools, counterparts of those found in Lourenço Marques and other cities.

At the new technical school, boys worked with wood, metal, and electrical equipment. Girls in neat blue smocks were being schooled in domestic sciences.

"These are the practical trades we need most," remarked the principal.

Busy evening classes proved that here the emerging tribesman realizes education is the key to "white man's magic." In one class I saw waiters, servants, cooks, a rural policeman, a baker, a lathe operator, and three automobile mechanics reading intently with lips moving, as beginners do.

At a mission school, nearly 100 girls washed, mended, cooked, and studied nutrition. Their "training aids" were little orphans contentedly playing in a kindergarten. The girls will one day return to their tribes to be mothers and teachers.

"Africa's future depends on its women," the mother superior told me. "Many of our tribes are matriarchal."

In today's quickly changing Africa, a continent seething with strife and ambitious hopes, I found Mozambique—to all outward ap-



pearances, at least—an island of tranquillity.

Portuguese civil servants and Mozambicans worked together to improve schools, health services, roads, and railways. People of many races and creeds lived harmoniously on government-sponsored land settlements. The Psycho-Social Service, an organization comparable to our Peace Corps, worked effectively among isolated tribes (pages 220-21).

Colonists Build a New Life

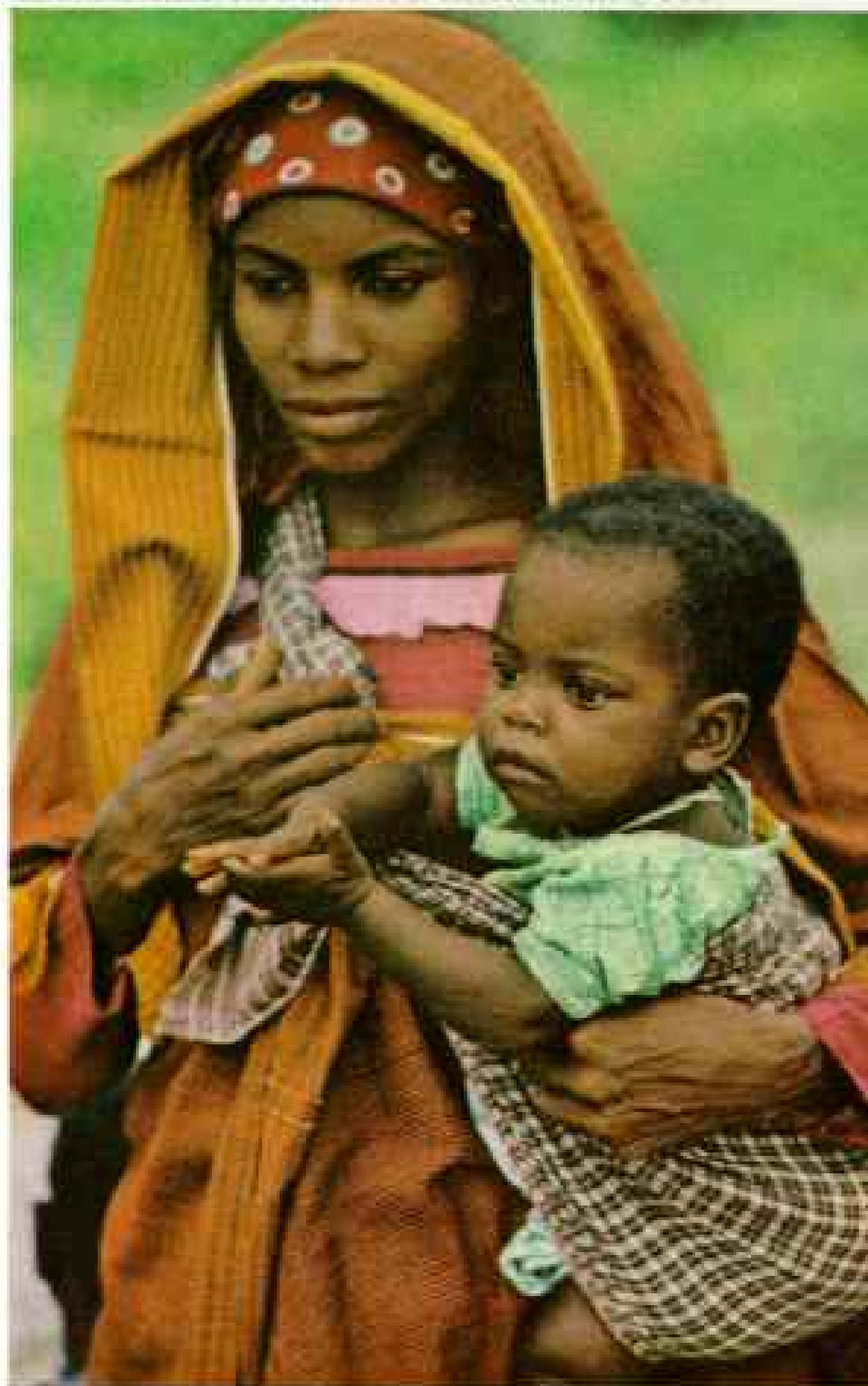
Driving through monotonous bush country along the Limpopo River north of Lourenço Marques, I came upon striking evidence of Portugal's determination to improve the Mozambican land and the lot of its people.

From a distance I saw village lights, and soon I was driving along a paved street lined with modern cinder-block buildings. A sign proclaimed the Pousada do Limpopo, an inn. I checked in for a room.

From workers relaxing at the inn's sidewalk cafe, I learned that I had arrived in Guijá, one of 13 villages comprising the Limpopo Colonato, largest of several settlement programs (pages 202-3).

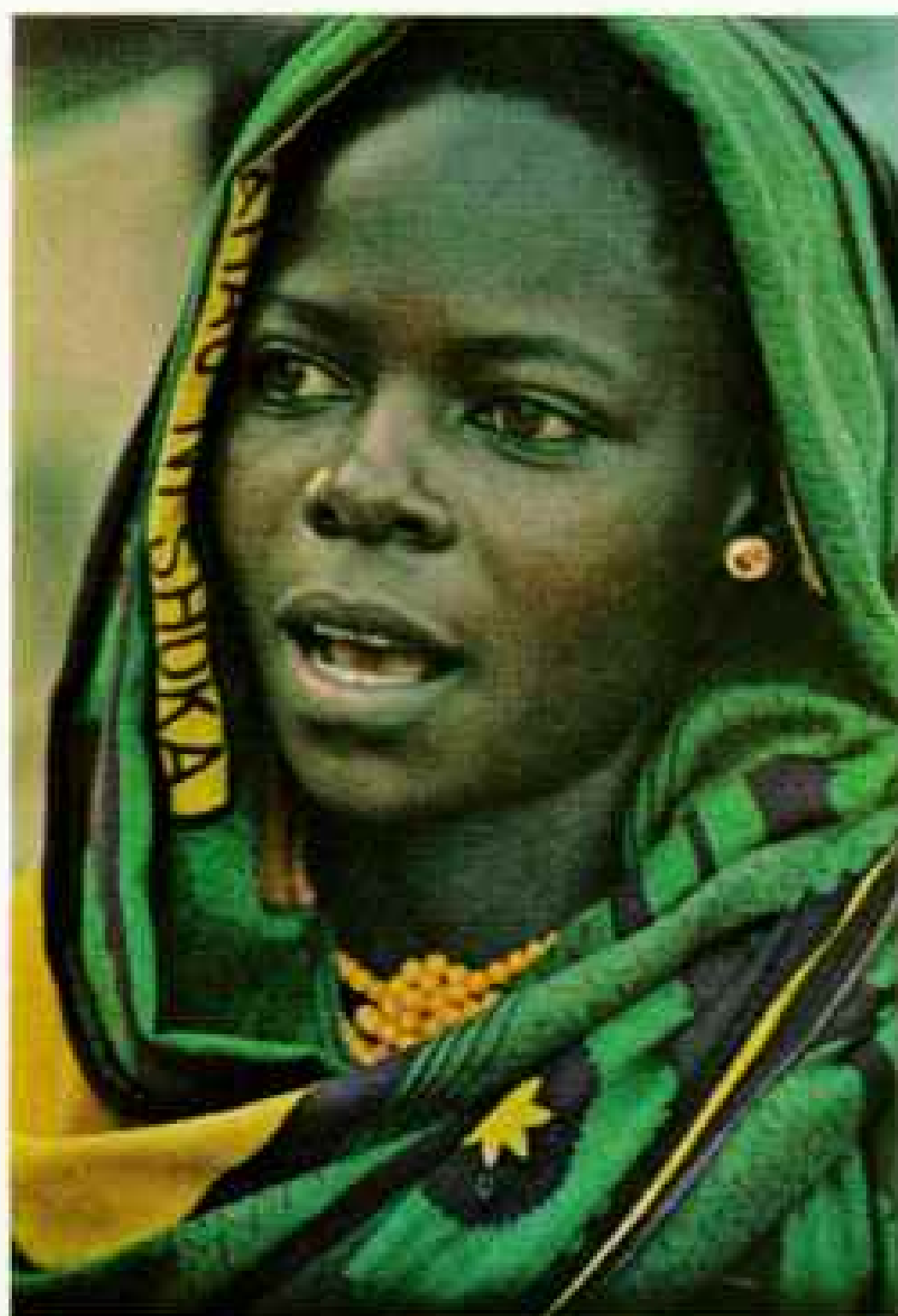
I looked up the administrator of the colony and asked questions.

"We have 2,000 families settled here," said



Arab blood shows in the fragile beauty of a young mother in Mozambique Island.

Vibrant Negro girl lives at Mocimboa da Praia, in a coastal area long exposed to foreign influence. Pierced right nostril holds an ornamental nose disk, an Asian adornment. Her sarilike robe doubles as a primer; its Bantu words mean a pretty girl is as sharp as an ax.



Faces form a racial mosaic

Lissome Eurasian belongs to a small Chinese community. Mozambique's Chinese have intermarried with other Asians, Portuguese, and Negroes.

Sturdy settler from Portugal (far left) crochets a tablecloth for her new home in the Limpopo Colonato (next page).



Weary migrants from Madeira step into a new life in the Limpopo Colonato, a colonization project. Immigrant families may receive as much as 95 acres of land in the broad Limpopo Valley.

Wilderness where elephants and lions roamed a decade ago sprouts a cluster of cottages. Thirteen government-built villages house settlers of the Limpopo Colonato.

Colonato school teaches immigrant and African children in the Portuguese tongue.



Borges Leitão. "More than 600 of these families are native Africans, and they live exactly as those who have emigrated from Portugal, Madeira, and the Azores. We are trying to absorb another 1,500, but it takes time for them to learn our ways:

"When I first came here seven years ago," Senhor Leitão went on, "the railway from Lourenço Marques ended in a fever-ridden wilderness. The soil is so rich it needs no fertilizer. But to use it, we first had to tame the Limpopo. We built a 2,100-foot dam across the river, with automatic flood-control gates



and 13 irrigation canals having a total length of 123 miles."

Flying over the colony in a helicopter, I beheld the winding brown snake of the Limpopo. I could see the dam, the lake it had created, and the irrigation channels that feed water to hundreds of lush green fields—more than 77,000 acres in all.

Nationalist Goal: Break With Portugal

For all its apparent calm, Mozambique may yet feel the unrest sweeping so much of Africa. A political organization called the

Mozambique Liberation Front, with headquarters in the neighboring United Republic of Tanganyika and Zanzibar, wants Portugal to pledge independence for Mozambique.

The Front carries on a campaign directed by Dr. Eduardo C. Mondlane, a Mozambican nationalist who formerly taught anthropology at Syracuse University in New York State.

Watching upheavals in nearby lands, Mozambique prepares for possible trouble. At Nampula I talked with Lt. Col. Francisco Eduardo Nazareth, chief of the Northern Territorial Command.



"My territory reaches from the Zambezi to the Rovuma River," he said. "It is almost five times the size of Portugal."

We inspected the barracks, mess hall, rifle range, workshops, and a class in grimly efficient counter-guerrilla tactics.

"Trouble here can come only from the outside," Colonel Nazareth said, "as it happened in Angola.* But this time we won't be caught unaware."

If similar trouble was brewing in Mozambique, I saw no sign of it among the humble folk of the bush country. Everywhere I found relaxed good humor and warm hospitality.

Once, crossing what Rudyard Kipling called "the great grey-green, greasy Limpopo," I rode the singing ferry. A dozen brawny men sang as they hauled away at the steel cable that pulled us across the river.

"*Boa viagem em Moçambique!*" they sang. "A good trip in Mozambique!"

The singing was so good I got out my tape recorder. A Mozambican passenger in a natty blue suit doffed his hat,

"*Patrão,*" he said, "you are not from here. You speaking English. I am Antonio Matavata. Can I help you?"

"Yes," I said. "Please keep them singing." Encouraged by Antonio, the men sang louder and with more zest.

Antonio told me he had picked up his English while working in the gold mines of South Africa. With the money earned there he could afford a wife and buy a truck. Now he had three children, a concrete house with a tile roof, and a hauling business.

The ferry bumped gently into its crude berth on the south bank of the Limpopo. Antonio shook my hand and climbed into the cab of his Mercedes-Benz diesel truck. I started up my Japanese-made Toyota.

"*Boa viagem em Moçambique!*" Antonio shouted as we parted.

Car Breaks Down in a Wild Land

A few days later, again driving the Toyota, I entered the heart of Mozambique's big-game region, which straddles the Save River. With me were Luiz Monjane, my Mozambican helper, and Shirley Duncan, an Australian journalist who was hitching a ride from Beira to Lourenço Marques.

All day long, with the heat pounding us like a jackhammer, we had driven over a dusty trail toward the Save River. Early in the morning, to our delight, we had spied elands, impalas, greater kudus, nyalas, oribis, hartebeests, and those beguiling midgets of the antelope family, toylike duikers.

The country abounded in lions, elephants, and much other game, we knew, but in the midday heat these beasts kept out of sight.

Suddenly a sharp "ping" sounded from the Toyota's innards, and we drifted to a halt. I tried all four forward gears and reverse. All that happened was a futile racing of the engine. Obviously, something had gone wrong with the transmission.

This was a real predicament. The last administrative outpost was a five-hour drive behind us. Somewhere ahead was the headquarters of the 18,000-square-mile Save hunting concession, largest in Africa, operated for Safarilandia, Ltd., by Werner von Alvensleben.

The thought of spending a night—or longer—in this wilderness was hardly agreeable.

"Let's see now," said Shirley. "What would Dr. Livingstone have done?"

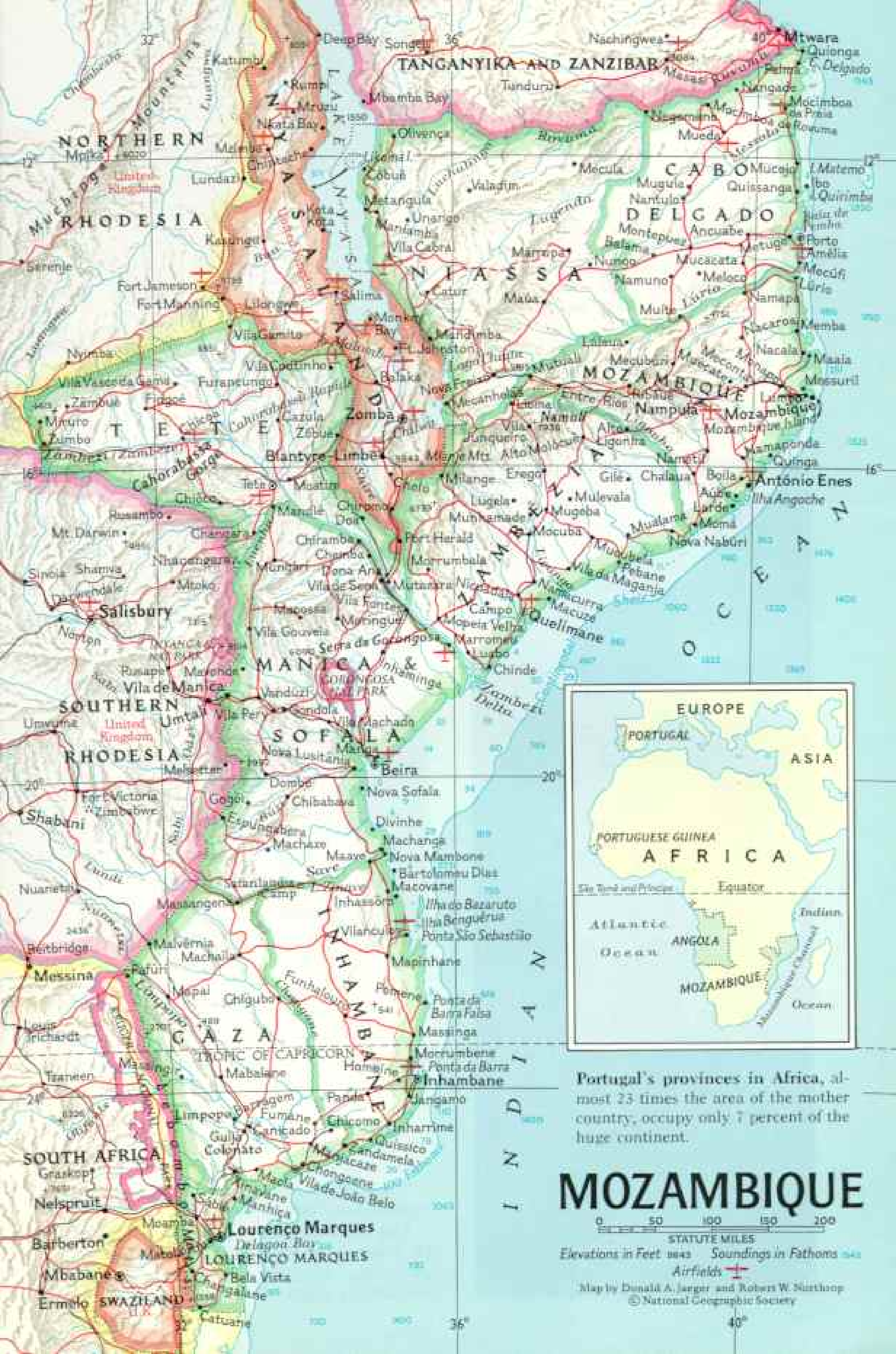
*See "Angola, Unknown Africa," by Volkmar Wentzel, NATIONAL GEOGRAPHIC, September, 1961.

MOZAMBIQUE

PORTUGAL'S CAPTAINS of the India trade cast speculative eyes ashore as they rounded little-known Africa in the 15th and 16th centuries. The search for food and water soon changed to quests for gold and commerce, and trading posts expanded inland. Today Portugal's flag still flies over Mozambique, second largest (after Angola) of its African provinces.

The East African land's bush-covered coastal plain stretches north to 8,000-foot mountains and rises westward to a plateau. The Zambezi, Africa's fourth longest river, divides the country in half. Agriculture thrives along the Zambezi, Save, and lower Limpopo Rivers. In the interior live tribes whose ways have changed little since the Scottish missionary Dr. David Livingstone explored the area more than a century ago.

OFFICIAL NAME: Mozambique, Portuguese East Africa. **AREA:** 302,328 square miles. **POPULATION:** 6,650,000. **LANGUAGE:** Portuguese, various Bantu tongues, coastal Swahili. **RELIGION:** Roman Catholic, Moslem, pagan. **ECONOMY:** Agricultural—cotton, sugar, cashew nuts, tea, sisal, vegetable oils, copra; some mining of coal, copper, beryllium, other minerals. **MAJOR CITIES:** Lourenço Marques (184,000 with suburbs), capital and chief port; Beira (81,000), second largest, important harbor, rail head. **CLIMATE:** Somewhat like Florida's; seasons are marked by a rainy period (November-March), dry (April-October).



Portugal's provinces in Africa, almost 23 times the area of the mother country, occupy only 7 percent of the huge continent.

MOZAMBIQUE

0 50 100 150 200
STATUTE MILES

Elevations in Feet 1643 Soundings in Fathoms 543

Airfields

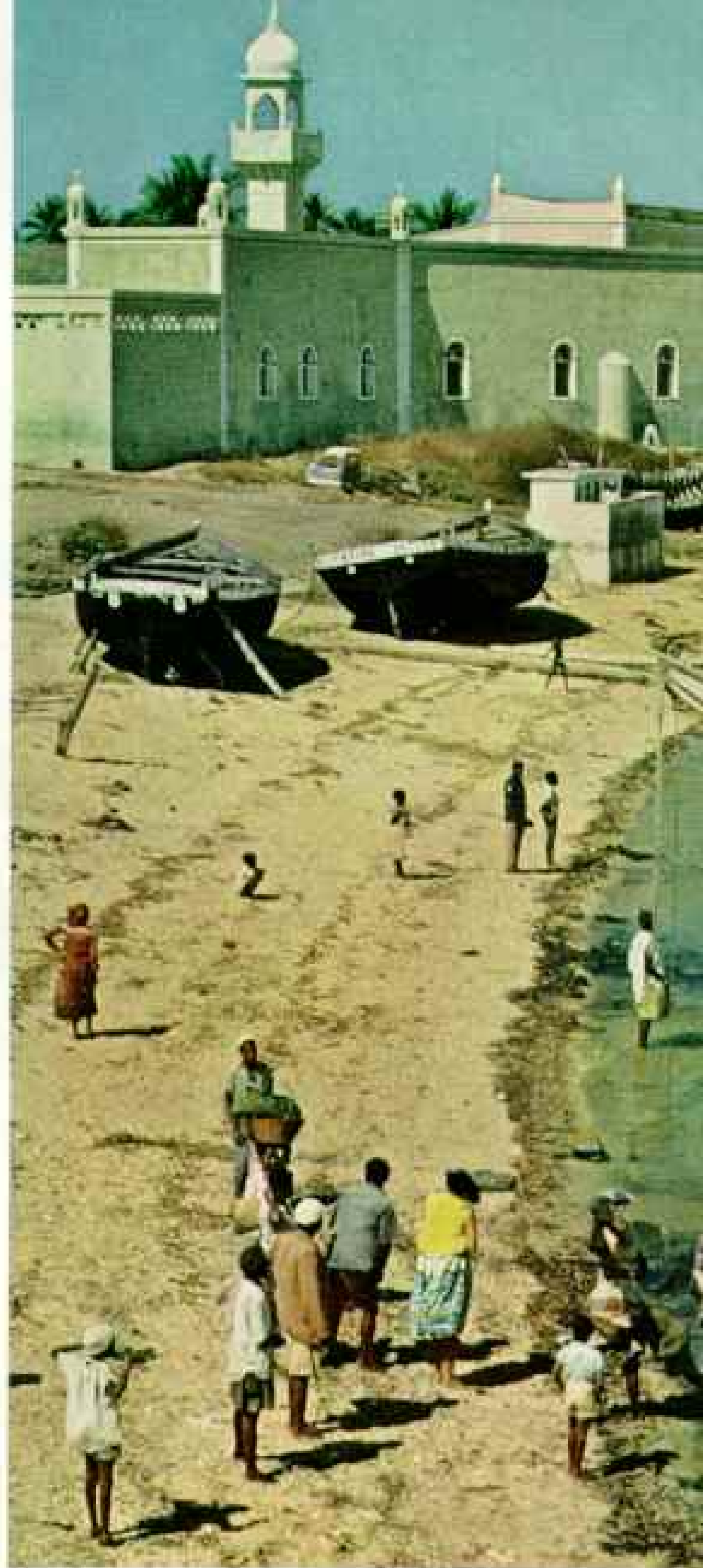
Map by Donald A. Jager and Robert W. Northrop
© National Geographic Society

African Breezes Send Fleets of Sailboats Flocking to Mozambique Island

Laden with goods and workers, the boats beach before a mosque in the Islamic quarter. Arching lateen rigs speak of Arab influence. Moslems made the coral sliver a trading center long before the Portuguese came in 1498. Vasco da Gama saw dhows loaded with gold, silver, jewels, and spices. Portuguese captains soon made the island the most important port of call between Lisbon and India. Trade declined when ships grew too large for the shallow waters of Mossuril Bay.

Boatmen carry passengers ashore to a bazaar where the women will spread produce for sale.

ILLUSTRATION © NATIONAL GEOGRAPHIC SOCIETY



"I guess he would have walked," I said.
"Right you are. Let's get cracking."

We started off southward, the way we had been heading when misfortune struck. Luiz cheered us by saying there might be native villages in the vicinity.

He was right. Within half an hour we came upon five scraggly huts. The inhabitants tumbled out to greet us.

"Viva!" cried the men, while the women curtsied and clapped their hands.

The wrinkled headman shambled forward. He listened gravely while Luiz, who has a smattering of many tribal languages, explained our plight.



"Njonjonjo will help you," said the headman. "I will send a runner."

"Njonjonjo," explained Luiz, "means the Tall One."

The chief then pointed to the setting sun and indicated that the Tall One might not arrive until after nightfall. He seated us on stools made of tree trunks and barked orders that sent the women scurrying like chickens.

Playful Cooks Serve Dish of "Nothing"

His daughter came back with a gourd of water, while the others set to pounding kafir corn in big wooden mortars. The women made a happy, laughing game of their work.

Showing off, they clapped hands while the pestle was in mid-air, then quickly caught it again for the downward thrust.

Their labor produced a coarse flour, which was mixed with water and kneaded into a yellowish dough. This they put in calabash bowls, together with manioc leaves, which resembled spinach, and served to us.

"It tastes like cold nothing," said Shirley. I had to agree. We washed it down with warm *shema*, a palm wine.

As darkness fell, the villagers gathered round a fire, and one struck up a tune on the *mbira*. This simple instrument consists of strips of metal on a wooden panel mounted

on a gourd or a hollowed piece of wood that serves as a resonator. Plucked with the fingers, the mbira makes pleasing, plaintive music.

