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Slow Boat to Florida

In *Tradewinds*, a 35-foot Ketch, the Authors Sail 1,100 Miles from Annapolis to Miami on the Historic Inland Waterway

BY DOROTHEA AND STUART E. JONES

ANOTHER weekend of sailing on Chesapeake Bay was almost at an end. My wife and I steered our ketch *Tradewinds* under the soaring steel tracery of Bay Bridge, and then turned out of the main channel to give plenty of room to a tanker bearing down on us from astern. From her starboard bridge wing an officer waved a jaunty salute.

The big ship plodded on southward, and *Tradewinds* wallowed in her wake.

"You know what I wish?" I said as we headed for our home port of Annapolis, Maryland.

"Yes," said Dorothea, "I know it by heart. You wish the same thing every time you see one of those big ships going down the bay. You wish we could make a real cruise—down the Inland Waterway. Well, some day, maybe. . . ."

A Dream of Years Comes True

"Some day" came with all the suddenness of a magic wand when an assignment to sail the waterway for the NATIONAL GEOGRAPHIC MAGAZINE unexpectedly dropped into our laps. With us went staff photographer Joseph Baylor Roberts, a grand shipmate even if he did persist in calling me "Captain Davy" Jones all the way to Miami.

For two months and 1,100 miles we followed as entrancing a route as a small-boat sailor can find. The Atlantic Intracoastal Waterway, to give it its official name, winds through time and tide from New England to the Florida Keys. As broad as Chesapeake Bay and as narrow as the Dismal Swamp Canal, salty, brackish, and fresh by turns, the waterway is no monotonous ditch but a rippling scenic highway of infinite variety.

Roughly paralleling the eastern seaboard, it passes some of the country's most important historic shrines and modern cities (see red dotted line on Atlas supplement map). Shielded from Atlantic winds and waves, it serves a steady flow of shrimpers, small tankers, and barges, as well as yachts ranging from lordly 100-footers to modest outboard cruisers. We heard of one man who made the trip in a 17-foot canoe.

Five-day Northeaster No Ill Wind

On the April day we planned to start, a northeaster howled through Annapolis, and ominous storm signals flew from the United States Naval Academy sea wall. For five days the cold wind and rain drove in from the bay. While *Tradewinds* lay holed up in her snug berth, we explored Maryland's picturesque capital in a car, which need not be steered from an open cockpit.

On an afternoon free of rain, we saw the entire brigade of midshipmen pass in review on Worden Field. Strong gusts of wind made not a ripple in the faultless ranks sweeping by to the stirring strains of "Anchors Aweigh."

We attended services in the Academy chapel and stood with reverent midshipmen before John Paul Jones's marble sarcophagus in the chapel crypt.

Mingling with midshipmen, we strolled narrow, hilly streets whose names carry the ring

Future Skippers of Atomic Ships, Midshipmen Train Under Canvas

The United States Naval Academy, pride of the Navy, hugs the southern bank of the Severn River at Annapolis, Maryland. In a crypt beneath the Academy's domed chapel (center) lies the body of John Paul Jones, illustrious sea fighter of the Revolu-

National Geographic Photographer Thomas J. Abercrombie © N.G.S.

tion. Bancroft Hall (left) is America's largest college dormitory; it contains 24 acres of floor space and three and a half miles of corridors. Midshipmen sleep on all five decks, eat in a 4,000-man mess hall at basement level. Maury Hall (right) houses the Department of English, History, and Government. These midshipmen learn basic seamanship and the ways of wind and tide in 44-foot Luders yawls. From Annapolis the authors began their 1,100-mile cruise along the Intracoastal Waterway.

of colonial days: Duke of Gloucester, Prince George, Compromise, Cornhill, Shipwright. Long navy-blue rain cloaks made the ramrod-straight midshipmen appear to be gliding along on casters.

Under the tall octagonal dome and cupola of the Maryland State House, we visited the Old Senate Chamber. Meeting in this room on December 23, 1783, the new Congress of the United States received George Washington's resignation as commander in chief of the Continental Army. A few weeks later, in this same chamber, Congress ratified the treaty of peace with Great Britain that officially ended the Revolutionary War.

Anchors Aweigh at Last

One morning the warning flags were missing, and white clouds raced across the bluest of skies. *Tradewinds* was doing a sort of pixie dance at her berth.

"I think she wants to go," said Dorothea.

We checked gear and stowed the last of our supplies. As whitecaps sparkled in the morning sunlight, we sailed out into the Severn River. A fleet of Naval Academy yawls stood out ahead of us. Their crews, we knew, were future officers learning the ways of the sea as they should be learned—in sail (page 2).

When we cleared the river mouth, we found the bay still boisterous. Short, steep seas sent icy salt spray flying over us. Green water broke across the bow, swirled aft along the deck, and gurgled out through the scuppers. A brisk wind honed the 40° temperature to a razor edge.

The wind was out of the southwest—dead ahead—and rising steadily. This meant no sailing, if we were to make the 45 miles to Solomons, Maryland, before nightfall; so we furled our 750 square feet of canvas and the 61-horsepower engine settled down to the first of many daylong stints.

For the initial 140 miles we would be sailing the broad waters of Chesapeake Bay, that great inland sea stretching from the Virginia Capes to the Susquehanna River. On previous sorties out of Annapolis we had ventured north to Baltimore and the Sassafras River and south to the Patuxent. On the Eastern Shore we had explored long, winding streams with Indian and English names: Choptank, Chester, Miles, Wye, Tred Avon. Now we were hugging the western shore, and before us lay unknown waters.

That first blustering day we made slow progress. By midafternoon we had clawed our way southward a mere 15 miles, and the prospect of reaching Solomons before dark seemed slight. Sheltering for the night seemed the most sensible procedure.

Reversing course, we headed for the broad bay formed by the South, West, and Rhode Rivers—a beautiful expanse of water well known to Dorothea and me. At dusk we dropped anchor at the snug little seafood-packing and boatbuilding port of Galesville.

Below deck, while Dorothea cooked dinner, Joe—a notorious landlubber—studied a nautical chart and a road map.

"Look!" he exclaimed incredulously. "After all that battering, we're just about 10 land miles from Annapolis! Next time I'll walk!"

With morning the Chesapeake was its usual calm, charming self. We headed south, cruising so close inshore we could recognize such places along the tall Cliffs of Calvert as Scientists Cliffs, where we had often wandered in search of fossilized sharks' teeth and other relics of the Miocene Age.

Science Attacks Stinging Jellyfish

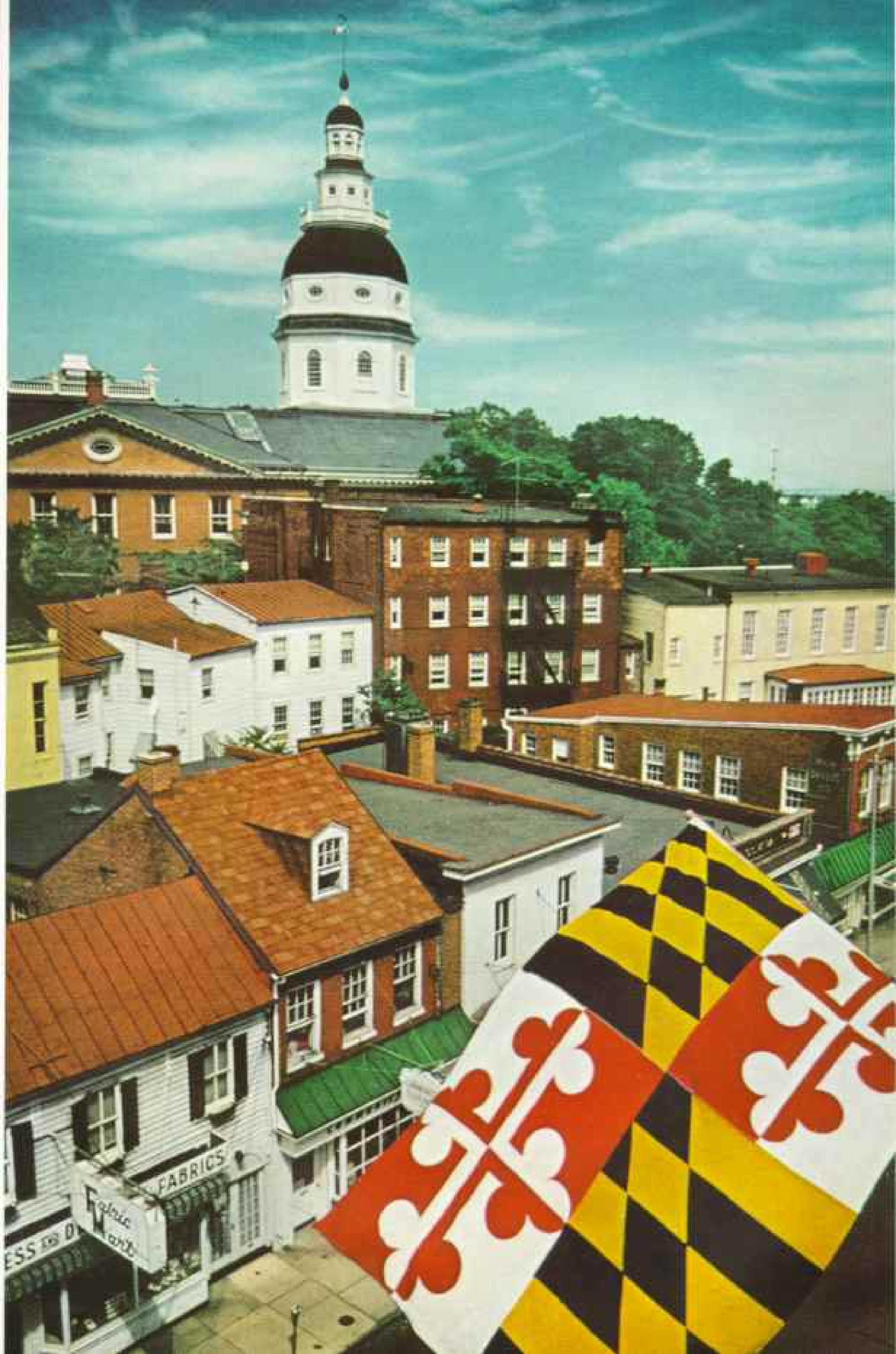
Solomons, an island village near the mouth of the Patuxent, enjoys huge popularity as a sport-fishing center. Most villagers earn their living fishing, oystering, and crabbing. Solomons also shelters the Chesapeake Biological Laboratory, a Maryland agency dedicated to improving and conserving fish and wildlife resources. When we visited the laboratory, we found researchers hard at work seeking ways to control the stinging jellyfish called sea nettles (page 8).

In common with all who frequent the bay, we have a personal interest in sea nettles. Millions of these pests infest the bay in summer and take the joy out of swimming. Many a time, diving off *Tradewinds*, we have

Maryland's 186-year-old State House Rises Above Annapolis Rooftops

Modern city in a colonial setting, Annapolis has served as Maryland's capital since 1694. The Continental Congress held sessions in the wooden-domed State House at the close of the Revolution. There, on December 23, 1783, George Washington resigned his commission as commander in chief of the Continental Army. St. John's College, one of the Nation's oldest educational institutions, makes its home in Annapolis. Maryland State flag (foreground) is based on Lord Baltimore's coat of arms.

National Geographic Photographer Thomas J. Abercrombie © N.G.S.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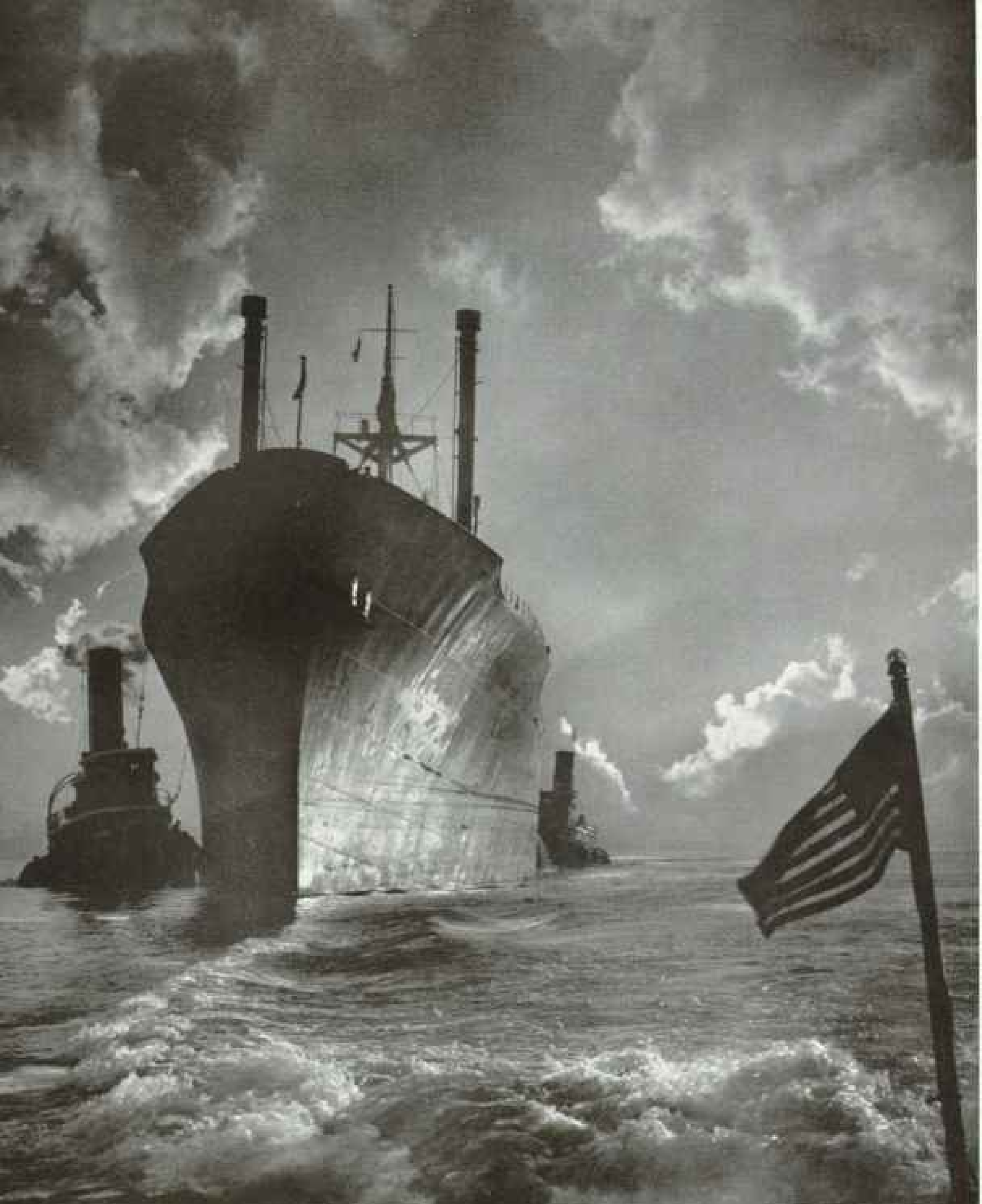


A. Aubrey Bodine

Dawn over Baltimore Harbor: Tugboats Help a Freighter to the Piers

The Nation's second largest port in foreign-trade tonnage lies 150 water miles from the Atlantic. Baltimore stands at the mouth of the Patapsco, where the river empties into Chesapeake Bay.

Cargoes pour in and out of the harbor day and night. Long before sunup tugs set out to the anchorage areas, where ships lie overnight awaiting an early-morning tow.

In 1956 the Maryland port handled an export-import volume of nearly 27 million tons, a figure exceeded only by New York; ocean-going vessels arriving in Baltimore reached an all-time high of 5,735.

been soundly stung—an experience like being splashed with hot grease.

"Are sea nettles being abolished?" Dorothea hopefully asked Dr. Romeo Mansueti, an estuarine biologist on the laboratory staff.

"Not exactly," he replied. "One of the things we're doing now is studying their breeding habits. This may show us at what stage they are most vulnerable to poisons.

"Even if we find ways to control or eliminate them, we must be careful not to upset the balance of nature; it might harm other marine life. Some authorities believe that nettles eat ctenophores, or sea walnuts—small, jellylike creatures that feed on oyster larvae. Thus the jellyfish may play an important role in the oyster fishery."

Another biologist, Joseph H. Manning, showed us an old-looking craft tied up near the laboratory pier. It was the *John A. Ryder*, a 42-foot work boat equipped with a centrifugal pump and a conveyor belt.

"This is the laboratory's softshell-clam research boat," said Mr. Manning. "Hydraulic clam dredging is responsible for a new $1,000,000 annual industry that produces a food as rich in proteins as oysters."

Succulent "steamer" clams (*Mya arenaria*) have probably always existed in the bay and its tributaries. But no one knew of an efficient way to gather them until 1951 when Fletcher Hanks, of Oxford, Maryland, devised the hydraulic dredge (page 9).

By last spring 132 dredges were harvesting clams in four Maryland counties. Several had also appeared in Virginia waters. To conserve all forms of bay marine life, their operation is regulated.

After Solomons came two strenuous days of head winds and heavy seas, topped off by an even more strenuous hour of dodging Mobjack Bay's fish traps in the twilight. The trap stakes, heavy timbers that reach 20 or more feet to the bottom, were solid enough to smash a hole in *Tradewinds'* bow. But everything has its use: they made us appreciate to the full the superservice that marinas provide for yachtsmen along the waterway.

At secluded King-Robins Marina off the York River the obliging dockmaster directed us into a handy berth and helped us make fast.

"You look hushed," he remarked. "You don't want to sleep aboard tonight, do you? How would you like hot baths and soft beds?"

Twenty minutes later the dockmaster's car unloaded us at a spanking new motel and restaurant in a Virginia hamlet called Ordinary—a name that doubtless harks back to colonial days when a tavern, or ordinary, welcomed travelers passing this way.

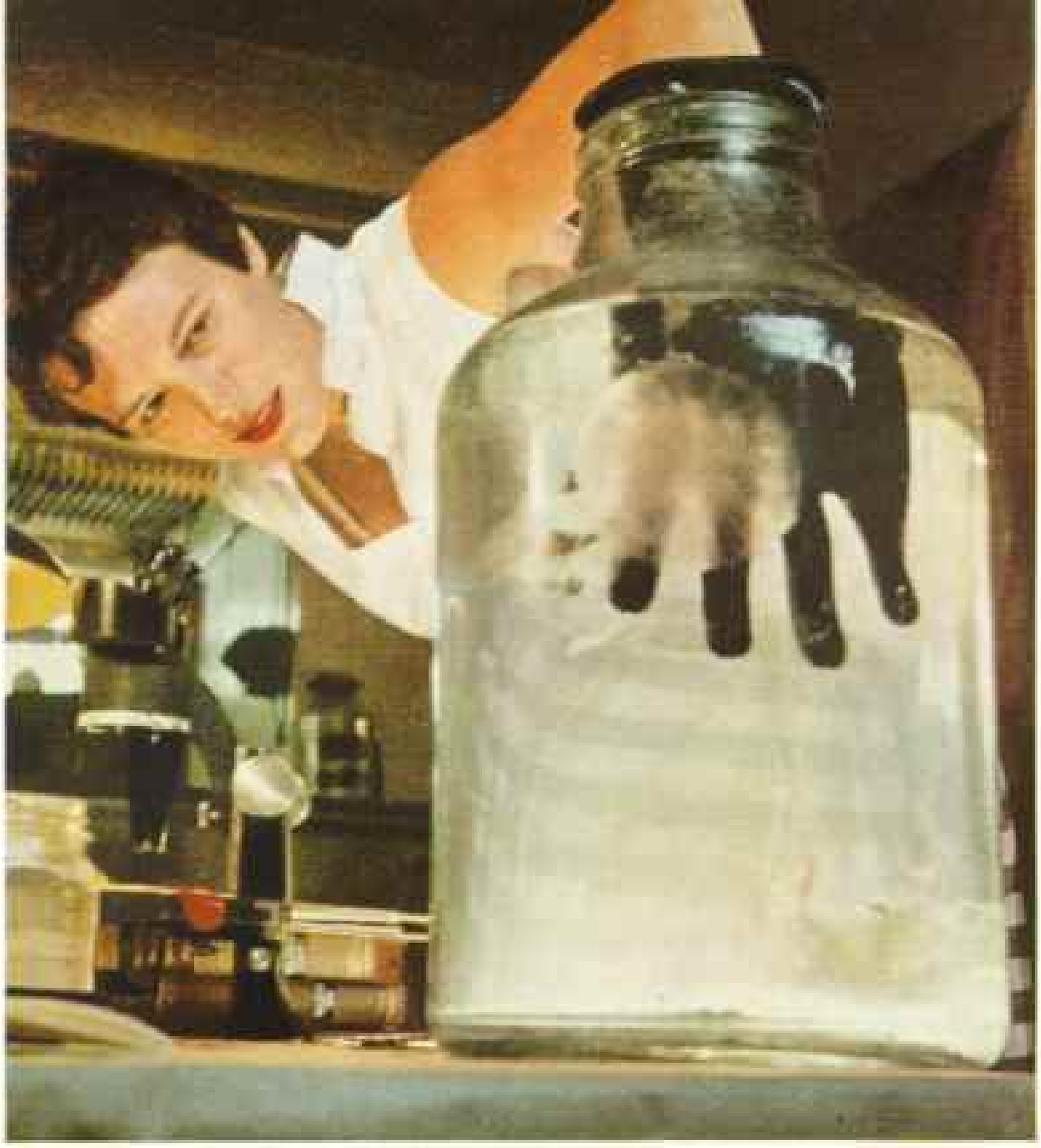
Where Iron Ships First Battled

Next day, as we rounded Old Point Comfort and Fort Monroe into Hampton Roads, a jet aircraft crashed the sound barrier with a thunderous bang; we wondered if the pilot was mocking our seven-knot pace. Jauntily we fell in behind a procession of destroyers, mine layers, and mine sweepers returning from exercises off the Virginia Capes.

Looking across the gray water of Hampton Roads, I was reminded of the naval revolution that had occurred here. On the misty morning of March 9, 1862, the Confederate ironclad *Virginia*—formerly the Federal frigate *Merrimac*—had steamed through these very waters and stumbled on the Union's armored *Monitor*. Blistering hours of combat

Skipper Holds *Tradewinds* on Course in York River

National Geographic Photographer J. Baylor Roberts



Science Tackles a Bay Nuisance: Sea Nettles

Sea nettles swarm by the millions in Chesapeake Bay and its hundreds of rivers and creeks during most summers. Tentacles of these jellyfish bear tiny cells that sting swimmers.

Hoping to control the pests, scientists at Chesapeake Biological Laboratory, Solomons, Maryland, study their breeding habits. Dr. Rosemary Hein, wearing rubber gloves, stirs up nettles in jar and tank.

Patuxent River Sands Yield a Harvest of Clams

Working near Solomons, these men call the catch of a hydraulic dredge, a new device for converting tidewater resources into money. The conveyor belt, mounted on the side of a boat, brings clams to the surface after water jets, driven by a centrifugal pump, loosen sand on the bottom.

National Geographic Photographer Thomas J. Abercrombie and (opposite) Emerton Jones © N.G.S.

produced a draw, but the guns of the world's first two ironclads had sounded a requiem for timbered warships.

When the smoke cleared over Hampton Roads that day, the age of wooden men-of-war had ended. Quietly but gloriously they sailed into history, colors struck before the inexorable march of science.

Flags of 15 Nations Fly at Norfolk

To the southeast we could see tall Cape Henry Light looming over Fort Story, an important part of Norfolk's defenses since World War I days. On Willoughby Spit and on the opposite shore at Hampton, massed machinery and mounds of newly dug earth marked the terminals of the $60,000,000 Hampton Roads bridge-tunnel project, just reaching completion.

Then the Elizabeth River led us southward past the vast installations that make the Norfolk area a naval base of great importance. The flags of 15 nations flew above SACLANT, headquarters for the Supreme Allied Command, Atlantic, western arm of the North Atlantic Treaty Organization.

Tradewinds was dwarfed but undaunted as she sailed past the battleship *Iowa*, the aircraft carrier *Valley Forge*, and the cruiser *Boston*. In the Lafayette River, which opens off the Elizabeth, we berthed at the hospitable Norfolk Yacht and Country Club.

We found the city abuzz with preparations for the annual International Azalea Court, at which a queen and a bevy of princesses compete with 125,000 blooms for beauty honors. Along with crowds of visitors and picnicking families, we strolled through the Norfolk Municipal Gardens. Dogwood, rhododendron, crape myrtle, and camellias mingled with azaleas of every flaming hue on more than 100 acres of winding walks, lakes, and woodland.

Crossing by tunnel to Portsmouth, on the

National Geographic Photographer John E. Fletcher

Hampton Roads Swallows Motorists; Cars Dive into the New Tunnel

Opened last November, the 3½-mile bridge-tunnel joins Hampton, Newport News, and Warwick on the peninsula to the north with Norfolk, Portsmouth, and Virginia Beach to the south. The 6,860-foot tunnel ranks as the world's fifth longest underwater tube, exceeded only by England's Mersey River tunnel and New York's Holland, Lincoln, and Brooklyn-Battery tunnels. At its lowest point automobiles pass 105 feet beneath the water. The new route, succeeding a ferry, cuts traveling time from 30 minutes to 7.

Two man-made islands, dredged from the depths, connect the tube with approach bridges. This view looks down the throat of South Portal, one of the islands. Within a moment northbound cars in the foreground will pass beneath the coal barge and emerge on North Portal, directly ahead.

Ships entering the harbor from Chesapeake Bay (to the right) pass Hotel Chamberlin on the tip of Old Point Comfort. Buildings beside the hotel belong to historic Fort Monroe. Hampton city appears in the distance.

The Union's *Monitor* and the Confederacy's *Virginia* (formerly the Union's *Merrimac*) fought the world's first battle between ironclads in these waters, March 9, 1862.

south shore of the Elizabeth River, we visited the Norfolk Naval Shipyard, oldest in the Nation. A Scotsman founded it as Gosport Shipyard in 1767, 31 years before the creation of the U. S. Navy Department.

Here was launched the frigate *Chesapeake*, built for the Navy in 1799. Here the historic Confederate ironclad *Virginia* was reconstructed from the partly burned *Merrimac*. Here, too, was built the U.S.S. *Texas*, the Nation's first battleship. Still in daily service is the shipyard's Dry Dock No. 1, built of Massachusetts granite and opened in 1833.

An excursion out of Norfolk took us across Hampton Roads to Newport News and its great shipyard, where we saw the aircraft carrier *Ranger*, commissioned soon after, and the Grace Line's 20,000-tonner, the new *Santa Rosa*, due for launching a few weeks later.

En route to the Jamestown Festival, we paused outside Newport News to inspect the ship models, figureheads, old anchors, marine engines, and other exhibits at the Mariners Museum, founded in 1930 by the late Archer M. Huntington (page 17).

Another day's tour took us to Cape Henry; here a simple stone cross marks the spot where the Jamestown colonists first set foot on New World soil in 1607.

Canal Cuts Through Dismal Swamp

Now *Tradewinds* plunged into the Inland Waterway's serpentine, all-weather passage through the Southeastern States. Here dredged ditches, canals, and deepened natural streams connect larger bodies of water. Our unhurried pace gave us plenty of time to explore this strange, timeless land of brooding swamps and serene rivers, of lonely dunes and wind-swept marshes. In it we found peace and solitude—and also, paradoxically, the tumult of an up-and-coming Southland.

A few miles south of Portsmouth we entered the 22-mile length of the Dismal Swamp

Canal, which streaks almost ruler-straight from Virginia into North Carolina (page 20). Opened in 1805, it is one of the Nation's oldest artificial waterways. A lock at Deep Creek, Virginia, lifts vessels 12 feet; another at the canal's end at South Mills, North Carolina, drops them back to sea level.

I was at the wheel when *Tradewinds* entered the Deep Creek lock chamber. Since Dorothea's attributes include neither tallness nor skill as a line heaver, we had a problem, for the lock tender was waiting for our bow line some 12 feet above us. After several unsuccessful casts, Dorothea threw seamanship to the winds and used a boat hook to pass up the line.

As soon as we were fast, gates behind us creaked shut and valves ahead were opened, admitting a cascade of Coca-Cola-colored water that gurgled and foamed against our hull.

When *Tradewinds* had risen to canal level, we cast off lines and powered through the southern gates.

To prevent erosion of the banks and shoaling of the dredged channel, the Army Engineers—who maintain the toll-free Inland Waterway—have set a speed limit here of six miles an hour. So we had time to observe reddish maple seed pods spiraling into brown water and white dogwood flowering in the shoreline's tangled growth.

It was an extraordinarily pleasant way to travel. The sunshine slanted through the trees, dappling the water with shifting patterns of light and shadow. Birds flashed among the leaves, and from far away came the melting legatos of a mockingbird's song. Turtles slid off logs as we approached. Occasionally water snakes swam alongside, and a muskrat cut a rippling V across our course. To us the Dismal Swamp seemed neither dismal nor a swamp.

Tall Tales Born in Swamp

To starboard lay forest George Washington had once surveyed. Formerly an impenetrable fastness, it is now laced with logging roads and marked by occasional farm clearings. But an element of mystery still lingers. Legend has peopled the swamp with ghosts, savages, moonshiners, and desperate criminals fleeing the law.

Hair-raising tales of enormous reptiles, poisonous plants, and treacherous peat bogs have also come out of the Great Dismal, which once spread over approximately 2,000 square

Secretary of the Navy Reviews the Fleet

Ships under inspection remained at anchor while the reviewing vessels moved past. U.S.S. *Canberra* sails ahead. Secretary of the Navy Thomas S. Gates, Jr., stands aboard the *Boston*.

Ships of Many Flags Ride at Dress Parade off Norfolk

Tidewater Virginia, celebrating the 350th anniversary of the Jamestown settlement, paid tribute to modern sea power last June when men-of-war from 18 nations staged a review in Hampton Roads. Here crewmen in dress whites form a picket fence around the flight deck of the French carrier *Bois Belleau*, formerly the U.S.S. *Belleau Wood*. Hr. Ms. *De Zeven Provincien*, a Netherlands cruiser, lies next in line.

Inset: U.S.S. *Barbero*, a guided-missile submarine, carries a Regulus I weapon on the deck. Hangar between missile and conning tower houses Regulus when the vessel submerges.

Cruiser *Boston* Reviews the Carriers *Randolph*, *Valley Forge*, and *Leyte*

Some 55,000 officers and men manned 114 ships taking part in the Norfolk naval show, largest international review ever held in American waters. The fleet lay at anchor in two 14-mile-long columns.

Kodachrome by Thomas W. McKnew, Vice-President, National Geographic Society ©

Thousands witnessed the spectacle from yachts and motor launches. The reviewing vessels, steaming at 7 to 15 knots, passed each ship in the northern column, then turned about and reviewed the southern column, which included these U. S. carriers. Yellow Terrier missiles point skyward from the stern of the *Boston*, a guided-missile cruiser. Radar for search and missile guidance crowns the superstructure.

miles of Virginia and North Carolina. Today drainage and a falling water table have shrunk it to an estimated 385 square miles, and hunters and school nature-study groups roam the game-rich swamp.

To the east only a narrow strip of tree-grown shoreline separated us from the Ocean Highway (U. S. 17), alive with rushing traffic and studded with filling stations, motels, restaurants, and drive-in theaters. We exchanged greetings with picnic parties and straw-hatted, middle-aged ladies who relaxed in comfortable chairs while they angled for catfish.

At Arbuckle Landing, midway between the north and south locks, a man-made feeder ditch joins the canal. Through it flows water from a spillway at Lake Drummond, in the heart of the Dismal Swamp, which keeps the canal at navigable depth.

When we docked at the landing, head dam operator Benjamin McCoy was waiting with an outboard-powered skiff to take us to see the lake. An ingenious power-driven marine railway lifted the boat six feet to the level of the lake.

Lake Inspired an Irish Poet

Half a mile beyond the spillway we passed into Drummond itself, a great circle of brown water ringed in green. Only the buzz of our outboard broke the stillness, and the eerie atmosphere was accented by the tortured shapes of cypress stumps.

McCoy, a veteran of 15 years on the canal, was proud of his domain. "It's a good life here," he told us, "except for the black bears that steal the honey right out of my beehives. And sometimes we hear strange noises in our houses—the sound of somebody walking, or eerie crackings and creakings. We've never been able to track 'em down. But it makes a person think that maybe all these stories he hears about Dismal Swamp aren't just myths."

Thomas Moore, the Irish poet, visited Drummond in 1803 and captured its spirit in "The Lake of the Dismal Swamp," a gloomy ballad about a young man seeking his dead sweetheart and imagining that

. . . all night long, by a firefly lamp,
She paddles her white canoe.

Some say that Drummond's water derives its strong-tea hue from juniper trees; others credit the leachings of juniper, gum, and cypress. In any case, old-time sailing masters prized the water for its "keeping" qualities, and watering parties went to the swamp to fill casks for long voyages.

Outer Banks: Birthplace of Flight

Back on the canal, we soon passed the Virginia-North Carolina border. At South Mills we were lowered back to sea level. The long straightaway of Turners Cut and then the winding Pasquotank River led us to Elizabeth City, near the head of Albemarle Sound.

There we temporarily abandoned *Trade-winds* to make an automobile tour of the Outer Banks, the 320-mile chain of elongated barrier islands that guard North Carolina's coast from the surging Atlantic.*

The dominant landmark in all that expanse of billowing dunes is a granite monument; like the brothers whose memory it honors, it reaches for the sky from the top of Kill Devil Hill. Near this spot on a windy December day in 1903, two bicycle mechanics from Dayton, Ohio—Orville and Wilbur Wright—sent a powered aircraft aloft for 59 seconds with Orville at the controls. Here, amid these lonely sands, they blazed a path that has already led man to the threshold of space and promises to take him to the moon.

At the famous old resort of Nags Head we met Julian Oneto, resident manager of the Carolinian Hotel and a font of Outer Banks lore.