Forest Provides Automobile Part

While the mbira throbbed, the villagers talked quietly. Babies slept in slings on their mothers' backs. Somewhere in the enveloping black vastness, a jackal howled. The modern world seemed very far away.

The spell was broken by the sound of an engine, and I saw lights coming toward us through the forest.

"Njonjonjo!" cried the villagers.

A car rolled into the clearing and out stepped the Tall One. It was the safari leader—towering, blond Werner von Alvensleben. I had heard much of this man. The preserve he

runs, bigger than Switzerland, draws the world's leading big-game hunters.

Werner had a tool kit and a manner of supreme confidence. By the light of a kerosene lamp he probed the Toyota's gearbox until he withdrew two bits of metal.

"Aha!" he exclaimed. "A sheared pin. Don't worry—we'll just make a new one."

I wondered how a machined part could be manufactured in the middle of the African night. Werner spoke to the headman. A tribesman trotted off into the darkness and reappeared with a piece of ebony.

With a jackknife Werner whittled the stick down to the heartwood and carved a substitute pin. The Toyota ran beautifully with its makeshift part and got us safely to the concession headquarters on the Save River.

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Silent cannon jut from Fort St. Sebastian, which repelled Arab, Dutch, and French attacks upon Mozambique Island. Boy near a cross-crowned sentry box gazes toward low-lying St. George Island, where Da Gama anchored.

Fort St. Sebastian, begun more than 400 years ago, commands the island's approaches. Outside its walls on the island's northeast tip sits a tiny whitewashed chapel. Jetties at right extend from the Islamic quarter. Warehouses crowd the shore beyond. Distant beaches outline the mainland across Mossuril Bay.



There, while a factory-made pin was installed, we relaxed beneath the tremendous thatched roof of the main lodge and gazed at walls hung with antique muzzle-loaders, bows and arrows, and hand-woven rings and ornaments.

Sea Islands Attract Sportsmen

Back in the capital, I boarded a plane of DETA, the Mozambican airline, and flew northward over beaches and open sea toward Mozambique Island. We winged over Benguêrua and Bazaruto Islands, resorts popular with Rhodesians and South Africans for skin diving and marlin fishing.

North of Quelimane a vivid rainbow dipped into shiny-wet coconut plantations, among the largest in the world. Some 5½ million palms grow in this area; copra, the dried meat

of the nuts, goes to all parts of the world to make soap, margarine, glycerin, and many other products.

In the wide mouth of palm-fringed Mos-suril Bay, Mozambique Island basked in the sun. Sails dotted the azure waters and a cream-colored ocean liner floated like a toy.

On this tiny island, which ultimately gave its name to the entire province, Vasco da Gama in 1498 found turbaned Arabs ruled by a sheikh of the Sultanate of Kilwa. The Arabs lived in fine houses and carried on a brisk trade with lands to the north. Da Gama anchored here a month—a month that ended in fighting because, as the Portuguese explained it, “the sheikh . . . harboured treachery in his heart against our men, coveting what he might be able to take from the ships.”



Morning bustle crowds an intersection near the waterfront of Mozambique Island. Few motor vehicles attempt to maneuver in the city's crowded streets. Instead, rubber-tired rickshas provide transportation. A 45-minute ride, costing about a dollar, covers the entire island. When idle, the energetic drivers gather to sing and dance. They also have a football team called the Hot Foots.

Laughing nuns urge on their driver in a race with a trailing ricksha. The island's 12,510 inhabitants include worshipers in church, mosque, and at pagan shrines. Several churches date from at least the 17th century.



The plane landed at Lumbo, on the mainland five miles away, where I spent the night. Next morning I crossed to the island by boat amid a fleet of lateen-rigged craft loaded with workers and produce. On the beach I found a lively market crowded with gossiping, laughing women wearing bright calicos and artfully wrapped bandannas.

By midday the heat took over. From the minaret the white-robed muezzin sounded his melodious summons to prayer.

As if an air raid alarm had sounded, the market dissolved. Moslems flocked to prayer, and from cool, thick-walled colonial buildings officials and businessmen stepped into rickshas to be jogged home for lunch and siesta. Shops closed and coffee sippers vanished from the cafes. Lying only 15 degrees south of the Equator, Mozambique Island wisely bows to the elements.

Inside Fort St. Sebastian, begun by the

Portuguese in the 16th century, I roamed the ramparts and inspected the pointed bastions, each named for a saint. I sighted along the cannon that once guarded against sea attacks (page 208), and underground I saw cisterns that held enough water to supply a thousand soldiers during a prolonged siege.

The garrison commandant, A. S. Gaspar, and a corporal who carried massive keys led me along a dark passage piercing the fortress wall. When heavy doors were unlocked, I was dazzled by sunlight reflecting from the white-washed walls of the little 16th-century chapel of Our Lady of the Bastion.

Cashew Capital of the World

Beside the harbor, Senhor Alcino Caldeira led me through the elegant 18th-century customs house in which he works.

"Our island is world headquarters for cashew nuts," said Senhor Caldeira, pointing



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to a pile of overflowing bags. "The nuts are brought here from the continent. Every year Mozambique ships as many as 90,000 tons of cashews to other lands. Most of them are consumed in your country."

Crates containing thousands of copies of the Koran, on their way from Egypt to points along the coast, reminded me that it was Mohammed's birthday, which that year fell on August 12, according to the Moslem lunar-based calendar. I had an invitation to a birthday celebration at the mosque.

Outside the mosque I removed my shoes, wondering if I would ever find them again in the jumble of footgear ranging from be-draggled sandals to morocco leather boots.

"*Al-salâm 'alaykum* [Peace be with you]," said Imam Ismail Umar, my host.

Worshippers were still washing at a row of taps and cleaning their teeth with frayed fibrous sticks, a kind of throw-away toothbrush

I had seen used by tribesmen in the bush. Fathers helped small sons into fresh clothes.

Suddenly there was silence. A golden pastoral staff in one hand and the Koran in the other, Ismail Umar faced his flock and led the prayers. Foreheads touched the matting.

Looking down rows of fezzes, turbans, and embroidered caps, I saw Negroes, Arabs, Indians, Chinese, Portuguese, and Greeks worshipping side by side.

After the service, the celebration of Mohammed's birthday began. A dark little man in a nightshirtlike caftan formed the celebrants into a large swaying circle. Sweat streamed from brows as he whipped the crowd into a syncopated, ever faster frenzy that went on through the night.

On the mainland near Mozambique Island lies Chocas Beach, the area's holiday resort. I went there to see a man who, I had heard, lived by the most agreeable of occupations.



Jump-rope samba demonstrates a fish-wife's grace on Mozambique Island. Companions in bandannas and sunburst-pattern cloth await their turn. Drums set a fast syncopated beat for the dance, a favorite island pastime. Young woman in center has smeared her face with putty-like paste—a mask of beauty.

Self-taught Artist Paints the West's Bewildering Effect on Africa

Malangatana Goenha Valente holds first prizes in Lourenço Marques competitions, and his paintings hang in the city's museum. Many of his works depict the struggle between European culture and African beliefs, including witchcraft. Malangatana sometimes writes comments on his canvases. Chalky face at lower left, representing a friend killed in a mine accident, explains the irony of the note above it: "Reminder—must return for doctor's checkup September 14." The words "Amo te"—I love you—cover the forehead of a reclining figure.

ILLUSTRATION BY V. G. S.





He was Kurt Grosch, beachcomber and conchologist. I found him barefoot and in tattered shorts, sitting on a rock. Palavering women and laughing children brought him seashells, from which he selected and bought choice specimens.

His morning's work done, Grosch led me to his thatched home and poured beer. He showed me tray after tray of neatly classified shells, part of his complete collection of the shells of the area.

"Most shells found in the western Pacific and northern Indian Ocean can be found here, plus others," he said. "Currents in the Indian Ocean and the Mozambique Channel favor their migration and distribution."

He picked up a beautiful shell with a delicate white pattern on a bright reddish-brown background.

"Pretty, yes?" he said. "It is a *Conus aulicus*. The mollusk which built this has venomous teeth, like tiny harpoons; they can inflict a fatal sting if the live animal is carelessly handled."

From a special drawer the learned German carefully lifted a conchologist's treasure. It was a knobby shell about eight inches long, of yellow, orange-brown, and chestnut color, with a flaring white aperture.

"That is *Cymatium ranzanii*," he said reverently. "The species was almost forgotten for a hundred-odd years. Of the ten good specimens existing in the world's collections, I have found five."

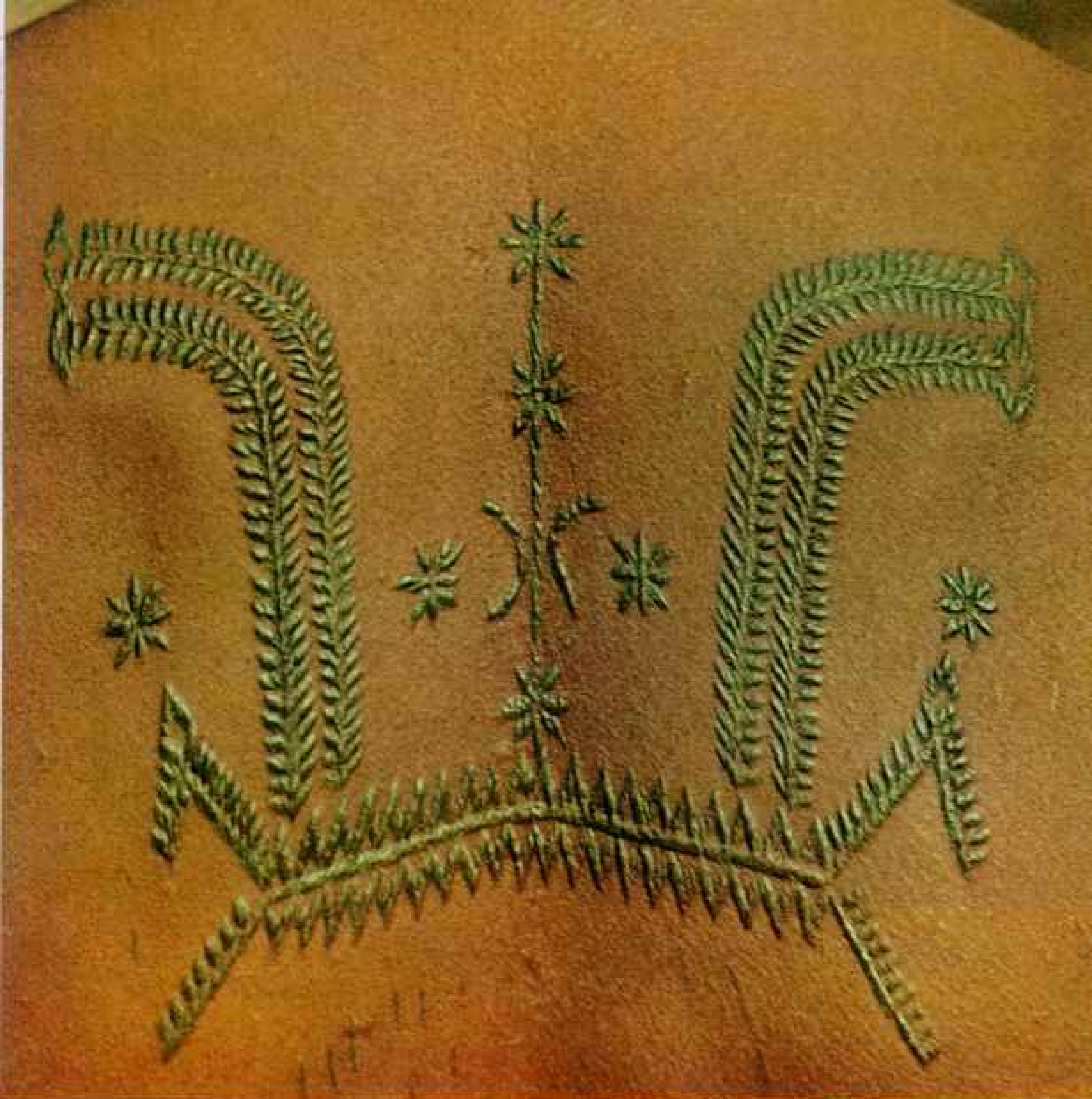
Sea Lashed by "Whip of God"

North of Mozambique Island lies Porto Amélia. From there I set out to visit the offshore islands that had been among the earliest settlements of the Portuguese.

Porto Amélia was still asleep as my launch, crewed by five muscular Negroes, chugged out of Pemba Bay into a sun rising among purple thunderheads. Hitting the open sea, we rolled and pitched heavily. Mariners had told me that Pemba Bay, capable of sheltering an entire fleet, was a blessing to this cyclone-ridden coast.

As if to banish thoughts of the "Whip of God," as these violent tropical storms are called along this coast, a school of porpoises cavorted back and forth across our bow.

Fringed by a whitecapped reef, the coast extends for miles as a panorama of rocky cliffs, beaches, and wooded stretches with an occasional village. To starboard lay strings of palm-studded islands and sand shoals teeming with birds.



By late afternoon a squall blackened the sky. Waves pounded our bow, and a driving rain reduced visibility to zero. The launch groaned and creaked. Whenever the stern lifted, the screws screamed in protest.

Loose gear flew about the cabin. One sailor took a precarious post on the bow, watching for reefs. The others, staring into the void, conversed in Kimuane, a coastal dialect. I gathered we would seek shelter in the lee of Quirimba Island, but it would be a close race against the powerful 13-foot tide.

By nightfall we made it. The storm had blown itself out, and tattered clouds exposed a pale moon. A lighted house beckoned among the palms. We beached the boat and hiked

across what seemed like a mile of sand to be welcomed by Joachim Gessner, his wife, and two children, one of the German expatriate families found throughout east Africa.

On Easter morning Gessner showed me his coconut plantation. "My father and a partner started all this 30 years ago," he said. "Now we have 60,000 trees. We also grow our own coffee, lemons, oranges, and vegetables."

Later I had a look at the island's jungly interior, honeycombed by sinkholes infested with pythons and giant snails.

I came upon yard-thick coral walls, remains of an early Dominican mission. Cacti and vines sprouted from cracks, and a fig tree grew through the stone altar. Tombstones

Not Fancy Clothes but Scars Make the Makonde Girl a Desirable Wife

Hundreds of small cuts rubbed with charcoal create facial tattoos of a Makonde matron. A nail adorns her lip plug. Authorities discourage the plugs, which invite tooth decay and cancer.

Earth and herb irritants daubed in wounds on a woman's back (left) have raised scar tissue. Tribesmen regard the welts as beautiful, and prospective husbands reject "plain" women.

Wood-carved face with tattoos rests in the Museum of Nampula. Accomplished carvers, Makondes transform hardwood into striking shapes.



PHOTOGRAPHS © NATIONAL GEOGRAPHIC SOCIETY

and pieces of a baroque baptismal font lay crumbling—reminders of a bold Portugal in a barbaric land.

With the high tide we sailed for neighboring Ibo, relic of the days when islands were safer from attacks by tribesmen than were the mainland harbors.

Stepping into a deserted square, I thought I was in a ghost town. Empty streets, shuttered mansions, and caved-in tile roofs added to the eerie mood. Rococo lamp posts of cast iron and elaborate façades hinted at 19th-century prosperity from a wretched traffic—slave ships carrying human cargo from Ibo to the West Indies.

As I stood contemplating the economic

vacuum that is Ibo today, the soft strains of a Te Deum drifted from the church facing the square. Bells boomed, and red-robed choirboys, parishioners, and a sun-helmeted priest straggled forth.

"Please join our Easter feast," said Mario Batista de Oliveira, the island's administrator. He escorted me to a large open veranda supported by well-proportioned columns. The house behind was a ruin.

Assisted by the postmaster, the customs officer, and the Goanese doctor, Administrator Oliveira spread the banquet table. From all directions matrons, girls, and servant boys brought platters heaped with lobsters, prawns, and mussels. A shellfish called *maraca*, skewered on split bamboo, was particularly tasty; also *chocos*, squids cooked in their own ink.

Drum Crescendo Routs Evil Spirit

Returning to the mainland, I turned northward to Mueda, center of a plateau inhabited by the Makonde tribe. Less than 50 years ago the Makondes enjoyed splendid isolation.



Even during the days when slavers came to round up human chattels, the Makondes were protected by steep escarpments and their own warlike nature. Now Mueda has an airstrip, and it can be reached by road.

Most Makonde men still carry weapons—spears, axes, bows and arrows (no longer poison-tipped), or muzzle-loaders. They tattoo themselves liberally, and the women wear lip plugs (preceding pages).

With Dr. Hector Fonseca, the local health officer, I joined a village crowd to watch a Makonde dance. Around a fire ten sweating drummers tuned their instruments, heating the heads and then testing them for tautness.

Suddenly, at a blast on a kudu horn, the drums throbbed in earnest, and three tall figures appeared cavorting among the huts.

Two wore yellow masks painted with characteristic Makonde designs. The third wore



WADING HOME BY SOLARAR WERTZEL, NATIONAL GEOGRAPHIC FOREIGN STAFF © N.G.S.

an amusing black false face with feathers protruding like horns. All the masks were complete heads carved from solid wood. The wearers could see only through the open mouths (page 218).

Suddenly, in quick leaping steps alternating with a swaying motion, one of the yellow-masked dancers, or *mapicos*, headed for the crowd. Feigning terror, the people backed away. At the peak of drum frenzy, the *mapico*

Specks in Africa's wilderness, a Shona tribeswoman and her children wade the Luenha River south of Tete after gathering manioc. Also known as cassava, manioc flourishes in poor soil, defying drought and dreaded locusts. Tropical Africans call it "the all sufficient," converting its starchy flour into porridge, paste, soup, and sauce. "Sweet" roots are cooked like yams. "Bitter" ones are soaked, often for days, then sun-dried to remove lethal prussic acid.



Personifying evil, a mapico dancer hides from spectators. His vest, studded with bells, jangles during frenzied performances. Fortified by throbbing drums, shouting Makonde villagers end each dance by chasing away the mapico. Another takes his place in an hours-long show.

Carved and painted masks help mapicos stay anonymous. Carvers work in secrecy; it is taboo for women to see masks being made.



EXTREMELY SPECIFIC AND FIDELITY © N.A.C.

stopped, quivered, and shook as if possessed. Then, as if defeated by the drumming sound barrier, the mapico stamped his feet and, with arms raised, retreated.

Tattooed faces broke out in smiles, and the shouting crowd pretended to chase the mapico back to the huts.

"He represents an evil spirit," explained the doctor. "Now the drums have driven him away. It is an ancient ritual, but we know little else about it."

Later on, between Mueda and the Rovuma River, I chanced upon a seven-man brigade of the Psycho-Social Service, Mozambique's version of the Peace Corps. In front of a

tent, a young Negro intern treated a queue of Makondes. Children wailed and mothers watched anxiously until all sores had been daubed with ointment (page 221). Other patients seemed to enjoy hypodermic injections.

"They have an unbounded faith in the needle, much more than in pills," said Senhor Narra Paixão, the brigade leader.

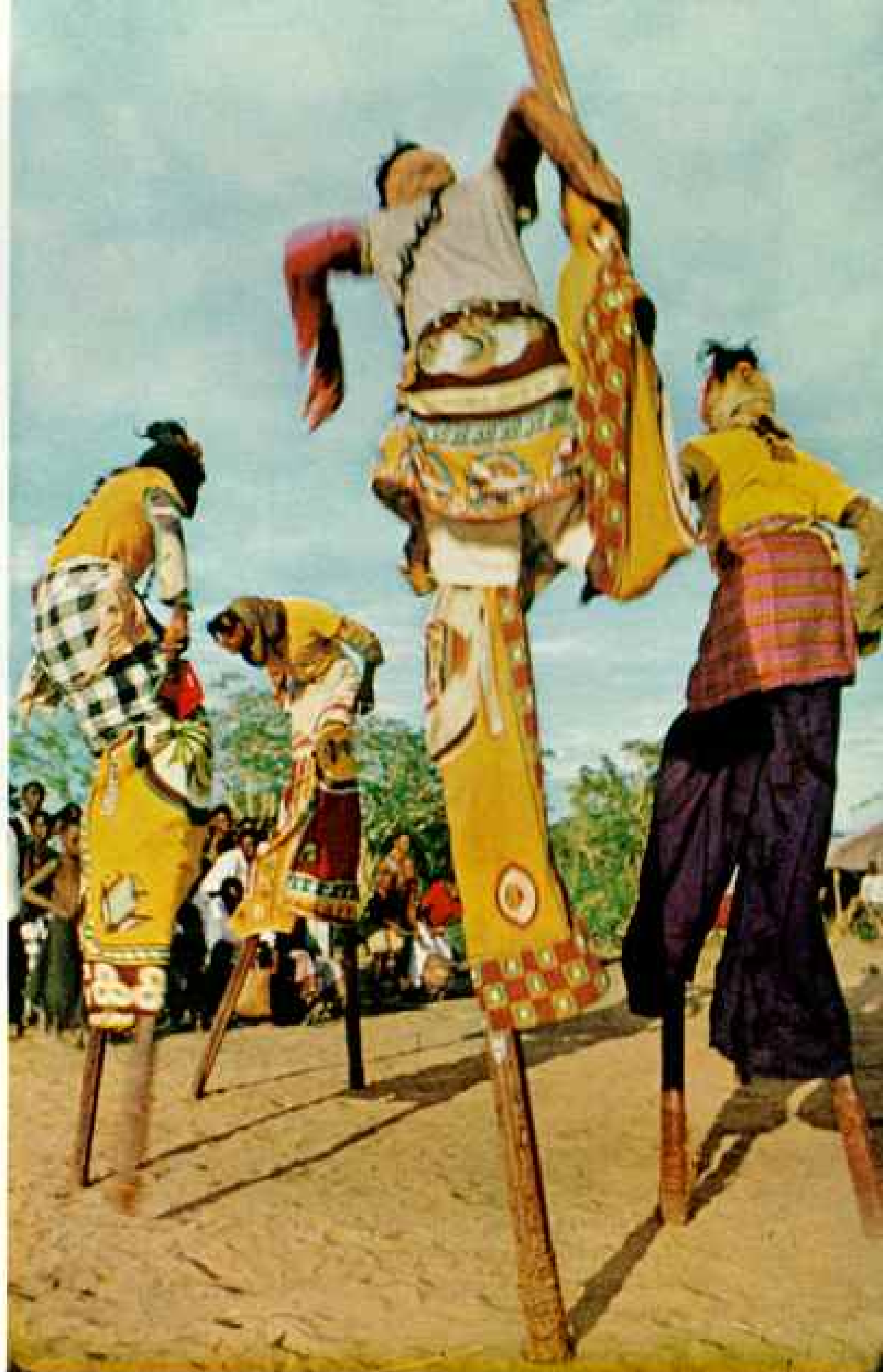
Under a tree, Paixão's wife, surrounded by earnest platter-lipped women, patiently taught knitting. A tattooed girl was having her first lesson in casting-on (page 220).

After dark, training films were shown. The Makondes liked movies of themselves best of all—especially their mapico dancing.



Moronic mask glowering, a Makua stilt dancer suits up. He lashes his legs to six-foot poles on which he will perform feats demanding an acrobat's balance and an athlete's strength.

Gaily garbed giants cavort as a Makua village gathers for a day of fun. The stilt dancers' teetering ballet has no ritual purpose. Men take pride in making outlandish costumes.



STYLING: JANE AND KYLE CHURCH (ARTIST) © NATIONAL GEOGRAPHIC SOCIETY

The next morning I traveled north to the Rovuma River, which borders the United Republic of Tanganyika and Zanzibar. At Nangade, near the frontier, I found Makua tribesmen preparing for one of their strange stilt dances. The stilts they mounted were unlike those I knew as a child; they had no supports for the feet. The upper ends of six-foot notched poles were simply strapped tightly to the legs with strong woven fibers. Red and yellow cloths like long, loose trousers draped the stilts. Grotesque masks covered the faces.

Assistants helped the dancers to their "feet." Like giants with tiny heads, they strutted to the center of the village where, to the beat of

drums, they strode along in a snaking conga line and then performed a kind of twist on stilts. As far as I could see, the dance was purely for fun and entertainment (above).

Among the amused spectators were several women to whom laughing must have been painful because of the big disks in their upper lips. Some scholars believe this disfigurement began during slavery days, to make the women less desirable.

Stern-wheel Steamers Ply the Zambezi

Flying southward from the primitive Makua country, I was struck again by the vivid contrasts that greet the traveler in Mozam-



Teacher's hands guide a learner's in the Mozambique Psycho-Social program, comparable to the United States Peace Corps. Member of a mobile brigade, this social worker teaches knitting to a tattooed Makonde girl. Teams of seven—specialists in medicine, agriculture, and home economics—penetrate to the most remote villages and teach by demonstration.

Startled baby, held firmly by his mother, receives penicillin salve for body sores; an intern applies the brush. Psycho-Social doctors search out cases of leprosy and operable eye diseases. When half-blind men dramatically regain full vision, tribesmen learn to trust surgery and medicine.

bique at every turn. In Quelimane, capital of the Zambézia District, I found people of varied races and creeds living in an atmosphere of elegance and charm. Quelimane, once a notorious slave center, today is headquarters of venerable firms that export copra, cotton, tea, sisal, rice, and timber.

Livingstone, after his trek across Africa in 1856, said: "I ought to speak well forever of Portuguese hospitality."

This is just as true today, as I found when I went to a party at the Governor's Residence. Among the guests were several smartly dressed matriarchs of mixed blood. These stately ladies, descendants of old Zambézia families, bear the title *dona*, dating back to the 18th and 19th centuries, when large tracts of land were given to women who would pledge to wed Portuguese from Europe. The practice has long since vanished, but the donas still enjoy great prestige among older Africans.

I accepted eagerly when Senhor Fragoso de Sousa, general manager of the Sena Sugar Estates, offered me a trip on one of his company's steamers. Here was a chance to see something of the storied Zambezi, ascended

by Livingstone's expedition in 1858.

At Luabo, the sugar firm's headquarters in the Zambézi Delta, the river flowed wide and tranquil after a 1,650-mile journey through Angola, the Rhodesias, and Mozambique.

With José Gomes Pedro, a Portuguese botanist, I boarded the *Dombe*, a small wood-burning vessel with a skinny red smokestack (page 223). The big paddle wheel churned the water into froth as we chugged into mid-stream. We were bound for isles at the river mouth to collect fuel for the *Dombe* and other ships of the company fleet.

In the wheelhouse we found Captain José Pinto with a green parrot perched on his shoulder. Two sailors tended the wheel. "We will pass through the Kongoni Channel, first used by Livingstone," said the captain. "Sandbars are our biggest hazard," he added. "They shift from day to day."

We passed many bars covered with ducks and Egyptian geese. To startle them into





flight, the captain blew blasts on the steamer's old-fashioned brass whistle. The birds rose in a cloud, then glided slowly down to settle on a more distant bar. Crocodiles, disturbed in their sunbathing, waddled toward the water like indignant dowagers. Captain Pinto pointed out islands with names like *Ilha dos Amôres* (Island of Lovers) and *Ilha dos Marabus* (Island of Marabou Storks).

Swamps Alive With Crabs and Monkeys

Turning into the Kongoni Channel, we cruised through a quiet jungle of palms and tangled foliage. Here Senhor Pedro was in his element. He pointed out almond trees with russet leaves, silver-topped papyri waving in the breeze, and the tall Zambezi Delta screw pines named for Livingstone—*Pandanus livingstonianus*.

Rounding narrow bends, our bow shattered calm reflections in the water and splashed through floating islands of water hyacinths. A few fishermen in dugouts waved heart-shaped paddles in greeting.

We continued downstream until we could see the Indian Ocean breakers, then turned into another wide channel lined with dense mangrove swamps alive with playful monkeys and huge crabs.

"The monkeys catch crabs by lowering their tails into the crab burrows," said Berniz, the ship's steward. "When a crab catches hold, the monkey jerks him out like a fish on a line. Sometimes the crab is too big to pull out, and it holds onto the tail of a monkey until the tide comes in and drowns him."

All this with a straight face! As for myself, I'll believe it when I see it.



STRUCTURES BY DELORIAN WORTZEL (MOVIE) AND CHARLEY HODMAN © R.A.S.

Foaming cataracts of the Zambezi River's Cahorabassa Gorge thwarted David Livingstone's dream of discovering a navigable waterway into Africa's heartland. No boat has survived Cahorabassa's crashing waters. Here the Zambezi crosses part of the continent's Great Rift Valley. In places the gorge squeezes the flow to a width of less than 50 feet. Mozambique soon will begin to dam the gorge to create a mountain-lined lake 150 miles long.

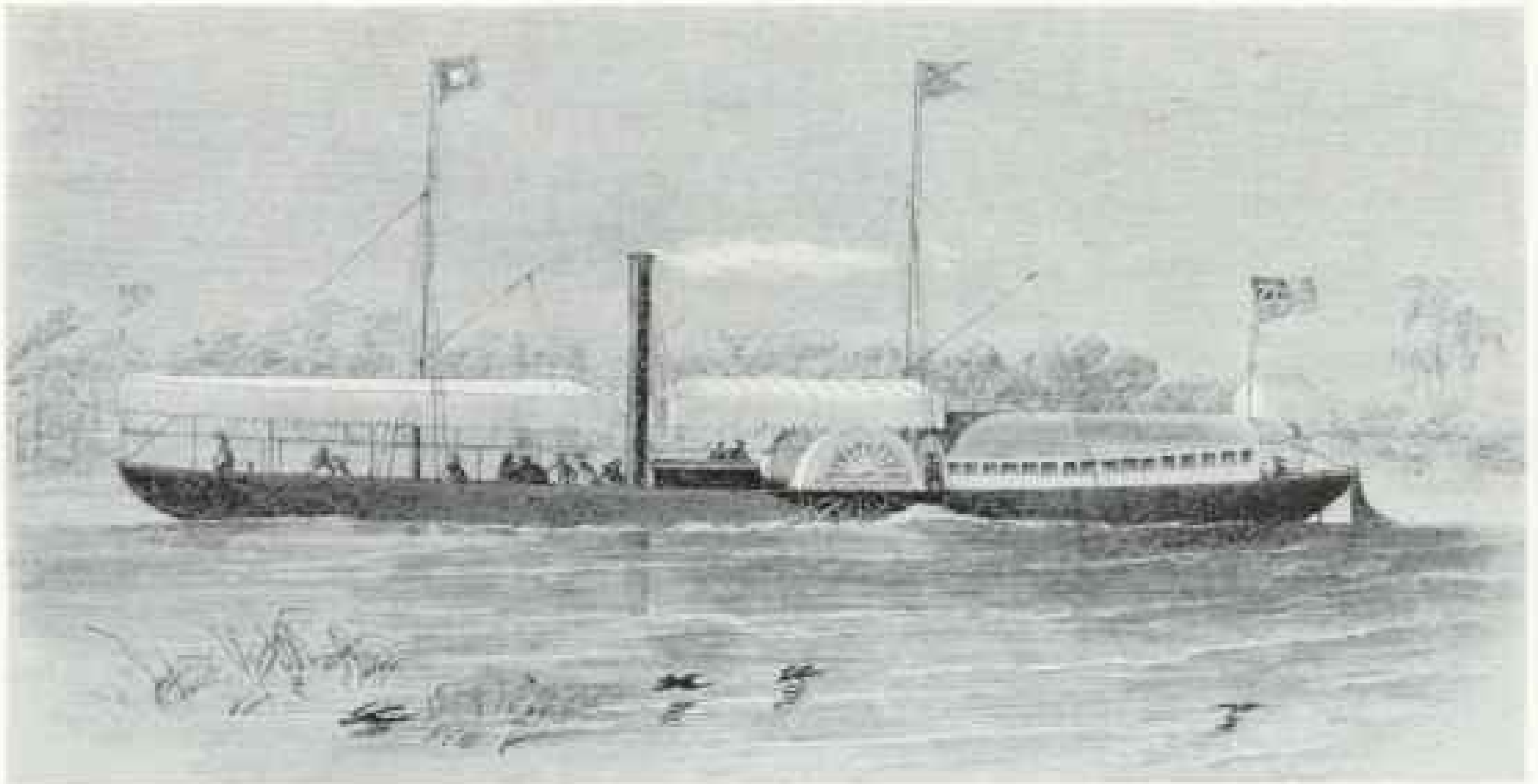
We anchored here for the night, and after dinner Senhor Pedro fascinated me with some botanical lore gathered in a four-year survey of Mozambique.

"Many of the fruits and vegetables raised widely elsewhere in the world did not reach this part of Africa until comparatively recent times," he explained.

"Portuguese sailors brought maize, manioc, cashews, and peanuts from the Americas. The mango comes from India, and the Arabs introduced oranges, lemons, and ginger. Farming in the European sense never existed here before this century. Even today, most of Africa belongs to a hoe culture."

At dawn I was awakened by the clatter of cords of mangrove wood being dumped into barges lashed alongside the *Dombe*. Mountains of this wood were stacked along the riverbank. It had been cut by a

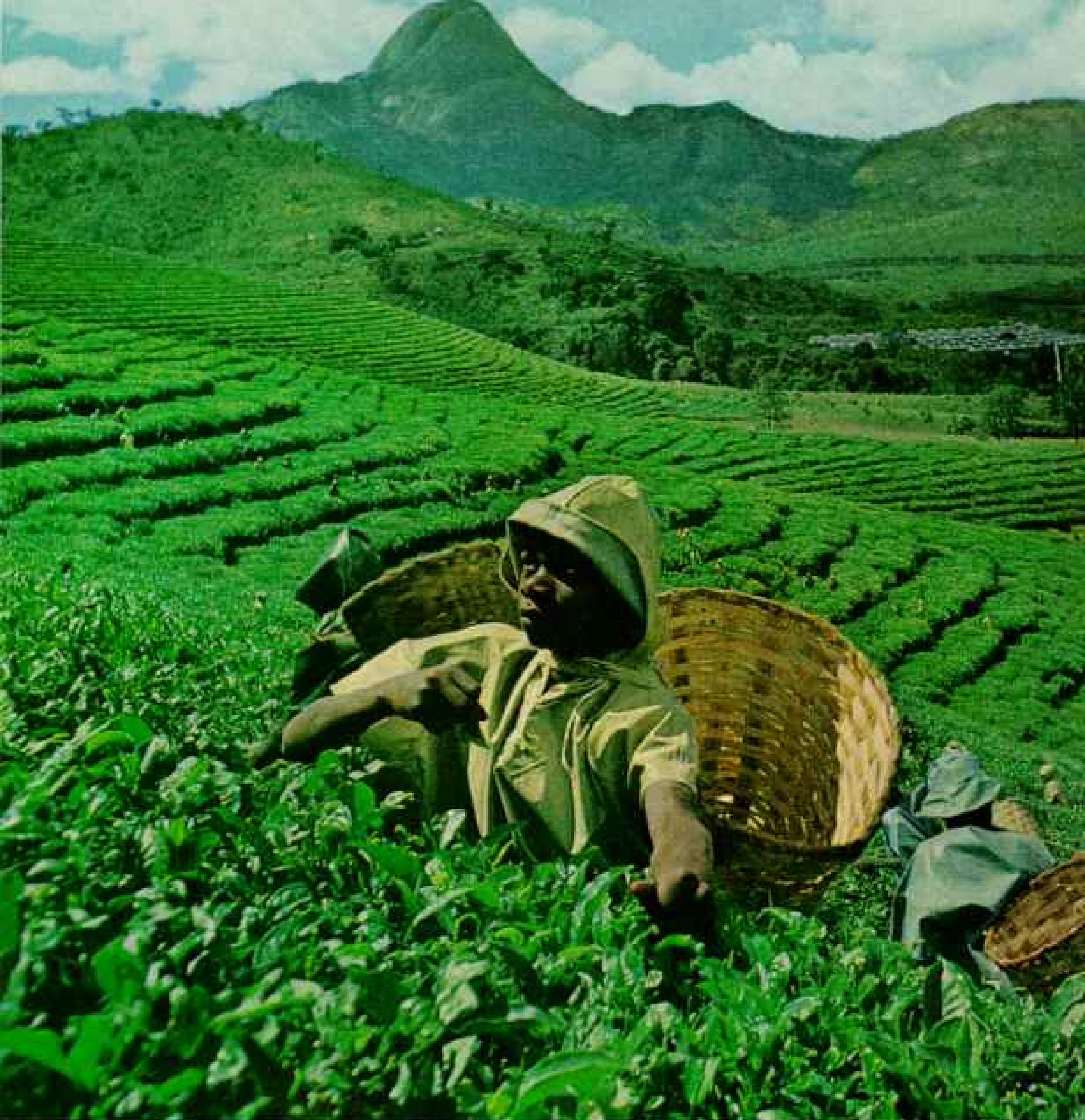




Paddle-wheeler *Ma Robert* carried Dr. David Livingstone from the delta of the Zambezi to the Cahorabassa Rapids in 1858. The 75-foot steam launch was shipped from England in sections and assembled on the river. Nicknamed "the Asthmatic," she grounded and sank in 1860.

Riverboat *Dombe* devours six cubic yards of wood an hour as she cruises the Zambezi Delta for the Sena Sugar Estates. Barges beside her haul wood for other boats. Half an hour after the picture was taken, rising tide drowned this party's fire and set the picnickers afloat in their dugout.





Tea-carpeted terraces climb slopes above Vila Junqueiro. A skilled worker can pluck

local people whose huts stand on stilts, for the 12-foot tide here often floods the area.

As the tide ebbed, the *Dombe* and the barges settled down on the mud. We loaded for six hours until four barges were filled, the tide rose, and we were afloat again. The *Dombe*, a greedy ship, consumed much of the wood on the way back to Luabo.

The Zambezi is navigable for 280 miles upstream to Tete, a dry, dusty town where I found two fortresses and a few stone houses—the only reminders of 400 years of colorful history. Livingstone reached this point with his side-wheel steamer. Twice he set out from

here to probe the Cahorabassa Gorge, 45 miles upstream, and once he sent his brother Charles. So discouraging were their findings that he confided to his diary:

“Things look dark for our enterprise. This Kebrabasa [as he called it] is what I never expected. No hint of its nature ever reached my ears. . . . What we shall do if this is to be the end of navigation I cannot now divine.”

His attempt, of course, failed.

The Cahorabassa still frustrates river navigation, but man’s ingenuity will change this. Construction soon will begin on a great dam across the gorge for power, navigation, and



about 130 pounds of leaves a day.

flood control, part of a scheme to develop the entire Zambezi Valley.

"The lake will back up for 150 miles," chief engineer Fernando de Castro Fontes told me.

Human Bones Hint of Tragedy

A light government plane flew me over the meandering Zambezi northwest of Tete for a visit to the engineers' camp and a look at the gorge. We sideslipped into a landing strip nestled in a valley. Later, a helicopter whirled us through mountain clefts, then descended several thousand feet to a landing on a sandspit in the churning river.

PHOTOGRAPHS BY HELEN WATTEL © N.A.S.



Wiglike load of sisal goes to the drying racks on Zembe Plantation, near Vila Pery. When sun-dried, the fibers will be twisted into rope.

With jabbing strokes against a spike, a Quelimane-area worker rips husks from coconuts.





Primitive designs adapted by architect Amancio Guedes adorn office and apartment buildings throughout Lourenço Marques. "Pancho," here seen in his studio, believes the blending of tribal and 20th-century traditions gives Africans a sense of participation with the Western World.

Soaring concrete curves outline a church in Manga, a Beira suburb. Stylized African mural decorates the arch-shadowed façade. The church, which also has bottle-glass mosaics, expresses the spirit of modern architecture in Mozambique. Crowd flowing out of the lofty sanctuary following Sunday Mass includes uniformed schoolchildren.

Laughing students take a break at Nampula's technical school. In airy classrooms, boys and girls study for careers in agriculture, home economics, and crafts. Seven years of high school prepare scholars for entrance into universities abroad, mostly in Portugal. Despite new schools, fewer than one out of ten of Mozambique's tribesmen can read or write.





Confined here to a width of less than 200 feet, the rushing Zambezi has carved curiously shaped galleries and caves, so that the steep banks resemble Swiss cheese. Spray and foam scatter from boulders as big as houses. Exploring at the high-water mark 60 feet above the river, pilot Antonio Cunha and I came upon a pile of human skulls, ribs, and pelvic bones—mute evidence of some forgotten tragedy.

South of Tete, at Vila Gouveia, I teamed up with Antonio Peixe, a young army officer, and John Vail, an English geologist. We

set out on a search for Nhacangara, a little-known mountain fortress, one of many ancient ruins that lie scattered along the Southern Rhodesia border.

A day's march with six porters took us through trackless rain forest, bamboo thickets, and into mountainous country. We crossed a swift river with water up to our chests and climbed rocks until after nightfall; then we reached the citadel at 4,500 feet.

The moon threw eerie shadows among the curving fieldstone walls and the narrow passages threading the mountaintop. Vertical



Diners in Lourenço Marques delight in doughnut-size shrimp on the Polana Hotel's seaside terrace. Riviera-like beaches attract vacationers the year round. Elephants and crocodiles live only a few miles away.

Taking the bull by the horns earns a dangerous ride for an unarmed *forcado* at Vila de Manica, near the Southern Rhodesian border. In this Portuguese version of Western bulldogging, the team chief leaps between the horns while his mates steer the brute in dizzying circles. The object: not to kill the bull, but to bring it down.

monoliths pointed like ghostly fingers into the night. Bats fluttered about and somewhere a jackal called.

Standing atop the ancient wall, in my mind's eye I saw people of another age toiling on terraces and men smelting iron, copper, and gold in charcoal ovens. Across these mountains slave caravans burdened with ivory and gold wound their way to the coast.

Folklore, much of it handed down from the Arabs who traded for gold here long before the Portuguese, has linked these highlands to King Solomon's mines and the Biblical land of Ophir.

Archeological evidence and early writings



indicate that the 16th-century Portuguese came upon a flourishing Iron Age culture in an empire known as the kingdom of the Monomotapa—Owner of the Mines.

In the ruins we found bits of iron slag and pieces of pottery. Scanning the valley to the west with binoculars, we discovered remains of hundreds of abandoned terraces.

Had Nhasangara been the stronghold of a powerful chief? Could it have guarded the gold route to Sofala, used by Arabs as early as the 10th century? There is some evidence that a chain of fortified positions once reached to the coast. Some archeologists believe traders carried Monomotapa's wealth as far afield as India and southeastern China.

The gold-seeking Portuguese soon learned that bartering was more lucrative than force. Far inland at native markets, they organized fairs to trade cloth, beads, and trinkets for the precious metal. Some of these markets continued to thrive, and one has prospered into the pleasant border town of Vila de Maniça—not from gold, but from citrus fruit, tobacco, and cotton.

I arrived there on the day of a Festa Brava.

Holiday throngs filled the streets and cafes, and an aroma of barbecued steaks and sausages drifted through the public park.

Placards announced a *tourada*, or bullfight, with Portuguese matadors. Posters vividly illustrated the suicidal daring of the *forcados*, who jump between the horns of charging bulls and hold on for dear life (below).

Bustling Beira Defies Nature

After a five-hour drive over a well-paved road, I noted still another dramatic contrast—this time between easygoing Vila de Maniça and thriving Beira, Mozambique's second largest city, facing the Indian Ocean. Jorge Jardim, a businessman involved in many enterprises, kept in touch with his office by short-wave telephone as he drove me about the city.

"Beira is all unnatural," he said. "It is built on a swamp, our water supply is 40 miles away, and our electricity comes from a hydroelectric plant 110 miles distant. It is all wrong, but there it is."

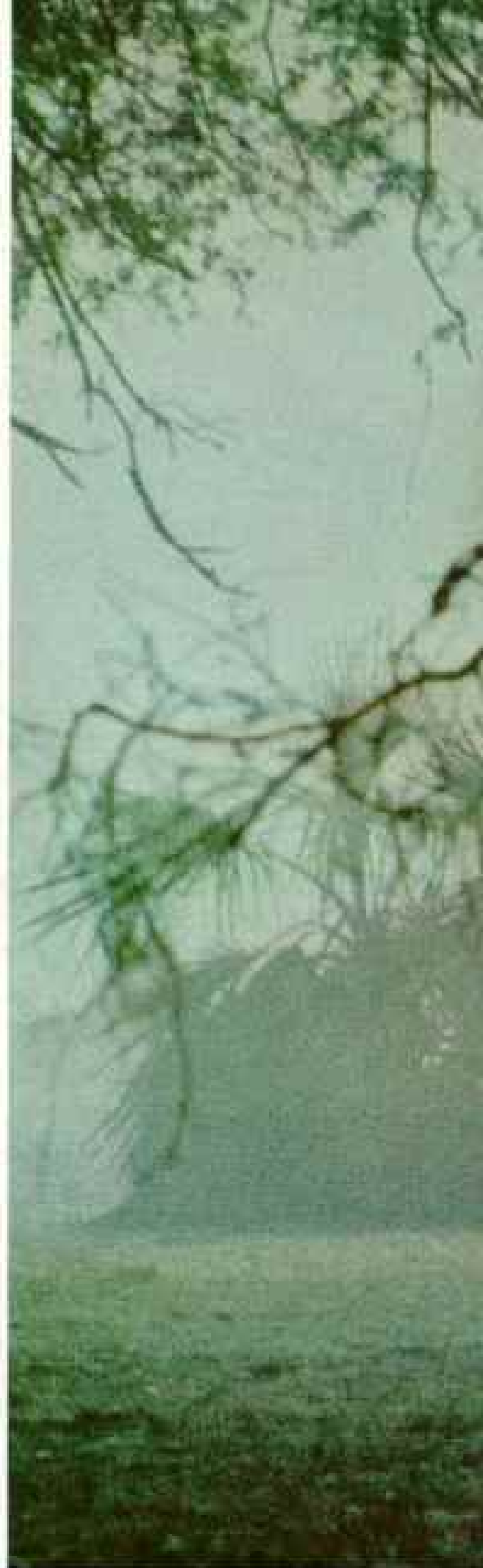
We watched cranes loading tobacco, tea, and timber into the holds of ships. Wharves



Shy impalas peer through morning fog in Gorongosa National Park, a 734-square-mile reserve near Beira that includes veld, forest, and lagoon. Africans believe the sulphur-hued fever tree, *Acacia xanthophloea* (right), grows only in healthful areas.

Trumpeting elephant in Gorongosa charged the author, who snapped this picture as he abandoned his movie camera and fled.

STUDIOS/REUTERS (2) NATIONAL GEOGRAPHIC SOCIETY



were piled high with copper, chromium, manganese, corundum, and rare ores of lithium, the lightest metal known.

"The wealth of our hinterlands and of the Rhodesias and Nyasaland funnels through here," Senhor Jardim explained. "Beira's people, regardless of race, enjoy perhaps the highest standard of living to be found in all of tropical Africa."

Wildlife Thrives in Gorongosa

Only 40 miles from Beira lies Gorongosa, Mozambique's largest national park. Here, with supervisor Augusto Silva, I visited a world as pure as the first dawn. Antelopes,

buffaloes, and zebras roamed the foggy plains, and herds of wildebeests stampeded through the morning mist, reminding me of the thunder of wild horses.

We drove many miles through a vast wilderness, where some 4,000 elephants, 500 lions, 25,000 buffaloes, and thousands of other wild creatures roam at will.

In a forest clearing we surprised lions feeding upon a freshly killed zebra and a young buffalo. We drove close, for cars do not disturb them. One black-maned male opened his mouth and uttered a sound that certainly was not a serious roar. It may have been merely a belch. He seemed bored and groggy.



"They tire easily after feeding," said Senhor Silva.

After more grunts the lion ambled off toward a palmetto cluster to join eight others stretched out, licking their paws. Vultures dropped down to clean the carcasses.

Most impressive were the elephants. We photographed them grazing on the open plain and browsing calmly in the forest.

One charged us. Quite unexpectedly he wheeled, at least four tons of him. Ears spread out and trunk raised, he screamed and came toward us in giant strides (opposite).

Driving off swiftly, Senhor Silva remarked, "That was just a mock charge."

Perhaps so, but I was glad that we fled. A few days later, waiting in Lourenço Marques for a plane to take me home, I thought of all the sights and sounds I had enjoyed, of all the Portuguese, Africans, and mixed-blood Mozambicans who had treated me so hospitably. Again I recalled Vasco da Gama and his crew of more than four and a half centuries ago, to whom this new-found shore of a vast, mysterious continent had been *Terra da Boa Gente*—Land of the Good People.

What changes might lie in store for the land, I could not say. But the people, I thought—the people of Mozambique will remain the same.

THE END



Mountains of Mourne, caressed by clouds, brood over the patchwork farms of Northern Ireland. Though the land of Ulstermen appears as timeless as legend, winds of change are astir. Booming industries help the country weave new dreams from the fabric of its past.

NORTHERN IRELAND

From Derry to Down

By ROBERT L. CONLY, Assistant Editor



PHOTOGRAPHS BY ROBERT B. GOODMAN, IRISH PHOTO © R.B.G.

A DREADFUL THING has happened. I've turned partly orange. My sainted Grandmother O'Brien, rest her soul, would rise from her grave in wrath if she knew. So would my Great-grandmother O'Leary and a whole army of more distant kinsmen—Carrolls, Fitzpatricks, and Kellys—if they could hear what I am going to admit.

My grandmother, I should explain, was one for singing and storytelling. She had a

memory like an iron safe, and could go on for hours with tales, poems, and songs about the Old Sod, with me sitting on her knee. Now, the gist of most of her songs was this: That Ireland is the finest country in the world, and the Irish the greatest people, but that the North of Ireland is a dreadful, dark, wicked place where a man can be strung up for wearing a green necktie.

So, the admission: I'm back from a long stay in Northern Ireland, and a prettier, friend-

lier, kindlier country I've never seen. Furthermore, while I was there I attended a massive celebration of North Irishmen, all dressed in orange sashes and fiercely loyal to the Queen (below and pages 236-7). Throughout these ceremonies, which lasted two days, I wore a green necktie, and nobody so much as glanced at it. I will explain the ceremonies themselves later, for they marked a milestone in the history of Northern Ireland.

I will continue to wear a shamrock, a green tie, a green sweater, and green socks on St. Patrick's Day, and so will my children. Yet the

truth is—and this hurt a bit when I learned it—that the saint himself was pretty much an Ulsterman, and Ulster Protestants of the Church of Ireland revere him as the Catholics do. He began his mission in the North, set up his headquarters there, and is probably buried there.

So there it is.

To understand Northern Ireland you need a small dose of history immediately: The place is commonly called Ulster (from the Gaelic *Uladh*), which was the name of an ancient kingdom ruled for centuries by a warlike



Ulster-born New Yorker, wearing insignia that identify him as Past Master of an Orange Lodge, celebrates Covenant Day in Belfast (page 236).



BY ESTHERNE JAVORSKI AND ROSEMARY W. S. S.

Best horse? Businessman Daniel Hughes and daughter Ann ponder the question at the Maze Race Course, near Belfast.



Master distiller at Bushmills, William Wilson makes Irish whiskey with exactly the same methods he once used to produce Scotch in Scotland. "Some mysterious chemistry," he muses, "makes the flavor come out entirely different."

clan named O'Neill. When Ireland was divided by the British Parliament in 1920, six of Ulster's nine counties (and the cities of Belfast and Londonderry) stayed in the United Kingdom. The counties of Londonderry, Antrim, Tyrone, Fermanagh, Armagh, and Down formed Northern Ireland, while Donegal, Monaghan, and Cavan joined what is now the Irish Republic.*

So that although the words Ulster and Northern Ireland are used interchangeably, they are not precisely the same.