"Long ago," he told us, "some Bankers went in for a form of piracy. They hung false

(Continued on page 25)

* See, in the National Geographic Magazine: "October Holiday on the Outer Banks," by Nike Anderson, October, 1955; and "Exploring America's Great Sand Barrier Reef," by Capt. Eugene R. Guild, September, 1947.

Relics of the Sea Crowd the Mariners Museum, Newport News

Massive figureheads standing in this Virginia exhibit hall once graced the prows of history-making vessels. Ship models illustrating man's conquest of the sea range from primitive Indian dugouts to the liner *United States*. Other treasures are an old Yankee whaleboat, Chesapeake Bay log canoe, Tahitian pirogue, and two-man Japanese submarine. Carved angels at top decorated the stern of the British man-of-war *Fame*. Two wooden figures carrying boat hooks depict United States sailors of the late 19th century. Steering wheel came from the steam yacht *Comfort*. Window, which gives the illusion of a picture, looks out upon a bronze statue of Viking seaman Leif Ericson.

Kodachrome by National Geographic Photographer B. Anthony Stewart © N.G.S.

FAME

Copies of the Jamestown Colony Ships
Lie off Reconstructed James Fort

Last year an estimated 1,200,000 visitors to the site of the first permanent English settlement in the Americas saw the colony's early days re-created in archi-

National Geographic Photographer Thomas J. Abercrombie © N.G.S.

tecture, pageant, music, and art (see "Captain Smith of Jamestown," NATIONAL GEOGRAPHIC MAGAZINE, May, 1957). Festival crowds here tread decks of the flagship *Susan Constant* (left), the *Godspeed*, and the *Discovery*, all built by a West Norfolk shipyard. Ferry slip in background juts into the James River.

National Geographic Photographer J. Baylor Roberts © N. G. S.

Tradewinds Cuts a Herringbone Wake in Dismal Swamp Canal

The 22-mile canal, one of the first artificial waterways in the United States, links Virginia's Elizabeth River and Hampton Roads with North Carolina's Pasquotank River and Albemarle Sound. Slaves began digging the canal late in the 18th century.

The Ocean Highway (U. S. 17) runs parallel to the channel. Rangers keep vigil for forest fires from the lookout tower at upper left.

Sitting on the forepeak, Dorothea Jones mends a tear in *Tradewinds'* jib. Her right hand carries a sailmaker's palm, a leather-and-metal device used to push needles through heavy cloth.

Above: *Tradewinds* (right) meets a cabin cruiser in the Pasquotank River.

Beauteous Buccaneers Hold the Author at Knife Point

Dare County's annual Pirate Jamboree launches the vacation season on North Carolina's Outer Banks. Pony and boat races, treasure hunts, a ball, and fish fries entertain thousands in the Nags Head area during the spring festival.

Cape Hatteras Light, whose 191 feet make it the highest in the United States, warns shipping against treacherous Diamond Shoals a few miles offshore.

Uncrowded beaches lure an increasing number of visitors to the Outer Banks, a thin chain of sandy islands shielding the North Carolina coast.

Diamond Shoals, "Graveyard of the Atlantic," has wrecked hundreds of vessels. This LST foundered in a gale a decade ago. Coast Guard men from the Chicamacomico Lifeboat Station ride an amphibious duck through the surf.

National Geographic Photographers B. Anthony Stewart (opposite, above) and J. Baylor Roberts © N.G.S.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National Geographic Photographer J. Baylor Roberts © N.G.S.

lights to mislead ships. Sailors thought they marked safe passages and drove onto the shoals. Then the wreckers helped themselves to the cargoes.

"One wrecker is supposed to have tied a lantern to the neck of an old nag he led, to imitate the bobbing light of an anchored ship. And that's how this town got its name, they say."

Nags Head village was in a state of siege. On all sides lay the ravages of the Outer Banks' most implacable enemy—shifting, wind-borne sand.

Along the ocean, cottages stood on stilts, with waves of sand, not water, piling up beneath. Nailed to the weathered shingles of one were boards salvaged from wrecked ships and bearing their names: *Flora Rogers*, *Peconic*, *William H. Macy*, *Mary Lee*.

By ferryboat we crossed Oregon Inlet with fishermen and vacationers. Then, with Pamlico Sound on the right and the Atlantic on the left, 50 miles of Hatteras Island stretched ahead. Except for a few picturesque villages, all of it is included in the wind-swept wilderness of Cape Hatteras National Seashore Recreational Area.

Long before we reached it, we could see the black-and-white tower of Cape Hatteras Light, tallest in the United States. Up the 265 steps we puffed and spiraled. From the top, 191 feet above ground, we looked down upon a fleet of wrecked vessels jutting starkly through sand and surf. Chief Boatswain Harold R. Daniels of the U. S. Coast Guard told us that hundreds—perhaps thousands—of ships had been lost in this "Graveyard of the Atlantic" (pages 22 and 23).

Men Turned the Tide at Cape Hatteras

Cape Hatteras Light sends a 23-mile beacon flashing out over treacherous Diamond Shoals; 15 miles at sea, Diamond Shoals Lightship rounds out the marine warning system.

When the Cape Hatteras tower was built in 1871, some 1,500 feet of beach separated it from the sea, but the waves ate the sand until they were lapping at the tower's very base in 1935. Then the National Park Service came to the rescue, built sand terraces, and planted special grasses and shrubs. The tide was literally turned. Now a healthy stretch of erosion-proof land stands between tower and sea.

Snug again in *Tradewinds*, we cruised southward across Albemarle Sound. The next major port, Belhaven, was beyond reach of a day's run. So we sheltered midway at an Army Engineers maintenance wharf in a side canal.

Mosquitoes? "Not Bad Yet"

Here a swing bridge carried an occasional car or truck across the waterway on Highway 94, and the sound of tires zinging away into the night was almost welcome in this lonely spot. Steep wooden stairs took us up to the highway to talk to the bridge tender. We asked about mosquitoes.

"Not bad yet," he drawled, batting at a persistent hum in the air. "But in another month they'll like to eat a man up."

About midnight the loneliness was shattered by three basso profundo horn blasts. As we rushed on deck, the bridge began swinging open with a clanging of its bell. A tugboat appeared, backed into our side canal, and sat there huffing and puffing.

Then we saw what it was waiting for: a giant Army Engineers dredge, pushed by two tugs, squeezed through the draw. The suction of its passing drew water out of our canal, and *Tradewinds* strained at her lines. Then the first tug, after beaming a searchlight on us, followed the dredge down the waterway. The bridge closed. An owl hooted. All was quiet again.

Everybody we met along the waterway spoke warmly of Belhaven as a stopping place, and upon arrival there we quickly learned why. A jovial Tarheel named Axson Smith has turned a roomy old mansion into River Forest Manor and dedicated it to the care and feeding of water-borne travelers.

When we grounded on a Pungo River sandbar, it was Axson who came out in his cruiser and pulled us off. When we called for extra dock lines, supplies, or repairs, Axson saw that our needs were met. His jeep and station wagon were available for shopping or touring the countryside. On Sundays he and Mrs. Smith spread a mammoth smorgasbord;

Azaleas and Cypresses Bank the Shores of Greenfield Lake

Each year, in late March and early April, more than a million azaleas turn Wilmington, North Carolina, into a gigantic garden. The floral fiesta attracts 250,000 visitors.

Wilmington artists (below) hold an open-air exhibit in Cottage Lane.

The Citadel: College of Arts and Arms

Established in Charleston, South Carolina, in 1842, The Citadel ranks among the oldest State-supported colleges. Cadets receive rigorous military training. More than 6,000 graduates served in World War II. Arched galleries, spiral staircase, and paved quadrangle distinguish these barracks.

Children and nurses watch a sailboat race in Charleston Harbor.

Venerable town houses face the Charleston Battery, or waterfront. Residents crowded rooftops on April 12, 1861, to watch the bombardment of Fort Sumter, start of the Civil War.

the eating lasted from just after church until bedtime.

Axson told us about the visitors he was least likely to forget. They were a couple who cruised all the way from Long Island Sound to North Carolina without spending a cent for fuel. Nor did they have sails.

"The boat was Government surplus," Axson said, "a converted landing craft fitted with a cabin. The owners, a man and his wife, would get a tow from the harbor to the nearest channel. Then they'd sit and wait. A yacht would come along and they'd yell 'My engine is out!' Well, yachtsmen are kind hearted, and the first thing you knew this old bucket would move along at the end of a towline to the next port.

"One day a real Samaritan came along," Axson continued. "He insisted on going below to fix the engine. He lifted the engine-room hatch. The engine really was 'out.' There wasn't any."

As we strolled Belhaven's piers between rows of gleaming yachts, we noticed that almost every one flew the "owner absent" flag.

Axson explained: "The owners flew home from Florida, probably, and hired professional captains to run their boats to summer harbors in Chesapeake Bay, Long Island Sound, New England, or even the Great Lakes."

We enjoyed a lively sail—a welcome change—after leaving Belhaven. Then, in the Pamlico River, Dorothea looked astern and discovered that our 8-foot plastic pram was missing; the towline had parted. There followed some tricky maneuvering as we retraced our course and retrieved the little boat.

Tons of Seafood, but None to Eat

Canvas had to be doused when we entered the narrow channel of Goose Creek, which led us to the Neuse River and the quiet fishing port of Oriental. The town's livelihood comes wholly from the sea, in tons of shrimp, fish, crabs, and oysters. Yet, strolling the quiet streets, we couldn't buy any seafood. We asked for shrimp or crab at several places; there was none. Every bit was shipped out in refrigerator trucks immediately after it was landed.

A short day's run took us to Bogue Sound and the harbor of Morehead City. Placed ideally for waterway cruisers, this fishing and resort center sits on a narrow peninsula between the sound and Calico Creek. The creek got its name many years ago when wind and tide scattered a shipwrecked cargo of the brightly colored cloth along the shores.

Morehead City, like most coastal towns, has more than a handful of salt in its history. John Motley Morehead, a North Carolina governor for whom the town was named, foresaw it as an important Atlantic port. Today, 100 years after the granting of its charter, ocean traffic plies deep Beaufort Inlet to do business chiefly in tobacco, the State's first crop, and in oil.

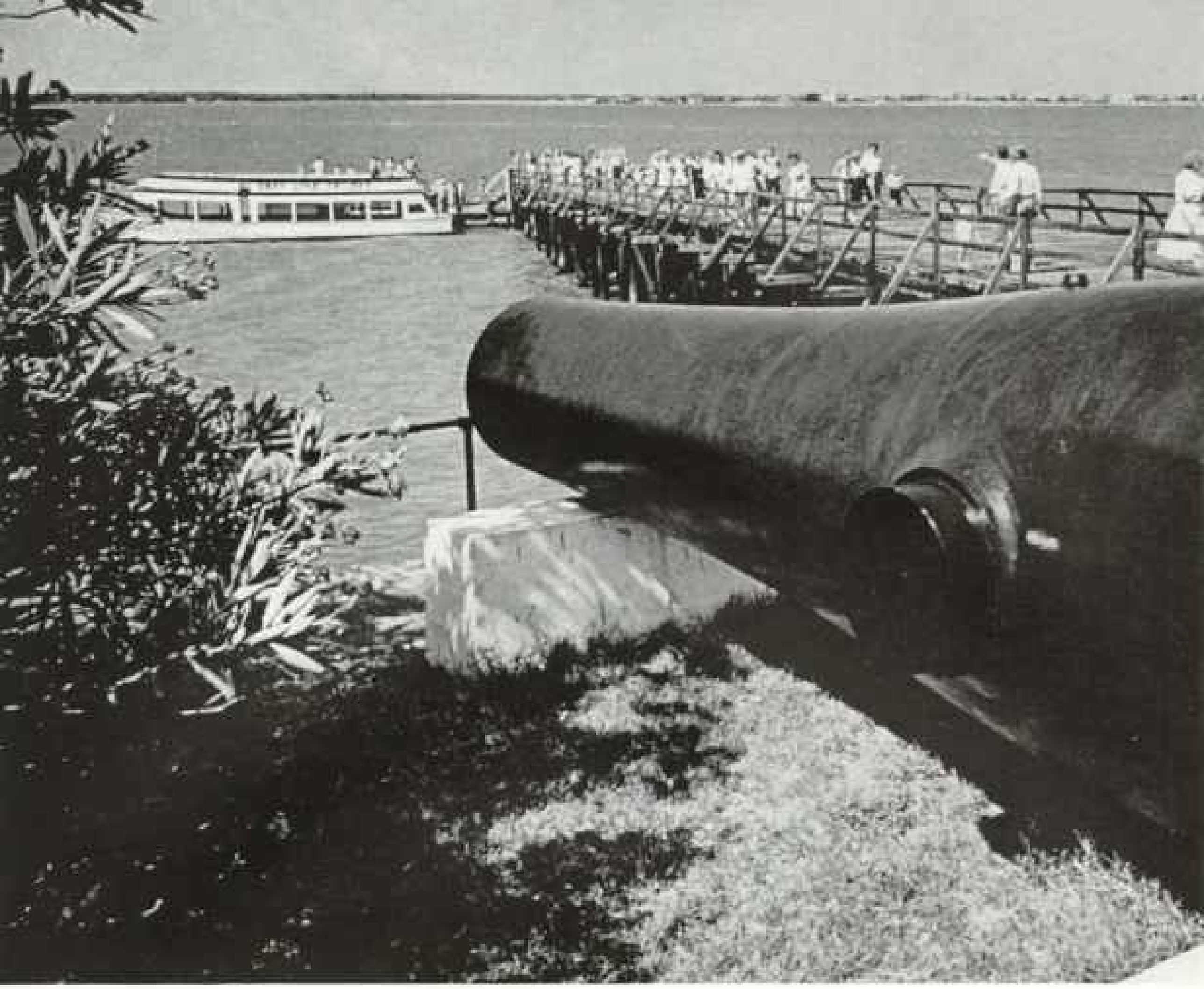
We found swimmers and sunbathers playing at Atlantic Beach, across the sound from

Three Horn Toots by the Skipper's Wife Set a Drawbridge Swinging Wide

Scores of drawbridges, too low for vessels with masts, cross the Intracoastal Waterway between Chesapeake Bay and the Florida Keys. As the signal to open, they require three long blasts.

This span crosses Skull Creek near its confluence with Calibogue Sound in South Carolina. It carries highway traffic between the mainland and Hilton Head Island. Here *Tradewinds* slips through the slot.

National Geographic Photographer J. Baylor Roberts © N.G.S.



Morehead City. Striking out to the east between high dunes, we approached Fort Macon State Park and soon saw the earthworks of the old fort itself rising above the trees.

This military relic, including moat, drawbridges, dungeons, and gun emplacements, is the third fort to stand on the site. The first, intended to fight off Spanish marauders, was never completed. The second, Fort Hampton, served in the War of 1812 and was destroyed by a hurricane soon after.

The present five-sided fort was named in honor of United States Senator Nathaniel Macon. In 1861 it was seized by Confederate forces, only to be captured by the Yankees a year later.

Layers of history are still peeling off. Recent hurricanes uncovered two jetties built by Robert E. Lee when he was in command of Fort Macon before the Civil War.

Stairs led us down into a tree-shaded court ringed by vaulted orderly rooms and quarters for officers and enlisted men. Beside us a small boy pulled at his loitering parents.

"Let's go down to the inlet and wade," he urged. "Remember, you promised we could!"

That would be Beaufort Inlet, or Old Topsail, where pirates sailed in to plunder or hide. Tales of Blackbeard loom in the lore of Beaufort, its inlet, and Bogue Sound.

In summer, sport fishermen stand out from the inlet each morning, making for the Gulf Stream about 35 miles away, or for the wreck-strewn shoals off Cape Lookout. Tropical game fish abound among the sunken hulks.

Wrecks Lure Treasure Hunters

Treasure hunters, too, have long eyed these waters, for off Cape Lookout lie some two dozen foundered ships—schooners, tankers, and freighters. Some were sunk by German torpedoes in World War II. Six marked "unidentified" on the charts tempt the imagination with dreams of pirate gold.

From such romancing we turned to near-by Beaufort, which knew pirates when it was settled about 1709. We sauntered past seasoned old Bahama-type houses, with their deeply sloped roofs sweeping down to cover front porches. Down shady streets, under white-

Fort Sumter, in Charleston Harbor, Heard the Civil War's First Shot

On April 12, 1861, a shell fired by Confederate forces at near-by Fort Johnson burst directly over Fort Sumter. The War Between the States was under way.

Confederate troops took possession following a 34-hour bombardment. They beat off repeated Federal attacks until General Sherman's northward march forced evacuation on February 17, 1865.

Fifteen-inch Rodman smooth-bore gun is part of Fort Sumter's post-Civil War armament. Tour boats ply to and from Charleston, 3½ miles distant.

Sumter's Masonry Walls Towered Nearly 50 Feet Above Low Water

The pentagonal fort, one of a series of coastal fortifications built by the United States after the War of 1812, commands the main ship channel into Charleston. Its name honors Thomas Sumter, a Revolutionary War patriot. An Act of Congress in 1948 made the bastion a national monument.

Scale model shows the fort as it appeared in 1860. By war's end Federal guns had reduced the five-foot-thick walls to rubble.

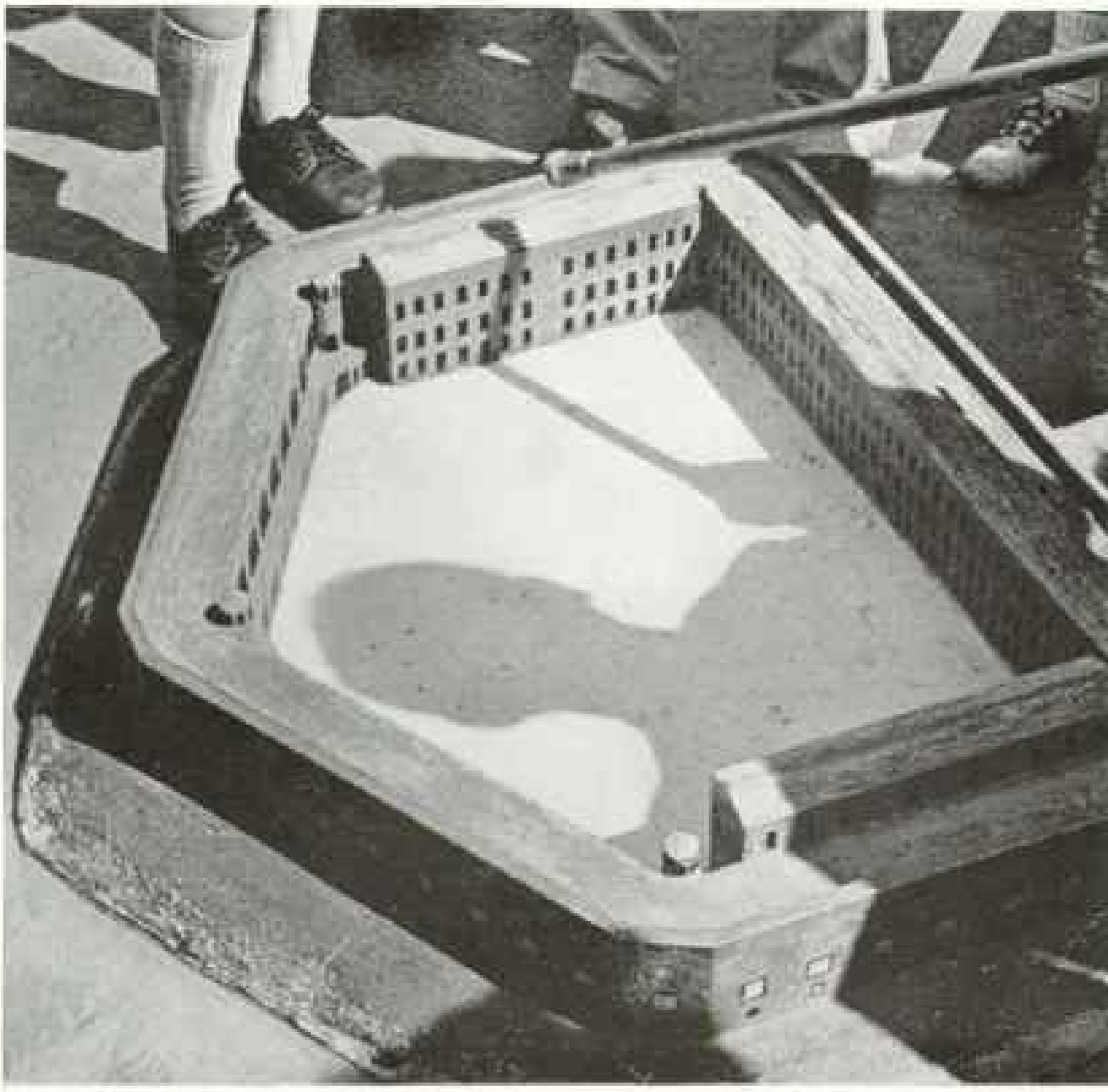
Thomas Nebbia

washed oaks and elms, the aura of timelessness persisted almost to the waterfront business center.

Time really turned back in Old Town Cemetery. Inside the iron fence a slab recorded the wishes of an "unknown British Officer," who requested that his body be buried standing up and in full-dress uniform.

Beaufort does a thriving business as a center of menhaden fishing. Tons of the small silvery fish are caught in offshore waters and processed here and at Morehead City, supplying oil for lipsticks and soaps, meal for farm animals, and fertilizer.

Out toward the islands of Core and Pamlico



Kodachromes by National Geographic Photographer J. Baylor Roberts © N.G.S.

Parris Island Marines Toughen Muscles in Boot Camp

A major Marine Corps post since 1915, Parris Island lies on the Atlantic coast between Charleston, South Carolina, and Savannah, Georgia. Today two-thirds of all newly enlisted marines get their first taste of service life on the island. In boot camp the recruit receives instruction in drill, rifle practice, and many hours of physical conditioning. His body is hardened by obstacle courses, weight lifting, team sports, and calisthenics (left). Legs locked to keep feet pinned to the ground, these young leathernecks do sit-ups.

Recruits (above) use pugil sticks, a training substitute for bayonets. They practice thrusts, slashes, and parries with padded poles that approximate the length and weight of a rifle with fixed bayonet. Stick battles combine the skills of fencing and boxing. Bouts are supervised and scored. Men wear football helmets, face masks, gloves, and body padding.

Sounds we drove, to land's end on Cedar Island.

There we dropped in on the Goodwin family to see a cottage industry in action. A weekly truck from a Beaufort factory calls at island homes to deliver cotton twine and to collect basketball, volleyball, and fishing nets woven by the women on a piecework basis.

From Morehead City we decided to make Wrightsville Beach, 80 miles away, in one day's sail. This meant getting under way by 5:15. At 6 we were at anchor in Bogue Sound, unable to proceed because of a pea-soup fog. After an hour's wait the fog lifted, and we moved again.

But, as we moved, we carelessly wandered out of the channel; at 7:30 we were aground and ruefully recalling a Morehead City fisherman's words of caution: "Mind the channel markers in Bogue Sound. The water there is spread mighty thin!"

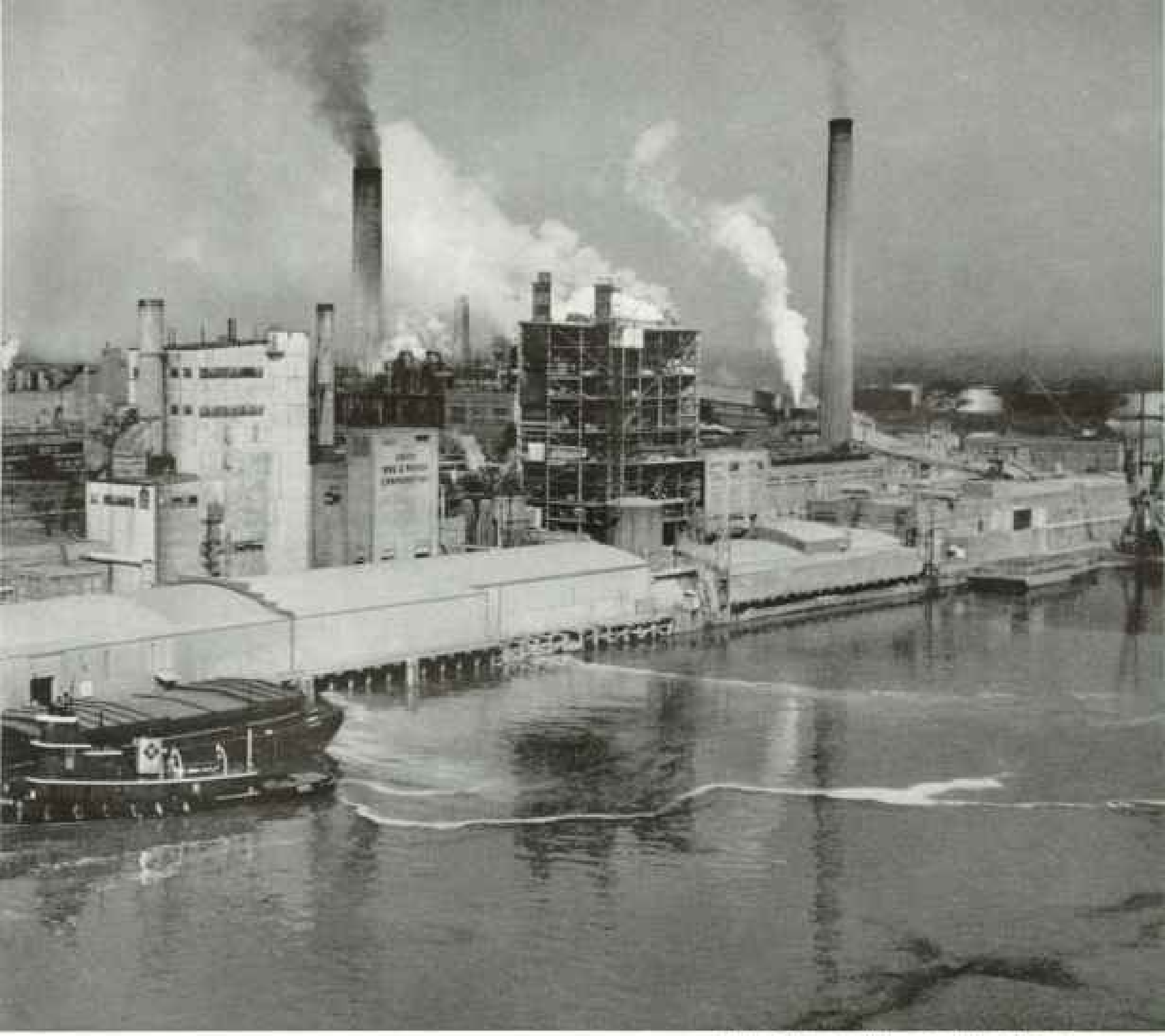
Luckily, we were able to back off the shoal with our own power. As we moved south, steering cautiously, we were startled to see clam diggers standing knee-deep only a few feet away.

Bargemen Load Rolls of Kraft Paper

Porpoises Put On a Show

It was in Bogue Sound that we saw our first bottlenose dolphins, or porpoises. First a single pair of arched backs with hooked dorsal fins appeared off our starboard bow. Then another pair breached, and another. From then on we were seldom without the company of these graceful seagoing merry-andrews.

For an unforgettable half hour or so two porpoises held station a few feet ahead of *Tradewinds* and sped along before us like leashed dogs. By crawling out on the bowsprit, we could look down on the animals and see the spiracles, or blowholes, in their heads, through which they breathed. Small orifices, like valves, opened with a sharp explosive hiss



National Geographic Photographer J. Baylor Roberts

Produced at Union Bag-Camp Paper Corporation's Giant Mill in Savannah, Georgia

when the creatures surfaced and closed when they submerged.

From its foggy dawning the morning grew into a sparkling, clean-washed day, every scene touched with a special radiance. Even the water looked golden. In sheer exuberance Dorothea talked us into anchoring in Bogue Sound so she could take a swim.

Wary lest the strong tide carry her away, we threw over a life ring on a long line. Lucky we did, too, because the tidal current boiling along with twigs and leaves—and Dorothea—would have left us far behind.

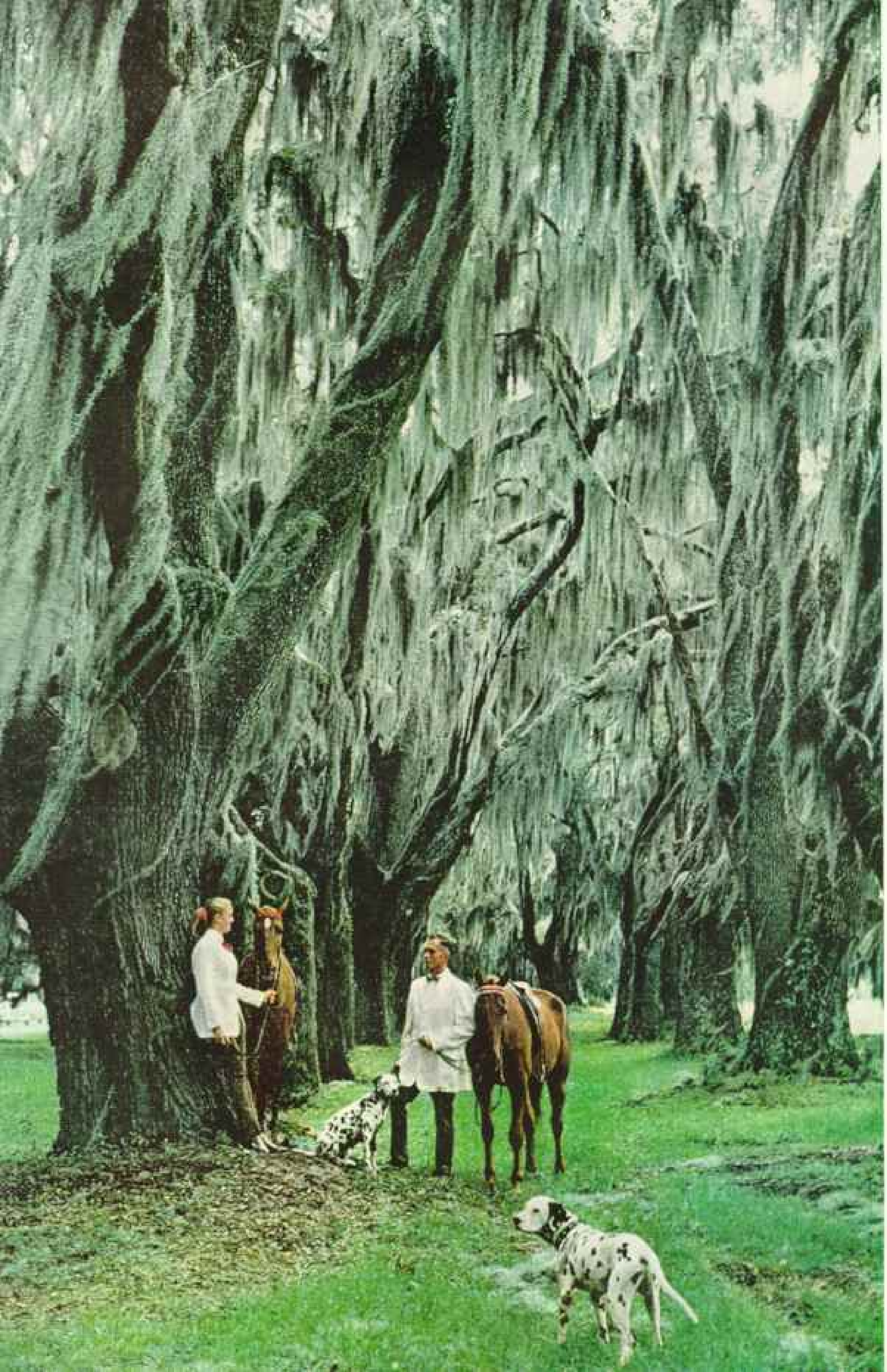
Wrightsville Beach offered us a snug overnight berth. Next morning we knifed through Masonboro and Myrtle Sounds, along a narrow dredged cut to the Cape Fear River, and down that broad stream to Southport.

Here we docked in wind and rain amid strong crosscurrents. The young man who helped us, Waters Thompson, turned out to be an artist as well as dockmaster. Invited into his little office to share his gas heater, we found one corner occupied by an easel, chair, and table bearing brushes and paints. On the easel stood a painting of a wood duck; the mounted model stood near by.

Latest Colonists: Cattle Egrets

"This is an ideal place for bird study," said Mr. Thompson. "We're just across from Battery Island, a great rookery. Six kinds of heron and also ibis nest there. Some herons and snowy egrets stay here all winter, and cattle egrets that have spread from South America have nested in the rookery for the past two summers." *

* See "A New Bird Immigrant Arrives," by Roger Tory Peterson, National Geographic Magazine, August, 1954.



On Southport's waterfront we found rambling old houses with widows' walks, like those in New England seaports. Some still bore the scars of Hurricane Hazel, and in one home we met Mrs. Jessie S. Taylor, a heroine of that big blow of 1954.

Since 1900 Mrs. Taylor has been a volunteer cooperative observer for the United States Weather Bureau. She telephones weather data to Wilmington. When the first reports of Hazel reached her, she not only hoisted storm-warning flags on a tower near her house but telephoned a warning to other Southport citizens. Though a shelter was available, she refused to evacuate her water-front house.

In 1955 Mrs. Taylor was summoned to Washington, D. C., by Secretary of Commerce Sinclair Weeks and presented with a citation "for outstanding service in warning the public of the approach of Hurricane Hazel."

From Southport the waterway carried us through creeks, rivers, and dredged cuts slicing between marshlands and palmetto-grown lowlands. At several ocean inlets powerful cross-currents swerved *Tradewinds* off course, despite the helmsman's best efforts. Soon after crossing into South Carolina we fetched up at Briarcliff Yacht Basin, a tidy haven near the booming resort city of Myrtle Beach.

Here we were met by our friend Fred Miles, operator of the Pine Lakes International Country Club, who treated us to a round of golf, a swim in the surf, and a tour of Brookgreen Gardens.

Brookgreen, 10,000 acres of Carolina low-country beauty, was once the home of the distinguished Allston family. From the Oaks, a neighboring plantation now part of Brookgreen, Aaron Burr's daughter Theodosia, bride of Governor Joseph Alston (some of the family used the single "l" spelling), set forth in 1812 for New York. Her ship never reached port. Presumably it sank in a storm, but some believe pirates seized it.