This article is about the six counties that make up Northern Ireland proper, which is part of the United Kingdom, as are Wales and Scotland, but which, unlike them, has its own domestic government—parliament, prime minister, courts, and so on. Its capital, biggest city, chief port, and center of industry and culture is Belfast, and it was there that I stepped out of a plane on a gold-and-green summer afternoon and first set foot on the Old Sod.

I was met at the plane by a pleasant, rather aquiline man in his forties, Mr. Eric Montgomery, Director of Northern Ireland's Government Information Service. He had rolled out the red carpet in the form of a sleek black limousine and a liveried chauffeur to drive me to my hotel.

His opening remark may not sound particularly significant, but it was, in two ways. In a very British accent, he said:

"You chose a nice day to arrive."

That was my introduction to an Ulster preoccupation that astonished me throughout my stay. Virtually every conversation, every business transaction, starts with comment on the weather. You cannot buy a toothpick without an exchange of meteorological data with the shopkeeper.

"A fine day it is," he'll say, though it be gray and foggy. You agree, but you cannot get off so lightly.

"But a bit close, for the time of year." Agree again; it will do you no good.

"However, at least the rain's holding off, so we can't complain, after the terrible summer we've had." Retreat, clutching the toothpick, and as the door closes he'll be adding, "Still, we could use a spot of wind to blow the fog away. . . ."

Some jokes about the weather are attributed to U.S. troops stationed here during World War II. Two standards:

"This would be a nice country—if they'd just build a roof on it."

"When you can see the mountains, that means it's going to rain. When you can't see them, it's raining."

It's not really that bad. True, it may rain six or eight times in any one day. But between the showers the warm sun comes out, often just long enough to fool you into leaving your raincoat at home.

The other significant thing about Eric Montgomery's remark was his British accent. I was expecting a brogue, but I soon learned better. There are 1,500,000 people in Northern Ireland, and almost as many different accents.

Brushes and palette await the inspiration of student Micheen Bradley in Kenneth Webb's Ballywalter studio. Founder of the Irish School of Landscape Painting, Webb conducts painting tours of the countryside.

BY FRANCES HOBBS © NATIONAL GEOGRAPHIC SOCIETY



*H. V. Morton described the Irish Republic in the March, 1961, NATIONAL GEOGRAPHIC.

They range from the broadest Scottish (in the northeast) to the most lilting Irish (in the southwest); you will hear Oxonian with Gaelic overtones, and brogue with traces of Cockney. I myself (born in New York City) was mistaken repeatedly for English, sometimes for Australian, and once for Welsh.

When you hear this babel of accents and begin meeting people with Czech, Polish, German, and French names mixed in with

the O'Neills and the MacDonalds and the Browns, you grasp one of the most important facts about Northern Ireland: It is not, strictly speaking, an Irish country, not English, and not Scottish, but a mixture of all three, with infusions of many others, including an important strain of French.

This mixture, watered by the gentle Irish rain and seasoned by centuries of wars, revolutions, and famines, has produced some-

Proud parade swings down Belfast's Bedford Street on Covenant Day, fiftieth anniversary of Ulster's declaration of allegiance to the Crown. Flying side by side, the Union Jack and the Ulster banner with the Red Hand of the O'Neills symbolize the link. The celebration drew derby-hatted delegations from Orange Lodges around the world.

Young pipers sporting the Dress McLeod tartan add a Scottish air to the procession.



thing unique and wonderful. It is peculiarly explosive when exported, as we shall see.

I have taken a long time getting from the airport into town, but now I am having my first look at Belfast, still through the windows of the limousine. The city roars with vehicles; traffic keeps to the left side of the streets, of course—small cars, giant lorries, and miles of double-decker buses. The air smells faintly of soft-coal smoke.

We turn right down the main street. As in many Old World cities, it changes name every few blocks—first it's York Street, then Royal Avenue, then Donegall Place, but all the same broad thoroughfare. The scene is Victorian. The stone-and-brick buildings look solid and comfortable, and there is little stainless-steel and glass.

As we reach Royal Avenue I see, straight ahead, a landmark I have read about, the



Belfast City Hall (page 240). This fantastic building, built in 1906, dominates downtown Belfast. It has a dome in the middle and four towers at the corners, and as the city traffic swirls around it on one-way streets, it resembles an ornate rock standing in the middle of a whirlpool.

At the Royal Avenue Hotel, a pleasant and cordial place where the staff quickly learns your name and your idiosyncrasies (mine is that I do not want coffee with my breakfast), I am told that I have a room for three nights but then I must move out. This is not inhospitality. It is Belfast.

To face facts, the place is bursting at the seams. It has half a million people, but only room for a quarter million, or so it seemed to me. Its bars are crowded, its restaurants jammed, its buses bulge with humanity. Its sidewalks are too narrow for the rush-hour crowds, and they overflow into the streets and dodge the buses.

While I was there, the newspapers and city officials were debating on which of several sites to build a new downtown hotel.

"I wish they'd stop arguing," a Belfast friend of mine said, "and build on all of them." He then offered to put me up at his club, and I accepted gratefully. It was a comfortable place, albeit somewhat creaky at night, with bathtubs about seven feet long and deep leather armchairs in the lounge.

Capital Clatters With Industry

Belfast holds one-third of Northern Ireland's population. It has the only symphony orchestra, only university (opposite), only big daily newspapers, only commercial airport.

It also has the lion's share of industry, in astonishing variety. I knew that Belfast was an industrial city and a busy seaport, but I had thought in terms of such traditional Ulster industries as shipbuilding or the weaving of linen.

I saw these. I spent a day watching the clattering looms of William Ewart & Son, Ltd., a firm that has been making fine damask tablecloths and other linen for 150 years. Like most of Belfast's mills, they were working at near capacity, and not solely because of the demand for linen (60 million square yards a year!). The same skills and machines that make fine damask also make fine nylon, Dacron, and other synthetic fabrics, and Ulster is rapidly becoming a major producer of these man-made fibers.

Another day I walked for miles through the cavernous worksheds of Harland & Wolff, Ltd., one of the world's great shipyards and Northern Ireland's biggest industrial plant. It was a sad visit in a way, because the shipbuilding business was in a world-wide slump, and 10,000 of the factory's 20,000 employees had been laid off. There were only a handful of ships in the berths—tankers and freighters—and the company was taking advantage of the lull by modernizing: installing three great new traveling cranes, together capable of lifting as much as 240 tons, and new automatic high-speed cutting and welding machinery.

Harland & Wolff built the ships of the famous White Star fleet. In 1960 they launched the streamlined luxury liner *Canberra* for the P & O-Orient Lines. In another year, 1911, they also launched the ill-fated *Titanic*.

Belfast Builds a Giant Tanker

And I'm happy to say that not long after my visit there the yard got some new orders that boosted morale substantially, among them an 88,000-ton, 10-million-dollar oil tanker for Texaco. When launched this summer, she will be the biggest tanker ever built in the United Kingdom.

The most cheerful fact about business in Ulster, however, is that a whole garden of new industries is blossoming there. At the Ministry of Commerce I received a fusillade of facts and statistics from James Reid, who was Secretary of the Northern Ireland Development Council. One of the functions of the ministry is to entice new industries to Northern Ireland. Even allowing for propaganda, its success has been astonishing.

"Our object is simple," said Mr. Reid. "We're buying jobs. Northern Ireland has traditionally the highest unemployment rate in the United Kingdom, and we take full advantage of it.

"Suppose you're an industrialist in New York or Texas, and you're thinking of building a European manufacturing branch. Our man in New York, Bill Taylor, will hear about it—believe me, he *will* hear about it—and he'll tell you what we have to offer. He'll be hard to turn down.

"He can offer you a brand-new factory, well lighted, close to transportation, on an attractive site—already built, empty and waiting. We call them 'advance' factories and we rent them for a third to a sixth of what the cost would warrant. That's quite an inducement.



ALL PHOTOGRAPHY BY ROBERT E. HOODMAN © NATIONAL GEOGRAPHIC SOCIETY

Planning a city of 100,000 people requires specialists, among them Professor E. Estyn Evans of Queen's University in Belfast. A world-famous geographer and pioneer in town planning, he works with developers of the proposed city in County Armagh. Here Dr. Evans supervises Queen's students in interpreting aerial photographs. Northern Ireland's only university, founded as a college in 1845, Queen's enrolls 4,000 students. It currently is expanding under a \$25,000,000 building program.

"If you would prefer to build your own factory, he may offer to pay one-third of the cost. What's more, if you expand later, and we hope you will, we'll share the cost of that, too. If you move machinery from a factory you already own, we'll help pay for that.

"Then he'll come to the main inducement: a labor force of men or women, skilled or unskilled, eager to work, quick to learn, with a mechanical aptitude as high as any in the world. Ulster is famous for that. If they need special training, we'll train them, or we'll pay you to do the job."

This aggressive and intelligent campaign to bring new industry, money, vitality, and diversity into the country's economy went into high gear after World War II. Two things brought it about:

First, Belfast was severely bombed and many of her older factories were blasted to rubble. When the war was over, new plants had to be built.

Second, factories and workmen who had never manufactured anything but linen doilies suddenly found themselves making bomber parts, land mines, or shell casings. Here was the beginning of diversity.

Immigrant Industries Boom in Ulster

How successful has the effort been? As I write this, construction is well under way on a very large new factory for the French Michelin Corporation, biggest tire maker in Europe. More recently, the Ford Motor Company has announced that it will build a new factory near Belfast to make auto parts. These two bring to more than 185 the number of new manufacturing plants built in Northern Ireland since 1945.

Forty-five advance factories have been built and leased, and another 20 are on the way. More than 50,000 new jobs have been created—well over one-fourth of all manufacturing employment in Ulster.



As for diversity, Northern Ireland is now producing substantial quantities of synthetic rubber, airplanes, oil-well drills, nylon, electronic computers, candy, jewelry, plastics, and tape recorders.

Of the new foreign firms in Ulster, more than a score are U. S.-affiliated; among these are International Telephone and Telegraph, Du Pont, Bausch & Lomb, Norton Abrasives, Oneida Silversmiths, and three Texas companies making oil-well gear.

My head now stuffed with statistics, I decided to relax by seeing how a Texan reacted to life in Ulster. I called on Mr. Stephen A. Brooks, of Houston, manager of the Hughes Tool Company plant, and quickly learned from him of another Ulster attraction.

"Do you know, there are *eight* golf courses in Belfast?" he said. "And you can play almost all year round."

What did he think of Ulstermen as employees? Mr. Brooks was enthusiastic.

"We make 200 sizes and types of drill bits," he said, "with tolerances sometimes as close as four-thousandths of an inch. These people weren't used to that, but they're doing it."

"These men have been making drill bits a maximum of seven to nine years. Yet our percentage of rejects is about the same as the Houston plant, where they've been making bits since 1909."

Another Houstonian, Mr. William Edwards, manages the Ulster branch of Camco (oil-field equipment). I found him equally enthusiastic about Ulster craftsmanship—and golf.

"You can play golf at 11 p.m. in the summer. There's almost a midnight sun."

His wife Pauline likes the place, too, though she told me (with high good humor) about some misadventures she had had when they first moved to Belfast in 1958. Her pretty teen-age daughter Beverly prompted her:

"Tell him about the potatoes."

"After I'd been here only a few days," Mrs.

Renaissance elegance marks Belfast City Hall. Reminiscent of St. Peter's in Rome, the central dome rises 173 feet above the heart of the city.

Blackthorn stick of a senior police officer points the way for a uniformed schoolboy in Belfast.



Edwards said, "I phoned the grocer and ordered some potatoes.

"'And how many stone would you be wanting, Mrs. Edwards?' he asked.

"I didn't know what a 'stone' was, but I thought it must be something like a pound. So I said, 'I'll take ten.' A little later a truck delivered 140 pounds of potatoes. Now I know what a stone is."

"Couldn't you have complained to the grocer?" I asked.

"It's no use," she said. "When I complain, the grocer just looks at me in a tolerant sort of way and says, 'Oh, be off with you now.'"

This breezy informality is a side of the Ulster character that might be annoying if it were not so totally disarming.

Toes steady a motor scooter as a girl stops on a slippery street in downtown Belfast. Scooters find only occasional acceptance in a land where off-again-on-again showers are the traveler's constant companion.

REDAUERBY © NATIONAL GEOGRAPHIC SOCIETY



A waitress comes to your table, sees no food on it, and does not ask if your order has been taken, sir. Instead she says:

"Are you getting, dear?"

And when you've been served, she'll come back, look at you searchingly and will not ask if everything is satisfactory, sir. Instead she says:

"Are you all right, dear?"

But one breakfast I complained that my egg had been boiled too long, as indeed it had. All she said was:

"Well, look who got up on the wrong side this morning!"

I ate the hard-boiled egg.

Wild Party Changed Ulster's History

Belfast sits in a bowl of hills; you glimpse them green and sparkling in the distance as you walk the streets of the city. One day Eric Montgomery and I drove five miles south and climbed one of the hills that are known as Castlereagh.

"From here," said Eric, "you can see all of Belfast, and also get a clear view of an event that changed Ulster's history.

"It began with a wild party, a real brawl, given 360 years ago by an Irish chief named Con O'Neill.

"Con O'Neill lived in a castle over there"—he gestured toward a nearby pasture—"and he liked to entertain his friends. Late one night when the wine was running low, Con sent some of his servants down to Belfast, which was then a handful of huts and public houses, to get a new supply.

"The servants had had a few themselves, and in Belfast they got into a fight with some of Queen Elizabeth's soldiers. In the skirmish one of the soldiers got killed. So the Queen's deputy arrested Con and clapped him in jail.

"The fortress where Con was locked up was called Carrickfergus, and it's still there, a few miles northeast of Belfast. I propose that we drive over there, and then I'll explain what all this has to do with Ulster's history."

"All right," I said. "By the way, you seem to know a lot about this brannigan. You weren't at the party, by chance?"

"As a matter of fact," said Eric with a smile, "I spent two years doing research on this incident, and I've written a thesis on it as long as a book."

We drove to Carrickfergus and parked the car near a quay that reaches out like a protecting arm to enclose the castle's own



NORTHERN IRELAND



Separate states exist on an island unmarked by physical division: Northern Ireland, a self-governing country within the United Kingdom, and the Irish Republic, a sovereign, independent nation.

NORTHERN IRELAND, part of the Old Sod, stands loyal to the Queen. Its vigorous people produce a surplus of food on their small mechanized farms and export manufactures ranging from linen and whiskey to ocean liners.

Slightly larger than Connecticut, Northern Ireland was carved from ancient Ulster. More than a third of the population—made up largely of English, Scots, Irish, and other Europeans—is shoehorned into the port cities of Belfast and Londonderry.

Immigrant Ulstermen wrote many a page in American history. "They formed the kernel of the . . . American stock who were the pioneers of our people in the march westward," Theodore Roosevelt noted.

OFFICIAL NAME: Northern Ireland. **GOVERNMENT:** Provincial Parliament within the United Kingdom. **AREA:** 5,461 square miles. **POPULATION:** 1,500,000. **RELIGION:** Protestant (two-thirds), Roman Catholic. **ECONOMY:** Agriculture, diverse manufacturing. **CAPITAL:** Belfast (500,000), industrial center. **CLIMATE:** Mild and rainy.





THE CIGARETTES AND TOBACCO WORKERS (RIGHT) BY ROBERT E. GODMAN © N.Y.C.



Cordage, carpets, and cigarettes



FOR a nation of only 1½ million people, Northern Ireland produces an astonishing variety of manufactured goods.

Hanks of golden sisal (above) enter a drawing frame for separation into strands at the Belfast Ropeworks. Products of this cordage factory, largest of its kind, range from common cord to specialized twine for fishing nets and for tying up roses. Increasingly, the industry makes use of synthetic fibers.

Skilled trimmers and rulers (right) add finishing touches to carpets in the Cyril Lord factory in County Down. The British-owned company, one of Europe's largest rugmakers, turns out 500 carpets an hour.

Cigarette worker (left) in Gallaher Ltd. at Ballymena balances packs of 10's ready for shipment. This Ulster-born tobacco firm claims 40 percent of all tobacco sales in the United Kingdom.





tiny harbor on Belfast Lough. Northern Ireland has so many castles, old and new, that no visitor, no matter how strong his arches, is likely to see them all. But Carrickfergus must rank high on anybody's list. A forbidding structure with gray stone walls and grim battlements, it could scarcely be more historic, and its setting is altogether magnificent (pages 248-9).

John de Courci, a Norman conqueror from England, is credited with building what is now called the inner ward in the 1180's. King John captured the castle in 1210; so did Edward Bruce of Scotland a century later. William of Orange landed here in 1690 and left his color indelibly stamped on Northern Ireland.

In 1778, during the American Revolution, Capt. John Paul Jones sailed his ship *Ranger* up to Belfast Lough; a British sloop, *Drake*, standing off Carrickfergus, came out to do battle. When the smoke blew away, *Drake* had struck her colors; she had 23 killed and wounded to *Ranger's* eight. There is no record that John Paul ever set foot in Carrickfergus, but his defeat of the *Drake* was the first major American naval victory.

In the keep of the castle I asked Eric Montgomery: "What *did* happen to Con O'Neill?"

"He was kept here, locked up tight, for a few months. Then Queen Elizabeth died, and James I succeeded her. Con O'Neill escaped one night—one account says his wife smuggled him a rope concealed in a large cheese—and with the help of Scottish and English friends in court, won a pardon from King James.

"But in return for the pardon he agreed to give away half of his land—a substantial ransom, since he owned most of the Ards Peninsula southeast of Belfast.

"That land was settled by Scottish and English *colonists*. Not just occupied by soldiers, but settled and farmed. It was the first successful large-scale British 'plantation' in the North of Ireland. You might even call it the beginning of modern Ulster."

The first question people usually ask about

Ulster is: Why is it separate from the rest of Ireland? The answer is simple. The "massive celebration of North Irishmen" I mentioned earlier marked the 50th anniversary of the Signing of the Covenant, a sort of a declaration of dependence.

More than 400,000 Ulster men and women signed this document in 1912, and it said that they did *not* want to be separated from Great Britain. So, when the British Parliament voted for Irish independence a decade later, they made provision for Ulster to opt out and remain part of the United Kingdom.

The reason the people signed the Covenant was that they were the descendants of colonists from Scotland and England, and their



THE EXTRACTORNS (ARVVE) AND KOLLECHPORE © N.E.S.

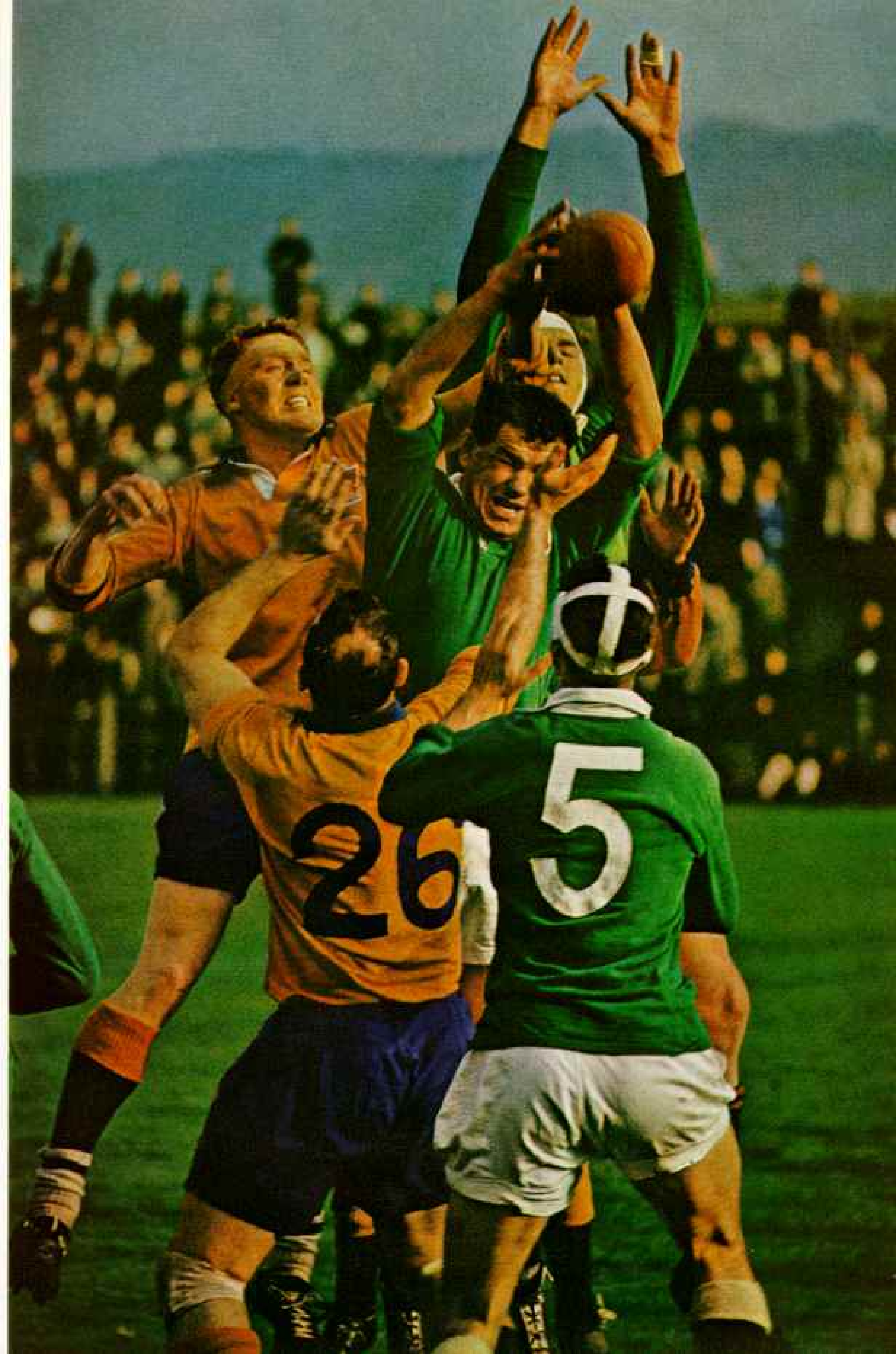
Rugby rooster flashes a victory smile as a team representing all Irish universities trounces visiting Canadians 32 to 8 at Ravenhill Park in Belfast. Politics forgotten, the best players from both Irelands represent the island in such competitions.

"Gentlemanly game" of Rugby turns playing field into battleground. Here a burly Irish forward snares a throw-in and fights off determined Canadians in orange shirts. Though similar to American football, "Rugger" allows no substitutions during the 80 minutes of play; the game stops only to allow time for carrying an injured player off the field.

loyalties lay across the Irish Sea. The Con O'Neill story was in a sense the beginning of it, but the big "Ulster Plantation" came a few years later—just at the time, in fact, that England was planting colonies in Virginia.

I think it is worth interrupting my trip through Northern Ireland here to tell about an important offshoot of this plantation. What happened was this: Sponsored first by King James I, but continuing through the 17th century, tens of thousands of English and Scottish settlers moved to Ulster. The Scots were mostly Presbyterians, and for various reasons—religious, political, and financial—many of them quickly became discontented with their lives there.

So they moved on—chiefly to America,



where they became known as the Scotch-Irish, and where they have played a most important role in shaping the history of the United States before, during, and since the American Revolution. Some historians estimate that by 1776, when the Declaration of Independence was signed, one-sixth of the population was of Ulster origin. At least eight Ulstermen, in fact, signed the Declaration (John Hancock was one), and John Dunlap, a printer from County Tyrone, set type in Philadelphia for the first copy. The print shop where he learned his trade still stands in Strabane.

One of the chief centers of the Ulster Plantation is still very much alive. It is the city of Londonderry, second largest in Northern Ireland, and it owes even its name to the fact

that it was "planted" in 1613 by the London Corporation. The Irish Society of the City of London, in fact, still owns much of the land.

Lonely Road Leads to Derry

I set out for Londonderry (or Derry, as the Irish call it) from Belfast one windy, drizzly day. I have said that Ulster is a pretty place, and so it is, and a pleasant country to drive through. The roads are good; the farms are small and green, with mossy stone walls and snug white stone houses, though not many of them have thatched roofs any more—too much hand labor. The cattle are brown and black and sleek, and you seldom drive far without crossing a stream with its bottom full of stones and its water full of fish.



But the drive from Belfast to Derry was different. It took me up a high desolate moor covered with rocks and sparse heather. I drove for miles and never saw a soul or another car, but only an occasional sheep, or a wraith of mist rising through the drizzle like a swamp ghost.

This was the Glenshane Pass, cutting through the Sperrin Mountains, the wildest and least inhabited place I saw in Northern Ireland. Why, I thought, would anybody build a road into such a desolate place?

To get from Belfast to Londonderry, that's why, and so I did, coming down from the mountains in pitch dark, crossing the River Foyle over the broad Craigavon Bridge, and reaching the city center in a driving rain-

storm. I could not read the street signs in the dark, and I had no idea where my hotel was. There was no one about to ask, except one small boy, about seven, sloshing along with a book under his arm.

"Can you tell me where the City Hotel is?" I called through the window.

"It's Foyle Street you're wanting, sir," he said with a lovely Irish lilt. "Just turn right and go down the hill." I drove on, then stopped. Was that a street on the right, or a driveway? The boy reappeared in the headlights, dancing and beckoning. For four blocks he skittered along, splashing through puddles and waving me on. Then he pointed to the right: there was the City Hotel. He smiled, waved his book, and dashed off into the rain.



REPRODUCED BY KENNETH R. GOODWIN © W. H. O.

Surviving siege and strife, cannon still protect the ramparts of Carrickfergus Castle on Belfast Lough, ten miles northeast of Ulster's capital.

Storm clouds swirl above the castle's square keep, five stories high and with walls nine feet thick. The first Norman conquerors of Ulster began the fortress in the 12th century, and for 750 years it remained continuously garrisoned as Scots, English, and French vied for possession. A stone at the harbor marks the spot where William of Orange first set foot in Ireland in 1690. Offshore, in 1778, John Paul Jones on the decks of *Ranger* defeated H.M.S. *Drake*.

There are walls around Derry, built in 1618 but still sturdy and thick. The Irish Society erected them to protect their plantation, and within a century they had held off three major sieges. Today the walls have been converted into a pleasant promenade, roughly a mile around, where Derry citizens walk their dogs, and tourists snap pictures of the bastions, gates, and cannon emplacements.

The cannon are still there. The most famous is called Roaring Meg, because it went off with such a deafening blast that it heartened the besieged in Derry and dismayed the enemy even when it missed them. Roaring Meg played a role in Londonderry's greatest drama, the Siege of 1689. You will not spend many hours in the city without hearing about that siege.

Youth Takes the Initiative

Unrest in Great Britain always reflected itself in Ireland, but usually in an incredibly complicated fashion. By the 1680's Ulster had a large immigrant population, and was fragmented like a broken mirror into factions including English, Scots, Irish; Church of Ireland (Episcopal), Presbyterian, Catholic; Royalist and Parliamentarian. And there were splits within the splits.

So that when an army of soldiers loyal to the Catholic King James II appeared outside Derry's walls in December, 1688, the city fathers were undecided whether to let them in or fight them off. James, with the aid of Louis XIV of France, was trying to re-establish Catholicism in Great Britain. His subjects had rebelled and invited William of Orange to occupy the throne.

We have two kings fighting for the crown; the fight is to take place in Ireland, and Derry is caught in the middle. The Catholic soldiers march toward the gate as the city officials hesitate. When the troops are less than 200 yards away, 13 apprentice boys rush the guard, grab the keys, slam and lock the gates. Derry's decision is made.

The army retired, but a larger force, 20,000 men headed by King James himself, returned in April. For 105 days they besieged the locked city. Food ran low; dogs, cats, and rats brought high prices. Disease broke out. At the end of three months, of the city's 7,500 defending militia, 3,300 were dead and more than 1,000 sick or wounded.

But Roaring Meg was still roaring, and on July 28 three ships, loaded with food and re-

inforcements from England, appeared in the River Foyle. They ran upstream under an artillery barrage and broke through the boom James's men had laid across the river.

That was the beginning of the end for James. William of Orange arrived at the head of an army, chased the enemy about 100 miles to the south, and beat them to a shambles at the River Boyne in July, 1690. Ulstermen still celebrate the day each year on July 12 with bonfires, speeches, and parades by innumerable Orange Lodges.

This was not the only war in which Derry played a key role. During World War II, when Nazi submarines and mines turned the English Channel into a death trap, convoys carrying American troops and arms veered north around Malin Head, and Londonderry suddenly found herself a bristling naval base. Some 300,000 U.S. troops passed through Ulster during the war, and many of them entered through Derry. When the war ended, no fewer than 70 Nazi submarines appeared outside her harbor to surrender.

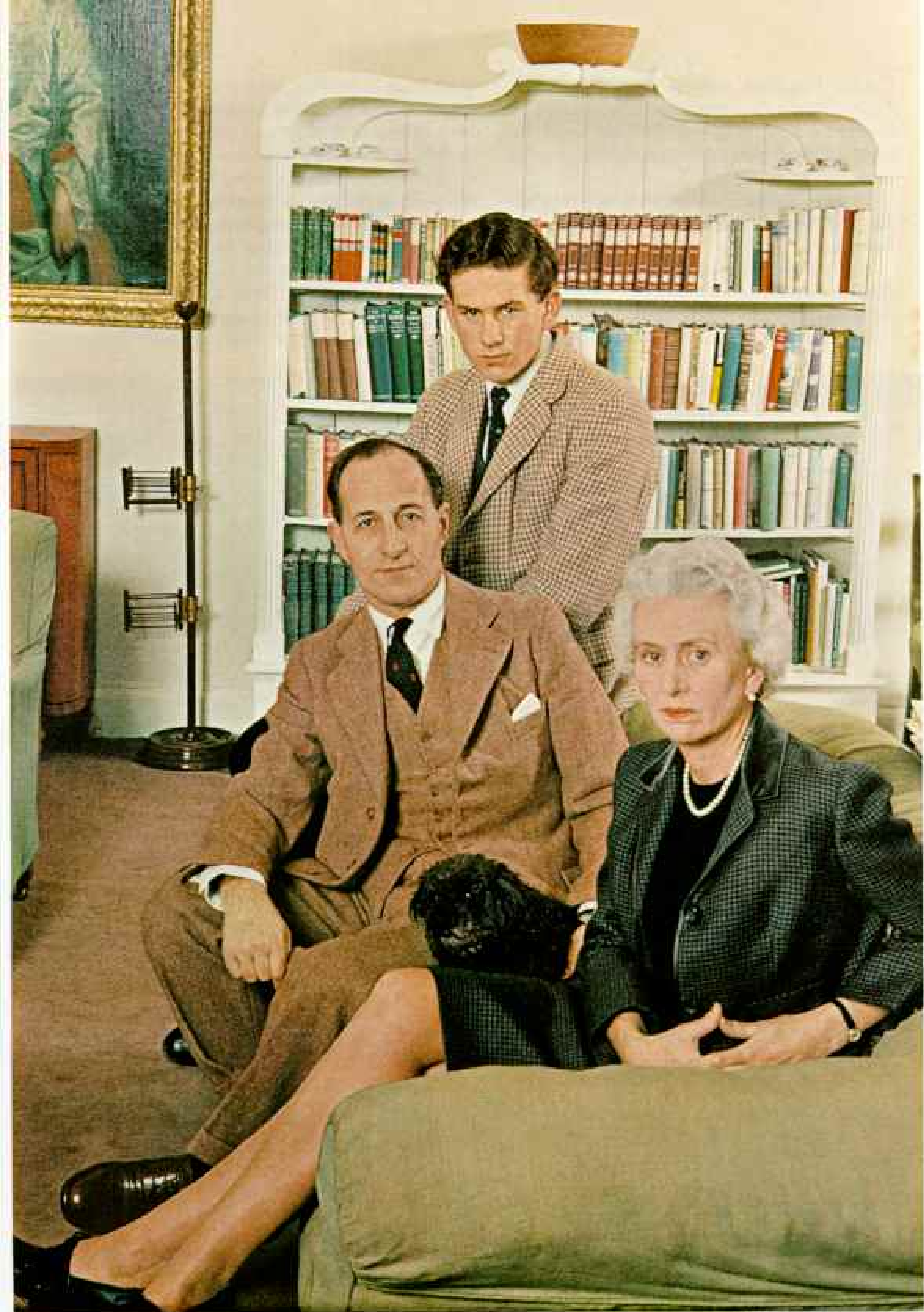
I cannot leave Derry without mentioning the song that has made her name familiar all over the world: the "Londonderry Air." There is a mystery about this beautiful and plaintive tune that baffles musicologists.

It is generally classed as a folk song, but it does not quite fit the class. For one thing, folk songs are sung, and the "Londonderry Air," when discovered, had no words, though many have been written for it since, including the familiar "Danny Boy." For another, its melody is more complex than most folk tunes. It *sounds* as if it had been composed by a skilled musician.

Who was he? Nobody knows. The tune was first taken down by a Miss Jane Ross in Lismavady, County Londonderry, in 1851; she heard it from an itinerant fiddler; and there the story ends. Luckily, the melody lingers on.

I AM SITTING in an open boat 26 feet long, the *King George VI*. She is tied up in quiet water in Ballycastle Bay on the north coast of County Antrim. Out to sea—where we will be going in a few minutes—the swells look as high as the boat is long; for yesterday the wind blew a 40-knot gale, and the water is still uneasy, though the air has calmed and the sun is shining.

A truck pulls up on the quay beside us, and a young man begins unloading cartons of food into the boat. He hands them down to Jack



PHOTOGRAPH BY TERENCE LE GORRY © W.G.A.

History repeats: Terence M. O'Neill, at 49 Northern Ireland's youngest Prime Minister, follows a family tradition of leadership. He descends from Niall the Great, fourth-century king of Ulster. Here Captain O'Neill, who took office in March, 1963, relaxes at his home, Glebe House in Ahoghill, County Antrim, with wife Jean and son Patrick.

Coyles, the pilot, who is a famous man in Ulster. When the cargo is secured we cast off, bound for Rathlin Island, six miles away, the northernmost part of Ulster and the hardest to reach (map, page 243).

I'd been hearing about Rathlin ever since my visit began, but I'd met no one who had been there.

"It's treacherous water," everyone said. "If the wind comes up, you're likely to stay there for a week."

252 But Captain Coyles reassured me. He was a

quiet man in his 50's, with graying hair close cropped, and a look of competence. He had been sailing to Rathlin and back for 30 years; he delivers the mail three times a week, weather permitting, as well as what the 115 islanders need in the way of supplies. They phone their orders by radiotelephone to Ballycastle.

"We'll make it all right," he said. "When I can't make it back, I don't go."

Make it we did, and home again, too, with the help of a smoking engine and a small sail hoisted by Jim Curry, Captain Coyles's crew,



We climbed up one side of the swells and slid like a bobsled down the other.

I rode all over Rathlin on a tractor driven by Bertie Curry, Jim's brother, who lives with his parents on a cattle farm.

It's a green and hilly place, roughly seven miles long by a mile wide, with rocky cliffs facing the sea as you come up to the harbor, Church Bay. There's a lighthouse at either end and a third one in the middle. Two stone churches—one Catholic, one Protestant—look down from a hillside. There are seven

Chimney smoke wafts gently skyward, mingling with the waning light of a September afternoon. These houses stand just outside the walls of Londonderry, Ulster's second city. Waving a homemade flag, child warriors (left) call to mind the Siege of 1689 when 13 apprentices of Derry slammed the gates in the face of James II's army.

Destined for demolition, many of these old houses will soon vanish, to be replaced by new developments. In the past 20 years, Ulster has rehoused more than a fourth of its 1.5 million inhabitants.



telephones, one pub, a district nurse, and a resident priest—Father Sean Connolly, who invited me to his rectory for tea and cookies.

Rathlin has seen its share of trouble, having been captured and recaptured by the Scots, the English, and the Irish over the centuries. It once had more than 1,000 residents, but there has been a steady emigration, and the young people are still leaving. "What's there for us to do here?" they ask, and move to factory jobs in Belfast, or to Scotland, England, or America.

The most famous thing on the island is the crumbling ruin of a castle where King Robert Bruce of Scotland once took shelter. Only a part of the walls remains standing on a hill above the coast, where the Irish Sea's North Channel meets the Atlantic.

There is a local legend that it was in this castle (and not in a Scottish cave) that Bruce lay tired and glum, having been six times driven from his throne by the English. Then he saw a spider trying to spin a web on the beams above him. Six times it failed, but the seventh time it succeeded. This was enough for Robert; he rallied his army, beat the English, and won his throne.

Scenic Coast Road Bypasses Towns

Northern Ireland attracts tourists, more than 350,000 a year of them—or to put it crassly, \$37,000,000 a year of them—by offering, besides excellent fishing and superb golf courses, some of the world's best scenery. The most spectacular lies along the coast below Rathlin Island, but the proper way to see it is to pick up the Antrim Coast Road 30 miles farther south, at the busy little port of Larne (map, page 243).

This is a surprising road, not only because of the scenery but because it doesn't really go anywhere. It was begun as a make-work project in 1833, and all it does is hug the coast, leaving industrial towns like Coleraine and Ballymena to use their own inland highways.

The Coast Road for the first few miles is merely picturesque, but near Ballygalley it bores through a black basalt tunnel, and when it emerges it has become magnificent.

The road is built, as the guidebooks say, "*en corniche*" with startling black-and-white cliffs rising straight up on the left and falling sheer on the right to the ocean breakers. In the distance you see small islands, and now and then the blue, misty hills of a big island—the hills of Scotland itself.

Then the road cuts across the famous Glens of Antrim, nine in all, lush green valleys running down to the sea (page 266). What I liked best was to drive or walk two or three miles inland up a glen, and then look back and still see a narrow window of ocean framed by hills rising a thousand feet on either side.

How the Giant's Causeway Was Built

At length the road arches west, and a sign points the way to Ulster's most famous scenic wonder, the Giant's Causeway (opposite).

This magic spot really looks as if a giant had taken thousands of pillars of stone and hammered them into the beach, trying to build a road to Scotland. And that is just what happened. An Irishman I met there, a man named Heaney, told me so.

"It was Finn MacCool, the Irish giant, that did it," he said. "MacCool wanted to get at the Scottish giant, Finn Gall, for a fight, do you understand, so he built the causeway all the way to Scotland.

"When he finished it he was tired, so he went home to bed, and who should come walking across the causeway but Finn Gall. He went to MacCool's house, and there was Finn in bed asleep, all covered with the sheets, he was, and Mrs. MacCool—she's his wife—sweeping the floor.

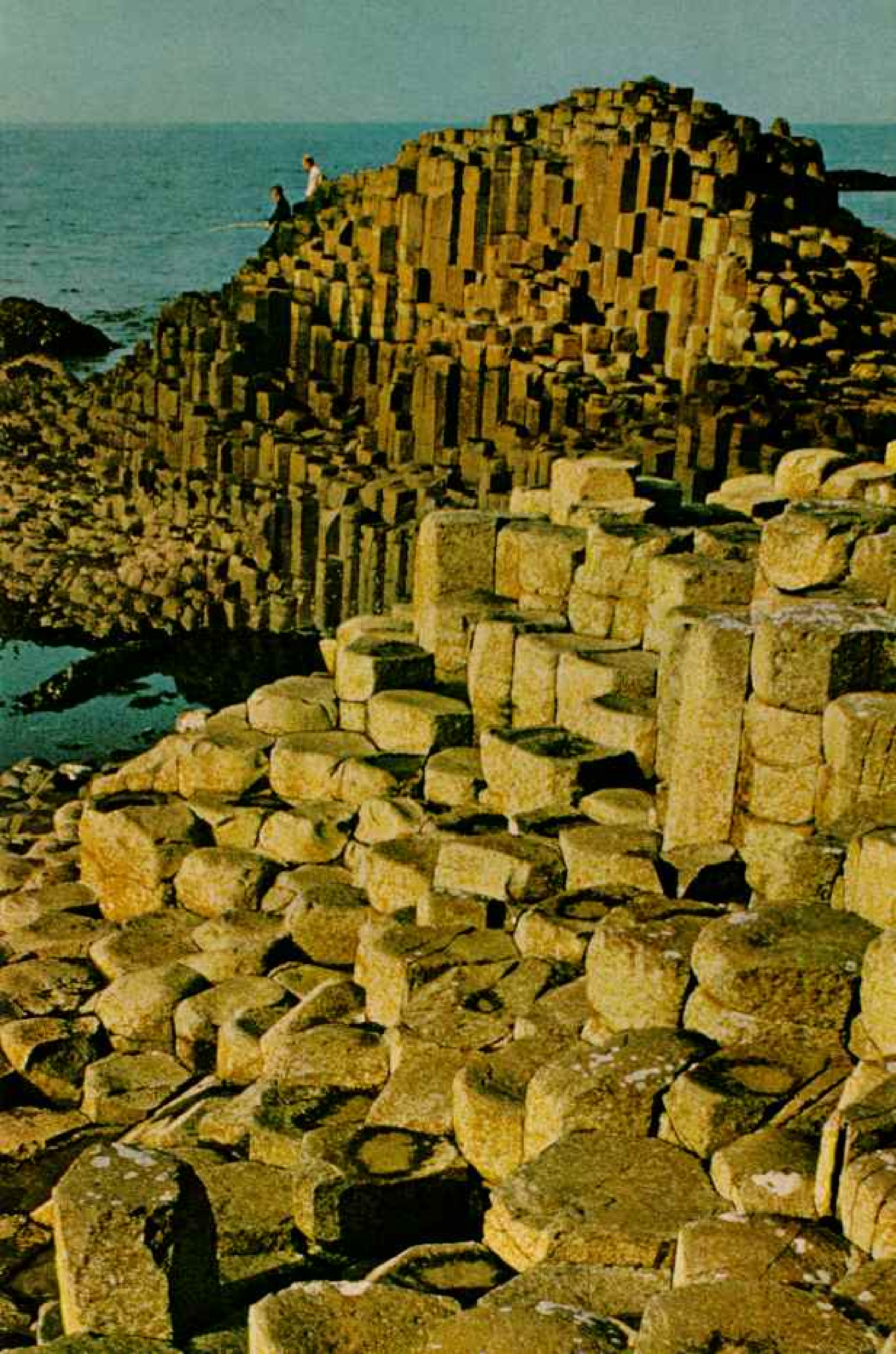
"'Is that your husband in the bed?' asks Finn Gall.

"'Him?' says Mrs. MacCool. 'Sure that's only me wee baby.'

"'Och,' says Finn Gall to himself, 'if the baby is that big, how big would the father be?' And he got so scared that he ran all the way back to Scotland, tearing up the causeway as he went. That's why there's only this bit of it left."

It's true, the part that's left extends only 200 yards or so into the sea, but the for-

Cathedral-like columns crown a point on the Giant's Causeway, remnant of a legendary pathway from Antrim across the sea to Scotland. Oddly enough, a similar formation reaches southward from an island off the Scottish coast. Lava flowing from volcanic upheavals cooled and split into thousands of these symmetrical basalt shafts; the closely packed pillars resemble precisely fitted stonework. Acquired by the National Trust, which preserves historic sites, the Causeway belongs to the people of Northern Ireland.





Crescent of plump silver eels emerges from the River Bann. Strong arms wrestle them toward the cage opening (left), where they will stay until shipped alive in tanks to London and the Continent. The fishermen netted their catch where the river leaves Lough Neagh, largest lake in the British Isles. Nets stretch across most of the river; only the deepest portion, a channel known as the Queen's Gap, remains open for shipping.

Writhing captives, scooped from the cage, go to market.

BY ERIC ARONSON (LEFT) AND ROBERTO DI CARO (RIGHT) © N. S. S.



mations are spectacular and bizarre. The vertical stone pillars, many almost perfectly hexagonal, stand as high as 50 feet. One cluster forms a huge pipe organ, another a fan; there's also a wishing chair and an Irish harp.

I climbed all over the Causeway and the rocky cliffs behind it with Mr. John Lewis-Crosby, Secretary of the National Trust in Northern Ireland, a nonprofit organization dedicated to preserving natural wonders, castles, and the like. The Trust runs the Causeway as a free public park.

Mr. Lewis-Crosby, along with a hatful of geologists, had the idea that the Causeway was formed by volcanic action; that tons of molten rock poured out over the coast, and as the rock cooled and hardened it shrank and separated into columns. Of course, I told him about Finn MacCool.

Little Eels Swim Long Distances

The biggest single business in Northern Ireland is the production of food: more than a sixth of the gross national product. The greatest part of this is agriculture, of course, but commercial fishing is also important. The strangest fishery I've ever seen operates at Toome, just where Lough Neagh flows into the River Bann on its way to the sea.

In Lough Neagh swims a small shrimp, *Mysis relicta*, which is presumably delicious and certainly nutritious to a larger animal, *Anguilla anguilla*—in layman's language, the common European eel.

The eel is a migratory animal; after it is hatched in the tropical Atlantic, it develops an urge to move to fresh water. Off it swims, thousands of miles, until it finds a stream flowing into the ocean. Then it heads upstream. At this stage it is called an "elver," is three years old, and about the size of a skinny earthworm.

Millions of elvers swim up the River Bann

every year. They get only as far as Coleraine, where a dam stops them cold. At this point the Toome Eel Fishery, Ltd., takes over; it trucks more than 20,000,000 baby eels annually from Coleraine to Lough Neagh and releases them (map, page 243).

This is not as kindhearted as it sounds, because eight or more years later, when the eels are mature (about a foot and a half long, $\frac{1}{2}$ to $1\frac{1}{2}$ pounds) they swim back downstream to the sea to breed, and on the way a million or so each year are trapped in the funnel-shaped nets of the Toome Eel Fishery and shipped off live to markets in England and continental Europe (opposite).

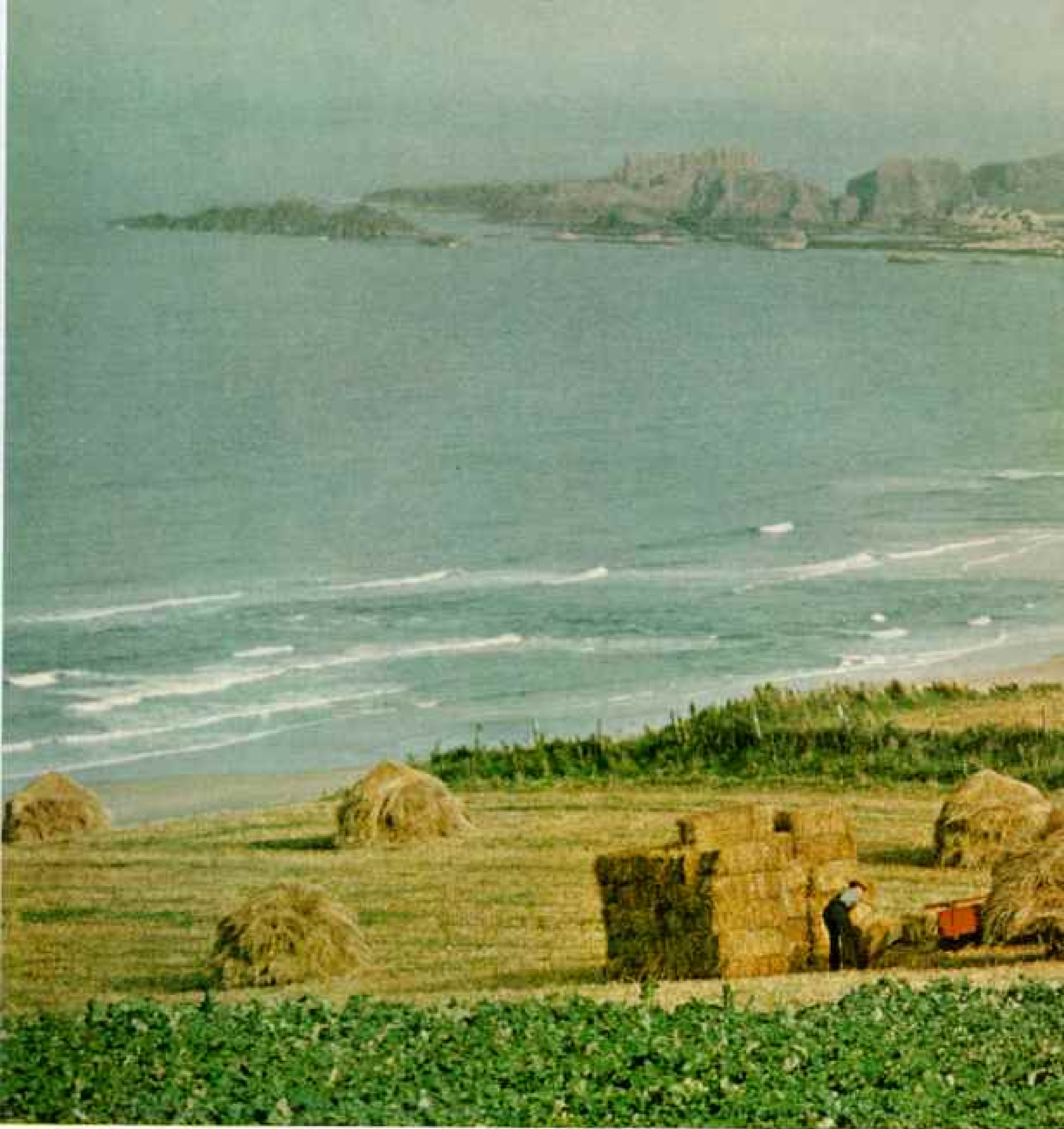
Oddly, the Irish scarcely ever eat them. I mentioned this to one of the fishermen as he scooped a netful of wriggling eels out of a trap in the river, preparatory to shipment. He stopped and leaned on his net.

"To tell you the truth," he said, "I used to

EDUCATION © NATIONAL GEOGRAPHIC SOCIETY



Country kinfolk of Woodrow Wilson stand before the County Tyrone home of the 28th President's paternal grandfather James. Five Wilsons—three brothers and two sisters, all unmarried—still occupy the thatch-roofed house at Dergalt. Recently installed electricity permits them the luxury of a television set. Recognizing the property's historical importance, Northern Ireland hopes to purchase and preserve it.



Earth's golden bounty yields to harvesters in an oat field at White Park Bay on the Antrim Coast.

do a lot of fishing before I came to work here. That was six years ago, and I've not had a rod in my hand since. I've lost my taste for fish." And he turned back to his slimy task.

Ulster not only fishes; it farms. Here are just a few statistics that sum up the story of farming in Northern Ireland:

Number of tractors in 1940: 1,241
Number of tractors in 1950: 15,700
Number of tractors in 1962: 32,000
Annual cash value of farm produce prewar:
\$44 million; 1963: \$318 million.

In other words, Ulster farmers have gone

mechanized at a giddy rate, and are still going. They've stopped growing flax (the linen industry imports it from Belgium and Russia), which must be hand-processed, and turned to barley, oats, hay, pasture, and cattle, where mechanization pays off.

To learn at first hand, I visited an Ulster farmer, Mr. John Richmond, at his home near the village of Dervock.