Archer M. Huntington, who gave Virginia the Mariners Museum at Newport News, bought Brookgreen in 1930. He also purchased the Oaks and two other plantations and gave the combined tract in trust for the State. The gardens contain more than 500 species of trees and plants as background for sculptures by a notable group of artists, including the donor's wife Anna Hyatt Huntington.

Swampy Paradise for Water Birds

Between Myrtle Beach and Charleston we passed close to the many swampy islands that make up the 34,645-acre Cape Romain National Wildlife Refuge. Thousands of egrets and ibises share the refuge with many other kinds of birds. As elsewhere along the waterway, there was almost always in view a great blue heron, the "po' joe" of the Southland, patiently stalking its prey in the reeds.

Riders Pause in the Avenue of Oaks, St. Simons Island, Georgia

St. Simons, adjoining the more famous Sea Island, is one of the Golden Isles of Guale that edge the Georgia coast. In ante bellum days these live oaks spread moss-draped limbs across the carriage drive of Retreat Plantation, now site of the Sea Island Golf Club.

National Geographic Photographer B. Anthony Stewart

Room service rides a bicycle at the Cloister, Sea Island. Waiter Benny Weems balances the tray as he pedals to the outlying hotel apartments.

National Geographic Photographer J. Baylor Roberts © N.G.S.

Prudential Employees Relax on a Skytop Terrace Overlooking Jacksonville; Northeastern Florida's Gateway City Port Hugs the St. Johns River

National Geographic Photographer B. Anthony Stewart © N.G.S.

Five major railroads converge on this manufacturing and distribution center, 15 miles inland from the Atlantic. A United States naval air station sprawls across more than 3,000 acres south of the city. Tugs here move an LST, part of the Navy's moth-ball fleet anchored in the St. Johns. This sun deck tops the Prudential Insurance Company's new 22-story building.

As we passed Fort Moultrie and entered spacious Charleston Harbor, the brick walls of historic Fort Sumter lay ahead and to port. It seemed a small and modest installation to have been the starting point of so great a conflict as the Civil War.

Here before dawn on April 12, 1861, Confederate batteries under Brig. Gen. Pierre Gustave Toutant Beauregard opened a bombardment which, though bloodless, drove the Union forces out.

Despite fierce Union assaults, the South held the fort for almost the entire course of the war, until the approach of General Sherman's army made it clear that the Confederate cause was lost.

Today the remains of the fort are a national monument (page 31).

We left Fort Sumter astern and cruised slowly past the Battery, admiring the pastel-shaded old houses that look seaward from the tip of a peninsula washed by the Cooper and Ashley Rivers (page 27).

A dockhand helping us to berth *Tradewinds* exclaimed, "I know that boat! She was here during the war."

He was right. Our ketch was built in Charleston in 1942. After brief service as a private yacht, she served two years with the Coast Guard on antisabotage patrol. Later she spent two years in the Bahama Islands. Another owner took her north to Chesapeake Bay, where we bought her.

Sword Gate Guards Famous House

On foot and by rented car we toured Charleston, savoring the 18th-century charm of Miles Brewton House, Heyward-Washington House, Manigault House, and other landmarks. In St. Michael's Episcopal Church, built about 1752, we were among the latest in a long line of visitors who have included George Washington and Robert E. Lee.

Henry and Frances Gaud, present owners of Sword Gate House, welcomed us to that famous home on Legare Street. Mrs. Gaud believes the 18-room house was built between 1800 and 1815. The gates are composed of spears and broadswords surrounded by intricate designs in wrought iron.

"Lincoln's granddaughter, Jessie Lincoln Randolph, once owned the house," Mrs. Gaud recalled. "However, this being Charleston, guides could not bring themselves to admit the fact. They'd tell sightseers, 'And this famous old Sword Gate House belongs to the granddaughter of Robert E. Lee.'"

From the gates we walked along an avenue of tall magnolias toward the house.

"When we bought Sword Gate eight years ago," Mrs. Gaud said, "we had to dispossess a big colony of night herons that roosted in these trees. They were very untidy eaters. They'd bring shrimp and fish from the rivers and scatter scraps on the walk."

Houses Built of Oyster Shell

From Charleston a snake-track route led to Beaufort—pronounced Bew-fort, unlike its North Carolina counterpart, which is called Bo-fort. The seaport was laid out in 1710, but beginning as long ago as 1561 Spaniards, Frenchmen, and British tried to colonize the area.

On a stroll around Beaufort on a rainy Saturday evening, we saw wisteria-draped old houses built for coolness, with deep basements and wide verandas, their design stemming from the Barbados planters who were among the original settlers. Many houses were built of tabby, the crushed-oyster-shell material peculiar to the low country.

A frolic of porpoises next day escorted us down the Beaufort River, past Parris Island, site of a U. S. Marine Corps training base (page 33), and onto the wide expanse of Port Royal Sound. In late afternoon we crossed the Savannah River into Georgia.

Savannah, Georgia's oldest and second largest city, looked its role—that of a stately dowager standing aloof but tolerant in the presence of a boisterous younger generation. The hum of modern industry was all-pervasive; almost as insistent were the softer undertones of a gracious colonial tradition.

(*Continued on page 49*)

Flippy Learned His Tricks in Porpoise School

Visitors to Marineland, south of St. Augustine, see some 5,000 specimens of aquatic creatures in two oceanarium tanks. Trained bottlenose dolphins ring bells and shoot basketballs into nets. Flippy's powerful tail propels him through the paper hoop.

El Verde Yacht Basin on Pablo Creek offers transients easy access to Jacksonville and neighboring beach resorts. Owner Jack Mayer slices watermelon for his guests, including the authors (second couple from right). Yacht club burgees brighten the lounge.

Kodachromes by National Geographic Photographer J. Baylor Roberts © N.G.S.


MARINE STUDIOS

Castillo de San Marcos Guarded Treasure-laden Galleons Sailing Past Florida to Spain

Spanish conquistadors founded St. Augustine in 1565 as the start of a drive to expand their New World empire along the east coast. Castillo de San Marcos succeeded a series of crude wooden forts designed to protect the rich Caribbean trade. Construction required nearly 23 years. Erected on an Indian village site, the fort guarded the harbor mouth.

Spanish treasure fleets hugged the Florida coast in convoy for protection against pirates. Off St. Augustine they turned due east and sped toward Spain.

The Castillo was attacked four times and besieged twice but never captured. It served as a military prison during much of the 19th century. President Coolidge made it a national monument.

Wooden schoolhouse (opposite, lower) dates from the middle 1700's.

St. Augustine's oldest house, now a museum, was built in early Spanish times.

National Geographic Photographers
B. Anthony Stewart (below) and
J. Baylor Roberts © N.G.S.

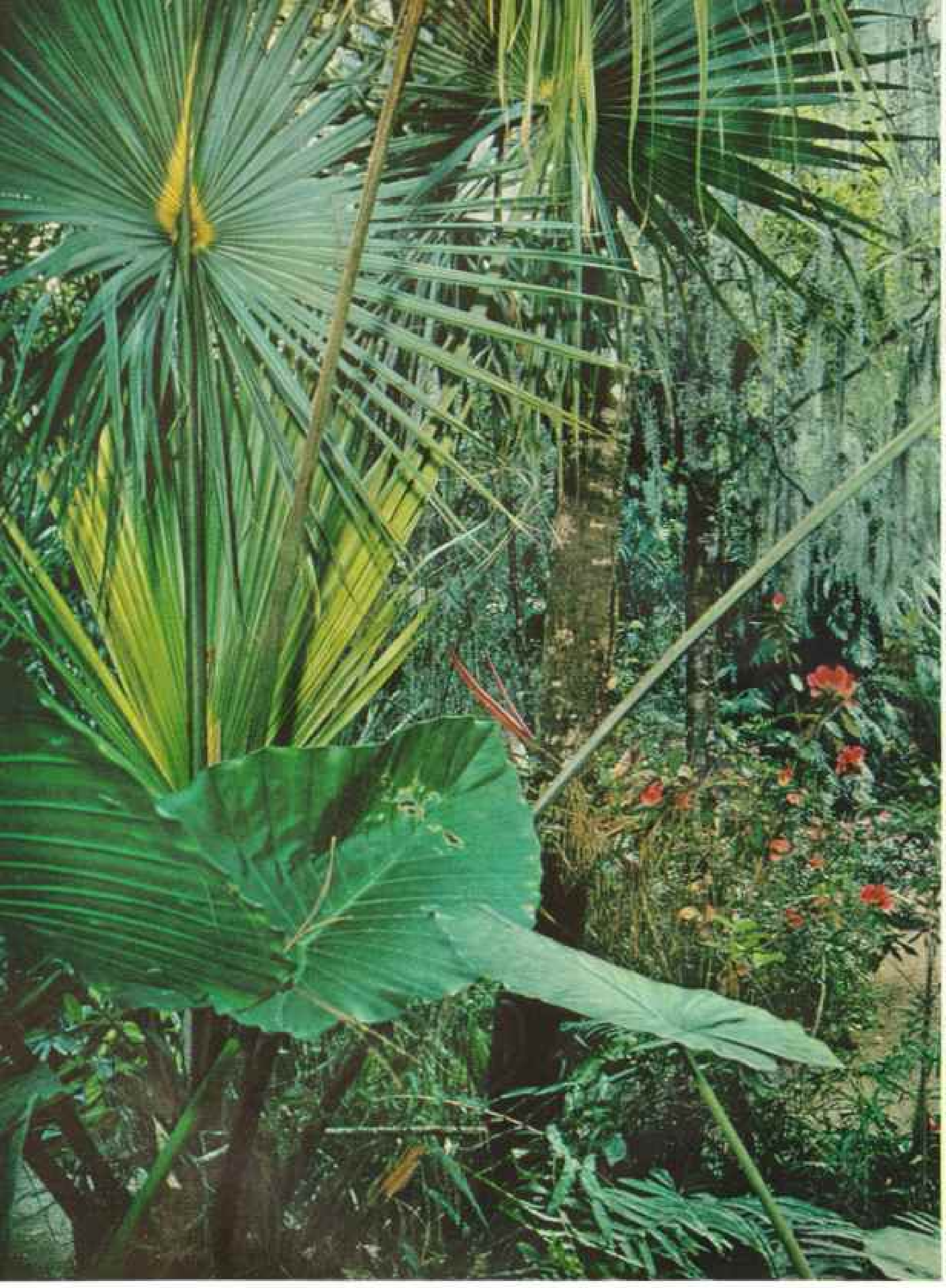

FLOATS
GG'S
10

Cars, Cyclists, and Bathers Share Daytona Sands

Unlike most Florida resort communities, Daytona Beach attracts more visitors in summer than in winter. Daytona bills itself as the world's speed center. The 23-mile strip of sand, so hard that cars can drive safely at surf's edge, has witnessed many automobile speed tests. Records up to 276 miles an hour were attained on the once sparsely settled strand. But rapid beachfront development has forced stock- and sports-car racing to the southern end.

Gulls on the beach are so tame that many eat bread from the hand.

Walter Meayers Edwards (right) and J. Barlow Roberts, National Geographic Staff © N.G.S.



Exotic Plants Endow McKee Gardens with the Beauty of a Tropic Paradise

Carved from a dense hammock two miles south of Vero Beach, these jungle gardens cover the west bank of the Indian River. Imported rarities from six continents include African sausage trees, Chilean

National Geographic Photographer R. Anthony Stewart © N.G.S.

monkey puzzle trees, Egyptian papyrus, gooseflowers from Guatemala, and shellflowers from Ceylon. Flamingos, macaws, and toucans dwell amid Javanese kapok trees and Malayan sugar palms. Raccoons, otters, and armadillos roam freely in the 80-acre sanctuary; monkeys perch in the palms. Elephant's-ears and cabbage palmettos frame this clearing; azaleas and other flowering shrubs spangle the floor.

The bargeloads of pulpwood and rolls of kraft paper we had passed on the waterway prompted us to investigate an industry that now looms larger than cotton or naval stores, for years the chief bulwarks of the seaport's economy. When the paper industry began making paper from pine, the South's tremendous stands of fast-growing pine became an economic asset that has effected an industrial revolution.

Accompanied by a young engineer, Philip Beckwith, we toured the Union Bag-Camp Paper Corporation's gigantic Savannah plant (page 34). Each day roaring machines convert 3,100 cords of pine into 2,000 tons of kraft paper and paperboard, enough to cover a highway from Georgia to Pennsylvania. "The plant's weekly bag output," Beckwith told us, "is large enough to take home almost half the Nation's weekly food supply."

In a sense, the Union Bag-Camp mill symbolizes the transformation of the South, for it occupies the former site of the Hermitage, an ante bellum industrial plantation owned by Scotsman Henry McAlpin, whose slave-tended kilns baked much of the brick still seen in Savannah buildings.

Only Cow Terrapin Go to Market

Back on the waterway, we called on Mr. and Mrs. William Barbee at Isle of Hope, a pleasant oak-shaded suburb of Savannah on the Skidaway River. The Barbees operate the country's leading diamondback terrapin hatchery—or "farm," as they call it. Their stock in trade figures importantly in the lives of a small but dedicated band of gourmets who believe that a festive dinner needs a terrapin course as much as it needs knives and forks.

Hundreds of diamondback terrapin (*Malaclemys centrata*) crawled about or lay like stones in a shallow, wire-enclosed pool just inside the entrance to the Barbee establishment, which resembles a country store.

"Those are bulls," said Mr. Barbee. "They serve as breeding stock; only the cows go to market. Come along and I'll show you some in the fattening pen."

We followed him to a board corral containing several hundred female diamondbacks, which were much larger than the males. They chewed on fragments of crabs dribbling into the pen through a pipeline from an adjoining crab-meat cannery, another Barbee enterprise.

In the near-by hatchery we saw thousands of terrapin ranging in size from a 25-cent piece to slightly larger than a man's hand.

"This is where the terrapin are born," said Mr. Barbee. "My father started breeding terrapin in 1898, after some scientists told him it couldn't be done, and he passed the method on to me. How we incubate the eggs is a family secret. Now and then we strengthen the herd with wild terrapin from the marshes."

Famed Restaurants Buy Diamondbacks

When the females reach an age of six to nine years and measure at least five and a half inches along the bottom shell, Mr. Barbee transfers them to the fattening pen. As orders come in, he packs the live reptiles between layers of Spanish moss in ventilated tins and barrels and ships them to such famous eating places as Lüchow's and the Waldorf-Astoria in New York City, Harvey's in Washington, D. C., the Queen City Club in Cincinnati, Ohio, and Miller Bros. in Baltimore, Maryland.

"In a good year we'll ship 150 to 200 dozen, at from $24 to $36 a dozen," said Mr. Barbee. "Restaurants charge from $2.75 up for a serving of terrapin stew—expensive, but it's awfully good for you."

On the 85-mile stretch from Isle of Hope to St. Simons Island, gateway to the "Golden Isles of Guale," the Intracoastal Waterway meanders through Georgia's 9,000 square miles of tidal marshland.

Here we were introduced to the giant stinging horseflies that plague the marshland in springtime. As soon as the sun was high, the bloodthirsty creatures swarmed aboard and zoomed about the ship, alighting frequently to nip one of us. Dorothea retreated to the cabin and put the screens up. Joe and I remained topside, swatting furiously.

Picturesque and lively place names mark the waterway's route past the coastal islands of Georgia. We passed Burntpot Island, Cane Patch Creek, and Sometime Creek. Soon we

Palm Beach Visitors Ride a Cycle-buggy on the Royal Poinciana Way

A strip of elegance on a narrow 15-mile-long island, Palm Beach has long been known as society's winter capital. Magnificent mansions front the Atlantic on the slender sliver of sand. Royal palms grow in profusion, lending a tropical beauty.

National Geographic Photographer B. Anthony Stewart © N.G.S.

Fort Lauderdale's Pride: South's Biggest Marina

Every imaginable service awaits Intracoastal Waterway travelers arriving at Bahia-Mar Yachting Center, which is owned and operated by the Florida resort city.

Bahia-Mar, covering 27 acres, provides berths for 450 vessels at concrete docks. Many boats stay the year round, their owners retired or going daily to jobs ashore. The central area includes a shopping center, restaurant, yacht club, and swimming pool.

Charter fishing boats and sightseeing vessels use the piers along Seabreeze Avenue. Across the street lies the Atlantic, with a beach for Bahia-Mar guests.

A vessel checking in is directed to her berth by a dockmaster in the airport-type control tower (inset). By the time the newcomer reaches her slip, dock boys, having sped to the scene on bicycles, stand ready to help with lines and to hand registration forms to guests.

Photographs by Lawrence Lowry, Basito-Guillumette (left) and Kodachrome by National Geographic Photographer J. Baylor Roberts
© N.G.S.

were threading Creighton Narrows and moving into Old Teakettle Creek.

Our search for a night's anchorage sent us into New Teakettle Creek, where the chart showed depths of 16 to 57 feet. Sitting in the cockpit after dark, we watched phosphorescent sparklings in the water. Occasional splashes and whooshing sounds betrayed the presence of fish and porpoises. The night was cool, with no mosquitoes, gnats, or horseflies.

Around midnight, when all was quiet below, a high wind set *Tradewinds* to swinging in gentle arcs. Then came rain, and all hands sprang to close ports and hatches. The squall ended, and the morning was sunny and glistening. We voted New Teakettle Creek one of the pleasantest stops of our trip.

At St. Simons Island, *Tradewinds'* crew broke out shore clothes, smelling somewhat of mildew and bilge, and headed for neighboring Sea Island and 48 hours of soft living at the Cloister, luxurious resort hotel (pages 36 and 37).

(*Continued on page 58*)

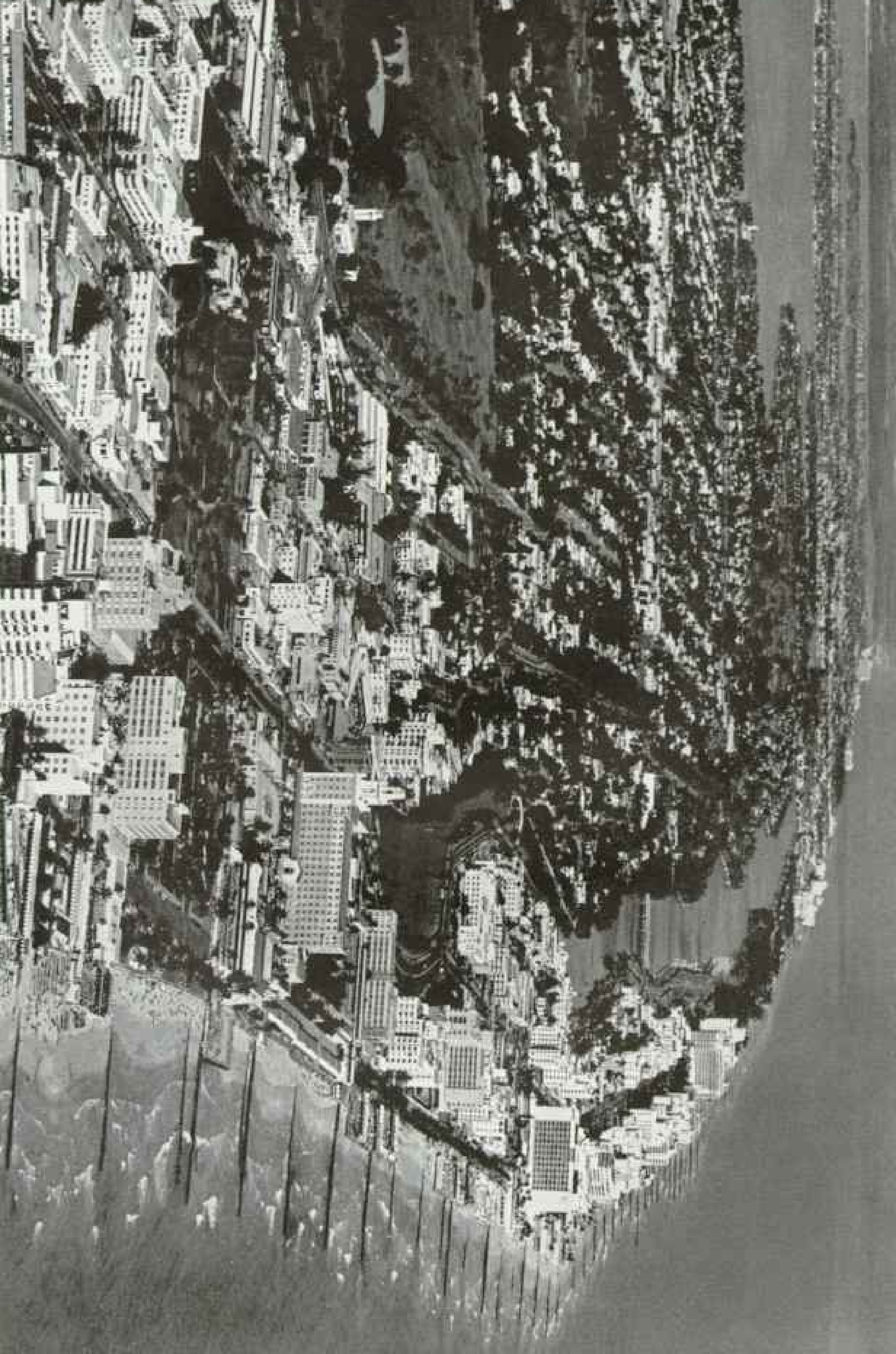
Foaming Wakes Trail Speedboats Racing Out of Biscayne Bay

Spectators line the 163d Street bridge between the Sunny Isles (left) and mainland to watch entries in Florida's annual two-day Gold Coast Marathon from Miami to Palm Beach and return. Bal Harbour and Surfside appear in the distance.

United Press

To reach Biscayne Bay, off Miami, *Tradewinds* loafed along the Intracoastal Waterway for 58 days. Heeling slightly in the wind, she heads for Dinner Key Marina. The pram trailing astern is made of transparent plastic.

National Geographic Photographer J. Baylor Roberts © N.G.S.



Chris Bonnie

Fabulous Miami Beach: Fifty Years Ago a Mangrove Swamp, Today the Vacation Mecca of Millions

Ocean-front hostelries in this air view show cabana-dotted beaches and private swimming pools (page 62). Famous hotels and shops line wide Collins Avenue, parallel to the strand. Indian Creek splits the far end of the island. Biscayne Bay at upper left separates the Beach from Miami.

Porpoise Statue Bids Visitors Welcome to Miami Seaquarium

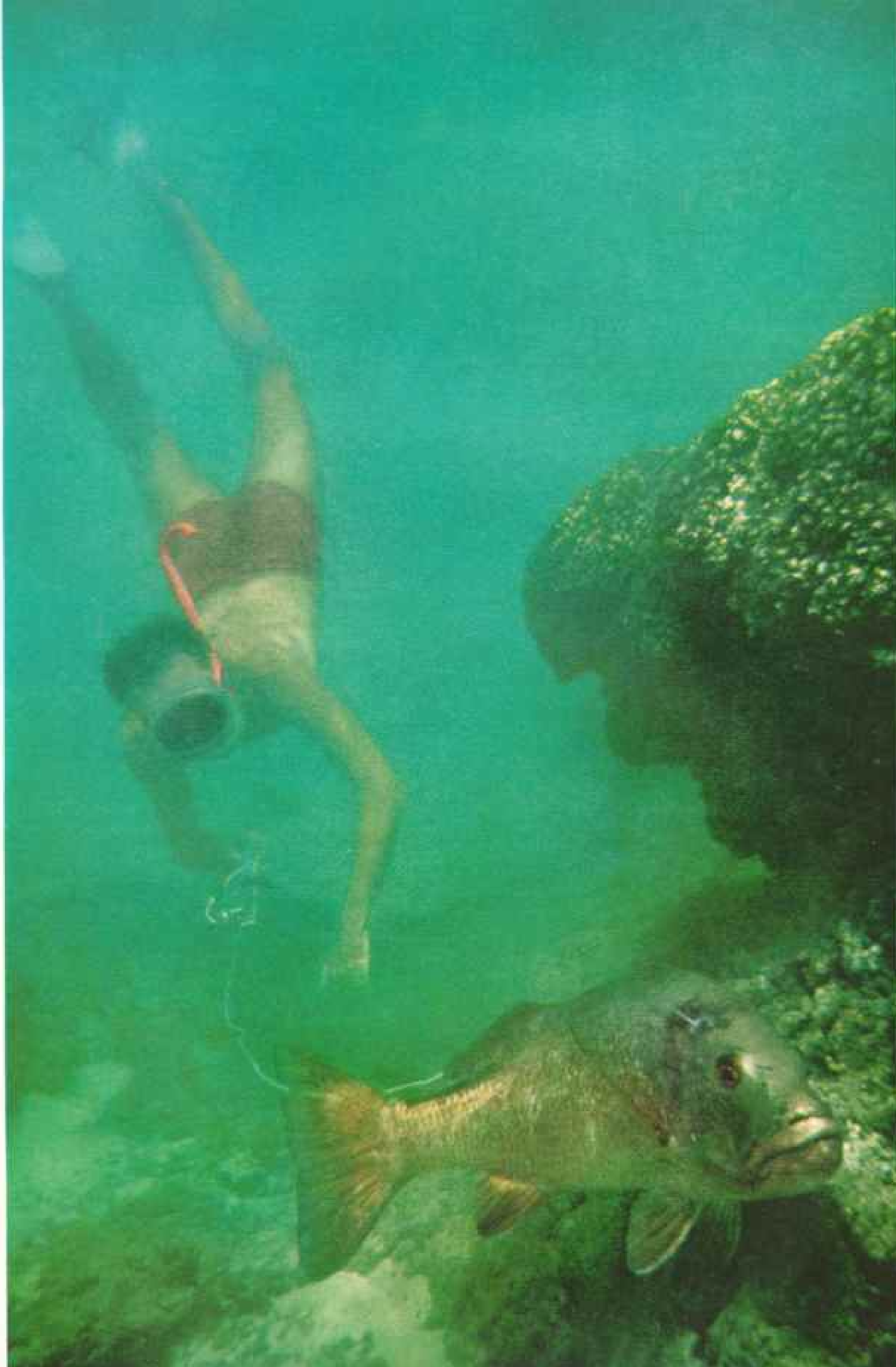
A show place of Virginia Key, 15 minutes from downtown Miami, the $2,350,000 Seaquarium displays one of the world's largest collections of live salt-water fish.

Table-size loggerhead turtles, 500-pound groupers, porpoises, tarpon, bonefish, and sharks swim together in two windowed tanks. Cleo, a 1,500-pound manatee, cavorts in a special viewing tank. Tidal channels hold crabs, crayfish, turtles, and triggerfish.

Corky the porpoise and Pete the pelican perform four times a day in the Seaquarium's outdoor amphitheater.

Masked, flippered swimmer captures a seven-pound red snapper in 20 feet of water off the Florida Keys. A missile from his spear gun is embedded in the fish's side. Coral heads mushroom from the sea floor.

Kodachromes by National Geographic Photographer J. Baylor Roberts and Kodachrome by Carroll Seghers II, Black Star (right) © N.G.S.



Windjammers Skim the Atlantic off Miami Beach: Lipton Trophy Race, 1957:

We arrived in time for the weekly fish fry, held by the light of fat-pine torches in a live-oak grove, with a Negro chorus softly singing folk songs and spirituals. Hotel guests came in a train of rubber-tired carts pulled by a jeep. Featured was shrimp mull, a spicy dish made from a secret recipe.

St. Simons Under Five Flags

Historical overtones are strong at St. Simons. During 400 years it has known the flags of France, Spain, Great Britain, the United States, and the Confederacy. There we walked through the remains of Fort Frederica, built in 1736 by Gen. James Edward Oglethorpe, Georgia's founder, to repel Spanish attacks. It is now a national monument.

Walls of barracks and citadel, overlooking the Frederica River, still stand; excavations have uncovered foundations of homes and a blacksmith shop.

A different kind of history was unfolded for us on Jekyll Island, across St. Simons Sound. Here, for 56 years, was the secluded retreat of the wealthiest men in the United States. The Jekyll Island Club's roster of 100 included such names as Rockefeller, Vanderbilt, Harriman, Pulitzer, McCormick, and Morgan. During Jekyll's heyday members arrived shortly after Christmas each year—many in their own yachts—and remained until early spring.

Occasionally the outside world reached in to touch Jekyll. A notable instance was that of January 25, 1915, when Dr. Alexander Graham Bell's telephone carried the first transcontinental conversation. Principals in that historic event were Dr. Bell himself, in New York City, and his associate, Thomas A. Watson, in San Francisco. In Washington, D. C., President Woodrow Wilson listened in with officials of the National Geographic Society.

Another participant was Theodore N. Vail, first president of the American Telephone and Telegraph Company. Mr. Vail planned to join Dr. Bell in New York for the ceremony, but lameness resulting from a fall detained him at Jekyll. Accordingly, an additional 1,000 miles of wire were included in the hookup so Mr. Vail might listen as Dr. Bell spoke to Mr. Watson across the continent.

World War II ended Jekyll Island's golden era. Among the last visitors to register at the club was Maj. Gen. George S. Patton, Jr.,

Chris Ransom

Miami's Oldest Yachting Event Matches Sailing Vessels of Varied Rigs

who arrived on April 3, 1942, from Fort Benning, Georgia, where he commanded the First Armored Corps. At that time the southeast coast seethed with rumors and alarms of Nazi agents sneaking ashore from U-boats.

Soon after the general's visit the club closed "for the season." It was never to open again. After service as a Coast Guard base, the island was purchased by Georgia and turned into a State park.

We tramped Jekyll's wide beaches, watched deer flitting through the forests, and enjoyed a sunset view of the "Marshes of Glynn" that so fascinated the Georgia poet Sidney Lanier. The club members, we agreed, had known a good thing when they saw it.

"I wonder if they ever had a slogan," said Dorothea. "It might well have been 'Come to Jekyll and Hyde.' "

South of Jekyll Island the waterway skirts a stretch of marshes notable chiefly for the fact that it carries southbound boats across the Georgia-Florida boundary—St. Marys River and Cumberland Sound.

Yachtsmen usually hurry past Fernandina, Florida's northernmost port. Shrimping, menhaden processing, and paper manufacture involve so many work-horse vessels that the harbor has little space for pleasure craft. We elected to spend a night there and found a berth at the municipal pier.

At sunset we sat in the cockpit and watched dozens of big sea turtles, which had come into the Amelia River to feed, surfacing all around us. The tide had ebbed, and our deck was a good eight feet below pier level.

Mystery of the Strange Noise

Soon after we settled in our bunks we noticed a strange noise. At first we pretended to ignore it, hoping it would go away. It really wasn't much; just a faint, ladylike chewing, as if mermaids were having a snack under water.

People had told us about the voracious pests that infest southern waters and the damage they do to wooden hulls. Could it be that shipworms, at work a few inches from our pillows, were boring through the planking? Would sea water soon come trickling in?

Resolutely we tried to sleep. After all, *Tradewinds'* bottom was well covered with poisonous copper paint, and the planking itself was of cedar stout enough to discourage

Herbert Wilburn, National Geographic Staff © N.G.S.

Cape Florida Light Has Withstood Flames, Gunfire, and Hurricanes

One of Miami's most colorful ties to its historic past, the 130-year-old light harks back to the days of pirates and ship wreckers. Rampaging Indians burned it during the Seminole War, marooning the keeper at the top. Federal gunboats shelled it in the Civil War. No longer in use, the beaconless brick spire stands on the tip of Key Biscayne.

the most persistent invader. And the vessel's keel was protected by a worm shoe, a heavy timber put there expressly to appease the appetites of teredos, gribbles, and their like and thus dissuade them from attacking more vital parts of the ship.

Before long we noted uneasily that the noise was becoming louder and less genteel. A new snap, crackle, and pop had been added.

Still other sounds announced that Dorothea was stirring in her forward cabin. She switched on a light, opened her door, and called out: "Must you eat peanut brittle at this hour of the night? If so, please pass me some."

That did it. Joe and I left our main cabin bunks and went on deck. Aiming flashlight beams into the black water, we quickly solved the mystery.

A few feet beneath the surface we could see fish feeding on the vegetation that formed a thin, slimy film on *Tradewinds'* hull. These lip-smacking eaters accounted for the opening movement of the underwater symphony. The percussive effects coming later, we discovered, were made by shrimp schooling around the pier pilings beside us. As bits of food arrived on the incoming tide, they opened and snapped shut their claws, setting up an elfin clatter that was amplified by the natural sounding board of our hull.

"Watch Out for Pablo Creek Bridge!"

Long before our trip began, and several times en route, we had been warned, "Watch out for Pablo Creek bridge! It can wreck you!" Now, heading south from Fernandina, it was time to meet that test.

The bridge carries traffic across the creek four miles south of the St. Johns River. A narrow channel, funneling a heavy flow of water into a small area, causes violent turbulence under the drawspan.

Low-powered craft find it almost impossible to buck the tide and pass through the draw at maximum ebb or flood. On the other hand, passage with a favoring tide means risking whirlpools and overfalls that can throw a boat out of control and slam it against the bridge fenders. Just such a mishap befell friends of ours, and their boat lost its bowsprit.

So we timed our arrival well before peak flood tide. We gave three horn blasts, and the span opened. We swept under the bridge with a helping two-knot current. But the channel was even narrower than I expected, and turbulence made steering tricky. Suddenly we hit an overfall. *Tradewinds* rose, veered out of control, turned—and then as quickly steadied again. We were through Pablo Creek drawbridge.

Alligator Comes to Dinner

Army Engineers plan to reduce the hazard by digging an auxiliary channel, providing twice as much water area for the tidal flow and halving the velocity of the current. Meantime, the first sign to greet the busy helmsman as he clears the drawspan advertises a handy ship-repair firm.

El Verde Yacht Basin, downstream from the bridge, served as our headquarters while we visited Jacksonville, Jacksonville Beach, Ponte Vedra Beach, and the naval base at Mayport, the Florida home of Atlantic Fleet carriers. Jacksonville, third largest of Florida's cities after Miami and Tampa, has become a Hartford of the South with the influx of insurance company headquarters (page 38).