Mr. Richmond believes in diversity; on his 125 acres he raises cattle, grain, pigs, hens, and eggs. Also children: five sons and one daughter, a pretty young lady named Doreen



RESEARCH BY ROBERT D. COOHRAN © NATIONAL GEOGRAPHIC SOCIETY

With mechanization, small Ulster holdings merge into larger, more efficient farming combines.

who, when I met her, was employed as a French teacher at the local school.

The Richmonds live well. They own a comfortable eight-room house, three cars, a truck, a tractor, and a combine harvester. After a walk around the farm, I joined the family for Sunday high tea. This consisted of more varieties of cookies, cakes, biscuits, meats, breads, rolls, and jellies than I can name, and there was ice cream for dessert.

John Richmond's comfortable living room was heated by a log fire. I'd always heard that the Irish burned peat, and I said so.

"They used to," said Mr. Richmond, "but seldom now. Too much hand work in cutting and stacking it. It's cheaper to use wood or coal. In fact, the government is planting trees in a lot of peat bogs today."

It's true. I must have seen a hundred fireplaces in Ulster, and never a peat fire.

Furthermore, I saw the bogs being planted with trees. This was in Ulster's far west, County Fermanagh, one of the country's poorest counties in terms of money, but surely one of the richest in beauty. For Fermanagh owns two of the prettiest lakes in the world, Lough

Erne and the Upper Lough Erne. These lakes are famous for trout: 10 and 15 pounders are not uncommon, and during the summer the small resort hotels around the lake shores are crowded with anglers.

Tractors Sometimes Sink in Bogs

With two young state foresters, Noel Parker and Cecil Kilpatrick, I went to see what's happening to the peat bogs. Of course, it's not all bogs; the government is buying and reforesting marginal land of all kinds. But the problems of planting trees in a bog are unique.

First enormous furrows must be plowed,

using tractors with tracks several feet wide to keep them from sinking into the bog. Even so, one sinks occasionally. The furrows provide drainage, and on the hills between them seedling trees are planted. Most of the bog plantings are Sitka spruce and beach pine (*Pinus contorta*), both from the western U. S.

Ulster was once, in the dim past, a heavily wooded country, and the foresters are working hard to make it that way again. Some 70,000 acres are already planted in spruce, fir, pine, larch, and other softwoods, and they are planting 5,000 acres more every year.

I seem to have drifted away from the Rich-



Round stone tower, one of the best preserved in Ulster, guards the shattered ruins of a Christian community founded in the sixth century on Devenish Island in Lough Erne by St. Mo-laise. When Viking raiders invaded their settlement, monks found refuge and preserved precious documents in the 81-foot shaft. Only the foundation and lower walls remain of the saint's house just behind the tower. Beyond lie the remains of the Great Church of Devenish. St. Mary's Abbey (foreground) dates from the 15th century.

St. Patrick sleeps here—and also at various other Ulster sites hallowed by legend. Etched in Mourne granite, a simple inscription and Celtic cross mark this traditional burial place on the grounds of Downpatrick Cathedral. Each year thousands of pilgrims pay respects to the saint's memory.



High on a hilltop above the village of Saul, St. Patrick blesses the County Down countryside he loved so dearly. In the fifth century, returning from France to the land where he had spent six years in slavery, the saint first stopped at Saul on his holy mission. And here, says the legend, in a barn lent to him by a local chieftain, he set up Ireland's first Christian church.

mond farm, but I have one more thing to tell about it. There is an old barn on the place which was once a thatched cottage. Here, during the 1700's, was born one James McKinley, whose family was one of the thousands of Scotch-Irish that emigrated from Ulster to America. James's great-great-grandson, William McKinley, became the 25th President of the United States.

This is no isolated instance. I have said that the Ulsterman, when exported, becomes an explosive commodity. Now here is a remarkable fact: Of the 36 Presidents of the United States, nearly one-third came of Ulster

stock. And this from a country with a population smaller than the Borough of Brooklyn.*

There are other famous Americans of Ulster ancestry: Davy Crockett, Stonewall Jackson, Horace Greeley, and Stephen Foster, for example, and a whole parcel of inventors, including Cyrus and Robert McCormick, Robert Fulton, and Samuel Morse.

A famous immigrant to Ulster—in fact, its most famous—first came as a captive. One day

* Presidents of known Ulster ancestry: Andrew Jackson, James Polk, James Buchanan, Andrew Johnson, Ulysses Grant, Chester Arthur, Grover Cleveland, Benjamin Harrison, William McKinley, and Woodrow Wilson.



early in the fifth century, perhaps A.D. 405, a raiding party of Ulster pirates sailed across the Irish Sea and captured, among other things, a teen-age boy of Britain. They brought him back to Ulster and set him to herding sheep in what is now County Antrim.

That was a great day for the Irish. The slave boy called himself by the Roman name Patricius, later shortened to Patrick. He was not yet a saint, of course. He stayed on as a shepherd for six years, and then escaped by stowing away on a ship bound for France. At this point Patrick would have been about 22.

In France and Britain he studied and became first a priest, then a bishop. Then, in a vision, he heard Irish voices calling him: "We beseech thee, holy youth, to come and walk among us once more."

Patrick got himself assigned as a missionary and sailed for Ireland A.D. 432, landing in County Down, in Ulster, near a place called Saul (page 260). You can still see the spot. There are the remains of a monastery, though it was not built until seven centuries after Patrick died.

The soft green Mountains of Mourne in County Down (pages 232-3) are dotted with reminders of St. Patrick. I spent several days looking at them, part of the time in the company of Mr. Harold Meek, an architect who works for Ulster's Ancient Monuments division.

Mr. Meek is an unusual man; besides being a skilled architect, he speaks German, Italian, French, Spanish, and Russian, and is pretty good in ancient Greek, Hebrew, and Latin. He impressed me as knowing more about Irish history than anybody else I talked to. He has a sense of humor. Witness his opening remark when I met him in Downpatrick.

"You'll hear a lot of controversy about St. Patrick between the Irish Catholics and Protestants," he said. "I myself am English, and I'm



City of seven hills, Armagh is the religious center of Ulster. St. Patrick built his first cathedral here in 444, and today the city serves the whole of Ireland as ecclesiastical seat for both the Roman Catholic Church and the Church of Ireland.

View through a Georgian window in the Armagh Observatory frames St. Patrick's Protestant Cathedral, on the hilltop site (center) where the saint's cathedral stood. Services have been held regularly for 1,500 years in a succession of churches on this spot.

Observatory director Dr. Eric Lindsay shares his office with a bust of Pricate Richard Robinson, who founded Armagh in 1790. Long a pioneer in observational astronomy, Armagh studies the solar system, variable stars, and the Magellanic Clouds. With other observatories, Armagh analyzes photographs of Southern Hemisphere skies taken at Bloemfontein, South Africa.







also a Jew, so you can be sure I'm impartial."

Very little is really known about St. Patrick. The dates and my other statements above are widely accepted, but nobody can prove them, and they have been disputed by experts.

One expert, in fact, wrote a learned treatise proving that there were really two St. Patricks; another, a German, has proved that he never existed at all.

That's nonsense, of course. Every Irishman knows that St. Patrick lived, preached, converted the heathens, and drove the snakes, turtles, and other reptiles out of Ireland by standing on a hill and ringing his sacred bell. The hill, incidentally, was in County Mayo, in the Irish Republic.

He began his mission in County Down, and

he's buried there. You can see his grave just outside St. Patrick's Cathedral in the town of Downpatrick, marked by a granite slab (page 260). If that tomb doesn't suit you, there are two or three others to choose from, all of them equally authentic, because nobody really knows where Patrick is buried.

Irish Heroes Lived in Armagh

Still walking in the footsteps of the saint, I went one day west to Armagh, one of Ireland's most ancient cities (page 263). Patrick built a cathedral here, and made it his base of operations for a time. It is still the Irish headquarters for both the Church of Ireland and the Roman Catholic archdioceses; it has two archbishops' palaces and two magnificent



Hurdling the hedgerows, horses at the Maze course, oldest in Ulster, race neck and neck. The season attracts fans from all parts of the country. Ulster's racing tradition dates from 1685, when James II granted a Royal Charter to the Down Royal Corporation, owners of the Maze, for the improvement of horse breeding.

Charming colleen displays a fashionable ensemble and winning glow at the races.

REDACHPHOTO (JELLYBY AND DE BENTHAM) © N.S.A.



St. Patrick's cathedrals. According to the city's official handbook, St. Patrick is unquestionably buried in Armagh.

The city has been a center of learning since early Christian times, and it still is. The Armagh Public Library contains a fine collection of medieval manuscripts and rare books including Jonathan Swift's own annotated copy of *Gulliver's Travels*.

The Armagh Observatory is world famous. Its catalogue of nebulae, first published in 1888, is still used by astronomers everywhere. Amateur stargazers also are familiar with another book, *The Amateur's Telescope*, by Canon W. F. A. Ellison, a former director of the observatory.

Some of the earliest Irish legends, written

down in a very old saga called the *Ulster Cycle*, are set in Armagh. The one I like best is the story of Cuchulainn, a sort of Irish Sir Lancelot, who singlehanded stood off a whole army that invaded Ulster from the south. He lived just outside the city in a fortress called Emain Macha. You can still see the remains of it, two large circular mounds, one surrounded by a deep moat.

No Border Raids for Two Years Now

There is controversy in Ulster about more than St. Patrick. You do not read the Belfast newspapers long, nor talk to many people there, before you become aware of an uneasy friction between the one-third of Ulster's citizens who are Irish Catholics (politically



“Nationalists”), and the two-thirds who are predominantly English, Scots, and Protestant (politically, “Unionists”). No honest discussion of Northern Ireland can ignore this.

In one form this friction is, in any case, already well known to most people who read newspapers. In 1956, a small but bitter guerrilla campaign against Ulster was mounted by an Irish patriot organization known as the IRA—the Irish Republican Army.

The IRA was not primarily made up of Ulstermen. Many of its recruits came from the Republic of Ireland, and its main tactic was the quick night raid across the border: dynamite a bridge, a police station, a post office; then dash back across the border.

Nevertheless, its object was to increase the friction in Northern Ireland. The theory behind the IRA was that, sufficiently stimulated, Ulster Catholic Nationalists would rise in rebellion against the British. As it turned out, they did not; the IRA never gained widespread support, and was eventually outlawed by both southern and northern Irish governments. In 1962 the IRA itself announced cessation of hostilities and its own disbandment. There have been no incidents for the past two years, and Ulster has breathed a collective sigh of relief.

Yet the basic problem remains unsolved. The Irish Catholics in Ulster are perpetually

in a minority. They have never won a general election, though they do win representation in each parliament. Thus Northern Ireland has never had a Nationalist, or Catholic, prime minister, and the Nationalists get very few of the best civil service jobs. They remain aloof. Most go to their own parochial schools; most favor reunification with southern Ireland, which the British Protestant community in Ulster vehemently opposes. I talked to a good many Ulster Catholics, and their feelings about these things ranged from mild resentment to deep bitterness.

What's to be done about it? *Not* more IRA. I heard another proposed solution from Mr. Cahir Healy, a leading advocate of Irish reunification. Mr. Healy is 87 years old and has been a Nationalist Member of the Parliament of Northern Ireland since its formative days four decades ago.

“The British Parliament passed the act that divided Ireland in two,” he said. “All they have to do is pass another act to re-unite it.”

But that isn't likely to happen.

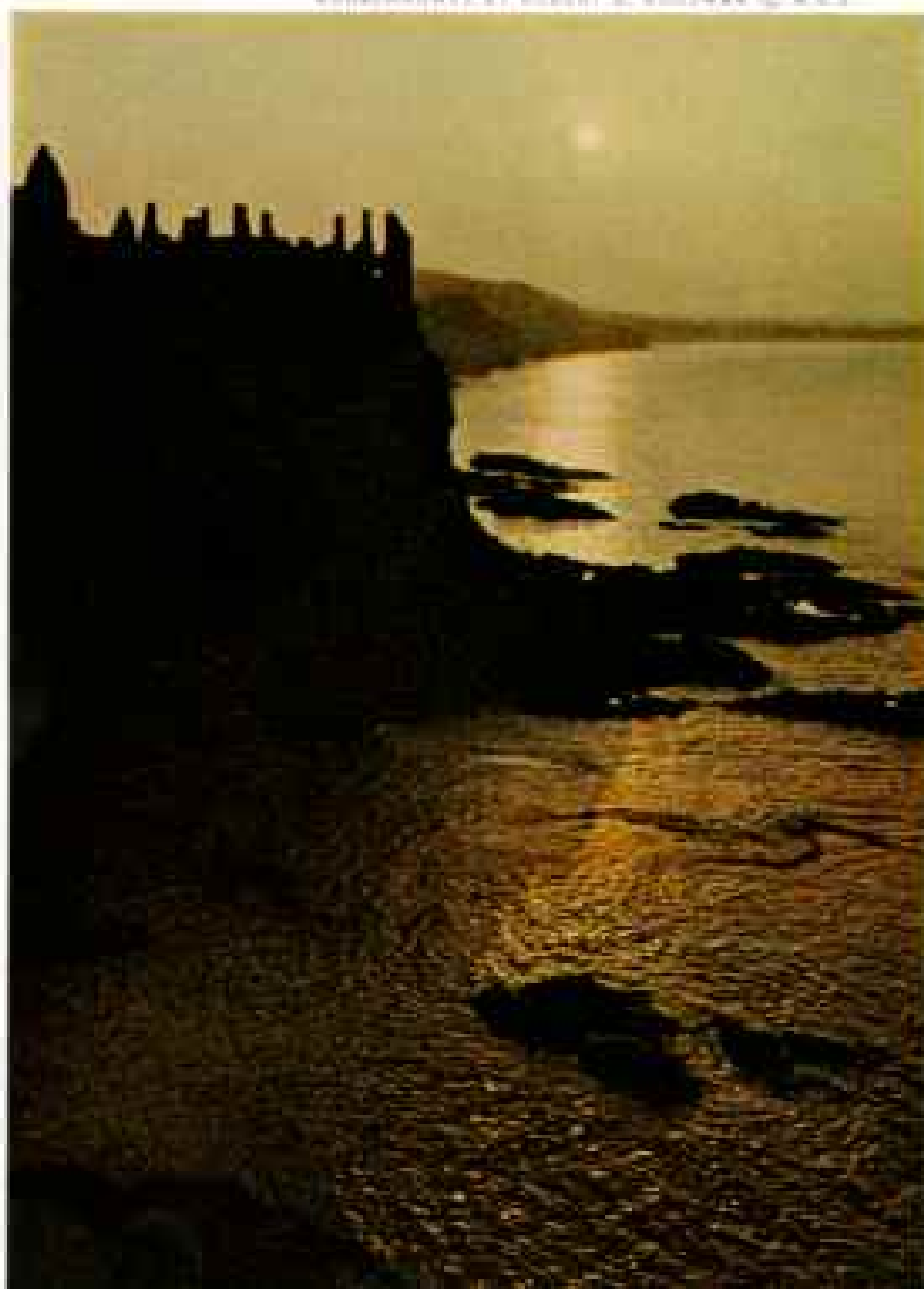
Personally I hope that over the years or decades, the Irish sun and rain will fade the difference between the orange and the green until someday the Irish themselves will no longer be able to tell which is which. As I said, though I'm mostly green, I've turned a little bit orange myself. THE END

PHOTOGRAPHS BY ROBERT S. GOODMAN © R.S.G.

Singing stream cascades over mossy steppingstones in the Glens of Antrim, between Larne and Ballycastle. Here verdant valleys intersect the black basalt cliffs and white outcroppings of the Antrim coast. Narrow byways lure the traveler away from the sea's roar past farmhouses and fields of flowers. In less peaceful times, the region served as an escape route for coast dwellers fleeing inland from raiders.

Sunset's golden glow silhouettes the gaunt skeleton of Dunluce Castle, near the Giant's Causeway. Built by Anglo-Normans in the early 13th century, the fortress proved impregnable to generations of enemy attack.

In 1588 one “invincible” galleass of the shattered Spanish Armada met its fate at the castle's rocky feet. The government preserves the castle as a National Monument.





PHOTOGRAPHED BY PETER H. GIBBEL © N.Y.C.

PARACHUTIST *Jack C. Joerns floats toward the unexplored Cordillera Vilcabamba, in the Peruvian Andes. A special high-altitude chute allows him to land safely two miles above sea level.*

By Parachute

By G. BROOKS BAEKELAND

CRAMPED IN THE AIRPLANE with our bulky gear, Peter Gimbel and I looked out of the open door and then, questioningly, at each other.

A year of careful preparation had brought us to this moment of decision far above a remote spur of the Andes of southeastern Peru. We planned to parachute through the thin air onto a 10,500-foot-high shelf in the wild, mysterious Cordillera Vilcabamba. So far as we knew, no man had ever set foot there. But now the lack of a brisk breeze to slow the landing speed of our gliding-type parachutes made jumping hazardous.

On this long step downward into unex-



Into Peru's Lost World

Photographs by the author and PETER R. GIMBEL

explored territory hung the success of the 1963 Vilcabamba Expedition, sponsored by the National Geographic Society and the New York Zoological Society.

The northern two-thirds of the Vilcabamba range, cut off from the south by the deep gorges of the Cosireni River, rises like an island from a vast sea of jungle and juts out into the Amazon Basin. It embraces 9,000 square miles, roughly the area of New Hampshire (map, page 271).

When we arrived, only tantalizing parts of the high, rugged interior had been seen from the air. Rumors of ruins, Inca gold, Indian taboos, and sacrificial lakes in the sky

shrouded it in mystery. No scientist had ever examined its plant and animal life. This would be one of our objectives.

But expedition co-leader Peter Gimbel and I planned as our major goal to traverse this wild range from the western side near the Apurimac River to the Urubamba River, its eastern boundary, which we would follow downstream to its confluence with the Sepahua. Two other expedition parachutists, Jack Joerns and Peter Lake, would join us for the 150-mile exploratory trek.

High in these mountains, according to vague reports, lay an extensive plateau, 50 miles long, fertile, temperate, ideal for colo-

*MACHETE-WIELDING EXPLORERS of the National Geographic Society—
New York Zoological Society Vilcabamba Expedition struggled nearly
three months to traverse 150 miles on foot, by raft, and by canoe.*

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AGUACHIBERO BY PETER H. L'ORIEL © NATIONAL GEOGRAPHIC SOCIETY

Snagging a line suspended between poles, a Hello Courier practices aerial pickups at the expedition base in Luisiana, Peru. Flying often in foul weather, two of these planes made dozens of bull's-eye cargo drops to the explorers and snared their packets of mail.

nization—a matter of great interest to the Government of Peru. Amateur archeologists noted that such a plateau might have been the fabled mountain redoubt of the last Incas who had fled north from the Spanish. Since 1572 a total silence had fallen over the fate of these people.

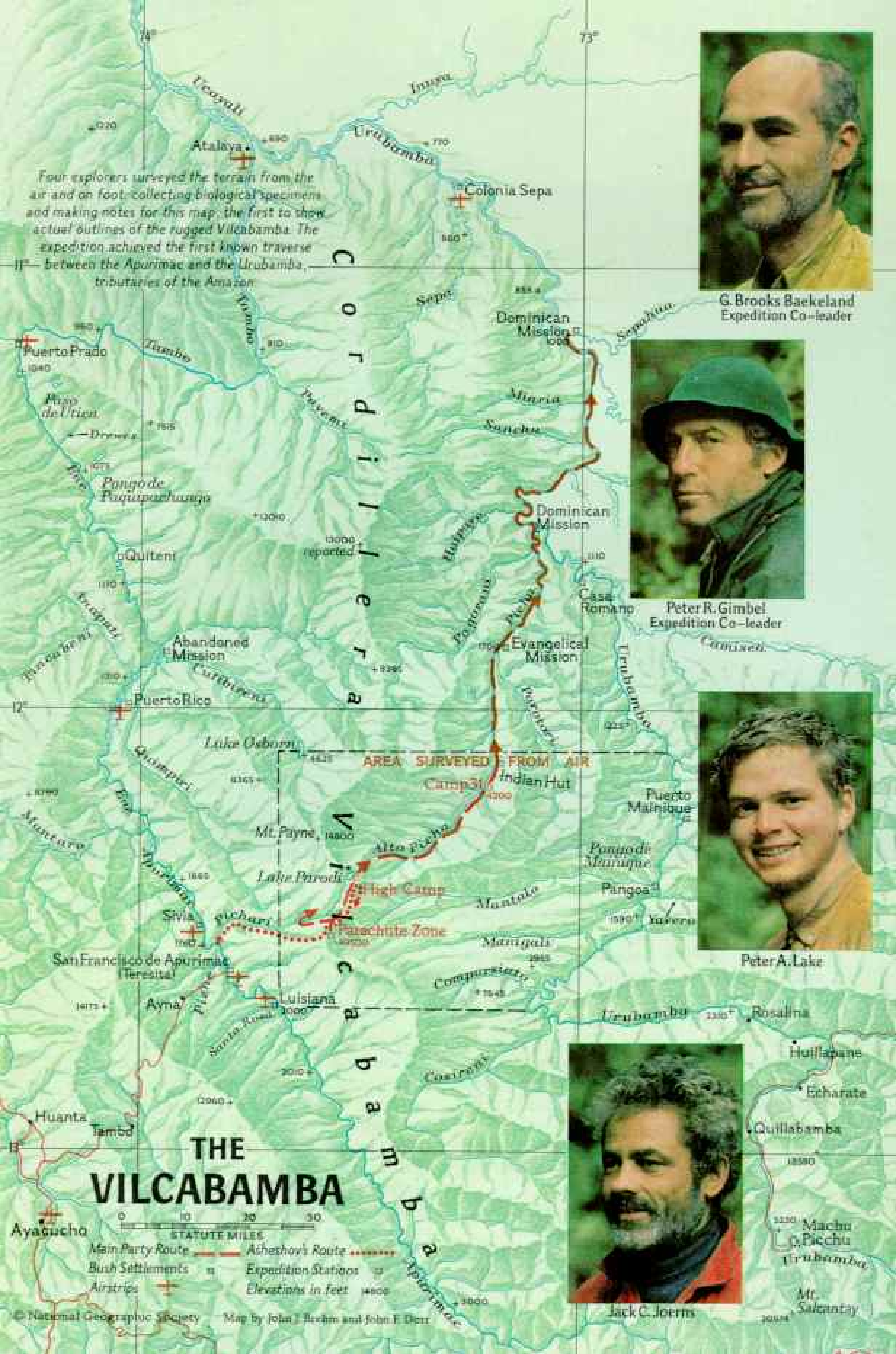
What awaited us in these mysterious heights? No one knew.

Now, at last, we were prepared to find out. Training for this day, each of us had made 67 practice jumps, the last ten with special high-altitude parachutes. To protect against a possible landing on rocks, we wore crash helmets and strapped football pads beneath our jump suits. Under thick-soled paratrooper boots my ankles were strongly taped. Shock-absorbent wrappings swathed our cameras.

Our calculations indicated that with no breeze the forward gliding speed of our new experimental parachutes in this rarefied atmosphere might bring us in at a dangerous rate—nearly twice that normally considered safe. A good ten-knot head wind would can-



© National Geographic Society





cel out the forward speed and thus lighten impact. But there was only a light, variable breeze—perhaps two knots.

What to do? We hesitated, balancing the risks of injury against the time remaining for our first job on the ground: preparing an airstrip for the expedition's two planes.

The date was August 5, 1963. Our biologists and second exploring team would have to be flown in and all hands flown out before September's drenching rains. A year's work hung in the balance.

I asked Dick Tomkins, at the controls, for his opinion. He was our chief pilot and our most experienced parachutist.

"I'd say it's inadvisable," he replied. Then he laughed. "But I'd do it anyway."

We circled in the clouds as occasional rain splattered the windshield. I turned to Gimbel.

"I think we should," he said.

For a few more thoughtful moments we studied the terrain through breaks in the cloud cover.

"O.K.," I said. "Let's drop our duffel bag and panel markers."

Soft Ground Poses a Hard Problem

The plane came in 300 feet above the central clearing, one of three we had spotted on the mountain shelf. As the first grass appeared under us, we pushed out the heavy duffel bag containing our sleeping bags and personal gear, and watched it fall until it hit the earth with terrific impact, half burying itself. We could see that a dark flower had opened around it. It looked like mud—a built-in cushion for a parachute landing.

Our reaction to this sight was a simultaneous guffaw of relief. But now there was another problem: Ground that might be per-



MOST MAPS still picture this land as a plateau, flat enough to serve as a landing field.

Instead, the explorers found these nameless mountains, "magnificent, varied, awe-inspiring in their loneliness." Expedition planes flew back and forth over jagged peaks and steep-walled valleys, photographing and making radar profiles of the ground. Nothing indicated that the area surveyed had ever been inhabited, although legends claim that Inca rulers, fleeing the conquistadors, built cities of refuge in the northern Vilcabamba.

KODACHROME BY
G. BROOKS BAEKELAND © N.G.S.

fectly safe for parachuting might also be too soft for an airstrip.

There was only one sure way to find out. We dropped the bag of panel markers, long strips of red and yellow cloth for ground-to-air signaling, and climbed to 14,500 feet for our first jump run.

My hands tightened on the door jambs as I felt the blast of air against my cheek. A cloud drifted toward us and passed swiftly underneath.

Then, three-quarters of a mile below, I saw the valley and wooded shelf to its north with three slanted, grassy clearings, one of which already contained our duffel and panel-marker bags. I could see nothing moving.

I had hoped to think of something amusing and memorable to say to my companions before I jumped. Peter and I exchanged a last smile. All I said was, "I'm going."

With that I pushed hard with both hands and was gone, launching myself outward and downward in a spread-eagle posture.

The roar of the aircraft engine died rapidly as I fell toward the Vilcabamba.