Returning to the El Verde marina one evening, we found the owner, Jack Mayer, lying on a pier dropping raw meat into the gaping jaws of an 8-foot alligator.

"He comes out of the marshes every few nights," said Mr. Mayer, "and I've made a kind of pet of him. I believe he really knows me, but you'll notice that I don't let my hands get too close to his jaws."

St. Augustine, oldest permanent white settlement in the United States, accepts water-borne tourists as readily as any other kind. Horse-drawn carriages competed for the privilege of taking us to the Fountain of Youth and the Oldest House.

Seafarers who preceded us here include Ponce de León, who landed on this coast in 1513 and stayed six days; Don Pedro Menéndez de Avilés, who founded St. Augustine in 1565; and Sir Francis Drake, who sacked and burned the town in 1586.

Near *Tradewinds'* berth rose the bastions of 285-year-old Castillo de San Marcos (pages 42-3). Beyond St. Augustine the ruins of another Spanish colonial relic, Fort Matanzas, looked down at us as we steered across Matanzas Inlet. Below the inlet we tied up at Marineland to pay a call on the talented porpoises and other swimming inhabitants of the Marine Studios (page 41).

From jungle growth along the Halifax River rise signs inviting the stranger to meetings of this and that organization in Daytona

Hotel Guests Bask in Tropic Sun on Miami Beach's Gold Coast

Glittering towers of new hotels spike the sky line along Miami Beach's hotel row, where the Gulf Stream's warm waters brush the southeastern tip

Herbert Wilburn, National Geographic Staff © N.G.S.

of Florida (page 54). More than 50 hostelries have risen since World War II. Ocean-front property along this eight-mile strip sells for as much as $6,000 a foot. Hotel Seville's interior theme is Spanish. Its Honeymoon Terrace offers privacy above the crowded poolside. Coconut palms rustle in the breeze.

National Geographic Photographer B. Anthony Stewart

Coring Tube Samples the Floor of Biscayne Bay

In cooperation with the National Geographic Society, scientists at the University of Miami's Marine Laboratory (background) are studying the life histories of pelagic fishes. Their new hurricane-resistant headquarters perch atop pilings on Virginia Key, near Miami Seaquarium (page 36). Mud cores help laboratory biologists determine the effects of pollution. Kneeland McNulty retrieves the steel pipe.

Beach, the big, sparkling metropolis of mid-Florida (pages 44-5). We sailed through half a dozen drawbridges, and in one bridge-tender's window a placard urged "Hurry Back!"

Florida's "Gold Coast" Booming

As we pushed south along Florida's "Gold Coast," burgeoning new settlements of salmon-pink and azure-blue homes appeared around each bend. Everywhere heavy construction machinery roared and scooped and lifted, as swimming pools and dream houses took shape. Full-grown coconut palms, trucked in and newly planted, stood with the assistance of wooden props.

At Palm Beach *Tradewinds* had a mid-town marina to herself save for the dockmaster in his houseboat and a family of purple martins high on a pole. Palm Beach would not be really alive again until winter.

In many Florida communities, however, we noticed that air-conditioning is boosting the trend toward year-round living. Man-made harbors open off the waterway, providing waterfront for homes, many with cruisers at their front doors. An illusion of traveling along a boulevard grew as we passed Deerfield Beach, Pompano Beach, and Fort Lauderdale, where traffic coursed U. S. A1A at our left, with the ocean just beyond.

Many yachtsmen who reach Fort Lauderdale and its municipal marina, Bahia-Mar Yachting Center, ask, "Why go farther?" From the moment he is directed to a berth by the airport-type control tower, the boat owner becomes a pampered being.

Largest marina in the South, Bahia-Mar has 450 berths, many occupied for months, even years, by boats that seldom move but are simply floating homes (page 51).

As we entered Biscayne Bay, the breath-taking outlines of Miami Beach's massed hotels brought us sharply to the realization that our waterway trip was near its end. We docked *Tradewinds*, and for a few days took part in the life of a salty community where sailing craft predominate.

We enjoyed a brisk sail on Biscayne Bay, then took *Tradewinds* to a snug haven up the Miami River to await friends who would sail her back north. Soon, from a National Airlines DC-7B, we looked down upon parts of the waterway on which we had spent 58 memorable days.

The airplane took us back to Washington, D. C., in three hours. It was a good way to get quickly from point A to point B, but, with a last glance at a waterway dappled with sun and shadow, we knew there is much to be said for traveling by slow boat.

Fritz Schulke

Cooling Trade Winds Sweep Decklike Halls of the University of Miami

Opened in 1926, the university barely survived the depression. Enrollment in 1945 was less than 2,000; today 13,564 students crowd three campuses and more than 50 new buildings, and the university has graduates in 60 countries. Its structures of glass, steel, and concrete were designed to meet the demands of a subtropical climate.

New Atlas Maps Announced by The Society

Expanded Map Program, Marking National Geographic's 70th Year, Will Bring to Members Plates for a Big New Atlas

By James M. Darley

Chief Cartographer, National Geographic Society

EVER since Marco Polo journeyed to Cathay and Columbus's caravels braved the Ocean Sea, maps have spelled adventure. Each inked-in line speaks of man's quest for the distant shore, his urge to fathom the mysterious sea or to scale the lofty peak.

National Geographic Society maps continue to strike this responsive chord. Members acclaim them as welcome companions on any trip and magic carpets to faraway places.

Now, on the 70th anniversary of the founding of The Society, members will reap even greater rewards from a vastly expanded map program. After long study and planning, The Society launches with this issue an ambitious new project—the National Geographic World Atlas map series.

The handy size and larger scale of these maps makes them ideal for guidance while traveling as well as for reference use at home. All maps in this series will be the same size, planned as integral plates of a world Atlas which each member can build up for himself.

Members formerly received four supplement maps a year. In 1958, however, your National Geographics will bring the first seven in this important new Atlas series.

Cartographers Charting World Anew

When I joined The Society's staff 37 years ago, its Cartographic Division consisted of two men—Chief Cartographer Albert H. Bumstead and myself. Today we have 38 men and women hard at work on the first half dozen sheets of the Atlas series.

Last year our four large ten-color supplement maps totaled nine million copies. This year, with the seven Atlas maps, the number will soar to 16 million.

For this series the entire world is being mapped afresh, region by region. There will also be an occasional special-purpose map, such as one planned for 1958 showing the National Parks and Monuments of the United States and Canada.

All Atlas maps will open out to 25 by 19 inches—small enough for ease of handling, yet large enough to permit a generous scale and wealth of detail. One, for instance, will portray the British Isles on a scale of 28.8 miles to the inch. Modern "bleed," or marginless, design makes use of all 475 square inches to convey geographic information.

To help members preserve their Atlas maps for ready reference, The Society is preparing a sturdy, attractive portfolio, which will be available at modest cost. With it will come a glossary of geographic terms used in the new maps. Later a comprehensive index will be compiled, containing an estimated 120,000 place names.

Large wall charts will also be presented to members from time to time, and copies of maps previously issued will continue to be available from The Society.

Winter Holiday Area Depicted First

Now, with Christmas past and winter's chill settling over the land, many Americans think longingly of royal palms, warm Florida sands, and majestic sailfish sporting in blue Gulf Stream waters. If you join the thousands heading south for a holiday in the sun, you will want to take along the new MAP OF THE SOUTHEASTERN UNITED STATES accompanying this issue of your Geographic.

Whether you cruise on the Intracoastal Waterway, drive along Florida's new Sunshine State Parkway, or travel by train or airplane, this lead-off map in the new Atlas series will chart your way to winter warmth.

Each year more hotels crowd the glittering skyline at Miami Beach (pages 54-55), more resorts open along Florida's "Gold Coast" to receive vacationing throngs (map inset C).

Key Biscayne, an uninhabited "South Sea isle" until about 15 years ago, is today a year-round playground linked to the mainland by Rickenbacker Causeway (page 68). County-owned Crandon Park, where thousands come to bathe on palm-fringed beaches, to picnic, or to visit the zoo, shares the key with a fast-growing community of homes, motels, and shopping centers.

In three decades a swelling tide of new resi-

National Geographic Photographer Willard R. Culver

Each Member Can Build Up His Own Atlas of the World

Chief Cartographer James M. Darley shows one way of binding the maps in the new Atlas series. Since all will be the same size, they can be unfolded and clipped or bound together in a variety of ways for quick and easy reference, or members may prefer the handsome box-type portfolio to be made available by The Society at low cost. Miss Carol Cunningham of the Cartographic Division checks a proof of the first Atlas map, Southeastern United States. She uses postal bulletins, one source consulted to assure completeness and accuracy.

dents has pushed Florida from 31st to 13th place among the States in population.

The entire Southeast is rich in history. Jamestown, Williamsburg, Yorktown, Harpers Ferry, Fort Sumter, Appomattox—a multitude of place names charged with meaning appears on this Atlas map. Here are scenic and recreational places that attract increasing numbers of America's tourists: Kentucky's Mammoth Cave, with more than 150 miles of explored passageways; the beautiful lakes of the Tennessee Valley; Shenandoah National Park and famed Skyline Drive; and the Great Smokies, the most visited of our national park areas, with an estimated three million visitors in 1957.

On North Carolina's Outer Banks, where Sir Walter Raleigh's Roanoke Island colonists perished and pirates and wreckers once lured ships to their destruction, the Wright brothers ushered in the age of powered flight. Even more portentous are the rockets that today blast off from Patrick Air Force Missile Test Center at Cape Canaveral, Florida. A 5,000-

Herbert Wilburn, National Geographic Staff

Rickenbacker Causeway Across Biscayne Bay Alters Geography and Maps

Opened in 1947, the 3½-mile span has developed a new oceanside suburb and recreation area—Key Biscayne—within minutes of downtown Miami. Homes, motor courts, and gardens replace palmetto swamps, bamboo jungles, and a coconut plantation. This view looks toward Miami; fishermen line the bridge on all but the stormiest days, or even nights. City, bay, and causeway are brought up to date by The Society's map supplement to this issue.

mile firing range extends from here to tiny Ascension Island in the South Atlantic.

The South ranks as a major atomic energy center, with key installations at Oak Ridge, Tennessee; Paducah, Kentucky; and the sprawling $1,250,000,000 Savannah River Plant near Aiken, South Carolina.

More than 1,000 new plants opened in the South in 1956; the petroleum, chemical, aluminum, pulp and paper, and food processing industries show heavy concentrations. About 80 percent of the Nation's cotton textiles are now produced south of Mason and Dixon's line. Manufacture of rayon, nylon, Dacron, and other synthetic fibers is largely a southern industry.

From Carriage Wheels to Satellites

In 1888, the year the National Geographic Society was founded, life in Washington, D. C., moved at the leisurely tempo of horses' hoofs and carriage wheels. Today artificial satellites orbit the world in 100 minutes, and man stands on the threshold of interplanetary travel.

It seems incredible that such epoch-making strides could have been encompassed within the traditional life span of three score years and 10. But these 70 years that witnessed The Society's growth from a small, local organization to a world force for knowledge and understanding are also the years in which man conquered North and South Poles, Everest, ocean depths and stratosphere, cracked the sound barrier, harnessed the mighty atom, and burst the fetters of time and distance.

The National Geographic has not only chronicled the world's startling progress in words, pictures, and maps; it has conducted more than 150 research projects and exploring expeditions, many of which have helped to fill blank spaces on the map.

In today's ever-narrowing world, accurate, up-to-date maps are more vital than ever to our understanding of world events. With its new Atlas program the National Geographic Society takes another significant stride in furthering the avowed purpose of its founders: "the increase and diffusion of geographic knowledge."

Members may obtain additional copies of the new Atlas MAP OF THE SOUTHEASTERN UNITED STATES by writing to the National Geographic Society, Washington 6, D. C. Price, postpaid to all countries, 50¢ each. The price of the larger supplement maps remains 75¢ on paper, $1.50 on fabric. All remittances payable in U. S. funds.

Winter Brings Carnival Time to Quebec

Hardy French Canadians Turn Their Frosty Climate into an Asset by Staging a Colorful Pageant in Ice and Snow

By Kathleen Revis

National Geographic Magazine Staff

With Photographs by the Author

THE February snow—soft, fluffy, soundless—fell steadily from a leaden sky as if bent on obliterating the grand old Canadian city of Quebec. Even the church bells calling devout French Canadians to Sunday Mass sounded muffled and far away through the falling snow.

Great drifts clogged almost deserted side streets. Reaching the Plains of Abraham, I discovered a white, wind-whipped emptiness. On the St. Lawrence River, 300 feet below, nothing moved but jagged, sullen ice floes.

Winter, I thought, has conquered Quebec.

City Makes Winter a Partner in Fun

Then I found that winter to Quebec, though an unrelenting adversary, is also an old playmate, bringing such fascinating forms of fun as curling, ice fishing, and racing on the frozen river in ice canoes, strange boats that slide over the floes like sleds.

By early afternoon the snow had stopped. The Plains of Abraham now rang with the shouts and laughter of children shooting down the slopes on skis, sleds, and flying saucers. Sleighs and carioles jingled along the curving roads. Beside Dufferin Terrace ice skaters swirled to recorded music, while screaming tobogganists hurtled down the Château Frontenac slide (next page).

I could even make out the merry strains of "Carnaval, Mardi Gras, Carnaval," the catchy musical theme of the Winter Carnival that each year puts the forces of Jack Frost to work for the pleasure of the city and thousands of visitors.

Quebec's winter festivities date from last century. City fathers proclaimed the famous 1894 ice and snow carnival "to enliven the monotony of our dull season." In pursuit of this goal, every cold weather pastime—from dancing to dog sledding—now entices the winter-weary *Québecois* from his fireside and the pleasure-bent vacationer to one of North America's most picturesque cities.*

During Bonhomme Carnaval's reign (pages 76 and 77), I saw skiers slalom down the slopes of the Citadel and colorful floats wind through the gates of the old walls. I crowded into hockey rinks where flashing skates threw up showers of ice flakes; I watched nocturnal dancers whirl in the squares while fireworks etched vivid patterns in the sky.

I had arrived on February 3, just in time for the 44th International Bonspiel that got the carnival into congenial high gear (pages 78 and 80). This famous curling tourney drew 128 four-man rinks, or teams, to the capital of Quebec Province.

Curlers are notoriously addicted to bright attire, and bonspiel headquarters at the sedate Château Frontenac blazed with unaccustomed color. One team, the Hamilton Thistles, was resplendent in yellow pants and tigerskin shirts, with tiger tails dangling down the back.

Scots Brought Curling to Canada

While the origins of the 400-year-old game are lost in the mists of Scottish history, its North American debut traces back to 1768 when it was introduced by Scottish regiments quartered in Quebec. Since then it has spread throughout Canada; until recent years, the sport has been most popular in the western provinces, where the winters are long and natural ice is dependable. The game long since hurdled the border as well, and the United States now boasts more than 100 full-fledged clubs and some 12,000 active curlers.

Curling is an ice sport somewhat akin to shuffleboard. Each man slides two granite stones along a 130-foot alley toward a circular target painted into the ice. Teammates armed with brooms sweep the path of the oncoming stone in an attempt to influence its course and speed. The team whose stone or stones are nearest to the target's center at completion of an end, or inning, scores accordingly.

*See, in the National Geographic Magazine: "Sea to Lakes on the St. Lawrence," by George W. Long, September, 1950; and "Quebec's Forests, Farms, and Frontiers," by Andrew H. Brown, October, 1949.

Tobogganers at Quebec Hold Fast for a Mile-a-minute Ride on Ice

A kind of Mardi gras dressed in the glitter of snowflakes and ice crystals, Quebec's Winter Carnival is a recent revival of an old-time festival. During seven

Kodachromes by National Geographic Photographer Kathleen Revis © N.G.S.

weeks last year, beginning in January and ending at Lent, the city staged ice races, curling matches, costume balls, and a queen's coronation (page 73). Skiing and tobogganing offered other thrills. This 1,400-foot runway ends at the turreted Château Frontenac, a hotel owned by the Canadian Pacific Railway.

Husky 74-year-old Hugh E. (Jim) Weyman is the moving spirit behind the 44-year-old bonspiel. Weyman came here in 1916 to help build the Quebec Bridge across the St. Lawrence and stayed. Today he is known as "Mr. Curler."

The sport's most ardent missionary, he lives only for the day when all mankind—regardless of climate or geographical situation—will have discovered the delights of the "roaring game."

"Just the other day," he told me, "I received a letter from a man in the States who wants to incorporate a curling section into a new country club he's building. He asked me to send him the specifications."

"Where will the club be?" I asked.

"In Florida!" Weyman answered triumphantly.

Campbells Are Coming—to Conquer

As the curlers swung into Quebec's rugged week-long schedule of two or three matches per team per day, the entire city resounded to "The Campbells Are Coming." For the four Campbell brothers, wheat farmers from the plains of Saskatchewan, were heavy favorites to sweep the bonspiel. In 1955 they had scaled the curling heights by winning the Canadian championship.

Beginning their play, the brothers lived up to their reputation by scoring flashing victories over their first two opponents.

While the Campbells were registering one conquest after another, I headed out of the city to investigate what is perhaps Canada's gayest and least strenuous winter diversion—ice fishing at La Pérade (pages 94-6).

This neat, compact French-Canadian village of 1,200 nestles on the Sainte Anne River just above its confluence with the St. Lawrence, 50 miles west of Quebec (map, page 74). Every year, from the end of December to early February, the Sainte Anne swarms with a small but succulent fish, *Microgadus tomcod*, popularly called the "tommycod." It is also known with affectionate simplicity among local gourmets as *le petit poisson*—the little fish.

When the year's first petits poissons wriggle into the river heading for their upstream spawning ground, La Pérade's own winter carnival gets underway. Péradiens joyfully trundle their specially built, brightly painted fishing *cabanes* from summer exile in back yards and fields to set them in place over holes chopped in the ice.

Then, exhorting the fish to bite with their happy anthem, "*Mordez, Mordez, Petits Poissons*," the villagers troop down the bank to the river. There is nothing Spartan about La Pérade's fishing festival; huts are heated, lighted, comfortably furnished; the hapless poissons, once they have taken the pork-liver bait, offer no semblance of a struggle as Péradiens haul them out by the tens of thousands to a common destiny in the skillet.

All night long lights twinkle warmly in cabin windows, convivial fishermen wander from door to door, and snatches of well-loved folk songs echo through the still winter air . . .

'I y a longtemps que je t'aime
Jamais je ne t'oublierai
(Long have I loved you
Never will I forget you.)

When I arrived at La Pérade, dozens of gaily colored cabanes dotted the ice like flecks of rainbow; inside, fishermen kept a relentless vigil for unwary tommycod.

Fishing Hut a Cozy Retreat

Following the example of the Péradiens, I scorned the long steel bridge that spans the river and drove directly out onto the ice. As I got out of my car, a window in one of the huts flew open and a small, silvery tommycod plopped out on the ice; in a flash it was frozen stiff. Next appeared the smiling face of the fisherman, who asked me if I would like to try my luck with les petits poissons.

When I accepted, he ushered me inside the tiny cabin. It was cozily furnished with a table, cushioned chairs, and a wood-burning stove. Red curtains framed each of the four windows, and an electric light dangled from the ceiling. A trap door the entire length of the floor opened on a long slit in the ice. Six weighted lines, suspended from pulleys on an overhead beam, disappeared into the water. A matchstick was tied in the center of each to signal the snaring of another luckless tommycod.

Queen Michelle Reigns over a Kingdom That Care Forgot

Miss Lacroix, who rides a coach that Cinderella might have envied, became queen of the Winter Carnival by majority vote. This parade followed her coronation in the Quebec Coliseum, where some 14,000 cheering subjects acclaimed her ascent to the throne.

National Geographic Photographer Bates Littlehales © N.G.S.

The City of QUEBEC

Coliseum

American Revolutionaries, led by Richard Montgomery and Benedict Arnold, attacked Quebec on the night of December 31, 1775. Montgomery was killed and Arnold wounded, and the Americans withdrew.

St. Charles River Basin

Victoria Park

Princess Louise Basin

Start of ice-canoe race

Present walls and Citadel were built in 1823-32.

St. Charles River

Canadian Pacific Railway Co.

Kent

Kerhulu Restaurant

Place de l'Hôtel de Ville

LOWER TOWN

Finish

Rue St. Vallier

Rue St. Jean

Ice Palace

Château Frontenac

Ice-canoe race

Ursuline Convent

Dufferin Terrace

Ecole des Beaux-Arts

UPPER TOWN

Esplanade

Queen's Wharf

Rue de l'Aqueduc

Parliament Buildings

Grande Allée

Lévis

Citadel

Here, on September 13, 1759, British troops under Wolfe defeated defending Frenchmen under Montcalm. Neither commander survived the battle, but Wolfe's victory added Canada to the British Empire.

Quebec Winter Club

Cap Diamant (Cape Diamond)

Wolfe's Monument

Plains of Abraham

Chemin St. Louis

Canadian National Railways

Institut St. Joseph de la Délivrance

City Limits

SCALE IN FEET

Wolfe's route to battlefield

Wolfe's Cove (Anse au Foulon)

While the main British fleet lured the French army downstream, Wolfe's troops made a night landing here, climbed a narrow path up a forbidding cliff, and forced the French to meet them in open battle on the Plains of Abraham.

Sillery

Quebec Sprawls at the Ringside of a Vast Arena for Winter Sports

Lower Town crowds the foot of cliffs fringing the St. Lawrence and St. Charles Rivers. Upper Town lies within broken walls on the rocky summit; the new city fans out beyond. Wrote Charles Dickens: "The impression made upon the visitor by this Gibraltar of America: its giddy heights; its citadel suspended, as it were, in the air; its picturesque steep streets and frowning gateways . . . is at once unique and lasting."

Equivalents

Ecole des Beaux-Arts	School of Fine Arts
Place de l'Hôtel de Ville	City Hall Square
Lac	lake
Anse	cove
Rue	street
Chemin	road

G.H. Emerson and V.J. Kelley

As I watched, one of the matchsticks wiggled. My host motioned with his hand. "*Voilà!*" he said. "*Allez-y.* Go to it." Carefully I pulled up the vibrating line. My tommycod turned out to be seven inches long and a bit too squirmy to suit me. So my host threw it out the window to join a dozen companions in nature's quick-freeze.

On a small island close to the eastern bank of the Sainte Anne River stands a graceful, sprawling house that dates from 1820—the home of Mlles. Cécile and Jeanne Marcotte. I found these leading authorities on La Pérade's annual fish fest with M. Auguste Baribeau, the town's courtly former mayor.

"What can I tell you about ice fishing?" M. Baribeau beamed. "Ah, we have such good times. Earlier this year there were 750 cabanes. They stretched out for almost a mile along the river."

Jeanne Marcotte said: "Many friends come from Quebec and Montreal to fish at La Pérade. Then, I tell you, everyone is happy—laughing and telling stories. Maybe Henri brings his accordion, and Jean pulls out a harmonica; then we sing."

M. Baribeau reminisced in a soft, clear baritone, "*Voupe, voupe, sur la rivière. . . .*"

"You're not supposed to make noise while fishing," said Cécile, "but when there are 10 or 12 people in one hut, you can't help it. And you should hear the whoop that goes up at the first catch.

"In the old days," Cécile went on nostalgically, "we used oil lamps, and it was very pretty to see the lights wink as the people came down the hill. And maybe a sleigh would jingle past. Now electric wires are strung along the streets of the ice village and there are lights and radios in the cabanes. Just this year, *hélas*, someone even put a TV in his hut."

Tinted Ice Sculptures Brighten Streets

I drove back to Quebec City along the winding highway that skirts the north bank of the St. Lawrence. Glistening ice sculptures brightened the city's streets and squares; a cluster near the Château Frontenac was dyed pink, blue, and yellow. An enormous stylized crown of ice blocks stood before the provincial Parliament Buildings.

The big news in Quebec continued to be the Campbell brothers. Their 10 straight curling victories had set the stage for a dramatic climax to the bonspiel, and I went to watch them in their final match on the ice of the Quebec Winter Club.

Garnet Campbell, youngest of the brothers, served as "skip," or captain. The skip's station is just behind the target, and he directs the play of each teammate with a combination of arm and broom signals. The remaining two team members stand ready with their brooms to sweep the path of the stone to "keep it coming." A skillful sweeper is a tremendous asset to any rink, and tests have shown that adroit broom handling can add as much as 15 feet to the average cast.

The Campbells had a brisk, competent manner on the ice; their deliveries were so accurate that little sweeping was necessary. The army of spectators watched spellbound as the brothers racked up dazzling shot after dazzling shot. So quiet and attentive was the crowd that the only sound I could hear in the immense hall was the rumble of the stones as they slid along the ice.

Finally the last stone skidded down the alley, the crowd roared, and the Campbells grinned jubilantly. They had defeated Quebec's own Etchemin team 11-9, captured all three major awards—and become the first ever to go through the bonspiel undefeated.

National Geographic Photographer Bates Littlehales (also opposite, upper) © N.G.S.

Bonhomme Carnaval Dances in Lights Above a Couple Riding to Costume Ball

In the flesh, Bonhomme Carnaval is revealed as a living snow man. Symbol of the Quebec festival, he rules as its king, having power to arrest all not imbued with proper spirit. On the opposite page (upper) he greets the Honorable Gaspard Fauteux, Lieutenant Governor of Quebec Province, at the Grand Regency Costume Ball in the Château Frontenac.

Children pay homage to the talking snow man in front of the Ice Palace (lower).

40-Pound Curling Stones Slide on Icy Alleys Like Bowling Balls

Some 600 curlers from Canada and the United States competed on Quebec's rinks during the festival. Bonhomme Carnaval (above clock) bade them welcome to the Winter Club.

Leaving the crowded excitement of the Winter Club, I found myself once more on the rolling, snow-covered Plains of Abraham (page 92). Perhaps nowhere else in the world is there a field richer in history, richer in tragedy. Here on September 13, 1759, the armies of British Gen. James Wolfe and French Gen. Louis Joseph de Montcalm clashed in a battle that decided the fate of half a continent.

Where Canada's Fate Was Decided

Under cover of darkness, Wolfe landed with 1,600 men at Anse au Foulon, a cove one and a half miles west of the city. Reinforcements swelled the ranks to 3,600. Laboring up a precipitous slope, Wolfe's men gained the heights of the Plains, where they drew up in battle formation (map, page 74).

In the morning a surprised Montcalm attacked Wolfe's line, but three withering volleys from the British muskets decimated the French ranks and decided the battle. Wolfe and Montcalm both fell, mortally wounded.

Wolfe's victory won Canada for Britain, and France's dream of a North American empire died with Montcalm.

Faintly silhouetted in the dusk was the simple monument marking the spot where Wolfe died; the gallant Montcalm lies in the chapel of the Ursuline Convent on Rue du Parloir, inside the city's old walls.

Quebec's past casts a long shadow across the early history of the United States, for the men of New France were among the greatest of North America's pioneers. At a time when English colonists were fighting to maintain a foothold on the continent's fringe, French explorers from Quebec had already penetrated far into America's heartland.

They were the first white men to set foot in Michigan and Wisconsin; in 1673 they reached the Missouri River. Chicago, Milwaukee, St. Paul and St. Louis were first settled by Frenchmen from the banks of the St. Lawrence. And their memory echoes still in familiar United States place names such as Terre Haute and Prairie du Chien.

Foremost among the early trail blazers were two of the most incredible adventurers Canada—or the world—has ever produced: Pierre Esprit Radisson and his brother-in-law, Médard Chouart des Groseilliers.

From where I now stood, the guns of Quebec in 1660 had boomed a salute as the two men led a canoe flotilla of 300 Hurons into the city. Their cargo: a fantastic 15 tons of beaver pelts that saved the bankrupt colony from ruin. The skins were the fruit of two years in the western wilderness, two years of starvation and danger, two years of discovery that took the two adventurers to the distant shores of Lake Superior.

Canadian National Film Board

His foot in the hack, a hole designed to brace the body, a curler makes ready to send his stone spinning.

The next century brought the American Revolution, and once again the fate of Canada was decided at Quebec. Led by Gen. Richard Montgomery, fewer than 1,000 Continentals laid siege to the city in the early winter of 1775. But Montgomery, who had sworn to eat his Christmas dinner "in Quebec or in hell," was killed on New Year's Eve, and his second in command, Col. Benedict Arnold, was wounded in the leg. The siege finally ended when British reinforcements sailed up the St. Lawrence in May, 1776.

Night Ski Exhibition at Lac Beauport

From the Plains of Abraham I strolled down the tree-lined Esplanade that parallels the old city walls. Then I followed Rue St. Jean until I reached Kerhulu restaurant on Rue de la Fabrique. Kerhulu's mouth-watering contribution to the Winter Carnival is a gastronomical *Tour de France;* each weekend

Curlers, Sweeping the "House," Coax a Stone to Enter

Nearly 200 years ago Scottish troops stationed in Quebec introduced to Canada the sport of curling—a kind of shuffleboard on ice. The game gets its name from the curl of a stone in play.

"Weel deserving o' its fame, the roarin' Curlin'," sing the curlers. And roaring indeed was the game at the 44th International Bonspiel, a Quebec tournament held last year during Winter Carnival.

Here Olivier Samson, the skip, or captain, of a Quebec team of four men, stands in a circle called the house. He and a teammate brush frost from the path of a moving stone; they can score only if it enters the house.

Medals and badges worn on coats and caps represent curling clubs and tournaments.

"Mr. Curler," as H. E. (Jim) Weyman is widely known, has organized Quebec bonspiels since 1936. Big patches on his jacket show victories in important tournaments.

chef Emile Cheneau prepares a complete dinner featuring the renowned dishes of a different French region.

I dined sumptuously on the specialties of Beaujolais—*Crépinette au Foie de Porc* (pork-liver patty), *Gratin de Poulet* (chicken with cream and cheese), and *Beignets Soufflés* (fritters)—which tasted even more delicious than they sounded.

The diners at Kerhulu, as well as the city at large, were excited over the approach of the annual night skiing exhibition at Lac Beauport, 12 miles from Quebec. So, the following Monday evening, I joined a seemingly endless cavalcade of automobiles to drive to Beauport—a mecca for skiers throughout the Quebec area (page 93).

Torch-bearing Skiers Pattern Slopes

Several local ski clubs had joined forces for the sparkling pageant. Under the benevolent gaze of Bonhomme Carnaval, squads of skiers made a series of beautifully coordinated descents. Each skier carried a lighted torch—red, yellow, or green—that traced a flickering, fluid pattern on the snow as they whooshed down the slopes in faultless figure eights.

But the most spectacular event of the carnival was still to come, the ice-canoe race across the St. Lawrence to Lévis.

A child of necessity, the ice canoe is peculiar to the islands that sprinkle the river in the vicinity of Quebec City. During the winter the ice floes that clog the St. Lawrence make ordinary water transport impossible. But because doctors, priests, mail, and supplies must reach the islands, the hardy French Canadians devised a special boat.

Tough and versatile, the ice canoe has a steel or aluminum band that covers the keel from bow to stern (page 86). The band acts like a runner, allowing the crew, usually numbering five, to drive the boat up and over the edge of an ice floe, vault out, and drag it to the next patch of clear water.

Nimble Boatmen Leap In and Out

Split-second coordination is necessary. Mounting a floe, the two boatmen in the stern must still be paddling hard while those in the bow are leaping out. Hitting the water, those in the bow must be boated and paddling before those in the stern jump back in.

Two races were scheduled for Sunday, March 3, capping the last weekend of the carnival. The first race was for amateurs, or nonislanders; these teams were recruited from men who lived along the river front in Quebec's Lower Town, Lévis, or the other suburbs. The main event was for professionals, these being defined as islanders to whom the ice canoe represents essential winter transportation.

To get action pictures, I made a practice run with an amateur crew sponsored by Quebec Alderman Paul Mecteau (pages 88-9). A brisk wind was raking the river as I clambered into the 380-pound oak-and-cedar boat.

"We practice every weekend," Capt. Laureat Fortier told me. "Each time we improve a little. But it is hard, mademoiselle. Above all, for the legs and the lungs."

The canoe turned and twisted among the cakes of ice, questing for clear water. Finally Fortier found a channel and the boat shot forward, propelled by flashing oars. Huddled in the center, I clutched my camera beneath my coat to protect it from the freezing cold.

"Hang on!" shouted Fortier as the men drove straight for an enormous floe. The boat rammed against the solid ice with a shuddering crash; the two men forward leaped out as the bow pitched up in a sickening skyward lunge. Forgetting the camera, I grabbed the gunwale. But, instead of capsizing, the canoe rode up and over the thick layer and we glided to a stop on the icy surface.

Alone on a Drifting Ice Floe

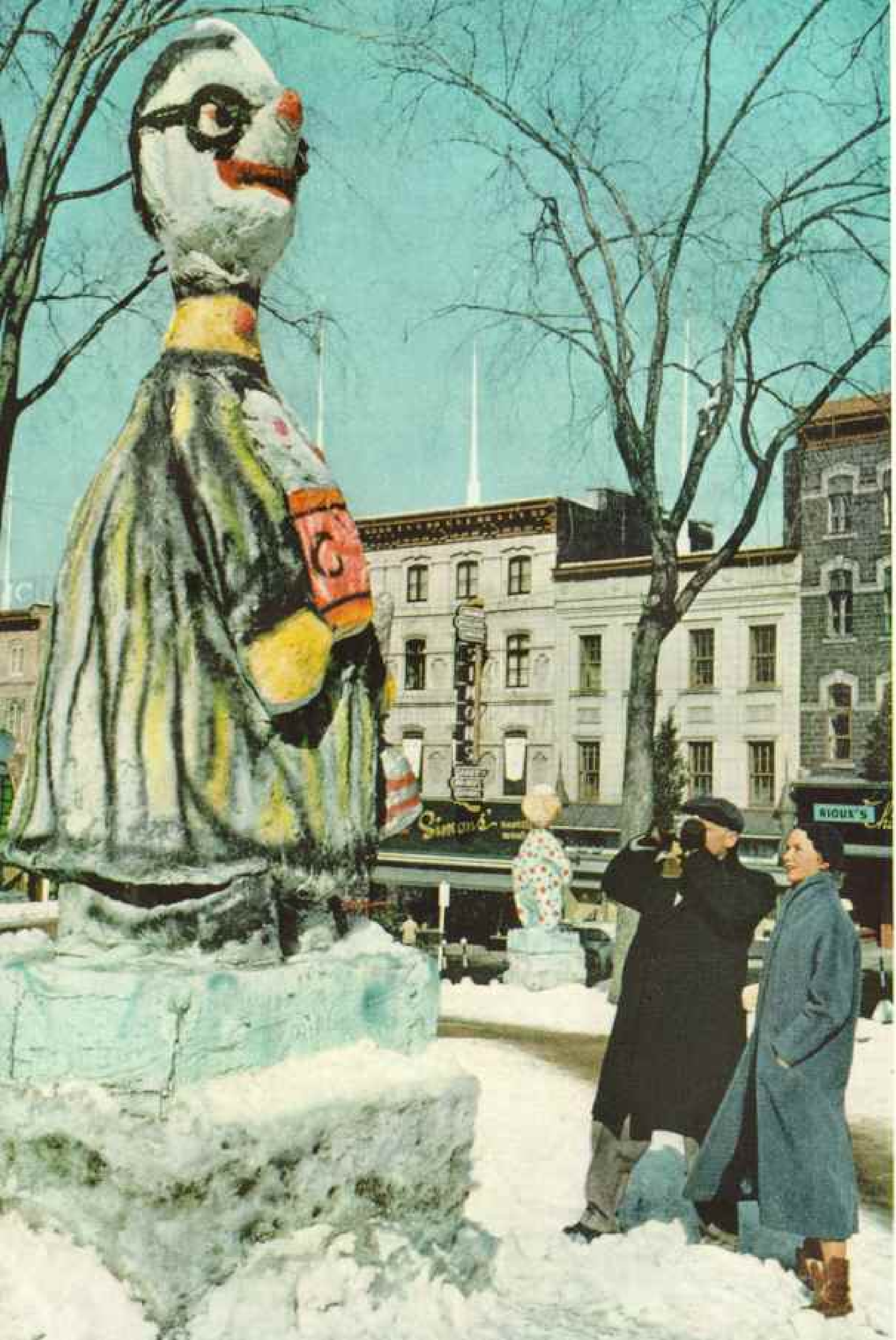
I shakily stepped out, and the crew pushed off and left me. The men made flying leaps into the boat just as it hit the water with a mighty slap. I looked around to get my bearings. My floe seemed steady enough, but it was moving fast with the tide, gliding swiftly downstream.

I had been cold in the boat, but I was doubly so here on my lonely cake of ice. Between the freezing temperature and the bitter wind that chuted down the river, my hands became so numb I could scarcely operate the camera.

The boat made several passes at the ice floe, driving up, over, and off the opposite side. Each time both canoe and crew seemed to teeter on the edge of disaster, but the men were complete masters of the situation.

A drizzling snow began to fall as I got back in the boat for the return trip. My teeth—and, I think, even my bones—were chattering. Icicles hung from the men's hair and eyebrows.

Back in a Lower Town boathouse, a roaring fire in a pot-bellied stove soon put the world to rights. But before looking to their


SIMON & SIMON
RIOUX'S

Papier Mâché Student Wears Owl Eyes, Fur Coat, and Solemn Air

Standing in the Place de l'Hôtel de Ville, the ice-glazed sculpture is the work of students from the Ecole des Beaux-Arts. These visitors were two of some 75,000 attending the last three days of carnival.

A youngster cranks an automobile that would sooner melt than move. Sainte Agathe des Monts, a town 155 miles southwest of Quebec in the Laurentian ski country, fashioned this icy touring car as decoration for its winter carnival.

French *voyageurs* paddle their canoe through the Coliseum at a Quebec carnival ball. Downstream, they met Cleopatra in company with Arabian sheiks.

own comfort, the crew inverted the boat so that the ice could melt off the bottom; then they proceeded to dry the hull with rags.

"All week long we work at our jobs," Laureat Fortier told me, "and every weekend we practice. Our wives and children hardly see us." Carefully he rubbed the steel runner until it shone. Then, patting the hull, he smiled ruefully. "We treat our boat better than our wives, *n'est-ce pas?*"

Specter of Satan Ends Dances Early

The week following my ride in the ice canoe brought the carnival's pinnacle of pageantry. On Friday night the Grand Regency Costume Ball at the Château Frontenac re-created a glittering bygone era of white-wigged nobles and silken ladies (page 77). The following evening nearly 1,000 dancers jammed the Coliseum for a mammoth costume ball (page 83).

Watching the laughing couples whirl to waltzes, I remembered one of the most famous folk tales of Quebec Province, the story of Rose Latullipe.

Once upon a time, at a village dance on the evening of Mardi gras, a flood of would-be beaus banished Rose's lover, Gabriel, to the sidelines, where he watched jealously.

An hour before midnight, a dark, arrogant stranger claimed the lovely Rose. Time after time they danced . . . faster and faster. In frustrated rage, Gabriel fled into the night. There stood the stranger's black charger, pawing the frozen ground, seeming to breathe fire. Around each of his hoofs the snow had melted away. The stranger was Satan!

Inside, as the clock hands crept toward midnight, Rose circled the floor furiously, dizzily. The Devil's dark eyes glittered in triumph. If he could keep her dancing until the stroke of midnight ushered in Ash Wednesday, another soul would be his. But with seconds to spare, the village priest burst in and tore Rose from Satan's arms. And that is why good French Canadians are careful to end their Mardi gras dancing well before midnight.

As the ice-canoe races drew nearer, the Château Frontenac's sports director, Stevan Kandić, grew more and more uneasy. On race morning, as I chatted with him beside the toboggan slide, he blurted out the reason.

"Every year the crowds flock onto Dufferin Terrace to watch the race. And from what spot on the terrace does one get the best view? From the toboggan slide!" He placed a hand protectively on its railing. "So they swarm onto it. By hundreds—by thousands. And my ice runways are trampled into slush. And that is the end of the year's tobogganing!

"But," he lowered his voice conspiratorially, "this year I will keep the slide active throughout the race. Tobogganers will shoot down it in relays. And it will be saved!"

By afternoon almost 100,000 people were cramming every vantage point overlooking the river. More than 10,000 swarmed over Dufferin Terrace alone. But none set foot on the slide. Every few minutes, just as a handful of spectators would begin edging toward it, *whoosh!*—a toboggan swept by at 60 miles an hour. Mr. Kandić's scheme worked perfectly, for the moment at least.

Canoeists Battle Ice and Tide

Blessed with low tide, the amateur canoeists lurched into action at 3:15 p.m., to the roars of the crowd. From the starting point at Princess Louise Basin they strained upstream three-quarters of a mile along the Quebec shore line to Queen's Wharf, where they angled across the river to the finish line on the Lévis side. The crowd roared encouragement as the teams pushed and dragged and paddled through the jammed ice. We were watching raw courage, skill, and endurance pitted against the hostile elements—and winning.

I saw Laureat Fortier steer over and between the floes, his eyes seeking a fugitive patch of blue that might signal a channel. Neck and neck with a boat representing Taverne Luc Fournier, the Mecteau canoe butted its way across the river. But the Fournier crew pulled ahead of my friends to win by a bare 27 seconds (page 90).

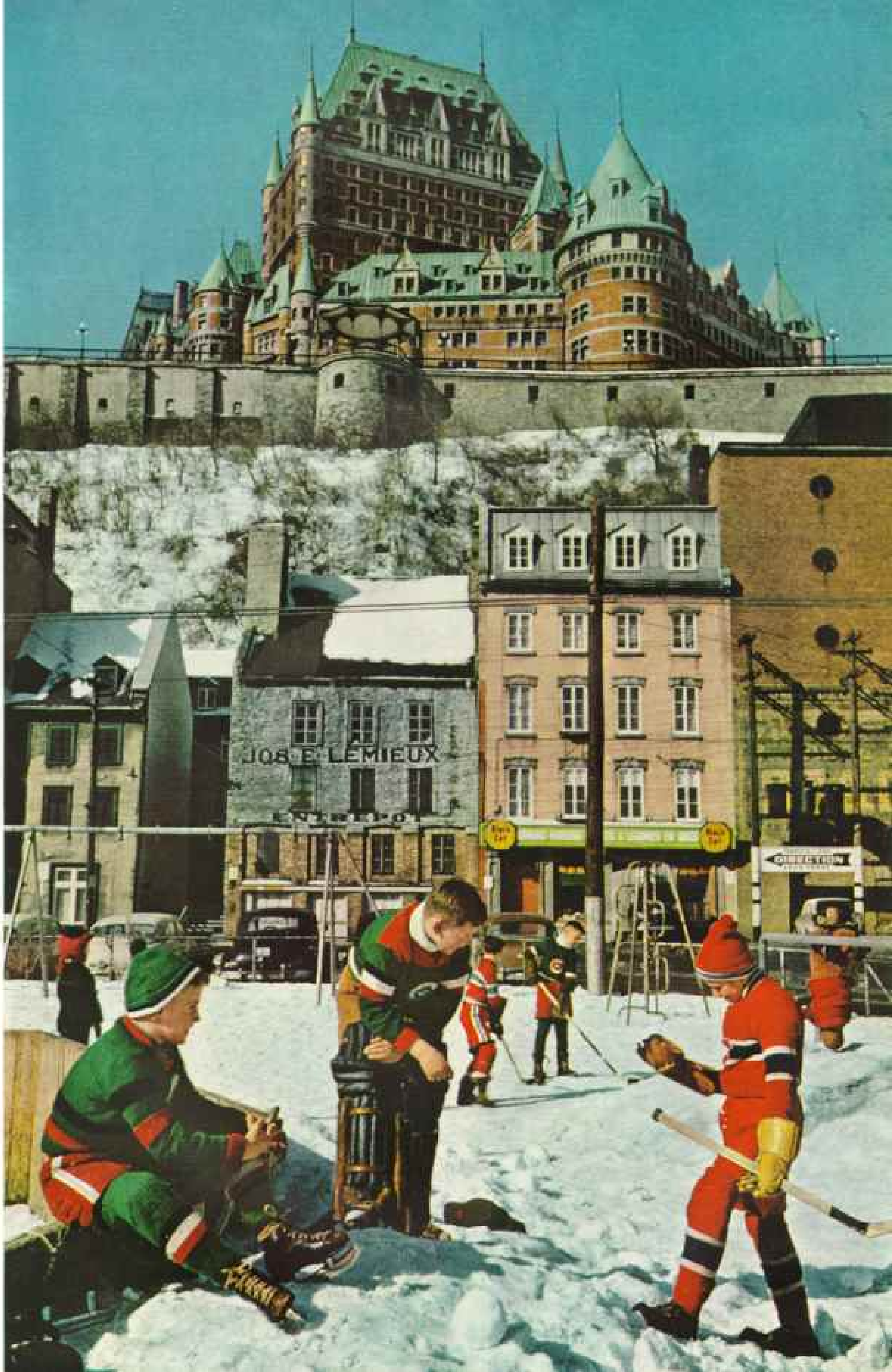
Then came the professional race. Against a tricky incoming tide, the five Lachance brothers, Liguori, Noël, Joseph, Anselme, and Paul, swept to their third consecutive annual

(*Continued on page 97*)

Château Frontenac Soars Like a Castle Above Young Hockey Players

In winter Quebec keeps some 50 rinks where Canadians play ice hockey, a sport that originated in their country. These schoolboys break their studies with a game. Pads protect the goalkeeper's legs from flying puck and sticks. Here, beside the St. Lawrence River in historic Lower Town, Samuel de Champlain built Quebec's first dwelling in 1608.

Kodachrome by National Geographic Photographer Kathleen Revis © N.G.S.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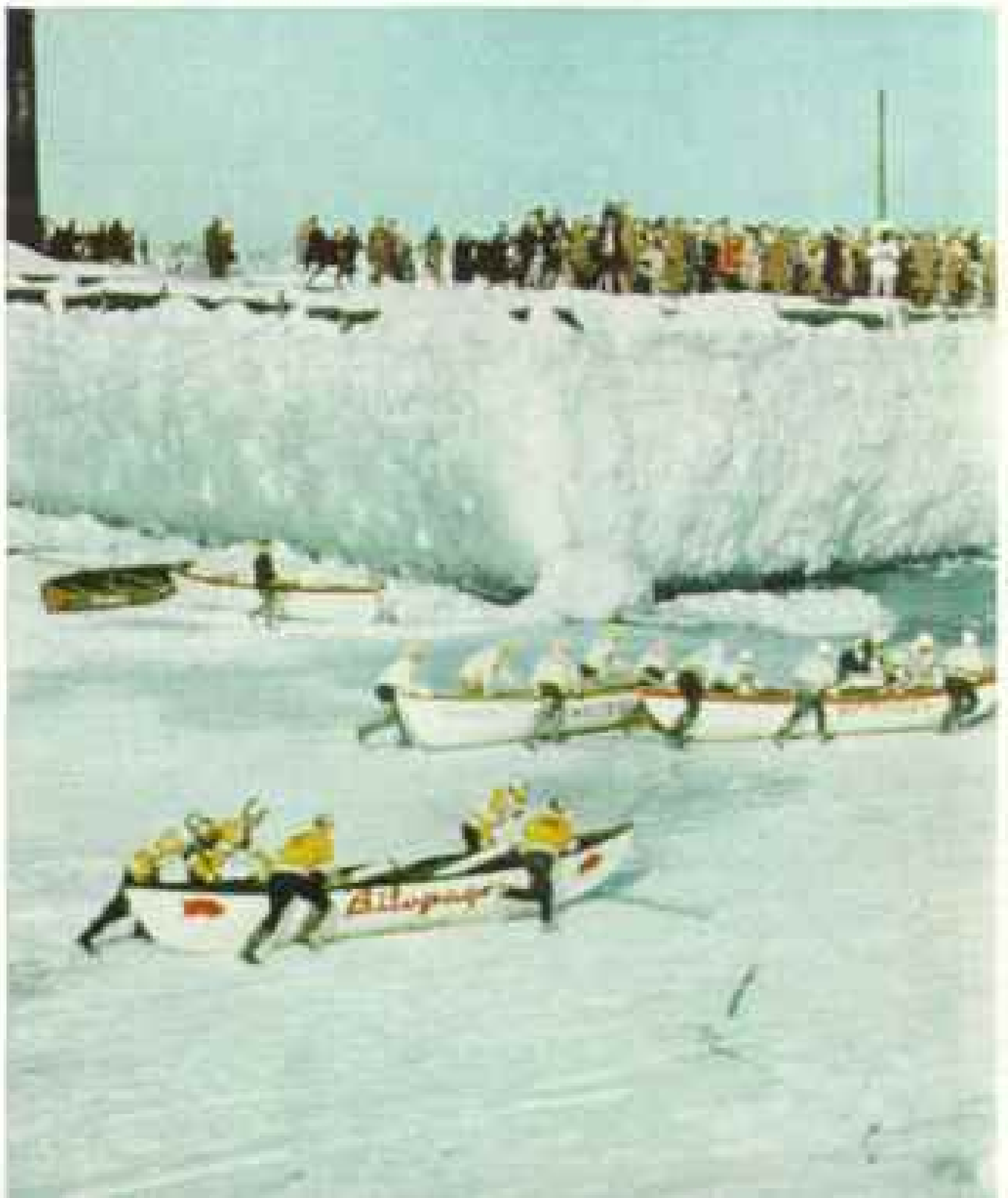


Crews on Foot Strain for Quick Take-offs in an Ice-canoe Race

Guns triggered by Canadian sailors (right) send the racers off. Using boats as sleds, ten amateur teams start on the ice of Quebec City's Princess Louise Basin. Freighters are frozen in for the season.

To farmers isolated in winter on islands in the St. Lawrence, the ice canoe serves as the only link to mainland. Equipped with a sledlike keel and a cutter-edged bow, it can navigate the river's ice-solid borders or main channel.

Almost daily users of the boat, the countrymen make up the "professional" crews that race at the Winter Carnival. Quebec City sportsmen are rated as amateurs.

Pushing their canoes, amateurs near the channel (lower). They will navigate upstream three-quarters of a mile and return to finish at Lévis on the opposite shore.

Steel reinforces the canoe's oak hull (opposite, lower). The runner narrows at bow to break thin ice and widens at midsection to glide over thick ice.

National Geographic Photographer Donald McPhail © N.G.S.


ECHEVIN

Paddling Furiously, a Crew Skims Through Ice-clogged Waters

Within a single race each member of the team must sprint while pushing the boat, paddle or row through bobbing ice cakes, and repeatedly vault in and out of the canoe at critical moments. These feats he must accomplish in the face of bitter winds, strong tides, and often snow or sleet.

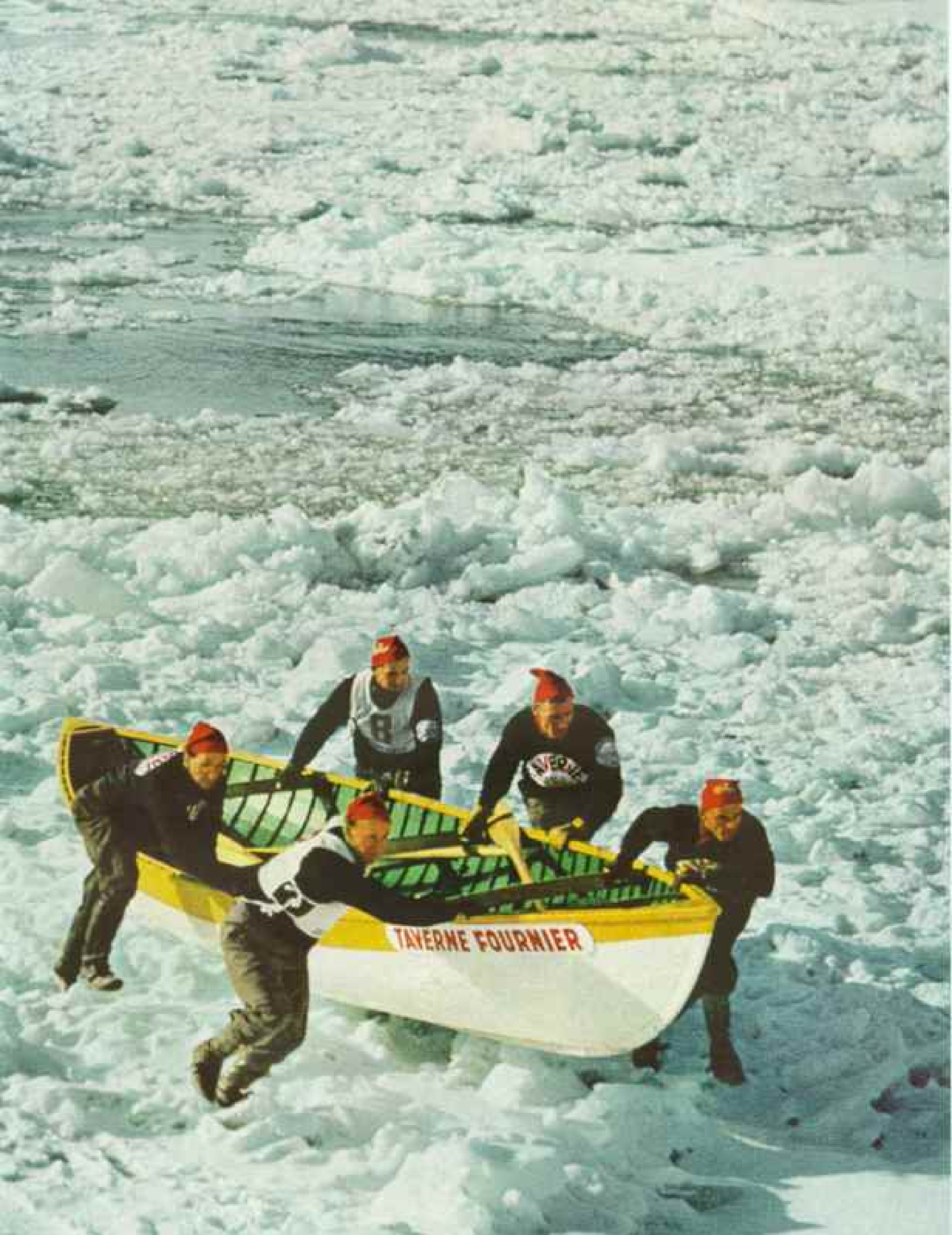
Crew on practice run (opposite, lower) took photographer Revis onto the St. Lawrence. Deposited on an ice floe, she felt safe enough until she looked to shore, which appeared to be flying by at an alarming rate as her raft drifted with the current.

These men leave the floe at racing speed. One makes a flying leap for the boat; a misstep would plunge him into the river.

Racers scramble as canoes hit water. Boat in foreground is made of Fiberglas. Crews use either paddles or oars.

Muscles Aching, Lungs in Agony, Teams Pull Across a Choppy Wilderness

Crewmen at left, sponsored by Paul Mecteau, a Quebec alderman, covered the three-mile course across the St. Lawrence in 18 minutes 34 seconds, taking



second place. They lost the race by 27 seconds to men of the *Taverne Fournier*, who here bend almost double at the finish line in Lévis. As the race neared its end, the tide was fast running out and carrying with it a jam of floes. One boat trapped between chunks of ice was swept downstream.

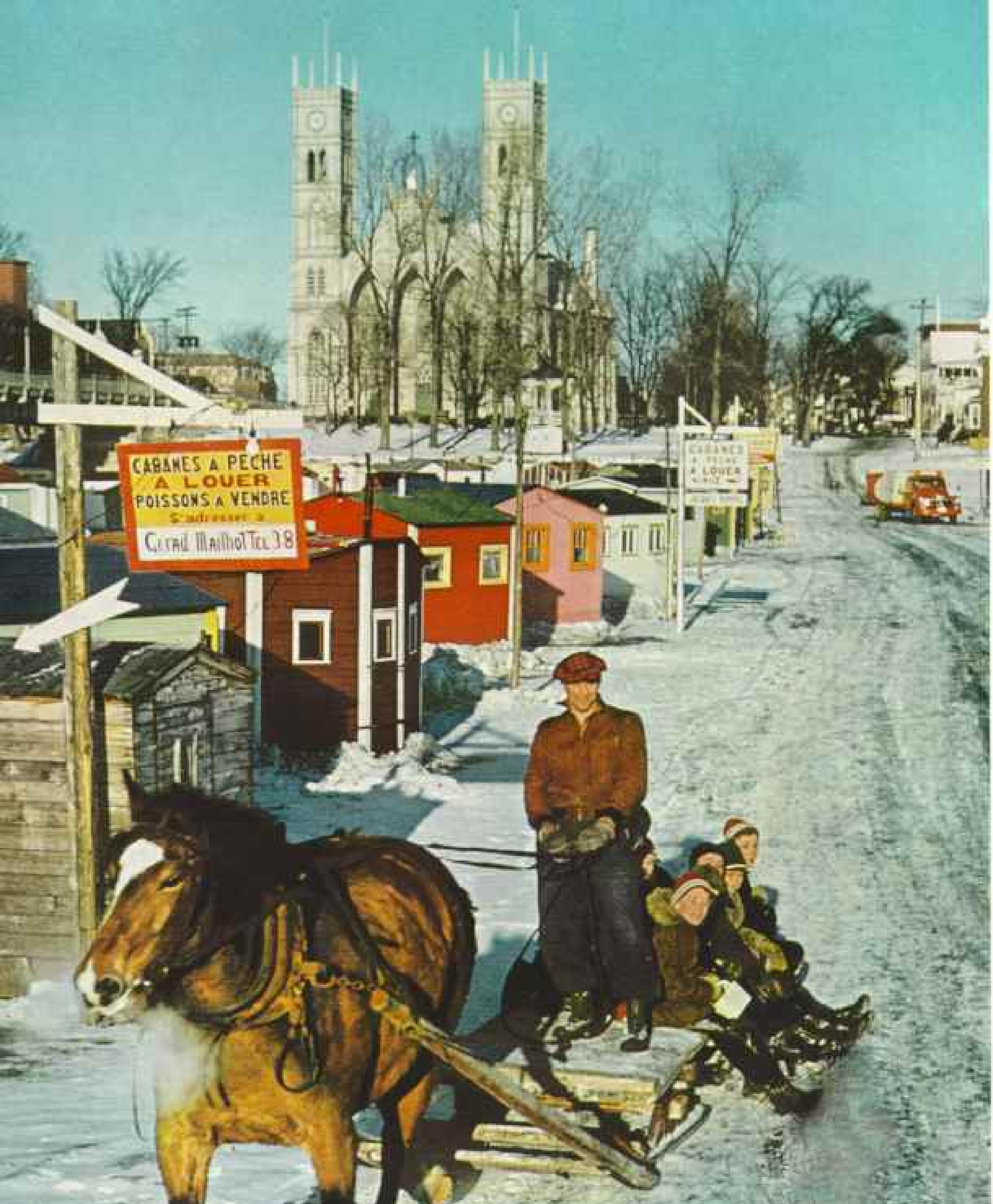
92 **Skiers Inch Up the Plains of Abraham. Sunset Gilds the St. Lawrence**

On this bluff-top field in 1759 the British General Wolfe surprised the French under Montcalm and won Canada for England. Both leaders died of battle wounds. Institut St. Joseph de la Délivrance, in distant Lévis, cares for orphans and the aged.

Kodachromes by National Geographic Photographer Kathleen Revis © N.G.S.

All skis off the ground, six-year-olds sweep down a slope at Lac Beauport. Christine Kandić (left), daughter of the sports director at Château Frontenac, learned as a toddler and practices daily.

Ski Hawk Club offers music and a roaring fire to skiers stopping at Château Frontenac. For their convenience, the hotel runs a shuttle bus daily to Lac Beauport, 12 miles distant.


CABANES A PECHE
A LOUER
POISSONS A VENDRE
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Fishing Huts Dot the Icy River at La Pérade

Each December schools of small fish known as *Microgadus tomcod* make their way up the St. Lawrence to spawning beds in its tributaries.

At the mouth of the Sainte Anne River, the arrival of *le petit poisson* touches off a festival of fishing, a carnival of conviviality.

Brightly painted cabins slide from back yards onto the ice. Singing "*Mordez, Mordez, Petits Poissons*" (Bite, Bite, Little Fishes), the fishermen move in. Snug in heated cabins, they often spend the night.

Through the long hours the frosty air rings with music and laughter. Feasting parties swarm abroad on rounds of neighborly visits.

This cabin, tipped by a jack, awaits removal by sled. Last season 750 such huts lined a one-mile stretch of the river.

Lines hung from pulleys drop through a trap door and hole in the ice. Cubes of pork liver serve as bait.

Children joy-ride on a cabin-moving sled. Signs advertise fishing cabins for rent and fish for sale.

Chill Air Preserves a Rack of Sturgeon

Both sea and lake sturgeon live in the fresh waters of the St. Lawrence the year round. In spring dense schools drive into tributary rivers to spawn.

Fishermen who caught this haul of sea sturgeon (*Acipenser oxyrhynchus*) followed a lane cleared by an icebreaker that keeps the St. Lawrence open as far west as Trois Rivières. The vendor holds a 30-pound 55-inch specimen at La Pérade.

Housewife Buys a Basket of Tomcod

Prized for its delicate flavor and texture, this fish rarely achieves more than a foot in length. Cabin fishermen consider four or five hundred a good night's catch. They quick-freeze the fish by simply tossing them onto the ice.

victory. Just to keep it a family affair, the second boat was manned by two additional Lachance brothers and three cousins.

After the race I spoke to wiry, black-haired Noël Lachance. His family, he told me, lived on an island aptly called Ile aux Canots, or Isle of Canoes. The ice canoe represented their only winter link with the mainland.

How did this year's race compare to others?

"*Pas trop difficile*," he said. "Not too difficult. Anselme hurt his knee on a jagged piece of ice, but he just ran alongside until it felt better; then he pitched in again.

"Last year," Noël continued, "there was a blizzard, and all the roads were out. So we had to walk through the snowdrifts for four hours to reach Quebec City for the race."

"But you won anyway?"

"By four and a half minutes," he grinned.

"How long does an ice canoe last?" I asked.

"About 25 years if one takes care of it."

"And an ice canoeist?"

"My father is 71 and he still takes an occasional turn in a boat. There is no real danger if you have experience. When we were younger, my brothers and I would ice canoe 35 miles to get to Quebec City to see our girls."

That was my last week in Quebec, and the weather turned milder. The sun blazed in a bright blue sky; the snow turned to slush underfoot.

And all Mr. Kandic's scheming was in vain.

As I took a last stroll on Dufferin Terrace, I found him staring mournfully at the melted ruin of his toboggan slide.

"What a shame," I said. "All your work was for nothing."

"No," he said, and his face brightened. "The slide is finished. But at least it is finished with honor!"

True, who is disgraced to lose a battle with the sun?

Ship's Horn Forecasts Winter's End

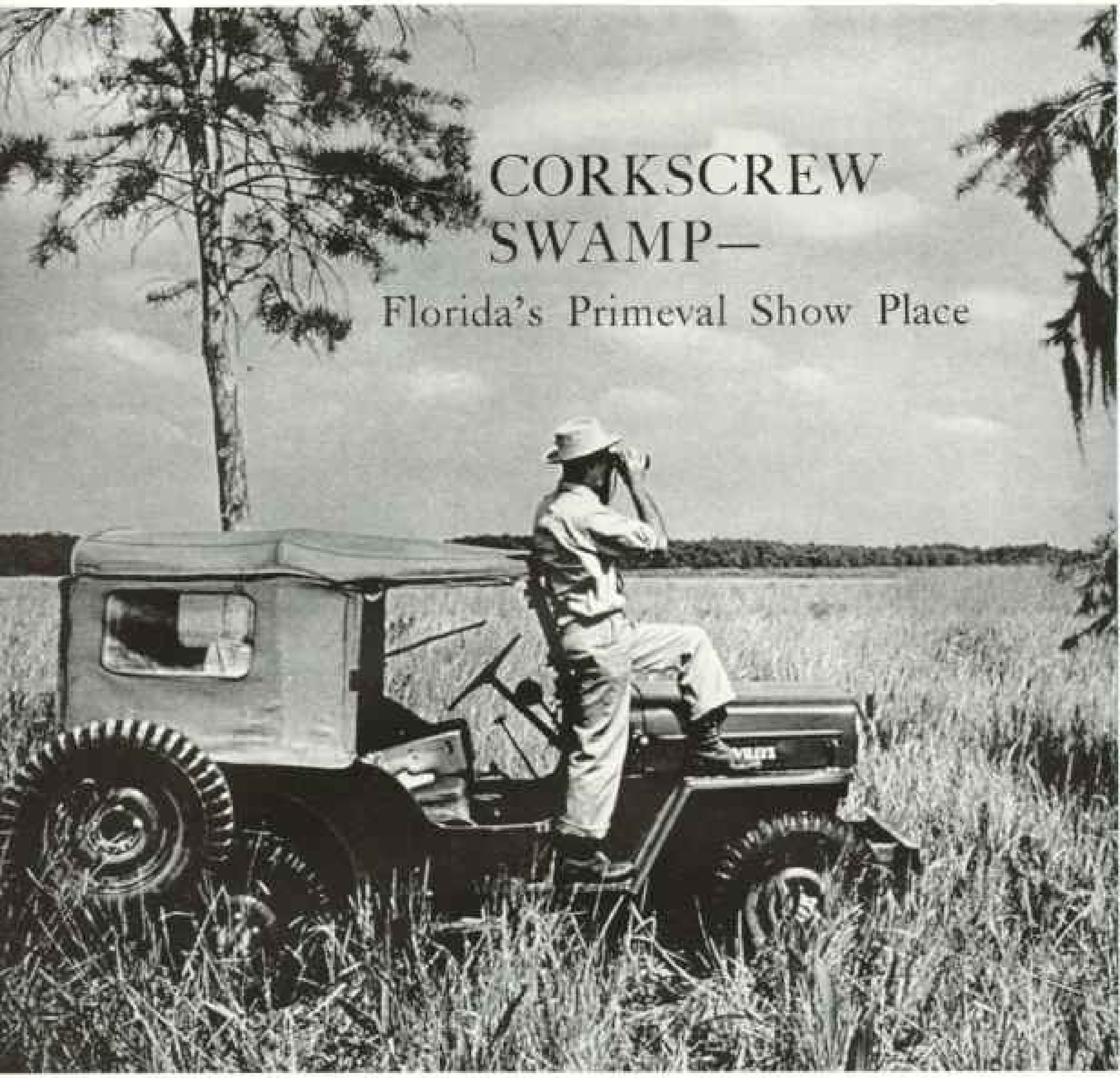
From the direction of Lévis, I heard the mournful sound of a ship's horn. I looked across and saw the season's first steamer slipping out into midstream. The long freeze was ending; navigation would soon resume on the St. Lawrence.

Winter was loosening its icy grip on Quebec; presently it would be in full retreat. The carnival was finished until next year. But it, too, was "finished with honor."

Outsize Saucer on a Snowy Hill Gives a Magic-carpet Thrill

CORKSCREW SWAMP—

Florida's Primeval Show Place



By Melville Bell Grosvenor President and Editor, National Geographic Society

FOR half an hour our party had slogged through muck and mire to reach the heart of Corkscrew Swamp. Now, though dark waters swirled above our knees at each step, discomfort was forgotten. We had walked out of the 20th century and into Florida's primeval past, a shadowy, hidden world of dreamlike beauty.

All around us the massive trunks of 700-year-old cypress trees thrust skyward, so high their crowns seemed to scratch occasional patches of blue. Only a few rays from the sun lanced through to the watery floor, where inky pools suckled grotesque cypress knees that jutted up to the height of my waist.

As I gazed overhead, a red-shouldered hawk sped through the branches, a fleeing wraith among gray shrouds of Spanish moss. Other birds, though hidden in tangled undergrowth, voiced their presence. One moment the forest brooded with the hush of an empty cathedral; an instant later a water bird's strident outcry rent the silence, followed by the high, ethereal song of a hermit thrush.