I allowed myself to fall free—perhaps for 2,000 feet—before I pulled my rip cord. I felt a tremendous jerk. Earth, sky, and horizon blurred together, swaying up and down. The swaying stopped.

I looked down. The valley seemed dark and bristly, like the mouth of a Venus flytrap waiting to catch me.

The plane buzzed faintly somewhere above the big nylon canopy. I grasped the parachute's two wooden steering toggles and maneuvered back and forth over the shelf. From 500 feet I saw small game trails running through the grass. The woods were a tangle

(Continued on page 278)

MOMENT OF DECISION: *Backeland prepares to jump. Shortly after, his parachute (opposite) lowers him toward an unknown wilderness of green. "Whatever's down there," he thinks, "I'm committed now."*

KODACHROMES BY PETER H. GIMBEL © N.G.S.





Chutists jump through holes in the clouds

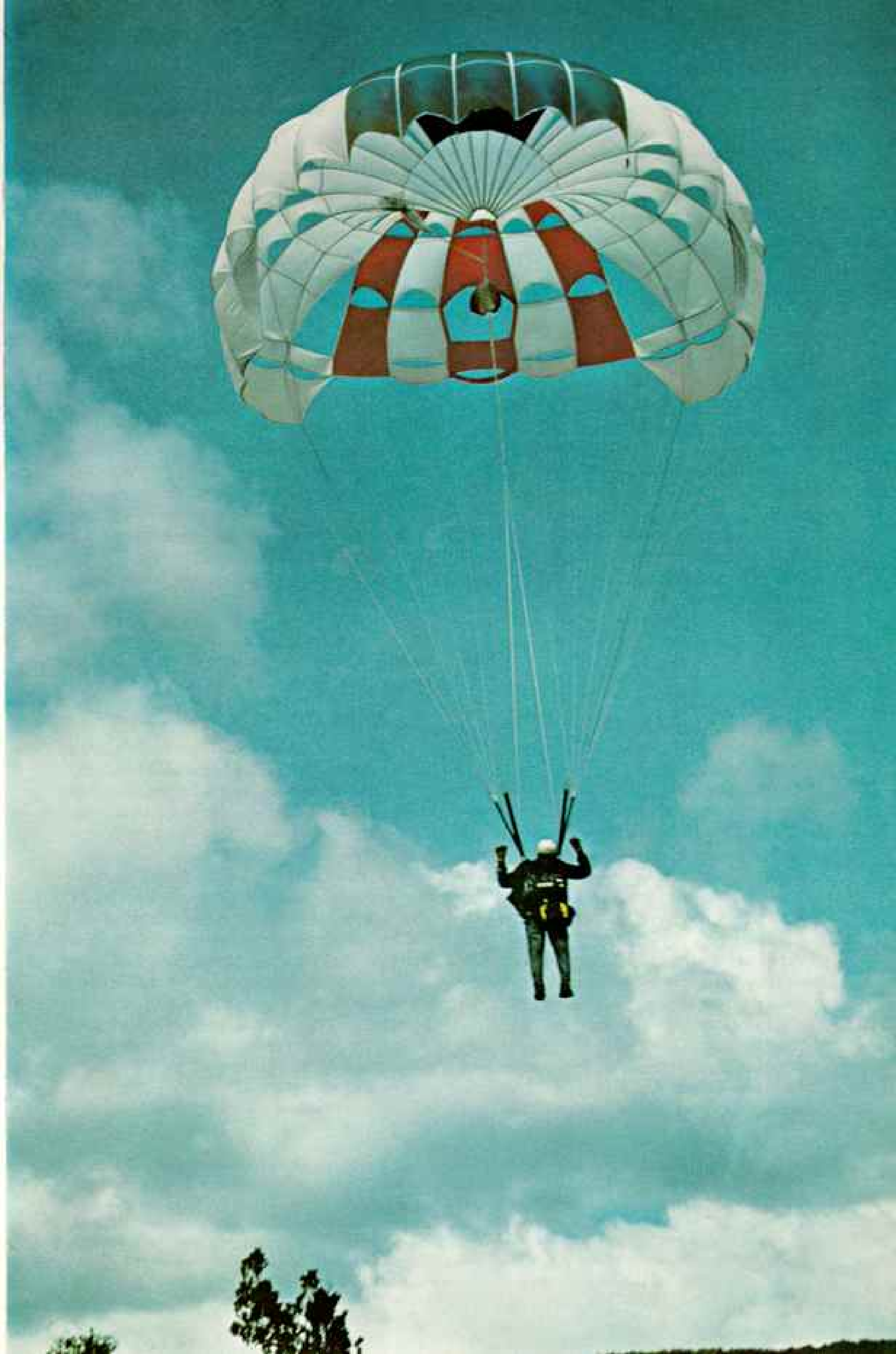
BAERKELAND and Gimbel dropped onto a 10,500-foot shelf in the Vilcabamba on August 5, 1963. Four days later, Joerns (left) and Lake (bracing for impact) joined them in the unexplored highlands.

Landings in the thin air of such elevations became feasible only with the development of a novel type of parachute, the Para-Commander. Dozens of slots exhaust air out the back of the canopy, giving the chute the lifting effect of an airfoil and the forward motion of a glider. Control lines to canopy openings permit turns and some braking of the forward motion.

Jumpers intended to prepare an airstrip but had to rely on airdrops when soggy ground thwarted the project.

Wearing plastic helmet and goggles, Gimbel looks skyward at the plane that dropped him. Parachute lines trail away at left.





of gnarled, stunted trees, covered with moss. In a gully I saw bamboo.

I aimed for a spot near our duffel bag. Tall grass came rushing up and engulfed me.

My 68th parachute landing was a good one.

Disentangling myself from the lines, I waved at the plane overhead. The waist-high grass around me seemed strange, unreal.

Down the clearing, which was as flat and unobstructed as any airfield, I could see more than 600 yards to the edge of the shelf. Beyond that was the wide glacial valley.

Dry Moss Conceals Black Mud

I was just thinking that this was even better than we had dreamed, when I felt cold water seeping in through the knees of my jump suit. I was kneeling on a layer of moss, perfectly dry on top. Thrusting a hand down into it, I discovered it was about a foot deep and covered a substratum of black mud soft enough to be squeezed between the fingers.

Ten minutes later Peter landed and rolled a short distance from the duffel bag. We shook hands and embraced, each grateful to find the other unhurt.

"Well, we're in, Brooko," he said, grinning.

He knelt down and parted the grass.

"Is it this wet everywhere?"

"Yes."

"Holy smokes!"

For the next half hour we tested the soggy ground. It would never take the weight of a plane, we concluded.

We discussed the possibility of using helicopters, which we had arranged to charter from the Peruvian Air Force if the terrain proved unsuitable for our fixed-wing Helio Couriers. These light craft need little take-off space—particularly with rocket assistance; slotted wings and oversize flaps permit landing at extremely slow speeds.

From exhaustive aerial surveys we knew the valley had some bushes and rocks. Surely it offered firmer ground than we had found so far. We decided to investigate.

"Better stop Dick before he drops any equipment here," said Peter. Tomkins had gone back to our headquarters, Hacienda Luisiana, 13 miles to the southwest, to pick

up the first load of supplies and equipment for the advanced base we had planned for the clearing. With the panel markers we laid out two signals: a long arrow pointing toward the valley and an L with a bar under it, meaning: "We are going in this direction. Landing strip impossible here."

The plane reappeared after we had staggered halfway down the clearing with our heavy bags of duffel and signal panels. Dick dropped a canister containing a message: "Where shall I drop equipment and food?"

We had only nine small chocolate bars, but we didn't mind going hungry a little while. Until we had examined the valley floor, we didn't want any premature cargo drops.

Quickly we laid out another signal, a large N for negative.

Picking up our awkward loads, we continued down the clearing, panting in the thin air and swatting the swarm of gnats that formed what Peruvian highlanders call the *manta blanca*—the white blanket—on our faces and necks. Dick circled over us.

Soon we were wrestling the heavy bags downhill in a jungle of roots, small bamboos, and wiry vines. We were in dense cloud forest. Moss-covered holes swallowed us to the thighs. Ahead we heard the plane gun its engine once; then we heard it no more.

Airstrip Planned for Second Team

As night fell, an icy cloud enveloped us. We were drenched by perspiration and finally by rain. The tangle increased. When the rain stopped, a full moon rose, glowing in the fog. The valley floor was still somewhere below. We bedded down for the night. Sleep came slowly; Peter and I talked at length, reviewing the plans and decisions we had made, and the progress of our expedition thus far.

First of all, no attempt to penetrate the heart of the Vilcabamba on foot had ever succeeded. We had decided that the first exploring team of four men would enter by parachute. They would prepare an airstrip so that the second team, including two biologists, could be flown in either by Helio Courier or by helicopter.

(Continued on page 284)

Tangled as a witch's dream, a nightmare landscape confronted the explorers. "Carrying packs weighing 60 to 90 pounds," says the author, "we hacked our way with machetes in freezing rain. We walked on tree roots; otherwise, we would have sunk in ooze. Several times we nearly marched off precipices suddenly revealed through gaps in the roots." In 1912 Hiram Bingham explored similar terrain 85 miles southeast of the parachute zone when he led a Yale University-National Geographic Society expedition to Machu Picchu, the Inca city he had discovered a year earlier.





Explorers had to climb to retrieve this parachuted package of equipment.

Using a radiophone, co-leader Peter Gimbel reads request for fresh supplies.



Radiophone and airplane: only links with the world

UNABLE TO LAND, support planes picked up mailbags from a loop between two poles. Jack Joerns, wearing the jump suit of his Las Vegas skydiving club, directs the pilot of this plane skimming a ridge to drop supplies.

Transceiver at left weighs 20 pounds with spare batteries. "A real back-buster," reports Baekeland, "but it saved our bacon. If the planes had lost contact, they might never have found us."

Smoke bomb held by Peter Lake guides a pilot on a supply drop. Flares and bright signal panels were soon abandoned, because of their weight.



RODACHOWSKI BY DEAN W. GIBBS; JARVIS AND BROWN AND G. BRUCE SAGEBIAND © N.S.A.



Lake Parodi Lends Beauty to a Peruvian No Man's Land

Map makers had no idea that so many lakes sparkled unknown in the Vilcabamba wilderness. The explorers informally named this one Parodi after the owner of Hacienda Luisiana. The expedition's tents (left center) seem lost in a patchwork of grass, trees, pygmy bamboo, moss, and orchids. Gnarled branches of an "ogre's orchard" writhe on the right.







Wildlife specimens go into the collecting bag

SLOGGING through the wilderness, expedition members gathered animals and plants for the New York Zoological Society.

As the men descended to lower altitudes, clusters of moths and butterflies approached, attracted apparently by salt from their bodies. Here *Coreura simoni*, a little-known moth, perches on Lake's sweaty hatband.

Hummingbird of the genus *Metallura*, held between fingertips, lives at 10,800 to 12,000 feet, where temperatures often drop below freezing.

"One night," says the author, "we spotted the silhouette of a frog on our tent. Peter Lake later found it in the grass." It turned out to be this strange tree frog. Instead of laying eggs in ponds, *Gastrotheca* stows them, with her mate's help, under the loose skin on her back. Carrying the moist eggs in a grotesquely bulging pouch, the frog nimbly climbs trees.

Diminutive *Lycopodium*, or club moss (half life-size), is not a moss but a living representative of a primitive plant group 500 million years old.

R. BRUCE BAYLARD (UPPER TWO) AND PETER R. HELL (BOTTOM)



When we began our planning, both parachutes and helicopters presented problems. The only suitable copters were owned by the Peruvian Air Force. They would be more costly to fly than planes. They were limited in range, load, and reliability. And the government could withdraw them at any time.

Parachuting at first had seemed too perilous. No chute yet developed could promise relatively safe landings in the thin air at 12,000 feet—our expected height of entry. This problem, however, was solved by Jacques André Istel, who introduced sport parachuting to the United States and was a leader of our expedition until taken seriously ill.

Early in 1963, Istel jumped onto 10,000- and 12,000-foot elevations in Mexico with a radically new parachute, the Para-Commander (page 277). It looks much like other chutes, but has many slots, mostly in the back of the canopy. Air flowing through these openings creates the lifting, gliding effects of an airfoil, slowing descent. The Para-Commander was the answer to our problem.



PHOTOGRAPH BY PETER H. RAVENHILL © NATIONAL GEOGRAPHIC SOCIETY

Camping in comfort for once, Baekeland (left) and Lake go about their chores beside newly discovered Lake Parodi. Here, at about 13,000 feet, the men observed numerous small birds, plus ducks and a gull-like species. They saw no fish.

Our final plan, then, combined the use of parachutes, short-landing-and-take-off Helio Couriers, and helicopters if necessary. A disassembled 700-pound tractor with a bulldozer blade was to be dropped to help prepare the landing strip for the planes.

The first exploring team—parachutists Gimbel, Peter Lake, Jack Joerns, and I—would traverse the region along the long diagonal of the Alto Picha River (map, page 271). A second group, including the expedition's biologists, would land by plane; some members would attempt a traverse by way of the Mantalo River. Both teams would be followed and supported from the air.

Thus, another main purpose of the expedition was to develop a technique for penetrating inaccessible mountain regions and for supporting work parties there over extended periods. The United States Army gave us generous aid in the form of experimental light-weight rucksacks, which needed testing, and cargo parachutes.

For a month before our jump we had flown

a systematic aerial survey of the Vilcabamba. We carefully recorded ground profiles with radar and sensitive barometric altimeters, provided by Honeywell Inc. and the Bulova Watch Company. Peter and I took hundreds of photographs and wire-recorded a verbal description of everything we saw.

Indian Farmers Shun Vilcabamba Heights

The needlelike peaks were higher than we had supposed, and thrust up through great tilted sedimentary layers. One peak, measuring 14,800 feet, we later named for Melvin M. Payne, Executive Vice President of the National Geographic Society. Knifelike walls of glittering shale rose everywhere above grasslands, low bush, and dozens of black tarns. Many of the lakes, we were to learn, froze every night.

Our aerial survey showed isolated *chacras*, or jungle clearings, of Piro, Campa, and Machiguenga Indians—but only at elevations below 6,000 feet.

Why no higher? Dense jungle crept up to



A false step on these slippery rocks could be a man's last. Carrying his heavy pack, Lake (right) cautiously feels his way along a cascade on the Picha River. One such hazard after another faced the explorers as they blazed a trail across the Cordillera Vilcabamba.

Parachute line lashes a sole to Baekeland's foot. He wore out five pairs of shoes. New sneakers were air-dropped from time to time.



PHOTOGRAPHY BY PETER B. SMITH, LEADERSHIP BY S. PHOENIX BRECKENRIDGE © N.A.S.

10,000 feet on the Vilcabamba's flanks. Was the belt from 10,000 feet down to 6,000 really deserted? Why? And why in the higher grassy regions above 10,000 feet were there no people farming or raising livestock? Similar heights are widely populated by the Quechua and Aymara Indians elsewhere in the Andes.

After a chilly night on the lofty slope, Peter and I scrambled down to the valley floor and found a planeload of supplies and equipment

dropped by Dick Tomkins after our jump.

Then we explored the valley. We photographed the topography and flora; recorded azimuths of the feeder valleys; took notes on the varieties of small birds, and hunted vainly for a mysterious animal that left tiny two-toed tracks and deerlike droppings.

Our survey revealed that no airstrip was possible here either—something we could never have determined from the air. Like

the shelf above, the valley was semibog; nothing short of a major engineering feat could drain it.

The first cargo drop included a walkie-talkie, and on August 9, in a message relayed from Luisiana to our expedition agent in Lima, we requested a helicopter.

On the same day Peter Lake and Jack Joerns parachuted in to join us. The first exploring team was now united in the Vilcabamba. Its initial job was to carry 500 pounds of gear to 13,000-foot-high Lake Parodi, nestled in a basin, where we planned to rendezvous with the helicopter.

Starting higher than 10,000 feet, we chopped through dense cloud forests with machetes, struggling hip-high in the "deep snow" of grass and moss (page 269), and fought insects, rain, and cold, always climbing with packs that weighed up to 90 pounds.

For three days the radio brought encouraging news about our helicopter, and Dick managed to drop us some mail.

And then the bad news came. The Peruvian Air Force could not let us have a helicopter. Thus it appeared that there was no possibility of landings in the Vilcabamba for our two biologists, Dr. Hans W. Koepcke of the University of San Marcos in Lima and Dr. Carl B. Koford of the National Institutes of Health near Washington, D. C.

Stygian Gorge Defies Penetration

Eventually we learned that Koepcke and Nicholas Asheshov, a young English jungle expert and newspaper correspondent, were attempting to reach our drop zone on foot via the Pichari River—a climb of some 8,000 feet. With two guides, one of them a Campa Indian, they had already been under way for three days.

The Pichari! Our hearts went out to them. We, who had just returned from three agonizing days in the upper Pichari gorge, had cut our way down into it through a bamboo forest, vainly searching its northern wall for a valley that we knew led up to Lake Parodi. Harrowed by rushing icy waters, constant rain, and the gorge's Stygian darkness, we had been forced to retreat.

Later we referred to it as the Valley of the Shadow of Death, for in the Pichari gorge we were constantly aware of the consequences of an injury. A man with a broken leg could never have been brought out.

On we climbed, often in the clouds. Daily the air grew thinner. We lost weight from exposure and exertion. Only at night, when hud-

dled in our sleeping bags and dry woolens, could we ever escape the permanent wetting cold. As we approached the basin containing Lake Parodi, our camps became perches. We joked at night about falling out of bed without a parachute.

Jack always wore his shoulder holster and a .38 automatic, even to bed. One black night he woke us up with an urgent whisper.

"I smell an animal. It's very close." The animal turned out to be Peter Lake's sneakers—very close to Jack's nose.

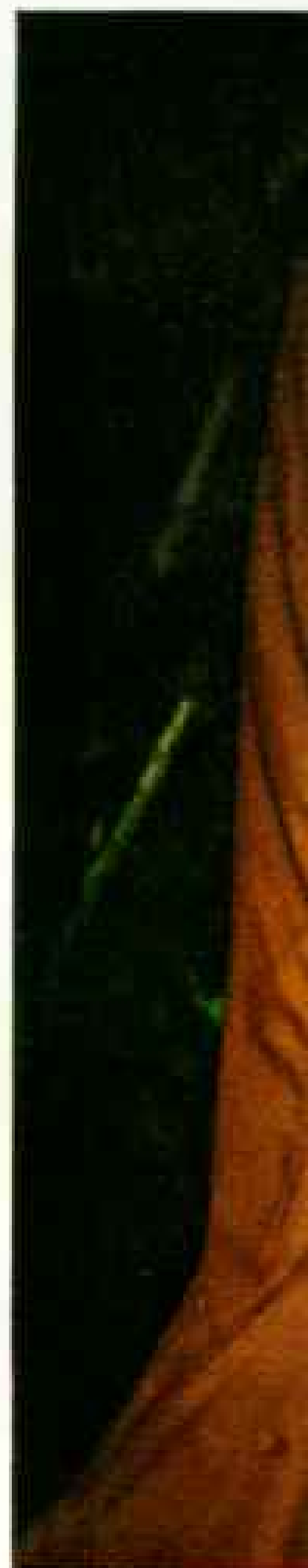
At these altitudes we were astonished to see hummingbirds; one of them was large—six inches from beak to tail. Now and then we came upon areas where a bear had pawed up the ground in search of hibernating lizards, roots, and perhaps small rodents.

Thirteen days after leaving our drop zone, we reached Lake Parodi. There Dick Tomkins and the second pilot, Frank Hay, dropped us food and tents—a welcome luxury.

From the pilots we learned that Asheshov and Koepcke had failed to reach the drop zone on their first attempt. Now a new effort by Asheshov, accompanied only by two guides, was under way. It succeeded; he reached our drop zone in the second week of September.

Next Asheshov made a forced march to Lake Parodi—following trails we had cut a month before—explored to the east, then returned to the drop zone with the intention of descending the Mantalo River to the Urubamba.

Fate, however, was preparing a checkmate. The rainy season had come. Mounting cloud cover now made it impossible for our planes to find Asheshov and his two freezing companions. They had already discovered that they could not live off the country. Their radio had gone bad; it was doubtful that, once they started down the Mantalo gorges, Dick and Frank could ever find them again. Indeed, at this time, Dick had no idea where Asheshov was.



Asheshov retreated. Half-starved and in physical distress, he retraced his steps down the Pichari, now in flood.

Although Asheshov failed to explore the Mantalo, one of the expedition's aims, he had found and proved a way 8,000 feet up the steepest flank of the cordillera. By so doing, he had filled in the missing link of our traverse across the Vilcabamba.

On September 2, with 15 days' rations and heavy packs, our own party had crossed the divide and headed down the gorges of the Alto Picha, on the first leg of our tedious de-

Blinded by Wasp Stings, Baekeland Sinks Into a Coma

When the venomous insects zeroed in on him as he climbed a cliff, the co-leader reports, "I felt as if I were being lashed with a cat-o'-nine-tails and tried to strip off my clothes. I thought I was going to die, but I was not much concerned. I thought of the irony of having avoided serious accidents only to have tiny insects put me out. Then I noticed that I was going blind. Everything



scent to the Urubamba. We were to find dramatic changes at successively lower altitudes.

At last we knew the answer to what had puzzled us from the air: The region between 6,000 feet and timberline at 10,000 feet was uninhabited by man because of rain, cold, and scarcity of game. Above timberline the soil

slowly went white, until I could see nothing at all. My strength ebbed away, and I passed out for about 30 seconds. If three or four more wasps had stung me, they probably would have done me in."

PHOTOGRAPH BY PETER H. ARNDT © N.C.A.

FLASH OF WHITE in a verdant canyon
(opposite), a plane drops supplies along the
Picha River. *Lake and Baekeland* (below) eat
canned tuna with improvised bamboo spoons.
Preparing for possible loss of contact with
support aircraft, *Gimbel and Baekeland*
tested jungle fare – wild fruits, tubers,
and bamboo shoots.

KODACHROMES BY PETER R. GIMBEL © M.G.S.





was a sort of muskeg, unfit for agriculture. Although equal elevations elsewhere in the Andes are temperate and relatively dry, this range collected the first deluge of water from air flowing in over the Amazon Basin.

With very little game and intense cold, we felt there was no reason for people to settle in this region, now or 400 years ago.

As we descended the winding canyon where the first trickle of the Alto Picha began, we had no idea of what was in store for us. We thought we did, but these were judgments made from the air, as if we were giants with seven-league boots. It was to take us not 15 days to reach our destination on the Urubamba, but 61; most of these were days remembered now as though in a nightmare. We were to live with the untried and unforeseeable. What else is terra incognita?

During much of this descent our lives de-

pendent on the uncanny skill and courage of Dick Tomkins and Frank Hay. They flew through the vilest weather and into some of the worst mountain country in the world to find us. Twice they had complete engine failures—fortunately not over the Vilcabamba—and still they kept flying, dropping food and replacements for our rotted clothing. Sometimes many days passed before they could reach us, but they always came.

Wasps Leave Victim in a Coma

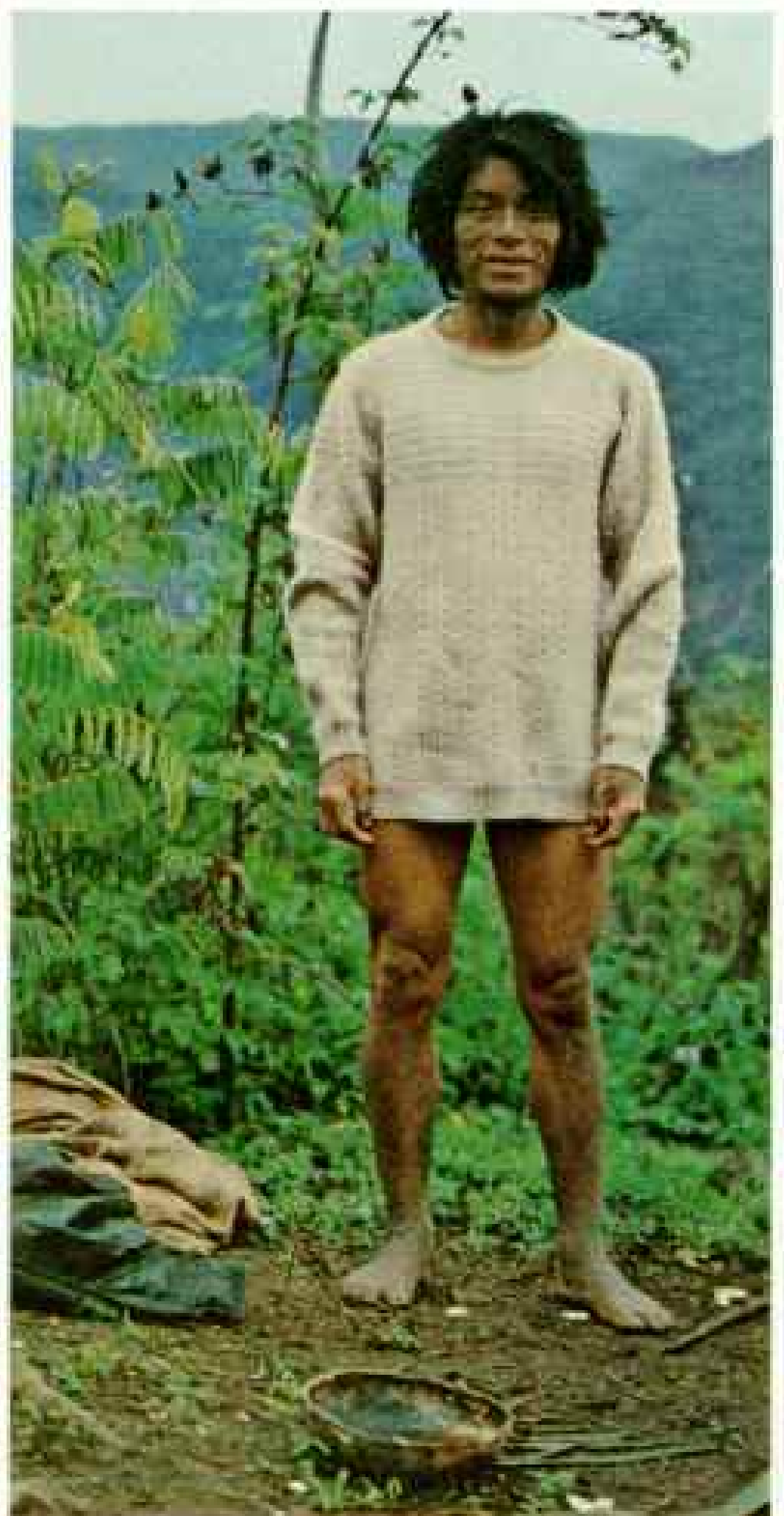
When food drops became more difficult, hunger set in. As our supply of dehydrated foods dwindled, we spent much time dreaming and talking of great meals we had eaten in the past and hoped to eat again.