Turning to the smiling man at my side, I remarked: "You were certainly right. No

An Audubon Warden Looks for Birds in Florida's Corkscrew Swamp Sanctuary

Across this fresh-water marsh rises one of the country's largest remaining stands of virgin bald cypress, the oldest tree in eastern North America. The forest, part of Big Cypress Swamp, is but a remnant of millions of acres of cypress that generations ago dotted parts of the southeastern United States.

In 1954 the logger's saw began to bite into this small but magnificent forest, just as it had consumed most other cypress stands. Appeals from friends of conservation and bird life brought swift cooperation by lumbermen, ending the threat. The National Audubon Society acquired nearly 10 square miles of the area for a wildlife refuge.

Here the warden in charge of the sanctuary trains his glasses on a feeding ground.

Hikers Slog Through Ankle-deep Water to Reach the Swamp's Inner Beauties

Dr. Gilbert Grosvenor, Chairman of the National Geographic Society's Board of Trustees, and Mrs. Grosvenor were among the sanctuary's first visitors. Here the party, forsaking dry land at the edge of the swamp, wades through water and mire. Until a boardwalk was built in 1955 (page 111), such arduous hiking was the only way the swamp could be entered.

Melville Bell Grosvenor (below) and National Geographic Photographer Robert F. Sisson

one could ever forget such a place!"

My comment was addressed to John H. Baker, President of the National Audubon Society. A few days earlier he had telephoned me with an invitation that proved irresistible.

"Corkscrew Swamp is ours now, an Audubon wildlife sanctuary," Baker had said. "It contains one of the largest stands of virgin cypress left in the United States. Somehow we must give the public controlled access to Corkscrew, and I'm going in on a survey trip. Won't you and your family join me?

Marcella Bell Grosvenor

Seemingly Impenetrable, the Primeval Forest Yields a Watery Passage

Poled in a square-ended canoe, Dr. and Mrs. Grosvenor cross one of the Lettuce Lakes into the wonderful world of a cypress swamp—a world of brilliance and shadow, of exuberant tangled growth and a multitude of wild creatures. Deep in this wilderness solitude, intervals of stillness are shattered by the shrill and clamorous calls of swamp birds.

"I can't exaggerate the beauty of the swamp," he added. "Seeing it, I promise you, will be a moving and unforgettable experience. But it will be rough. Wear sneakers and old clothes, for we'll be wading through the swamp up to our knees and waists."

So, with my parents, Dr. and Mrs. Gilbert Grosvenor, off I went through Corkscrew in the wake of the resolute Mr. Baker.

That trip, which took place nearly three years ago, was my introduction to the subtropical water forest. Recently, however, I returned and strolled with leisurely ease and dry feet through the same areas that had begrimed and tired our party.

If this seems a bit miraculous, I can assure you that a visit now is, quite literally, child's play. Thousands of casual visitors, including many children, this winter will explore the green maze from the comfort and safety of a 3,658-foot boardwalk that winds into the finest part of the swamp (pages 111, 112).

The walk leads deep into a naturalist's unspoiled paradise. There one may contrast delicate orchids with dozing alligators, or tiny songsters with lordly birds such as the American egret and the wood ibis, the only stork native to the United States.

Area a Forbidding Mystery for Years

Corkscrew Swamp lies just 25 miles southeast of Fort Myers, Florida, and 120 miles by the Tamiami Trail from Miami (see Southeastern United States supplement map). Yet, until acquired by the Audubon Society, it was virtually as inaccessible to the average person as a mountaintop in the Himalayas.

Swamp-wise hunters and trappers, plus an occasional timber surveyor or naturalist, ventured into Corkscrew despite its muck, alligators, and venomous snakes. So did a few groups of visitors led by experienced guides. For others the swamp remained a forbidding mystery.

Today's boardwalk sightseer often experiences a sense of discovery, as if he had ventured into some remote and utterly strange land. Invariably he exclaims in awe at the remarkable beauty of the forest. The fact that a forest is still there, timeless and undisturbed, is in itself remarkable.

Swamp Saved by Audubon Society

Four years ago the last stand of magnificent cypresses seemed fated for the logger's guillotine. Most of Big Cypress Swamp, a huge area that includes the present sanctuary, had been stripped of its marketable timber. Part of Corkscrew, too, had been cut, but the remnant was immensely valuable.

The Audubon Society, though it befriends all nature, has long had a particular reason for interest in Corkscrew. Through many generations the swamp has been a preferred nesting site of the showy American egrets, famed for their nuptial plumage, and the wary wood ibises. In years when the water level is sufficient to assure them of fish and other food, these great birds nest by the tens of thousands in the cypress crowns. From a distance their massed bodies look like snowy cotton bolls atop giant stalks.

To save this rookery and the virgin cypress, the Audubon Society rallied financial support from many conservation groups and individuals. John Baker led the drive with skill, patience, and unflagging determination.*

He found a sympathetic ally in the Lee Tidewater Cypress Company, owner of the

* See "Saving Man's Wildlife Heritage," by John H. Baker, National Geographic Magazine, November, 1934.

Cypress Roots Lift Wooden Knees Like Stalagmites in a Cave

The cypress sends its roots in a shallow but far-flung network, seeking stable footing in the wet soil. Roots often throw up grotesque, cone-shaped kinks known as knees, some rising as high as a man. Scientists are not sure of their function. Many people once supposed the knees were "breathers," but the theory has been discredited. Others believe the growths help support the trees. Knees do not grow foliage or develop into trees themselves. Stripped of bark and polished, they bring a good price as lamps, book ends, and novelties.

Melville Bell Grosvenor

timber. In 1954 the company donated 640 acres and accepted $170,000 for other choice property. Collier Enterprises, Inc., another landowner in the area, leased extensive acreage for a token dollar a year.

The sanctuary thus assembled totals 6,080 acres. Part is a buffer zone of pineland and wet prairie. Within this protective area the great trees group in a curving, horseshoe-shaped belt.

My foot-weary tour of Corkscrew in pre-boardwalk days began with an incident that gave me much secret amusement.

We had assembled in the pineland buffer zone under the watchful eye of Henry P. Bennett, the sanctuary's warden and a superb woodsman. Hank thought he detected a problem. He knew that Dr. Grosvenor, who had recently retired after 55 years as Editor of the NATIONAL GEOGRAPHIC MAGAZINE, was both a friend of conservation and an accomplished amateur ornithologist—enthusiasms Mrs. Grosvenor had long shared. But could the couple bear up under the rough going of an untamed swamp?

A Gallant Lady Accepts a Challenge

With the oblique tact of a diplomat, Bennett suggested to my globe-trotting parents that they stay where they were and await us in comfort.

I knew what the answer would be, and it came, emphatically, from Mrs. Grosvenor:

"We wouldn't think of remaining here while everyone else was out in the swamp!"

With that matter decisively settled, we began our trek, passing first through a stand of slender pond cypresses underlaid with ankle-deep silt and rotting vegetation (page 99). Soon the muck was succeeded by water, and I noticed that Bennett slyly placed a protective cordon of men around Dr. and Mrs. Grosvenor. He was taking no chances on an encounter with an alligator or a water moccasin—the deadly cottonmouth.

At times we barked our shins on knobby cypress knees (page 101). Viewed in deep shade, these strange roots often looked like droll gargoyles. We leaned against them at rest stops while admiring the white blooms of spider lilies or the violet-blue flowers of pickerelweed.

Pushing on among the columned giants, we came at last to the loveliest of Corkscrew's hidden mysteries, the Lettuce Lakes. There, in an open, sunlit area, water lettuce grew in amazing profusion, so lawnlike in appearance that it seemed we had strayed into a formal garden (page 108). But the glade was not so inviting as it looked; beneath its carpet the water deepened to a maximum of about four feet.

Dr. and Mrs. Grosvenor took to a boat pushed by Hank Bennett. John Baker and I waded up to our waists behind them and found the footing surprisingly firm. Alligators and moccasins, loathe to attack men unless provoked, were gracious enough to find business elsewhere.

Snail Shells Reveal "Crying Bird"

Later that day, while the senior Grosvenors rested, we trekked deeper into the forest to spy upon nesting ibises and egrets. Our vantage point, Bennett said, would be Corkscrew's innermost recess, a saw-grass marsh within the cypress horseshoe.

Most of us were preoccupied with the treacherous footing, but Bennett, ever vigilant, suddenly halted and pointed to a pile of snail shells atop a fallen log. Here, obviously, was the remains of a dinner eaten by that skulking swamp habitué, the limpkin. The presence of these birds in the new sanctuary had been suspected; now it could be officially chronicled.*

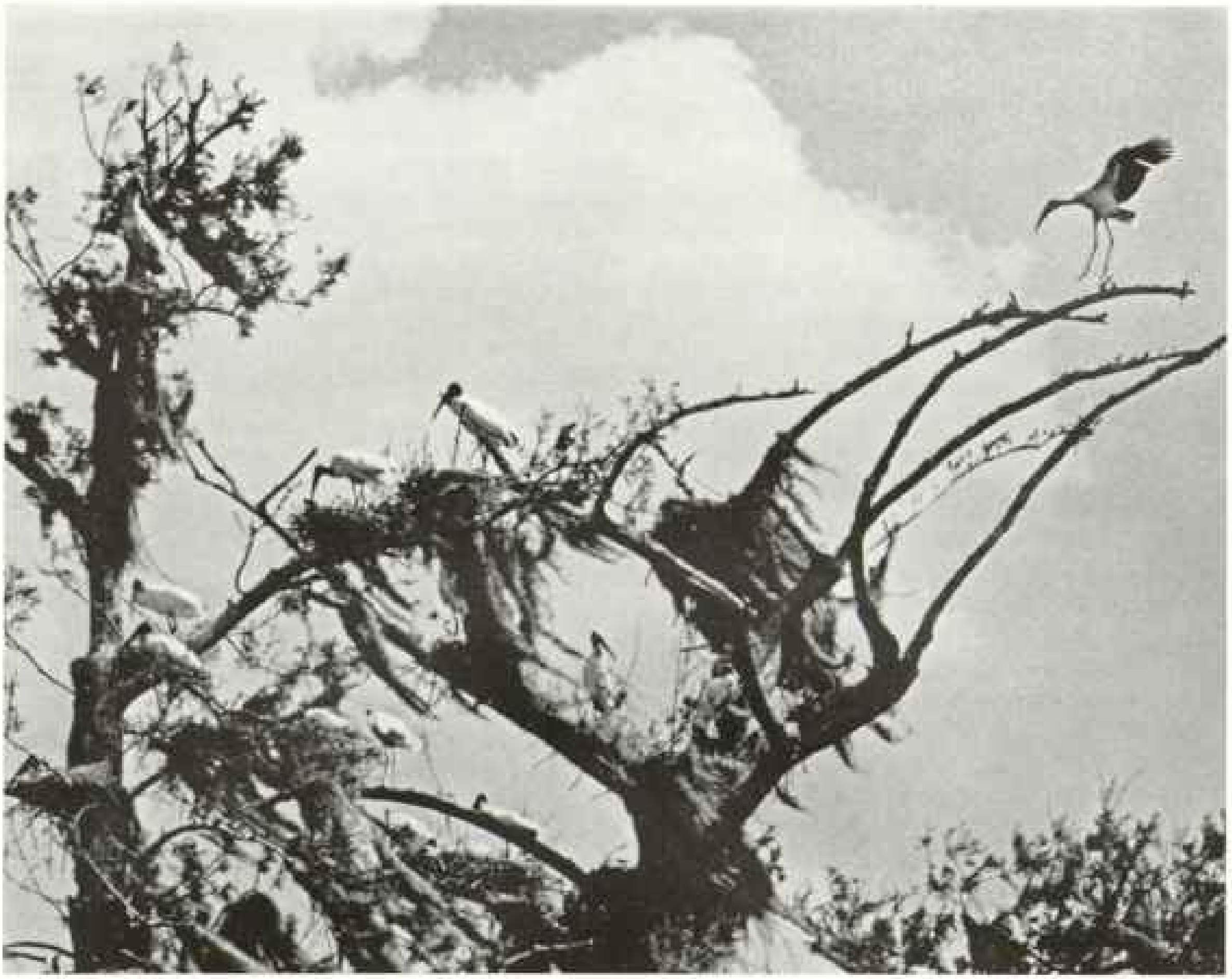
Reaching the edge of the forest, we gazed across an uninviting expanse of saw grass toward trees near the southern end of the sanctuary. There an estimated 3,000 ibises and egrets frosted the cypress crowns, busy at housekeeping tasks around their nests of twigs. At times the clamor of young birds reached us faintly.

Loggers' Axes Halted by Purchase

John Baker said the size of the rookery was far below normal. Communal groups estimated at more than 100,000 are not uncommon at Corkscrew. But for the past several years most of the birds have gone elsewhere because of low water during the winter-spring nesting season. This year, however, water is plentiful throughout the swamp, and the exodus may be reversed.

Before we turned back, Baker pointed out a distant, clifflike silhouette where the big trees abruptly ended. Loggers, after slashing their way through scores of patriarchal cy-

* Frederick Kent Truslow, a gifted naturalist, writes of the wailing limpkin in a companion article beginning on page 114.



National Geographic Photographer Robert F. Sisson

Graceful in Flight, the Wood Ibis at Rest Is an Ungainly Clown

In wet years, when food is plentiful, these gregarious birds form huge colonies in Corkscrew, nesting in the treetops and soaring by the hour on motionless wings. Except for the complaining of hungry young, and the bill clacking and wing swishing of the adults, they add little to the cacophony of the swamp.

The wood ibis is actually a stork, the only one in the United States. An enormous beak gives rise to the Latin name *Mycteria*, meaning snout; its bald, scaly pate resembles that of a vulture and accounts for the nickname Spanish buzzard.

presses, had been stopped at that point by Corkscrew's purchase. Giants we now surveyed had been pardoned, thanks to the Audubon Society, just as the headsman approached to claim them.

Aching muscles, a product of that first trip into Corkscrew, were vividly in my memory when I returned to saunter along the new boardwalk, once more in company with John Baker and Hank Bennett. With us this time went Allan C. Fisher, Jr., of the National Geographic's Senior Editorial Staff.

The promenade, sturdily built, with railings and occasional inviting benches, begins in the pineland. It crosses a strip of wet prairie, winds among the big trees to the Lettuce Lakes, bridges the lakes, and finally dead-ends deep in the forest.

Ordinary lumber would soon decay in the swamp; so cypress itself, "the wood eternal," was used in construction. It is tough and extremely resistant to rot and insects. Well-preserved cypress stumps, believed to be 100,000 years old, have been found buried far underground in some swamps. Builders long have prized the wood for its durability, but this very fact has almost doomed the larger cypress trees; virgin stands are all but exterminated.

Workmen Endured Neck-deep Water

Bennett and his assistant, Sam Whidden, who has lived since childhood on Corkscrew's outskirts, shrugged off a comment that erecting the walk must have been a temper-searing and extremely difficult job.

"It wasn't so bad," Bennett said. "Sam supervised the construction and recruited several men; I helped. We averaged 60 to 70 feet of boardwalk a day.

"But there were a few places," he smiled, "where we worked in water up to our necks. One man had to stand lookout at all times on the completed part of the boardwalk. We got along fine with the snakes and alligators, but we didn't take any chances.

"Under that tussock," he added, gesturing toward a near-by tangle of grass and mud, "we knew there was an 11-foot alligator. You learn where they live and then treat the vicinity with respect."

Since last I had seen him, warden Bennett had cruised the length and breadth of Corkscrew, often alone, to assist in cataloguing the sanctuary's flora and fauna. He carried only a knapsack of food and a machete.

A mature swamp is one of the most fecund habitats in nature. To date Audubon Society experts have listed 131 species of birds as full- or part-time residents of Corkscrew, and the roster is still growing. Sixteen species of mammals have been catalogued, including Florida black bears, panthers, and bobcats.

Bold Bobcat Invades the Boardwalk

The bears and big cats, however, have never ventured near the boardwalk during daylight hours—with one exception. Sam Whidden rounded a turn in the walk early one morning and came face to face with a promenading bobcat.

"Don't know who was the more surprised, that cat or me," he recalled. "It spat at me, then bounded over the railing as if it had been scalded. It got lost in a real big hurry."

Among other swamp denizens are raccoons, opossums, otters, and white-tailed deer. A wire fence now being erected will help protect wildlife and keep cattle from straying into the sanctuary.

Bennett's philosophy of protection for wildlife includes even the deadly and frequently encountered water moccasins. He doesn't believe in killing them.

"Snakes, like mammals, have their favorite haunts," he explains. "Let's say I killed a moccasin in one of those places. The next time I came that way I might assume the place was safe—and that's a dangerous attitude. If you let the snake live, you're bound to be careful whenever you enter his territory."

Air-drinking Orchids Cling to Trees

The swamp's fecundity is most noticeable in its luxuriant plant life, particularly the eye-catching flowers. Botanists have catalogued 83 species of flowering plants, and that does not include 18 separate varieties of orchids. Many of these small but exquisite blooms are epiphytes, or plants that draw their sustenance from the air. They peer down at visitors from tree trunks and branches.

Not all the orchid species, however, can be seen from the walk, and their time of blossoming varies. Night-smelling orchids, for example, bloom during summer and early fall. The butterfly species spreads petals in early summer; the white ghost, or spider orchid, awaits heavy rains later in the season. The shell orchid prefers fall and early winter.

All along the walk there are numbered observation stations. Visitors stop and refer to Audubon "self-guided tour" pamphlets, which explain phenomena visible from the numbered vantage points.

For example, at Station 31 I spent long moments examining the tentacles of a strangler-fig vine, thick as a fire hose, that encircled a huge cypress trunk. My pamphlet explained that the vine's powerful embrace was slowly garroting the tree. This process will continue for decades.

"We have taken tape measurements of some cypresses along the boardwalk," Bennett said. "That one," he added, pointing to a venerable specimen, "is the largest. It has a girth of 21 feet. Many others are nearly that big."

(*Continued on page 113*)

When King John Signed the Magna Carta, This Giant Was a Sapling

In the swampy surroundings it loves, a bald cypress continues to grow for centuries. Test borings suggest ages of 700 to 1,200 years. The straight-shafted trunk may reach a diameter of eight feet, and the topmost branches may rise 120 feet. But the tree grows at a leisurely pace, requiring some 200 years to reach lumbering size.

This choice specimen is called the Baker Tree in honor of Audubon Society President John H. Baker, who started the moves to make Corkscrew Swamp a wildlife refuge.

The two women at right have unusual interest in the swamp. Mrs. Gardner D. Stout (checked shirt) is wife of the Chairman of the Audubon Society's executive committee. Mrs. Eugene A. Smith, as President of the Florida Federation of Garden Clubs, helped raise funds to save Corkscrew.

Tillandsia Grows on Trees but Lives on Air

Like the related Spanish moss, this pineapple air plant is not a parasite; it sucks no food from the tree that supports it.

Warden Henry Bennett wears on his shoulder patch an American egret, symbol of the National Audubon Society. Few men know Corkscrew as he does. He can identify most of the swamp's myriad wildlife on sight.

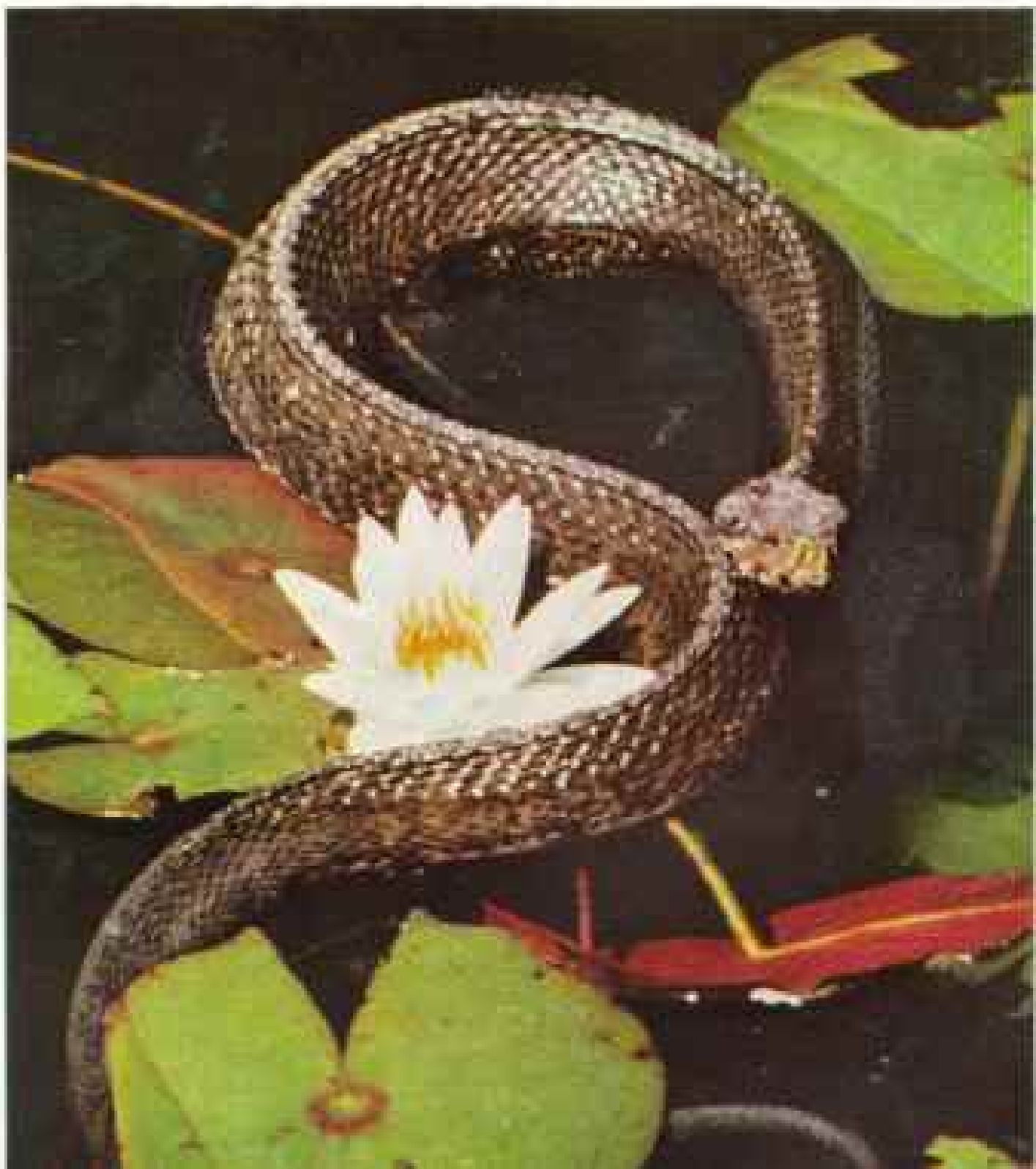
American Egret Gleams in Lonely Splendor

This species, nearly exterminated by plume hunters before World War I, is protected by law today. Its rookeries in Corkscrew Swamp, along with those of the wood ibis, were for many years the largest in the United States.

Venomous water moccasins, waiting on log or branch, ambush many a frog and fish. This fourfooter, curved around a golden-heart lily, does not show the usual gaping "cottonmouth."

Butterfly-weed, a variety of milkweed growing at the edge of the swamp, often plays host to the lordly monarch butterfly.

National Geographic Photographer Robert F. Sisson © N.G.S.



Hoary Beards of Spanish Moss Drape Cypresses but Shun a Cabbage Palm

Acres of water lettuce suggest the clipped lawn of a suburban estate. The green rosettes grow so thick on the surface that they often completely obscure

Watercolor by C. L. Burrow © National Geographic Society

Corkscrew's water. Wading men power the rowboat where oars would tangle in the dense growth; an outboard motor would be equally impracticable and would disturb the wildlife. Water lettuce superficially resembles the garden greenery for which it is named, but those who have tasted it call it unappetizing.

The Society's President Signs Corkscrew's Register in a Seminole-style *Chickee*

Seminole Indians, who once fought United States troops in Big Cypress Swamp, still live there in elevated, palmetto-thatched huts.

With Dr. Melville B. Grosvenor, National Geographic Society President, are National Audubon Society President John H. Baker (checked shirt), Henry Bennett (left), and Sam Whidden, Mr. Bennett's assistant.

Boardwalk Strollers Spot a Flash of Gold

On the cypress boardwalk, which winds more than half a mile, visitors spy the radiant yellow of a prothonotary warbler (left). This was the first known sighting of the bird in the swamp. Its ringing *sweet! sweet! sweet!* always betokens water near by.

This glowing bird haunts dense undergrowth beside swamps or streams. In summer, lucky bird watchers may see the prothonotary as far north as Wisconsin and New York.

Kodachromes by Anne Royle Grosvenor (above) and Melville Bell Grosvenor (right)
← Illustrations by Ralph E. Lawson © N G S

Melville Bell Grosvenor © National Geographic Society

"There's One!" An Alligator Basks amid Water Lettuce

Hoarse bellows rising unpleasantly on the evening air betray the presence of alligators. Frequently they sun themselves in full view of the boardwalk.

Contrary to common impression, 'gators offer little threat to man. None of the swamp's reptiles or other wildlife may be killed.

Here John Baker points out a young four-foot specimen (right) to Mrs. Melville Grosvenor. To catch its portrait, the photographer stretched full length on the boardwalk.

Farther along we came to a point where the walk completely enclosed one of the forest monarchs. There we watched visitors stop, feel the bark, and take pictures of one another leaning against the improbable-looking trunk.

Test borings have been taken from a few trees so that their age could be determined by annual growth rings. Experts agree these specimens are about 700 years old. But the age of a huge cypress, unlike trees of cooler climates, often is difficult to gauge from its rings. Bennett believes some of the largest may have a life history of 1,200 years.

Corkscrew's giants are bald cypresses, so-called because they shed their small, needle-like leaves in winter. They belong to the conifer family and, in a virgin state, grow to a maximum height of about 120 feet.

The early history of this wilderness refuge seems as shadowy as the forest itself. We know that Big Cypress Swamp south of Corkscrew was a haunt of Seminole Indians during their bloody encounters with United States troops before the Civil War. But there is no indication that the present sanctuary was invaded.

Even the origin of the name Corkscrew is clouded. It may have come from a near-by stream. Imperial River, which empties into the Gulf of Mexico near Bonita Springs, was called Corkscrew River years ago. Although this sinuous waterway does not drain from the swamp, its headwaters rise only a few miles to the southwest.

In 1912, when the craze for egret plumes to adorn milady's hat was at its height, the Audubon Society sent a warden into Corkscrew to protect egrets from slaughter. A few years later the Government outlawed traffic in plumage, and the warden was withdrawn.

Once a Hunter's Paradise

Sam Whidden, who took many a 'coon and 'gator from the area in earlier years, recalls it nostalgically as a hunter's paradise—but a dangerous one. Sam nearly met death there on one of his first visits as a boy. He was kneeling to drink from the edge of a pond when a moccasin sank its fangs into his leg.

"Took six and a half hours to get me out of there by oxcart," he reminisced. "I was a mighty sick boy."

Even in the automobile age, getting in and out of Corkscrew takes a bit of doing. The entrance lies a mile and a half from the nearest highway. Often the approaches are a quagmire, and only jeeps or swamp buggies can negotiate them. A surfaced road is planned, but it won't be ready this winter.

Meanwhile, visitors who wish to see this natural wonder may make reservations for an official tour by contacting the Audubon Society's Miami office (13 McAllister Arcade). Travelers who prefer unofficial tours may obtain from that office the names of approved guides with jeeps or buggies.

Complacent 'Gator Poses for Author

From the safety of his path on stilts, the visitor sometimes sees a moccasin sunning itself. Alligators are commonplace and have become quite blasé about humans. I photographed one while a crowd of onlookers chattered near by, but the creature, undisturbed, kept to its log in the Lettuce Lakes (opposite).

"Don't let that 'gator's sleepy look fool you," Sam Whidden said. "If something good to eat comes along, it'll spring alive. A 'gator can be mighty fast and will eat almost anything—fish, turtles, birds, even pigs that come into the swamp to root around."

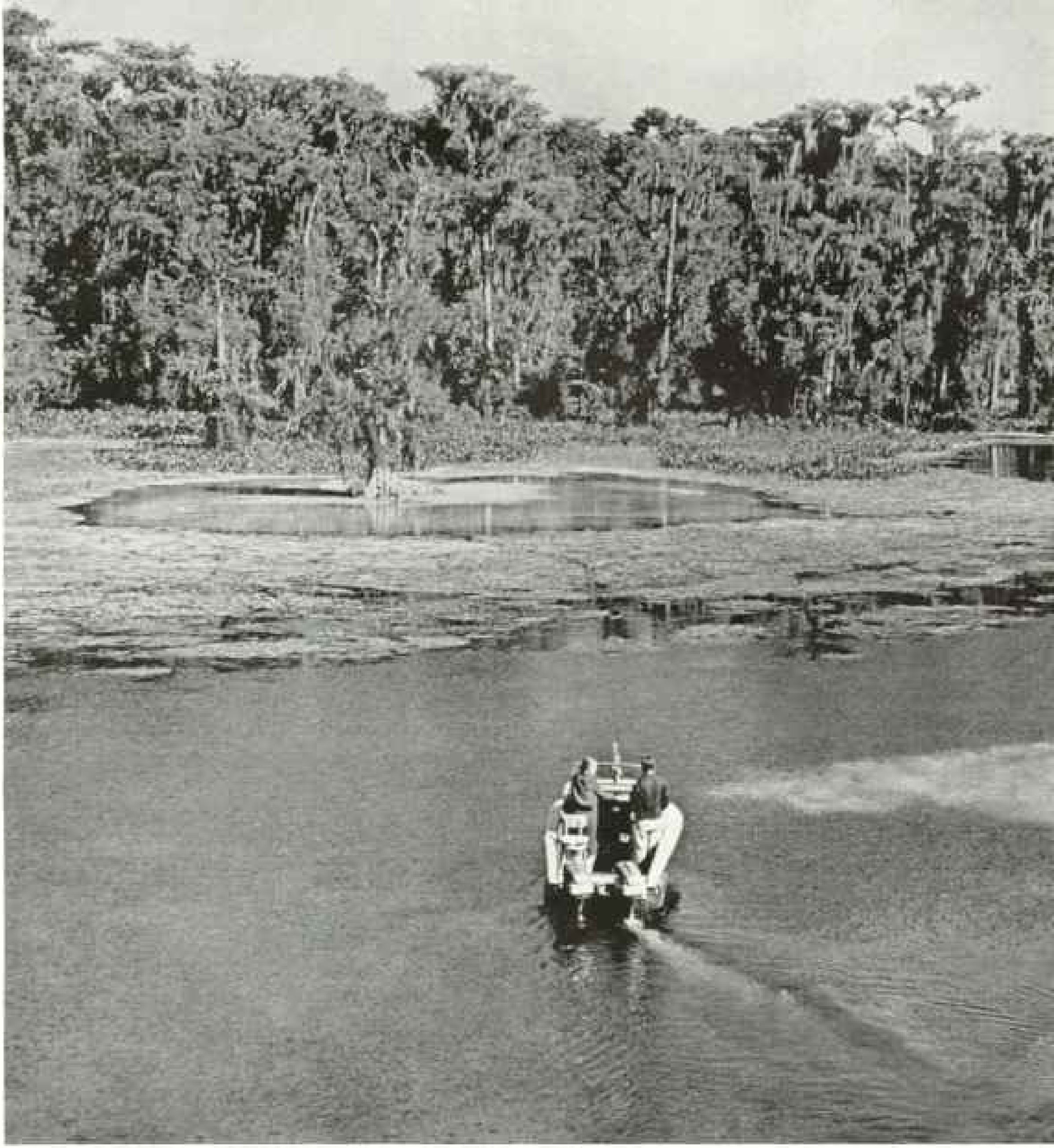
High above the lakes' green coverlet, I saw a water turkey, or anhinga, perched upon a cypress limb. His lazy slouch suggested the satisfaction a full stomach brings. Closer by, a little blue heron walked atop the lettuce like a mincing tightrope artist, and from the encircling trees a black-crowned night heron launched itself into the sky.

For a time I forgot photography and gave my senses freely to the magic of the forest. As we strolled onward into the big trees, flickering color caught my eye: the red of a cardinal, the flashing yellow of a prothonotary warbler (page 110). Within one brief minute Bennett's trained ear identified a dozen unseen choristers: a tufted titmouse, crested flycatcher, yellow-throat, and others.

At the boardwalk's end Hank pointed out many ibis and egret nests, homes of previous years. Now, though it was nesting season, the cypress crowns waited in vain to cradle a new generation. Again, only fragments of the vast flocks had returned.

"I think they will be back," Hank said. "There will be good years, many of them."

A reflective smile lingered on the warden's face as he surveyed his swamp, and I knew what he was thinking. Corkscrew had been saved. The great trees would remain, serene and unchanged. There was plenty of time—and Bennett is a patient man.



Limpkin, the "Crying Bird" That Haunts

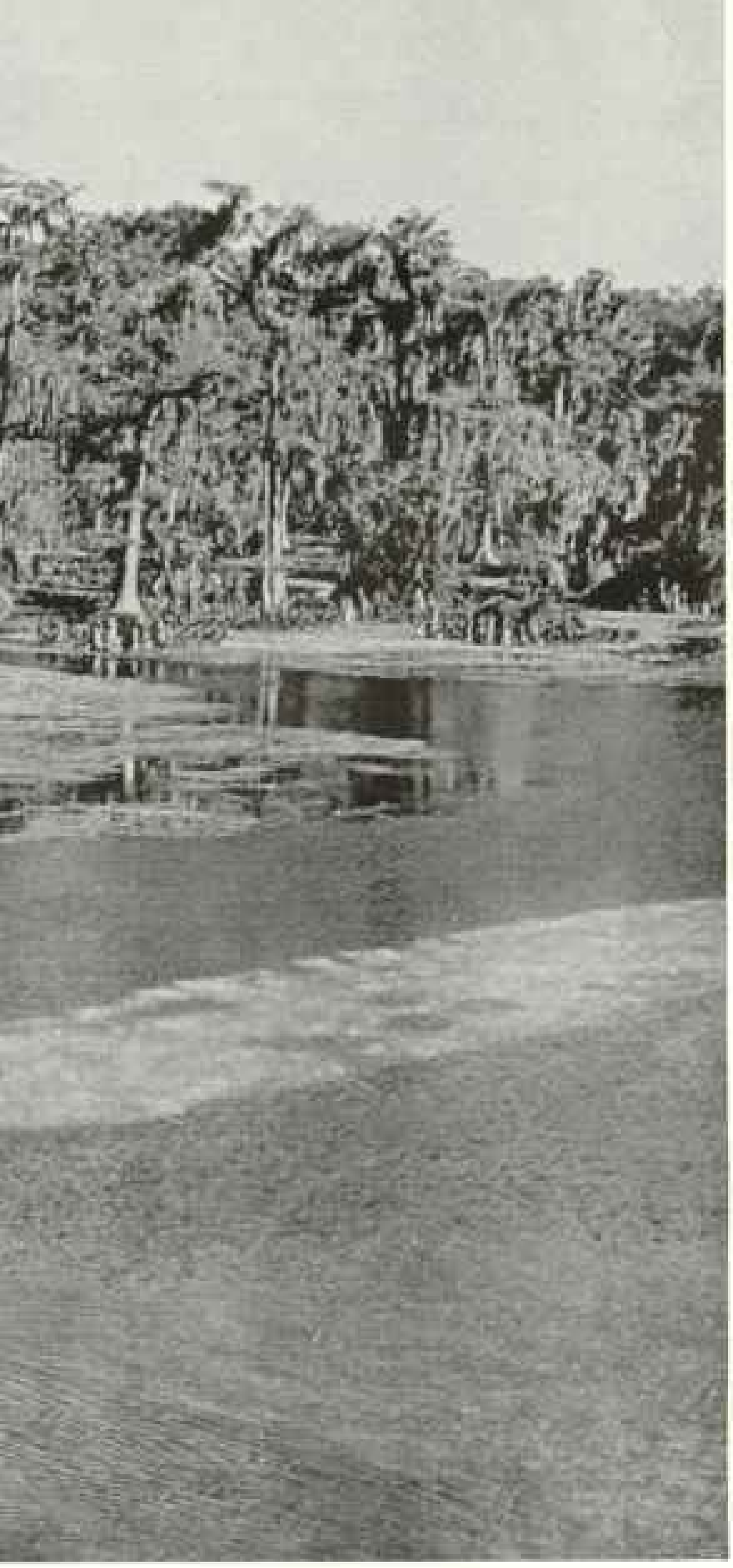
Shy and Strange Is This Finicky Eater with the Weird Wail

IT WAS LATE at night, and my wife and I sat quietly on the wharf. Before us the moon glinted on the black water of Wakulla Springs; around us we could hear the rustling night life of the Florida swamp. I watched a fish break the still surface of the water, heard a barred owl hoot in the moss-draped trees, and followed the dark snout and back plates of an alligator as it swam slowly along the moon's wet path of light.

Then, suddenly, it happened: a dark shape launched itself directly upward from a tangle of swamp plants to our right.

"That's it, Mil," I whispered. "That's a limpkin. Now listen."

The bird flew low, with flapping wings and dangling legs, and dropped among some cypress knees on the far shore. Then, from near the ground, came its loud, unbelievable cry—a sound like nothing else in the world



Near This Cypress-bordered Pool at Wakulla Springs, Florida, Lives the Timid Limpkin, a Bird That Limps and Cries Like a Child

Marvelously clear waters boiling from a limestone formation fill a five-acre pool that feeds the Wakulla River. Heavily populated with wildlife, this area near Tallahassee forms part of a State game preserve.

National Geographic Photographer Bates Littlehales

Florida Swamps

By Frederick Kent Truslow

so much as the forlorn wailing of a lost child.

"Folks used to think they was little boys a-cryin'," we'd been told by Chester Goosby, venerable chief of Negro guides at Wakulla Springs Lodge, "little boys lost in the swamps forever."

That night we went to sleep in the comfortable lodge listening to this mournful sound, the wails that ornithologist T. Gilbert Pearson once described as having "a quality of unutterable sadness, as though the bird was oppressed beyond measure by the desolateness of its surroundings."

The courlan, or limpkin (so named for its peculiar limping gait), was known to Indians as the "Crying Bird." The great 18th-century naturalist William Bartram used this latter name when writing of it: "A very curious bird . . . I cannot determine what genus. . . ."

Limpkin Looks as Odd as It Sounds

His puzzlement was understandable. This brownish, white-streaked bird has eggs and flight features like a crane, black and fluffy young like a rail, and the downward-curved bill of an ibis. Later ornithologists classified Bartram's crying bird in a family (Aramidae) found only in the New World. Today they call it "certainly one of the strangest birds of the country."

Most people never see or hear a limpkin (*Aramus guarauna*). In the United States the birds are seldom found outside Florida and the Okefenokee Swamp, which straddles the Georgia-Florida border. They abound at Wakulla Springs, some 15 miles from Tallahassee, where water boils out of the ground to form a five-acre lake. The lake gives birth to the Wakulla River, whose waters flow through wet, subtropical jungle into the St. Marks River and thence to the Gulf of Mexico.

I have always been fascinated by natural history, and for years I had read of the strange and little-known birds that haunt Florida's swamps and marshes by night. But as a member of a large manufacturing company, I had put production charts and New York routine ahead of outdoor interests. Then my doctors ordered my prompt exit from the industrial world, and I found myself suddenly faced with a new problem: I had nothing to do.

For two weeks I moved restlessly about our New Jersey home. Then my wife, an accomplished artist, quietly called the Audubon Society for information and suggested a trip—a different kind of vacation, with a purpose. With her help and encouragement, I turned to a new and absorbing interest: observing

and photographing birds and animals in their natural habitats.

My wife packed her paints; and I selected camera equipment. The Everglades, the coast of Maine, the Canadian Rockies—we picked our places and our seasons carefully. We discovered satisfactions far greater than those tied to production records.

Snails Keep Limpkins from Straying

Our first close contact with limpkins had been almost a year before our present visit. We had come to Wakulla Springs in March, their nesting season. By patiently approaching a little closer each day, I found I could get within six feet of a nesting limpkin without disturbing it. I photographed the nests themselves, built over the swamp in vine tangles or grass clumps and woven of leaves, twigs, and stems. I saw the buff-colored eggs and the black fledgling birds, which can leave the nest almost immediately after hatching.

Yet the limpkin activity I most wanted to see eluded me. Throughout their territory I saw small heaps of shells, the debris of countless limpkin dinners. The shells were those of fresh-water apple snails, the birds' favorite food. Teddy Farmer, my guide and a self-trained but expert naturalist, pointed them out to me (page 118).

"That snail keeps the birds home," he said. "They don't want to fly too far from these victuals."

In all cases I noticed the snail had been removed without breaking the shell—in spite of the tough trap door that protects this creature against the outside world. I had, of course, read various accounts of the way the limpkin feeds. But never had I been able to find a photograph of the process. That was the chief reason for our return visit now.

We rose early the morning after arriving. After breakfast we checked and assembled photo equipment and enjoyed the view of primeval forest, sapphire-blue waters, and the untamed beauty of this refuge. Three glass-bottomed boats, equipped with silent electric drive, give visitors glimpses of Wakulla's beautiful aquatic life.

The Negro boatmen, grown up in this service, chant the springs' history from the time of Ponce de León. In singsong voices they point out, with feigned amazement, a sunken branch over which "Henry, the pole-vaulting fish," may be seen jumping. He never quite clears the bar. Of course, they well know that "Henry" may be any of thousands of black bass "jumping" over the submerged branch in play. Still, they encourage each fish with loud shouts: "Come on, Henry! Jump, son!"

Two larger boats, seating 15 and 20 people, take visitors on jungle cruises down the "River of the Crying Bird." But we chose a small rowboat to pole through inlets and tree-roofed channels in our quest for rare, intimate close-ups of the feeding limpkins.

Oddly, the birds and animals here are so used to the big boats that they ignore them, but the quiet little rowboat encouraged suspicion. Our quarry was hard to find.

"Right behind that cypress knee," said Teddy Farmer finally, "see those limpkins?"

Shell Heaps Reveal Dining Places

Throughout the day we saw other limpkins peering at us from behind broken stumps and occasionally from perches in vine tangles. Then, in the late afternoon, Teddy pointed out the remains of an old rowboat, moss-covered, on a distant mud bank.

"That's a place they really like," he said.

Through my field glasses I could see a pile of snail shells on the open shore near the wrecked boat. As I watched, a limpkin came out of the water, carrying a snail.

Then another limpkin waded ashore with another shell. They moved slowly toward the shell pile. Although their backs were toward us, the waning daylight showed they were feeding.

"Too late to get pictures now," I said. "I'll try this spot tomorrow." My guide agreed, and we poled back to the wharf.

Mildred was still asleep next morning when I got up and put on sun-tan clothing which I hoped would blend with the swamp background. The camouflage was not for the birds.

(*Continued on page 121*)

Florida's Elusive Limpkin Clamps a Snail in Its Beak

Few people have seen the limpkin, a wading bird of swamps and marshes. Fewer still have watched the bird enjoying its favorite diet of snails. In these remarkable photographs the author catches rare views of the limpkin feeding.

This bird fishes the shallows of the Wakulla River. The source of the stream, Wakulla Springs, is one center of the United States limpkin population, which confines itself to Florida and southern Georgia. Central and South America also have colonies.

All Kodachromes by Frederick Kent Truslow © National Geographic Society

Shell Heaps on a Riverbank Tell of Many a Limpkin Visit

Locating a snail by probing with his bill or by shuffling his feet, the limpkin seizes his prey and carries it in leisurely fashion to shore or to a near-by log (page 117). There he wedges the shell securely in a crevice, under a stout root, or in heavy mud. Patiently he waits. As the snail relaxes its operculum, or trap door, a long bill flashes downward and shakes loose the prize.

The limpkin seldom swims, since his feeding habits keep him in shallow water. Legs are gangly, and the neck is snaky; the body is about the size of a large hen's.

White-striped feathers result in a speckled effect, as though paint had been splashed over the bird.

Limpkin flesh is delectable, according to old-time reports, but it is seldom eaten today since the bird is protected by law. Draining of swamps threatens the limpkin's existence.

A Gourmet Savors a Tidbit Before Gulping It

A finicky diner, the limpkin prefers the golf-ball-size apple snail but also eats other mollusks. It haunts places where the snail abounds, such as Florida's Lake Okeechobee and Corkscrew Swamp (page 98) and Okefenokee Swamp in Georgia and Florida.

After extracting the spiral mollusk, the limpkin usually holds it for a minute or two before swallowing.

Beak Spread Wide, the Crying Bird Wails Like a Soul in Anguish

Much folklore surrounds the limpkin because of its eerie and unbelievably loud shrieks. At night, when the bird is most vocal, the cypress alleys echo with prolonged cries that suggest to some people the wailing of little boys lost in the swamp forever.

Here a slender tongue rises as the bird gives voice to its harsh and melancholy note.

Balancing Limpkin Washes Down a Meal

In the air the limpkin is a gawky bird, legs dangling and wings beating in jerky, mechanical rhythm like those of a crane. To fly, it springs straight up; it descends just as abruptly.

On foot the limpkin shows the same jerkiness that marks its flight; its tail bobs nervously. A characteristic limp explains the bird's name.

which seem indifferent to color, but for people—who tend to stop and chat with a wildlife photographer, frightening off his quarry.

I was able to approach within 100 yards of the spot by rowboat. Then I walked through the damp growth to the ruined boat that would be my blind. I was well smeared with insect repellent and supplied with sandwiches, water, and camera equipment. By 6 a.m. I had my camera mounted on its tripod between my knees, the lens just clearing the moss-covered gunwale and focused on the heap of snail shells. Only my head and shoulders showed above the hulk as I sat down to wait.

An hour and a half passed. The sun rose higher, playing directly upon the shell pile. Conditions were just right—except for a subject. Not a limpkin was in sight.

Another half hour went by. Then I heard something land on the shore to my left—just outside my field of vision. I turned my head a fraction of an inch at a time.

On the shoreline just 20 feet away I saw a limpkin looking directly at me. For long minutes I fought to keep from blinking. He stood with his weight upon one leg, the other resting slackly; he did not bring his foot up under him in the manner of other waterfowl. Then he turned and began to walk off slowly, still favoring the relaxed leg. This was the famous limpkin limp.

He disappeared into the bushes. I did not move.

Ten minutes later two limpkins suddenly appeared where the first had been. Both stood motionless, looking directly at my exposed head. None of us moved for a while. Then the birds relaxed. One stretched his right wing, fully extending his right leg under it. The other scratched the side of his head with one of his long middle toes.

Nighttime Banshees Primp by Day

I looked in amazement as these screaming banshees of the night preened themselves like any barnyard fowl. With nightfall they would again become creatures of superstition, but now, in the warm sunshine, they were quiet, apparently contented.

Another limpkin appeared from behind the bushes, observed me closely for a few minutes, and relaxed with the other two. Then one waded out into the water up to his belly, probing the swamp bottom with his bill and feet. Twitching tailfeathers punctuated his cautious, jerky movements.

His head went under the water—and came up again grasping a snail by the outside flange of the shell (page 118).

Slowly, deliberately, the limpkin waded ashore and mounted a partly submerged log only 15 feet behind my old boat. In a crevice of the log he carefully lodged the snail shell, its opening turned upward. Then he stood for a few moments, quietly, one leg bent in the characteristic lame position (page 117). Perhaps he was waiting for the snail to relax, as I had waited for him to do. His head suddenly darted down; the upper point of his opened bill stabbed behind the snail's trap door. The limpkin gave a little sideways jerk of his head—and the snail came out of its shell.

Bird Dines Like a Gourmet

Instead of bolting his favorite morsel, he held it in his bill for perhaps two minutes. As though in anticipation of his meal, he looked about, bringing to mind a French gourmet who waits, fork and snail in hand, to savor his delicacy (page 119). Then, apparently satisfied with this ceremonious prelude, the limpkin swallowed the snail. Soon all three birds were hunting and feeding.

The first time I tripped the shutter of my camera, the modest click startled my subjects. They jumped off the ground, and regarded me nervously. I waited a tense quarter hour before making a second exposure. By then the birds had lost some of their wariness and scarcely noticed the shutter noise.

Working as unobtrusively as possible, using no light meter, holding my movements to a minimum, I exposed a whole roll. Reloading the camera was a real test of the confidence I had so painfully won. It took me 10 minutes to change film. The limpkins continued to hunt and feed, slowly, deliberately. Each ate his own snails without regard for the others.

I was using my third roll of film on this rarely viewed scene when dark clouds threatened. Large raindrops soon began to splash around me. As I thrust my camera equipment into waterproof bags, the timid limpkins dispersed into their familiar bushes.

That evening after the storm I listened as a shrill cry drifted across the darkened water. Even now it startled me. This was the drab, gangling bird I had watched all day. Yet I could almost hear it as another voice: that of a little boy calling plaintively—a little boy lost in the swamp forever.

Cappadocia: TURKEY'S COUNTRY OF CONES

FANTASTIC rock cones stud Göreme Valley in the heart of the Anatolian highland. Slumbering on the horizon, snow-capped Erciyaş Dağı, Asia Minor's loftiest peak, guards a conical brood. This volcano, now extinct, created Cappadocia's coneland. Eons ago the fiery mountain spewed ash and lava hundreds of feet deep across the countryside. As the mass cooled, it cracked. Rains and melting snows widened seams into chasms and carved pyramids. Early Christians hollowed cells and chapels within the cones, and today Turkish farmers dwell in many of the honeycombed rocks (following pages).

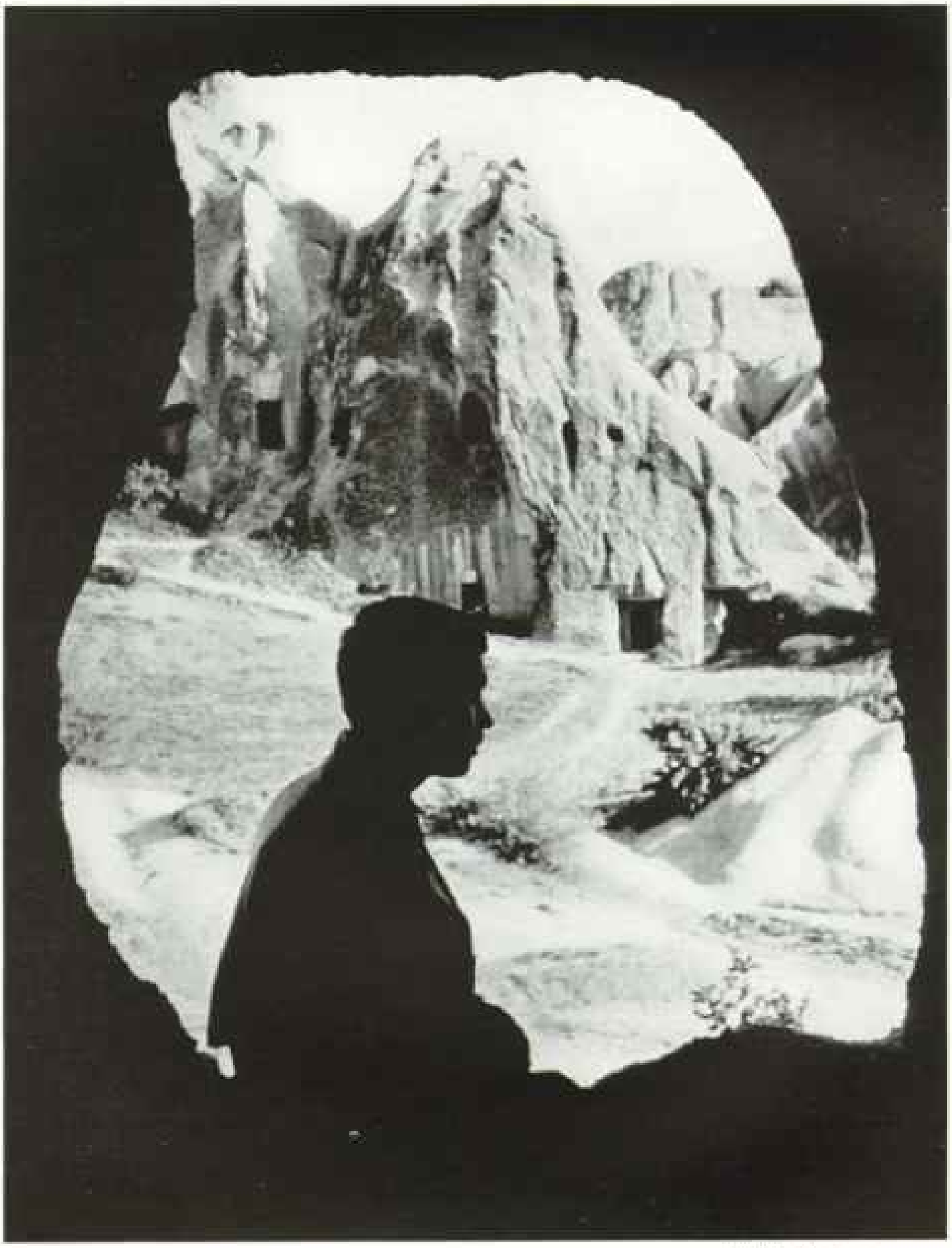
Photographs by Marc Riboud

The first cone dwellers found it easier and less expensive to hollow out homes in the soft rock than to build in a land where wood was scarce. Many carved entrances high above ground to discourage marauders; they reached their doors with rope ladders or finger-and-toe holds in the rock. This double cone, no longer inhabited, contains many small rooms on several levels; additional windows open on the far side.

Grit-laden winds, sandblasting the walls, give a clean, polished look.

Rock-hewn Window Looks Out on a Pinnacled Skyline

Some of Cappadocia's volcanic towers have as many as 10 floors. In the center of the cone a chimneylike tunnel, scarcely wider than the human body, provides the only access to upper levels. Priests and hermits climbed up and down by means of niches chipped in the sides of the shaft. These vertical halls have been called fairy chimneys.



Anne Rynin Bernstein

Marc Riboud, from Magnum

Once a Temple, This Stone Mushroom Now Houses a Farm Family

Caps of hard stone roof many of the cones. The umbrellalike covering on the monolith at right has protected the softer stone from eroding. Sugar-loaf cones in the village of Maçan (left) have lost their cap-stones and weathered into needle points.

Christians of medieval times used the cone as a chapel. One columned room (shown in close-up above) is thought to have been carved as a tomb. Door at ground level leads into a large room whose windows open on the far side.

Plows have scratched the field at left. Distant peaks mark the castlelike town of Ughisar.

A cloistered community grew up in Cappadocia between the fifth and twelfth centuries. Side by side with the farmers who inhabited the valleys, holy men excavated chambered tombs, shrines, and even sizable churches out of rock.

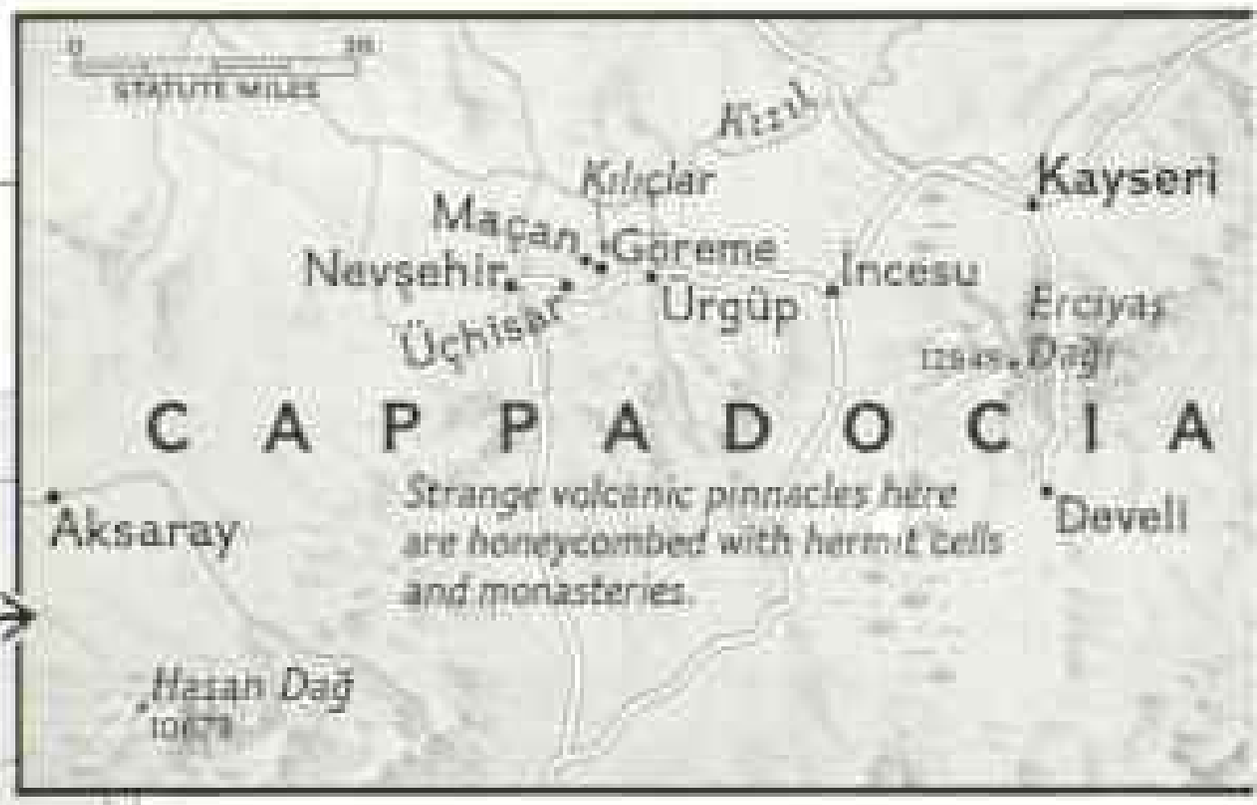
Though they sought retreat from the world, the desert fathers were far from being uncivilized. Often they were leaders in the arts and letters. (See "Where Early Christians Lived in Cones of Rock," by John D. Whiting, National Geographic Magazine, December, 1939.)

Mother and Daughter Ride to Market in Ürgüp

Cappadocians, like four-fifths of all Turks, gain their living from the soil. Daily this farm wife toils in the fields beside her husband to make the semiarid plain produce. Over her head she wears a *yazma*, or printed shawl. This is one of the rural areas in Turkey where veils remain in use.

Farmer Leads His Donkey Through a Cone-studded Orchard

Volcanic pumice lies deep on the sandy fields. Grapes, melons, cereals, and vegetables grow amid the peaks and domes. Apricot, pear, apple, and walnut trees thrive.



Early Christians Found Haven in Cappadocia, Central Turkey

The First Letter of Peter, addressed to dispersed Christians, includes the Cappadocians in its salutation.

The Biblical name Cappadocia has vanished from modern maps. The area, embracing some 37,000 square miles, covers parts of 10 Turkish provinces. Kayseri has been a crossroads of commerce since Roman times.

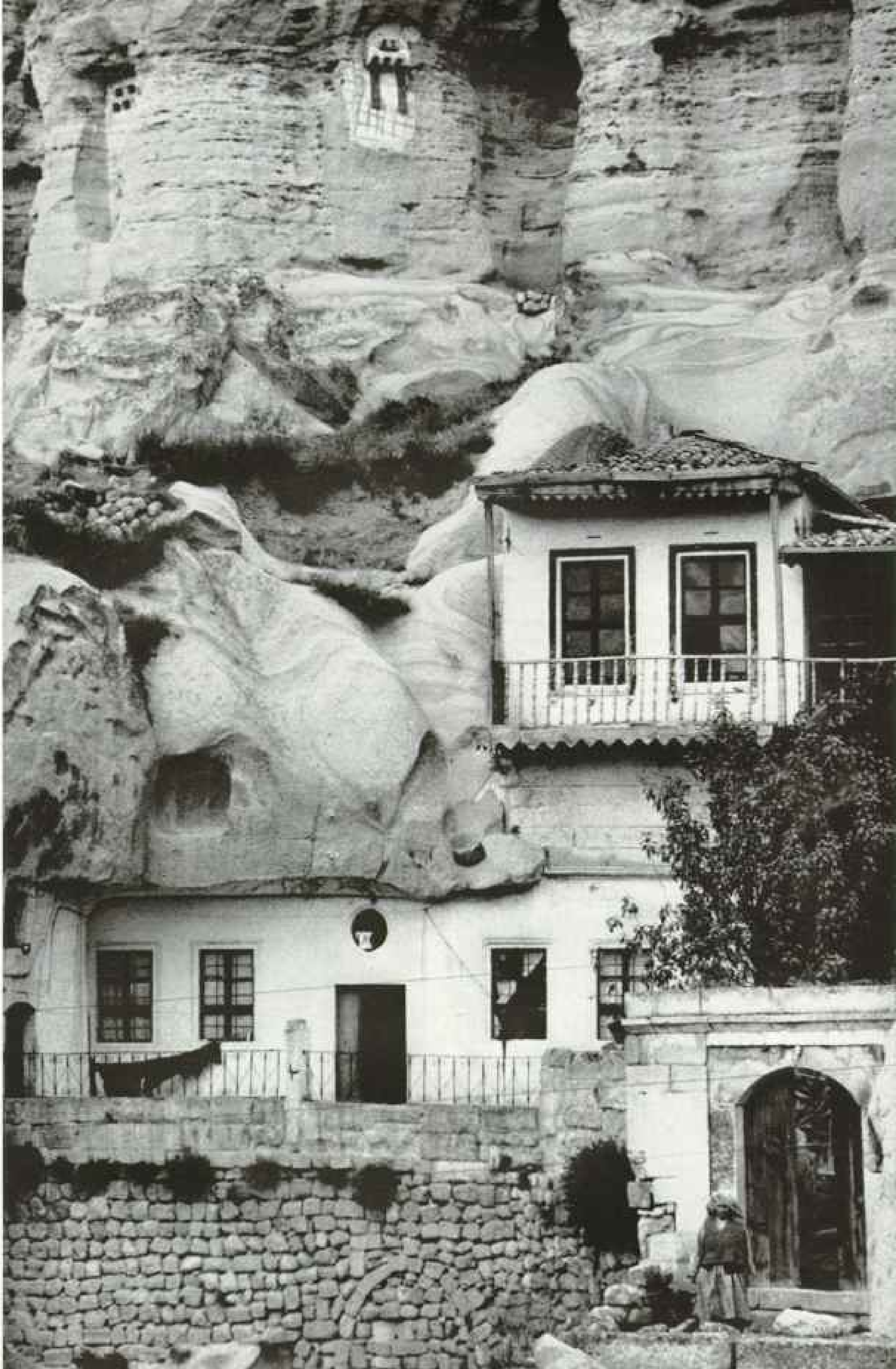
Gabled Balconies and Arched Doors Dress House Façades in Ürgüp, a Cave-dwellers' Town Built into a Cliff

Like the false-front towns on motion-picture lots, Ürgüp reveals but two dimensions; its depth is concealed behind solid rock. Chambers facing the street are windowed, but others remain in darkness the year round. Most families eat and sleep in front rooms and use the unlit quarters for storage. Wooden window frames, iron grillwork, and painted walls mark this two-story dwelling as the home of a well-to-do family.

An Ürgüp Family Celebrates a Moslem Holiday with a Feast

Sitting on rugs in their house carved from stone, this circle of close relatives dines on fruits grown in the cone country. Main dish (center) is the Malta plum. Cucumbers are sliced and eaten raw. Tablecloth serves as a communal napkin. Two of the women plait their hair in a score of braids, an old Turkish custom. The men's up-to-date dress contrasts with the traditional costume of the women.

George Pickow, Three Lions

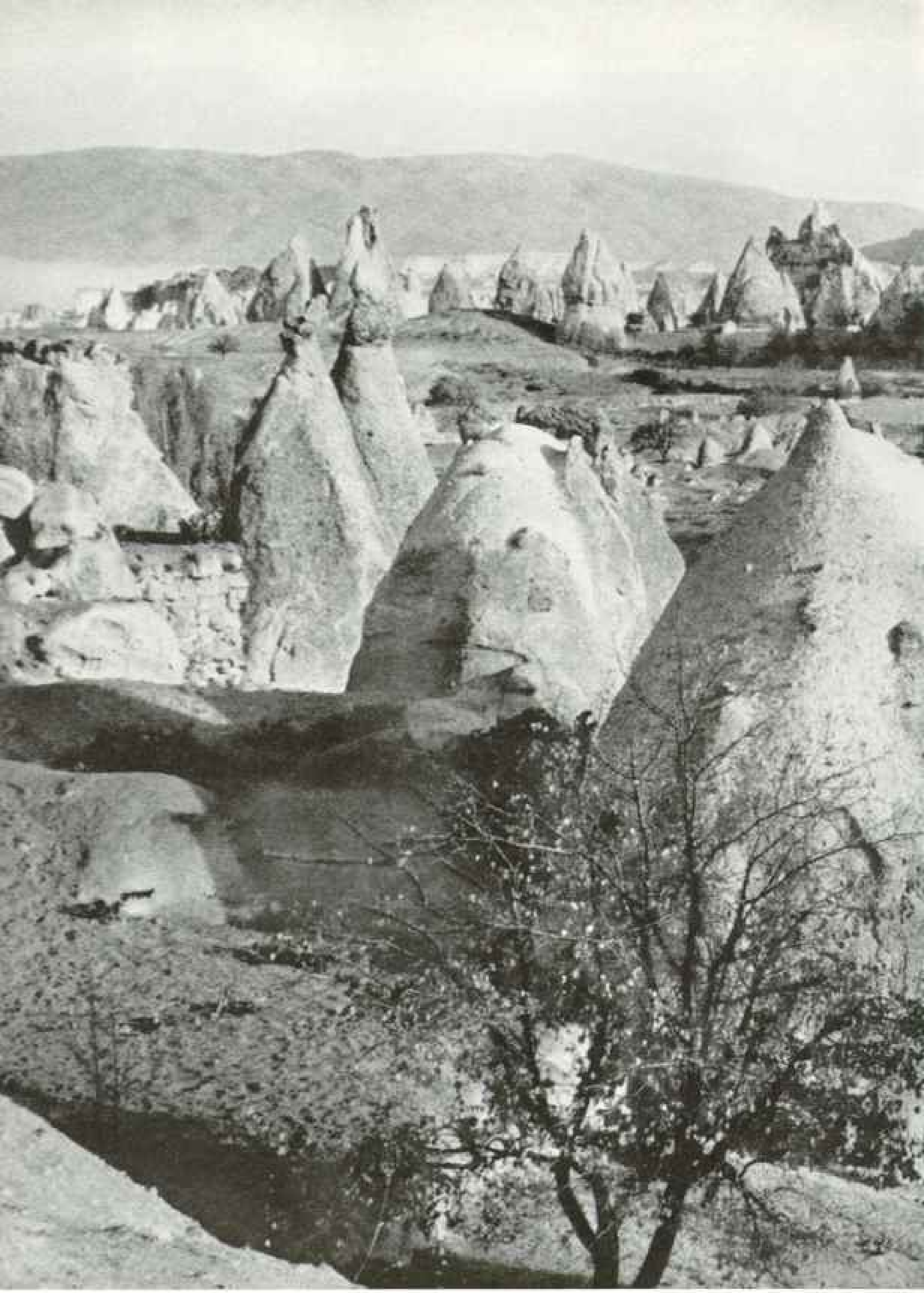


Women Perform Heavy Chores

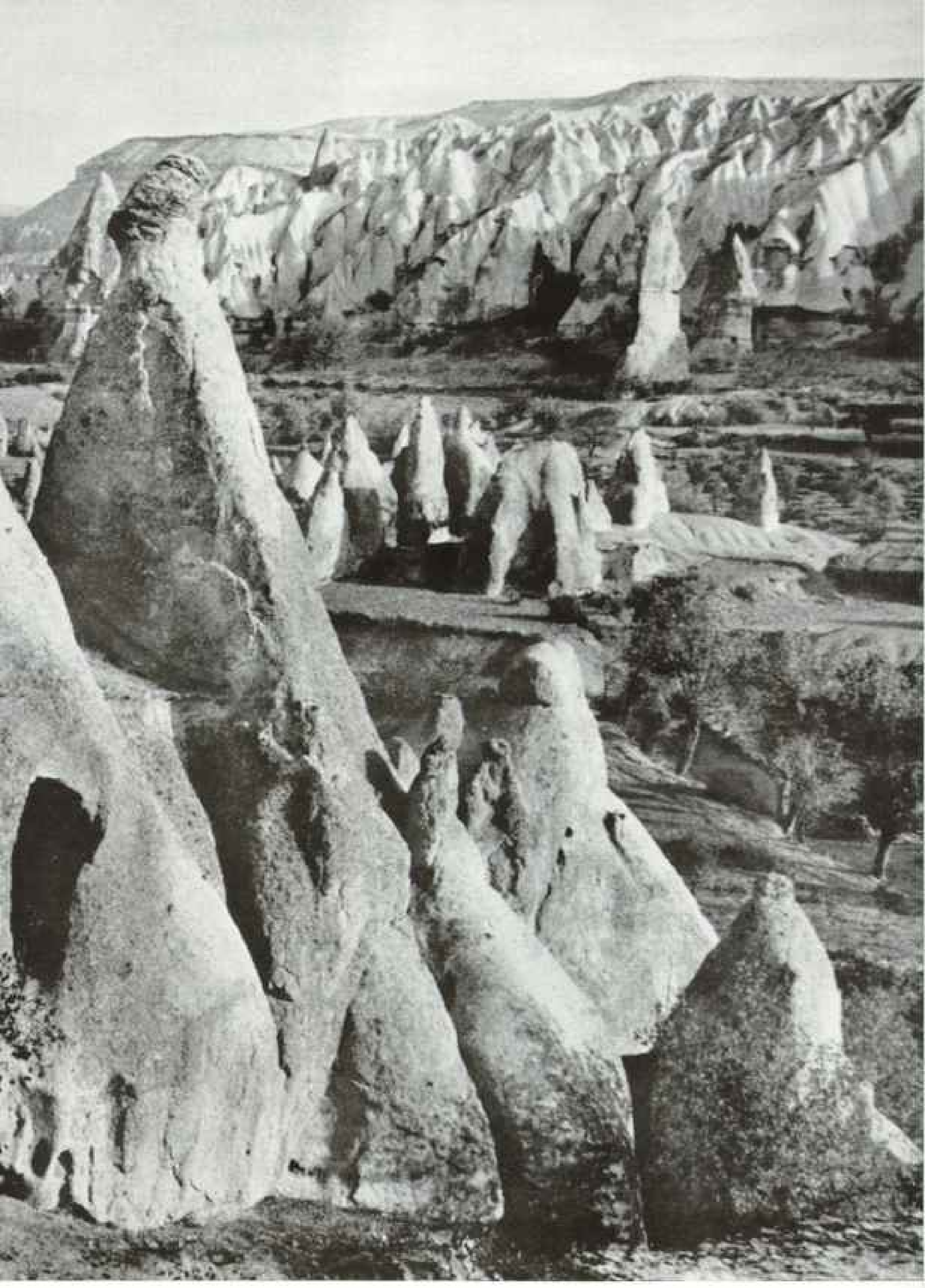
A housewife at Ürgüp's public fountain (right) goads her balky donkey to quit the trough. She is moving to a new home, and all her household possessions ride the beast's back. Two jolly friends laugh at her plight.