Then, on September 22, I thought I was going to die.

As I climbed a rock face, a swarm of small



Two months passed before the expedition met its first Indian. The Muchiguenga refused to reveal their names; the men called this one Marino. Seated, he wears an ankle-length *cashma* of wild cotton and (standing) a sweater traded for food. Bowl holds *masato*, a beer made from starchy yuca chewed by the women.





PHOTOGRAPH BY PETER H. GIMBEL © NATIONAL GEOGRAPHIC SOCIETY

Marino (left) plays host to Backeland (seated) and companions at his highland home. The thatched roof leaks but lets smoke escape without a chimney. Here the explorers rested from their arduous trek and prepared for a raft journey back to civilization. In such clearings the little-known Machiguenga, who live as isolated families rather than in tribal groups, raise papaya, yuca, plantain, and corn.

wasps attacked me, stinging my neck and cheek repeatedly. Soon my whole body was on fire. Peter Gimbel lowered me to a ledge, where I slowly went blind, lost all power of movement, and had great difficulty breathing. Stabbing pain shot through my chest. I felt no great fear of death, which seemed so near; only dumb astonishment that it should come in this strange way.

As Peter prepared to give me artificial respiration, I blacked out (page 289). Half a minute later I revived. In an hour I was almost recovered. Peter eased me to the river bank, and we walked back to the camp.

The weather grew warmer as we moved north. All of us occasionally suffered from weakness, cramps, and nausea. Ahead we could often see blue sky. The jungle changed strikingly throughout our descent. We suddenly observed new trees, new vines, new orchids; as suddenly, the old disappeared.

At Lake Parodi we had glimpsed a large black bear and a Peruvian puma, and had found tracks of a ratlike animal. Otherwise we saw no mammals in the high country. Not until we had descended to 4,000 feet did we find snakes—the deadly fer-de-lance and bushmaster. And then suddenly there were signs of game of all kinds: wild pigs, monkeys, tapirs, ocelots, jaguars, and a cacophony of birds, including toucans and parrots.

On October 13 the first evidence of men appeared. Lake and Gimbel came across an Indian trail. For two days we followed it cautiously to the top of a 1,000-foot cliff.

Far below, like a silver thread, the Pichu ran through a typical huge V. It was the end of the high country—and of our life under rain, fog, and cold. Behind us now lay the dark rocky waves of the cordillera rising to the clouds. Up there we had felt an uncanny sense of hostility to life. Here, after passing

the great tilted sedimentary shield at about 4,500 feet, the feeling changed. It was the sun that made the difference.

All of us were a little awed, I think, by what we had done. In the bright, blue distance to the northeast we could see the low foothills; shortly beyond them began the Amazon plain.

Though we felt we had been observed, we couldn't be sure. Three days later we knew it.

Gimbel, Joerns, and Lake were washing their clothes in the Picha when I decided to join them. At the top of a ten-foot bluff above the river, I surprised two armed Indians spying on them from behind a screen of giant cane. They drew their bows on me.

At 15 feet, I could almost feel their barbed arrows in my stomach. Completely at a loss, I grinned and waved at them. They bolted and ran like deer. I had never seen humans so terrified.

Some hungry weeks before, Peter Gimbel had said: "I'll be so glad to see Indians that even if they shoot an arrow through me, I'll die smiling."

Whenever possible, we wanted to make contact with the Indians; it was part of our job. A few days before, we had learned by radio that a Peruvian Air Force helicopter was operating on the Urubamba. We asked that it



Lighter than cork, stout balsa logs were lashed together to form a raft for the expedition's journey downstream to rendezvous with a canoe. Besides four explorers, the raft carried three Machiguenga Indians, who departed without a word of farewell to their relatives. By river the trip took one day; on land it would have required three weeks.

Barbed hunting arrows under his arm, Marino leads expedition members down the Picha River toward his home. "Trotting ahead, he at first waited for us but soon disappeared," says Backeland. "He covered ten miles in a few hours. It took us a day and a half to catch up." Marino carries a duffel bag filled with tin cans, bottles, and other discarded items. "To him the stuff was precious."



ACCOMPLISHED BY C. THOMAS BATTLELAND © NATIONAL GEOGRAPHIC SOCIETY

be chartered to bring us two Spanish-speaking Indian guides. With their help we hoped to study the wild people we had just seen.

The helicopter, guided by Frank Hay, arrived on October 18 at our camp number 31, a mile below the sedimentary shield. It carried the guides we had requested: Juanito, a Machiguenga Indian, and Julio, a Campa.

Returning from an afternoon's search for local Indians, they reported that all had fled into the jungle. Yes, the people up here were Machiguenga. They were very shy.

Next morning at dawn we were awakened by a deep-voiced jabbering. A tall, handsome Indian, armed with a bow and arrows, emerged from the cane. He looked at us steadily as he palavered with our two guides.

This man, whom we called Marino, had been attracted by all the air activity. He had a *chacra*, or burned-out clearing, nearby, but

he lived at another "a few hours away." He would take us now to his house. We broke camp at once and followed him (opposite).

"A few hours away" was for Indians only. At a breakneck pace we made it, exhausted, by midmorning of the following day. We arrived in a steady rain. The house and the *chacra*—planted with papaya, yuca, plantain, and corn—stood 1,000 feet above the river (page 293).

My notes describe the interior of the long thatched house: "In the dark I cannot see anything at first. . . . I notice the figures of Marino and his wife. I later see three small children, one a suckling babe hung in a shoulder strap on mama, who sits with her back to us. Juanito and Julio are squatting on the log ends of a small fire in the center of the hut; Marino sits cross-legged in a new *cushma*, an ankle-length garment of cotton. He faces us



PHOTOGRAPH BY G. BRONKS REYNOLDS © N.A.S.

Silver nose pendant decorates a tattooed Machiguenga. Like the men of her tribe, she keeps her name secret. Although only 13, she has a husband and daughter. The family floated downstream on the expedition raft.

with negligent grace: Jean-Jacques Rousseau's "noble savage."

"In the rafters I see bundles of five-foot arrows of three distinct types: One with an eight-inch bamboo blade, razor sharp, for hunting pigs, tapirs, and jaguars; one, which is barbed, for birds; and one, multi-pronged, for fish. Except for the bamboo-bladed ones, the arrows are tipped with the hard wood of the chonta palm, also used for bows.

"Small parrots shiver on perches against the wall. . . . The guides occasionally take food—plantains, beans, yuca—and roast it in the coals of the small fire. A pipe is passed around; its stem is made from the hollow

bone of a monkey's forearm. *Masato* and honey are both offered around and we drink politely. [Masato is a beer made by the women; they chew yuca, spit it out, and let the result ferment.]

"From our tents we hear Marino's deep voice rising and falling all night. . . . An aristocrat of the jungles, an old-fashioned orator, spellbinding his two visitors."

Indians Part Without Farewells

Because these wild Indians are shy and guarded under direct questioning, it was hard to learn much about them. They live not in tribes but in small, widely scattered family groups. Linguistically they are related to the Campa of the Apurimac Valley.

The people we met are the result of a movement away from the Urubamba that began long ago. They and their ancestors fled white man's civilization—largely to avoid the rubber slavers.

Although they have no memory of it, their blue facial tattoo, we were told, dates back to the rubber-hunting days of the 1800's. An Indian who had a specially fine nose for wild rubber trees was tattooed thus by his owners. The mark is now purely decorative.

After leaving Marino, we lived and traveled with small bands of upriver Machiguenga, finally taking a young man and his wife and child out to civilization with us by balsa raft and canoe. The Indian wished to work at a mission downriver so he could buy a machete. This Machiguenga family taught us an interesting thing about their jungle tribe: They may greet each other volubly, but they do not say goodbye.

The three Indians knew they might never make the long journey back to the Alto Ficha. But when they got on our raft, neither they nor the relatives they left behind smiled, waved, or spoke a word. No one looked back.

We reached our goal—the Dominican Mission at the confluence of the Sepahua and Urubamba Rivers—on November first, 89 days after we had jumped into the cordillera.

A thin line had been laid across the map of the Vilcabamba by our two small teams, supported by another in the air. The Vilcabamba had been crossed.

It has been seen in a first small glimpse that will be followed, I am sure, by other, more leisurely eyes. Eventually all parts of the world are opened up and used in ways undreamed of by the men who were first interested enough to go.

But the first trip through is never easy.

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◀ **COVER:** Para-explorer drops toward Peru's unknown Vilcambamba wilderness (page 268).



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Hardship etches explorers' faces

THE STRAIN of being first to conquer one of earth's unknown areas shows in the haggard faces (right) of two New Yorkers who parachuted into Peru's forbidding Vilcabamba mountain fastness. Forsaking life in Manhattan's man-made canyons, they and two companions spent 89 harrowing days traversing the wilderness. (See "By Parachute Into Peru's Lost World," page 268 in this issue.)

G. Brooks Baekeland (upper), 43-year-old grandson of the Belgian who invented Bakelite, trained as a physicist at Columbia University. During World War II he flew in Europe as a U.S. fighter pilot.

Peter R. Gimbel, 36, a great-grandson of the founder of the Gimbel-Saks department stores, graduated from Yale University and then attended Columbia. His activities range from parachuting to skin diving. He is a trustee of the New York Zoological Society.

In addition to bringing the always colorful, always timely NATIONAL GEOGRAPHIC, your Society dues help courageous men like Baekeland and Gimbel fill in the last blank spots on the world map. You can share the privileges—and the pride—of membership. Nominate your friends on the form below.



Baekeland in Manhattan.



Gimbel in city clothes.



Stung by Andean wasps, Baekeland goes temporarily blind, then loses consciousness. Gimbel, machete in hand, rests beside a waterfall.



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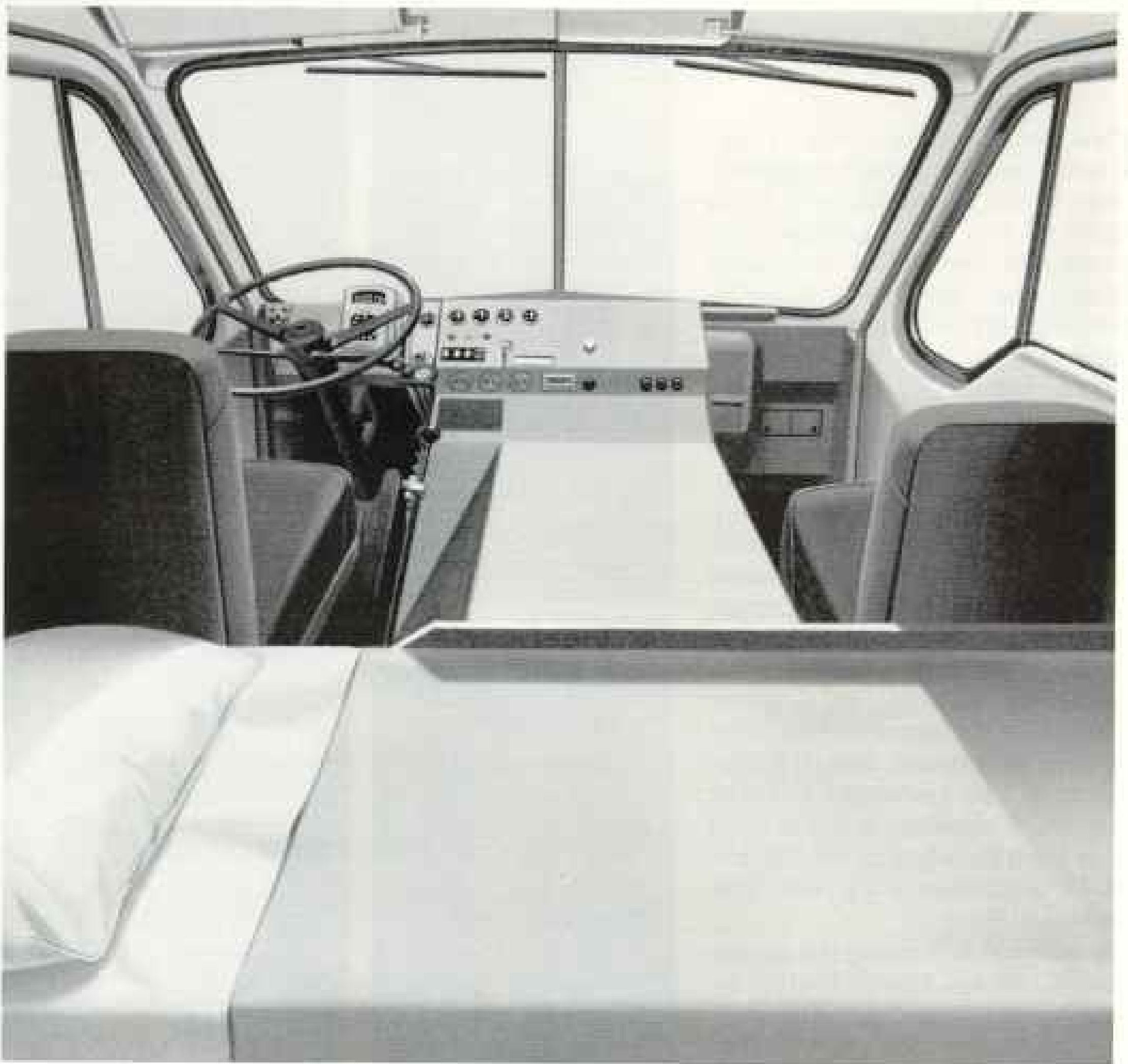
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Before attempting rescue breathing, lay victim on back. Turn head to the side. Wipe any foreign matter out of the mouth with your fingers. Then straighten victim's head.

1 Place one hand under victim's neck and lift. Tilt head back as far as possible by holding the crown of the head with your other hand.



2 Pull chin upward until the head is tilted back fully. This is essential for keeping the air passage open.



3 Place your mouth tightly over victim's mouth. Pinch nostrils shut. Breathe hard enough to make the chest rise. For babies and very young children, cover both nose and mouth tightly with your mouth.



4 Remove mouth. Listen for sound of returning air. If you don't hear it, recheck head position. Breathe again. If you still get no air exchange, turn victim on side and slap between shoulders to dislodge foreign matter. Repeat breathing, removing mouth each time for escape of air.



For an adult, breathe vigorously about 12 times a minute. For a small child, take relatively short breaths, about 20 per minute. Don't give up. If possible, call a physician promptly. Keep the victim warm and quiet.

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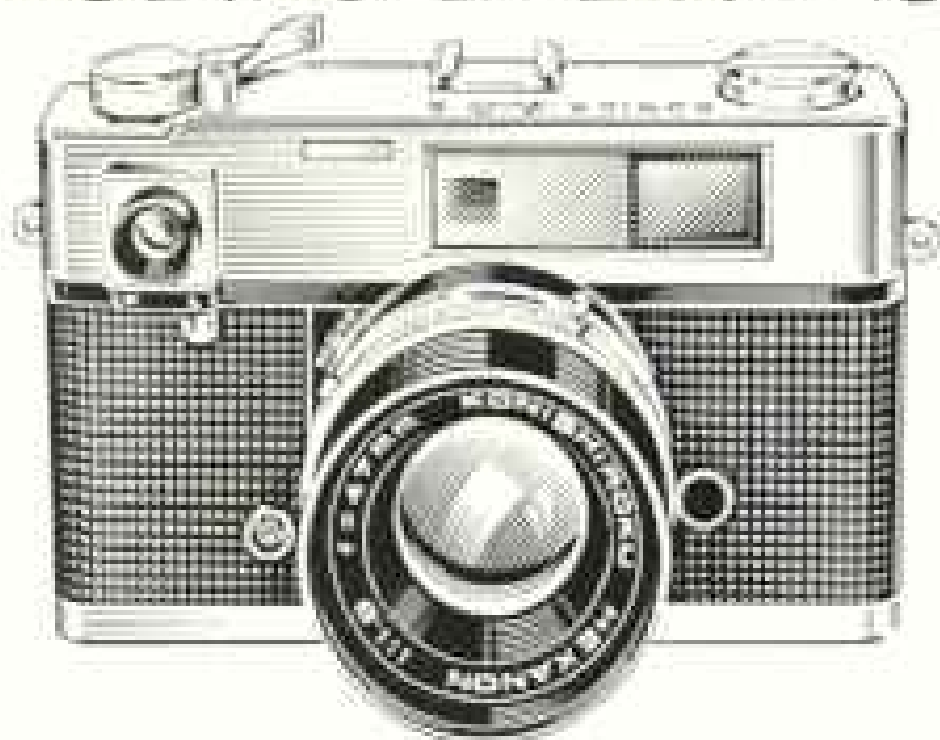
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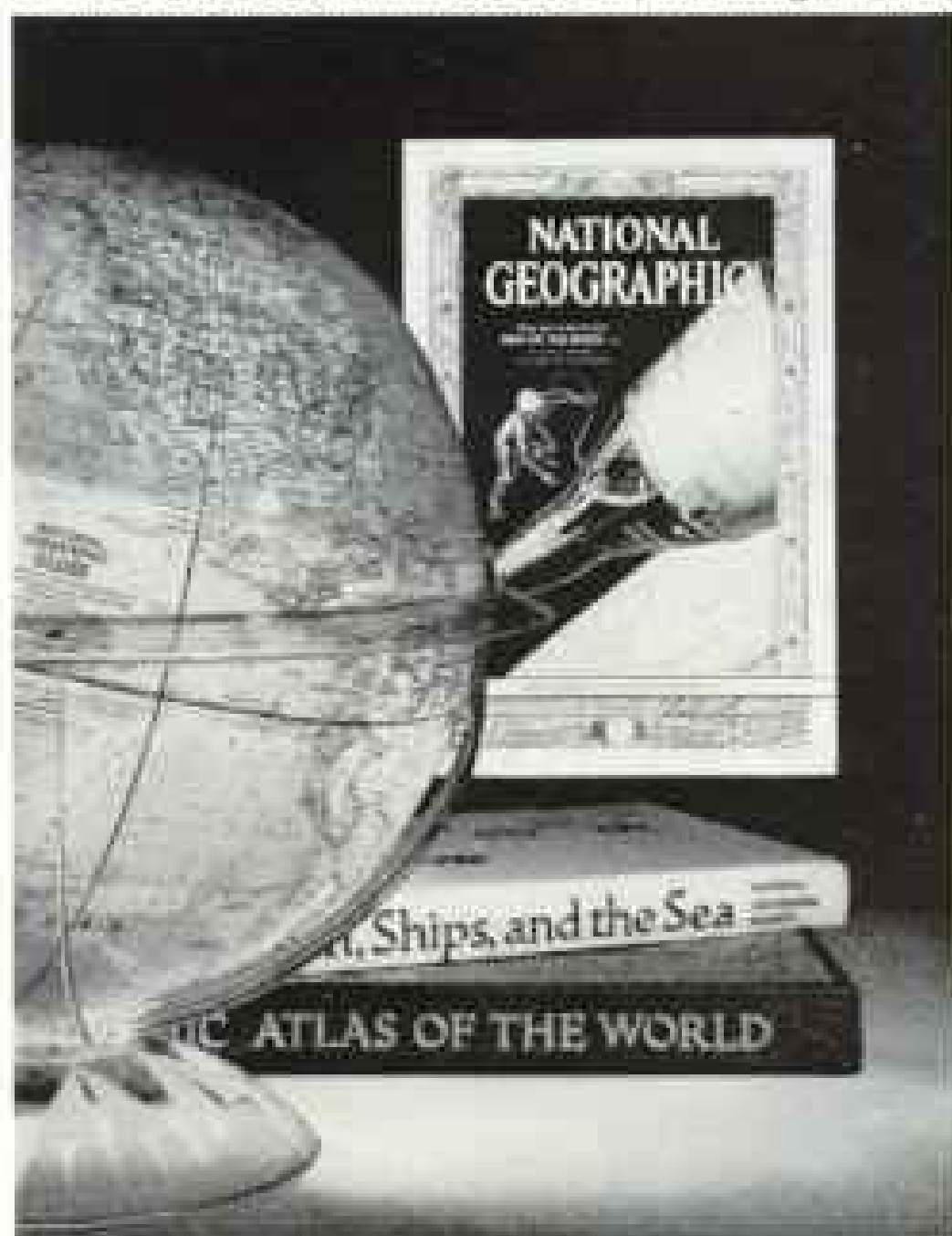
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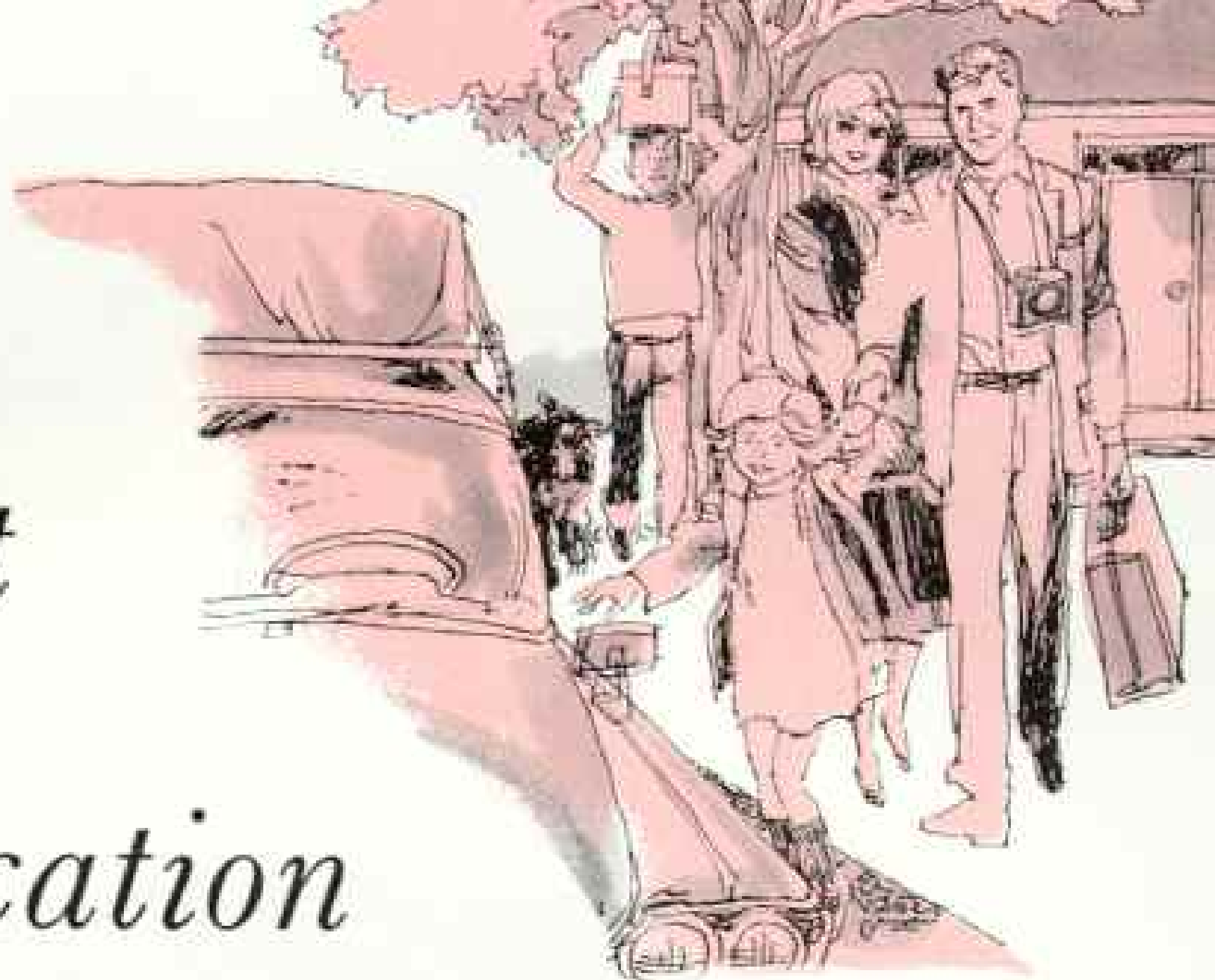
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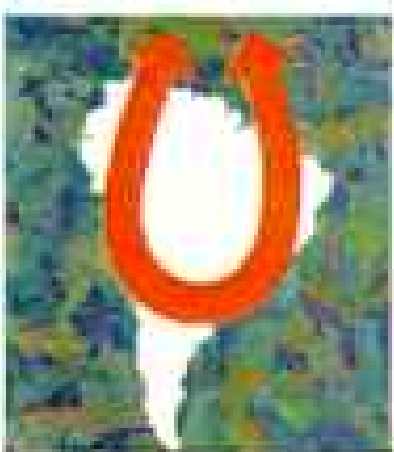


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