Water jugs filled, the woman above heads home.

Cone dweller below spins wool by hand. She prefers the sunlit street to her dark quarters.



Rock Cones, Resembling Indian Tepees, Spread Across the Valley of Kılıçlar;



Towering Spires Stand Guard amid Oasislike Gardens Dotting the Sandy Floor

Cone's Single Room Serves a Family of Seven

Mother, father, four children, and a grandmother eat and sleep in this chamber. The chimney carved on the far wall is decorated with arabesques but has no flue. Women wear their veils even indoors; one works at her loom.

Mutton Hung Above the Door Will Dry in the Sun

Each Cappadocian farmer must be his own butcher and grocer. He stores his grain and grapes in caves. His dried meat feeds the family during the long winter. This man has stacked thorn brooms and cattle feed on the roof.

Seated Before Her Loom, a Cave Girl Weaves a Rug

In the cone's dim light she works for hours each day. The making of a carpet takes her about two years, but it will bring a fair price from an Urgüp merchant. Sample design at top serves as a model.

Hammers, Whitewash, and Brush Accomplish Spring House Cleaning

Smoke from the flueless chimney blackens the cone's interior. Once a year the inhabitants chip away the begrimed layer on ceiling and walls. The operation not only cleans the room but enlarges it.

Coat of whitewash completes the redecoration. A bundle of twigs serves as the brush.

Balancing atop a woven basket, this woman smears the ceiling. She cloaks her head and face against drippings. Like most women of Cappadocia, she wears baggy trousers in place of a skirt.

Spattered with the white liquid, a girl emerges smiling from her cone house near Maçan. Her task is done for another year.

Cone dwellings remain cool in summer and provide warm quarters even on below-zero days. In Maçan, once an early Christian bishopric, many residents have built modern flat-roofed houses.


3215
3215

Göreme's Bizarre Landscape Calls to Mind Dante's Inferno

Traveling the byways of Asia Minor's interior ranks as a difficult undertaking, even today. But the visitor who makes the venture wins an impression he never forgets.

This Ankara taxi recently carried the Melville Bell Grosvenors a circuitous 1,000 miles from the Turkish capital to Beirut, capital of Lebanon. A side trip from Kayseri took the Editor and his wife into the heart of the cone country.

"So narrow was the twisting, tortuous road that the cab's fenders scraped the rock walls," Dr. Grosvenor recalls. "As we rounded another of the seemingly thousand turns, this panorama burst into view. The cones and cliffs revealed an unearthly beauty."

Alighting from the car, the Grosvenors hiked across the tumbled terrain and climbed into high, hollowed cones. In one abandoned seven-story cone they scrambled up a narrow central shaft, "like Santa Claus up a chimney," stopping at each level to inspect the apartmentlike quarters. They found beds, tables, and closets carved in the rock, kitchens equipped with rock stoves and cupboards.

Exploring the deep, cavelike churches of the ancients, they came across subterranean refectories, wine presses, and cemeteries with graves cut into the floor.

Melville Bell Grosvenor (left and below)

Men and Cones Wear Caps at Rakish Angles

Sandstorms and rains gnaw at the small, soft mounds. These rock hats, already drunkenly askew, will one day tumble off, and the unprotected cones will crumble. The men repair a road between Ürgüp and Göreme.

Donkey Caravan Hauls Huge Jars of Grain

Flocks of pigeons roost in the deserted cones edging the road between Ürgüp and Üçhisar. Farmers have walled the windows but left holes for the birds. Once a year they collect guano from the dovecotes to fertilize their fields.

Sacred Frescoes Embellish Göreme's Rock-cut Churches

Biblical scenes and painted likenesses of saints and evangelists cover the walls of caves where Christian anchorites sought refuge and seclusion a millennium ago.

Images stand on columns in the apses, look down from small domes, and lean toward one another in the vaulting. The same forms and attitudes occur again and again.

Dome-shaped central room of the Karanlik Kilise, or Dark Church (above), is characteristic of Byzantine churches. Angels, archangels, apostles, prophets, and martyrs surround the figure of the Blessing of Christ.

Elias carries a scroll in the vaulting of Elmali Kilise, or Apple Church, named for dwarf apple trees that once grew outside its door.

Man Defiled This Chapel's Priceless Paintings

Walls of Tokali Kilise reveal the damage wrought by thousands of thoughtless visitors. Initialed autographs, the oldest dating back to 1650, have mutilated the frescoes almost beyond recognition. Scenes above the pillars (left to right) show Matthew at receipt of custom; disciple fishermen on the Sea of Galilee; and the marriage feast in Cana.

Melville Bell Grosvenor (opposite) and Gerry Shrader, Black Star (above)

Bargaining in the Livestock Market Is a Time-honored Ritual

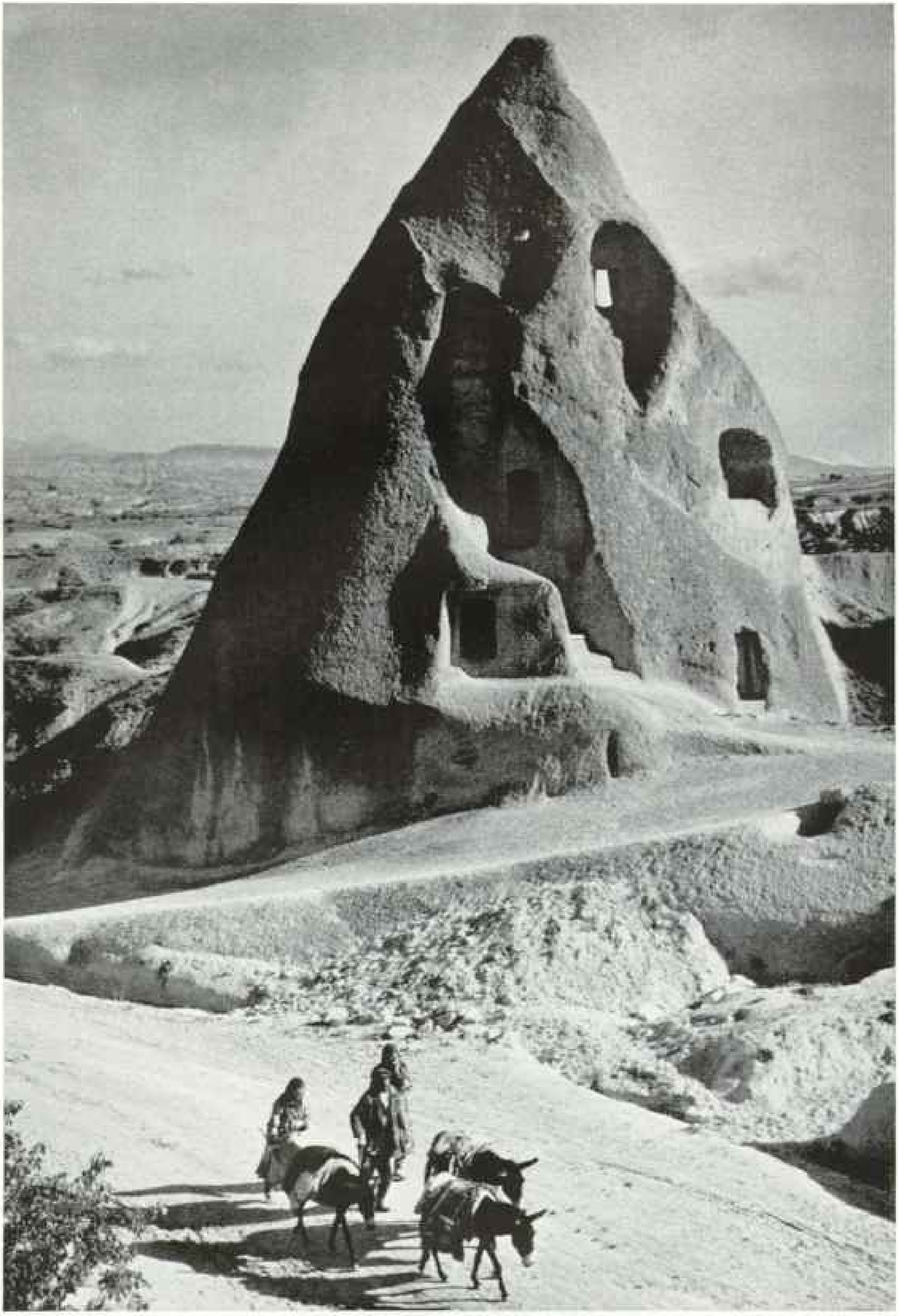
A trip to the open-air market is a rare treat for these youngsters, one hugging her father and the other gravely watching the photographer.

Perched on a hilltop, elders haggle over the price of goats and sheep and bewail the small profits on their sales.

Goats form a basic resource of pastoral peoples in central Anatolia. In fact, the Angora goat (lower right) gets its name from a Turkish province—Ankara, formerly Angora. Four sheep cluster near the men.

Moslem Washes His Feet Before Going Indoors to Pray

Wall rack holds the farmer's flower garden. His plants grow in bottomless earthen jugs turned upside down.



Weathering Walls near Üçhisar Expose a Cone's Honeycombed Heart

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Don Smith lives in New Orleans. Three years ago, when Don wrote to us, he knew nothing about art—even doubted he had talent. Today, he is an illustrator with a leading advertising agency—and has a future as big as he wants to make it.

Harriet Kuzniewski was bored with an "ordinary" job when she sent for our talent test. Once convinced that she had the makings of an artist—she started to study under our program. Soon she was offered a job as a fashion artist. A year later, she became assistant art editor of a big buying office.

Earns 7 Times As Much

Eric Ericson of Minneapolis was a clerk when he enrolled with us. Now, he heads an advertising art studio business and earns *seven times* his former salary.

John Busketta worked for a big gas company when he enrolled with us. He still works for the same company—but as an artist in the advertising department. At a big increase in pay!

After taking our training, busy New York mother, Elizabeth Merrisk, now adds to her family's income by designing greeting cards and illustrating children's books.

Earns $1,000 on Vacation

After studying with us, H. I. Hopkinson, a Wyoming school superintendent, sold $1,000 worth of paintings during summer vacation and was commissioned to work on a large mural for the new Mormon Temple in Los Angeles.

John Whitaker of Memphis was an airline clerk when he enrolled with us. Two years later, he won a prize in a cartooning contest and was signed to do a daily newspaper comic strip.

Stanley Bowen—a married man with three children, unhappy in a dead-end job—switched to a great new career in art. Now he's one of the happiest men you'll ever meet!

Profitable Hobby—at 72

A great-grandmother in Newark, Ohio, studied painting with us. Recently, she had her first local "one man" show—where she sold 32 water colors and 5 oil paintings.

Lilian Ashby, Toronto, writes: "I believe I've painted 57 and sold 41 pictures since beginning your wonderful course."

Cowboy Starts Art Business

Donald Kern—a cowboy from Miles City, Montana—studied art with us. Now he paints portraits, sells them for $250 each, and gets all the business he can handle.

Gertrude Vander Poel had never drawn a thing until she started studying with us. Now a swank New York gallery exhibits her paintings for sale.

How about you? Wouldn't you like to trade places with these happy artists?

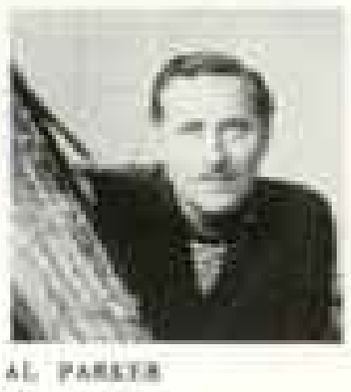
Free Art Talent Test

Now you can find out if you have talent worth training for a full-time or part-time art career. Simply send for our revealing 12-page talent test. Thousands paid $1 for this test but we'll send it to you *free*. If you show promise, you'll be eligible for at-home training under the now-famous program we direct. No obligation. Mail coupon today.

America's 12 Most Famous Artists


ALBERT DORNE


NORMAN ROCKWELL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STEVAN DOHANOS


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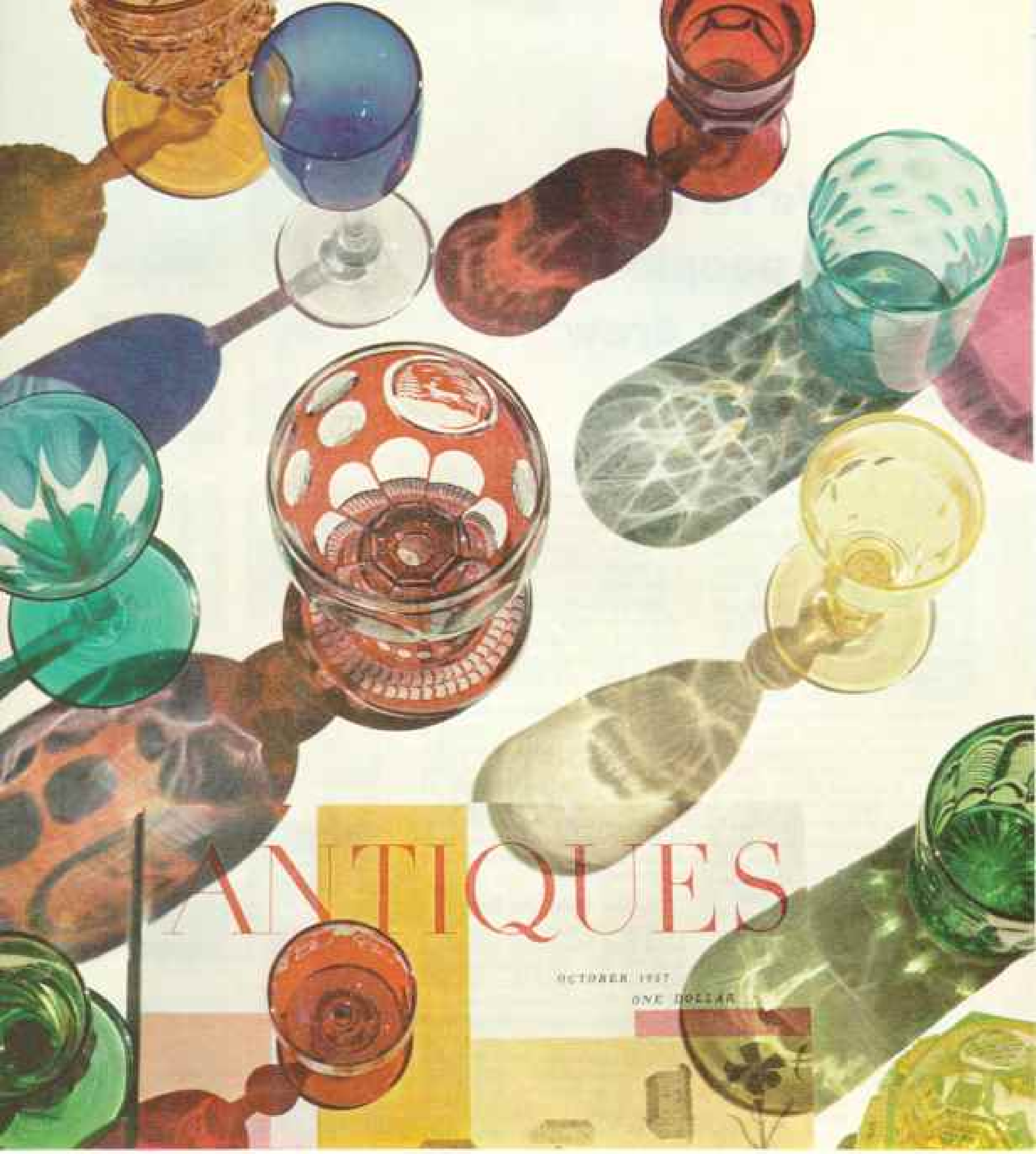
AUSTIN BRIGGS

FAMOUS ARTISTS SCHOOLS
Studio 512, Westport, Conn.
Send me, without obligation, your Famous Artists Talent Test.

Mr.
Mrs. _____ Age_____
Miss (PLEASE PRINT)
Address _____

City_____ Zone_____

County_____ State_____



NATIONAL GEOGRAPHIC SOCIETY

JUST 70 YEARS AGO this month the National Geographic Society was born.

On the misty evening of January 13, 1888, a little group of scientists, explorers, and other forward-looking citizens of the Nation's Capital met at the old Cosmos Club, near the White House, and decided to organize "a society for the increase and diffusion of geographic knowledge."

Among the founders were some of the finest minds —as well as many of the most impressive beards—in the Washington of the '80's. But even the most optimistic could hardly have foreseen the phenomenal growth of this infant society and the slim little journal which appeared a few months later with the title, "The National Geographic Magazine." It undertook to come out only at "irregular intervals." Membership at the time totaled 200.

Today The Society's Magazine each month goes to 2,175,000 members throughout the world. This year the unprecedented total of *16 million* full-color maps will be mailed to members as supplements to their Magazine, for on this anniversary The Society is embarking on a greatly expanded world mapping program, the Atlas Map series.

Instead of four supplement maps, members in 1958 will receive seven, all of uniform and practicable size for handy use. This continuing series will enable each member to build up gradually his own home National Geographic Atlas of the world.

Veteran of 37 years with The Society, Chief Cartographer James M. Darley launches the new Atlas Map series (page 66).

RECOMMENDATION FOR . . . AND INQUIRY ABOUT *Membership*

Members of The Society roam the world through the pages of their official journal, the NATIONAL GEOGRAPHIC MAGAZINE. Their enthusiastic nomination of friends for membership explains The Society's phenomenal growth. Members receive the Magazine and its 10-color maps without cost beyond their annual dues, which are less than nonmember subscriptions.

Those who are interested in The Society's work and its Magazine but do not know a member should inquire (below) concerning membership.

TO: THE SECRETARY
NATIONAL GEOGRAPHIC SOCIETY
WASHINGTON 6, D. C.

CANDIDATE FOR MEMBERSHIP (PLEASE PRINT)

STREET

CITY, ZONE, STATE

MEMBERSHIP DUES OF $6.50 INCLUDE SUBSCRIPTION TO THE NATIONAL GEOGRAPHIC MAGAZINE

Please fill in section that applies:

☐ **I NOMINATE** for membership the candidate above. (Use separate sheet for additional nominations.)

☐ **(GIFT MEMBERSHIP)** I nominate and enclose $_____ for dues of candidate shown at upper right. Please send gift card to recipient. ☐ Yes ☐ No

☐ **I DESIRE INFORMATION** regarding membership and the NATIONAL GEOGRAPHIC MAGAZINE. (Fill in upper form.)

FOR CALENDAR YEAR 1958. $6.50 rate applies in United States, U.S. Poss., and Canada. Countries in the Postal Union of the Americas and Spain, $7.00. Elsewhere, $8.00. (Determined by postage differentials.) Life Membership, $150.00 U.S. funds. Make remittances payable to and send direct to National Geographic Society. 1-58

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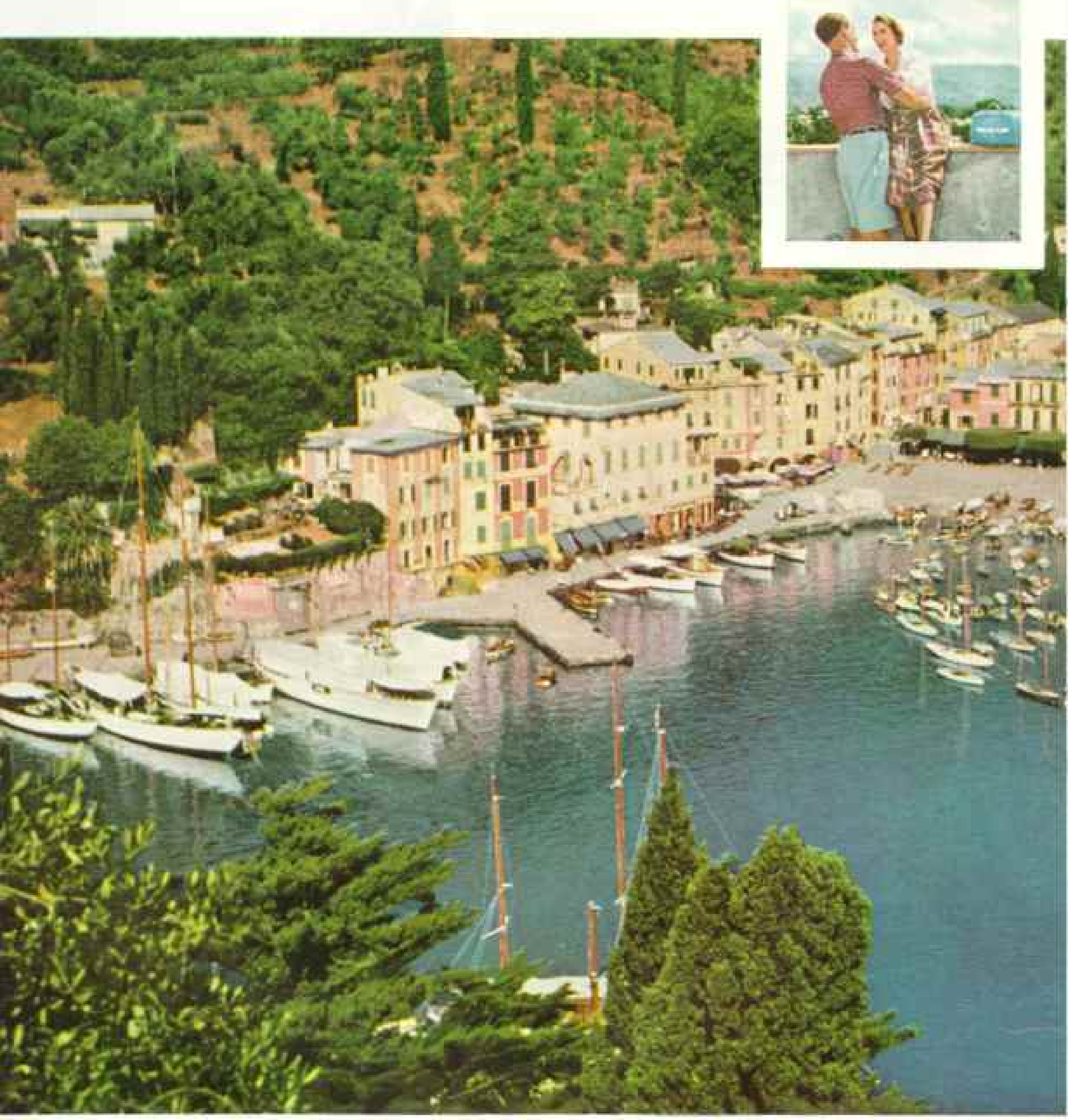
NOMINATOR (PLEASE PRINT)

STREET

CITY, ZONE, STATE

Members and others interested in The Society's work may make gifts or bequests of money, securities, or other property for "the increase and diffusion of geographic knowledge." Such gifts are deductible for tax purposes.

Discover your own Secret World on even a 2-week vacation



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Armed with only a two-week vacation and the swift wings of Pan American's high-flying Clippers, you can steal away to any place your heart desires.

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West Coast to Hawaii	9 hrs.	$25
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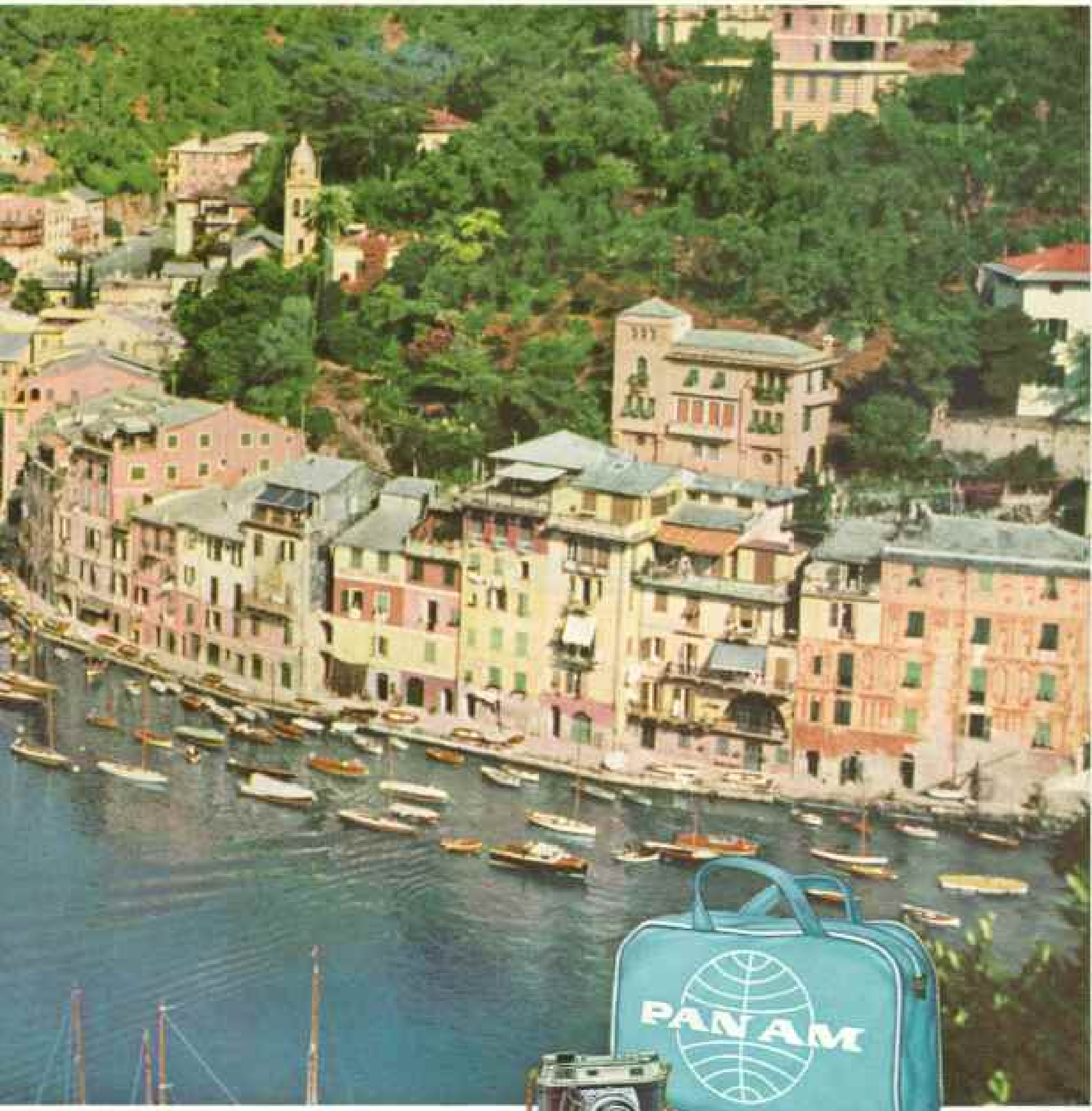
Miami to Buenos Aires	16½ hrs.	58†

†Tourist excursion fare



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Studebaker President

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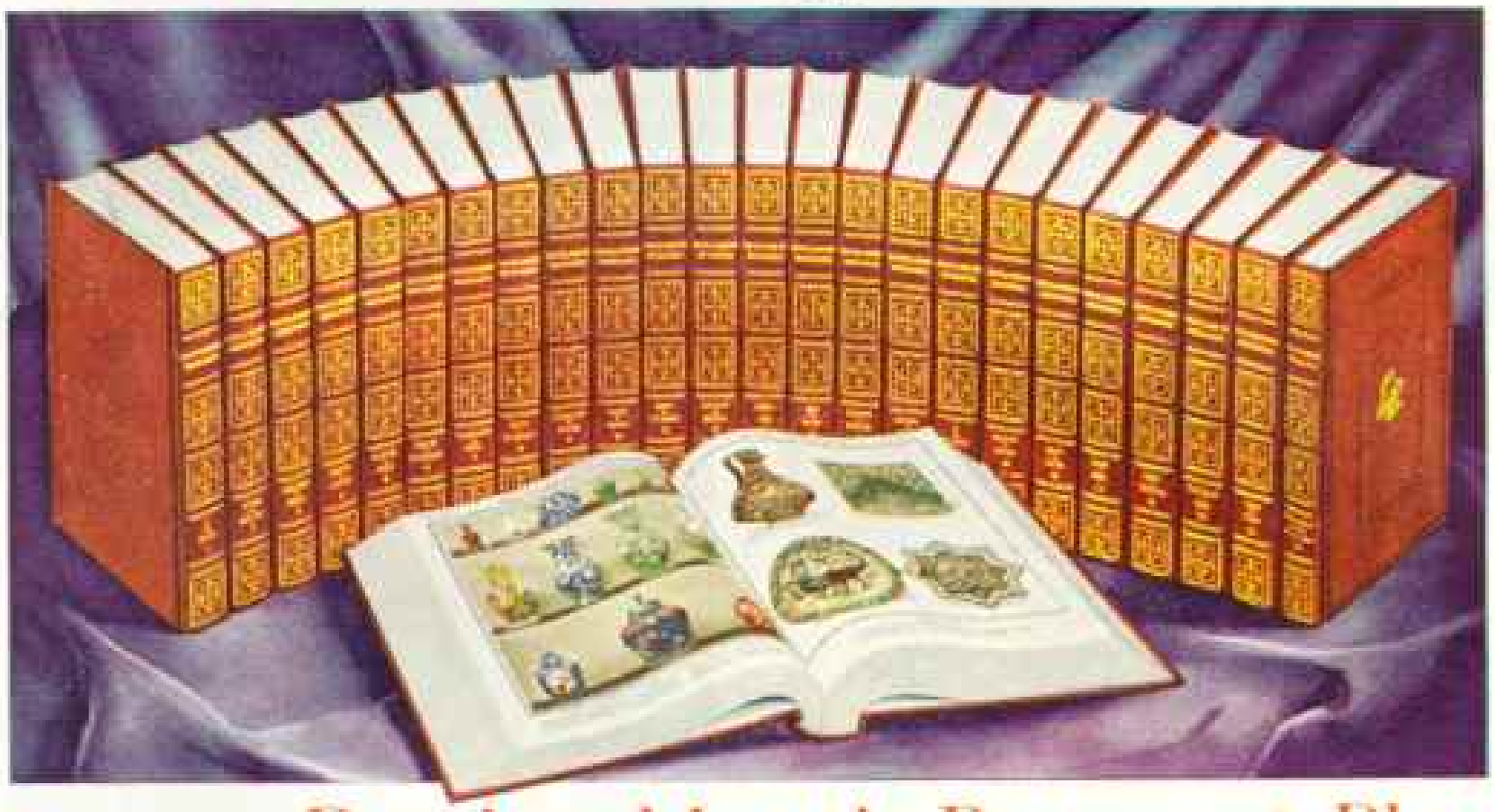

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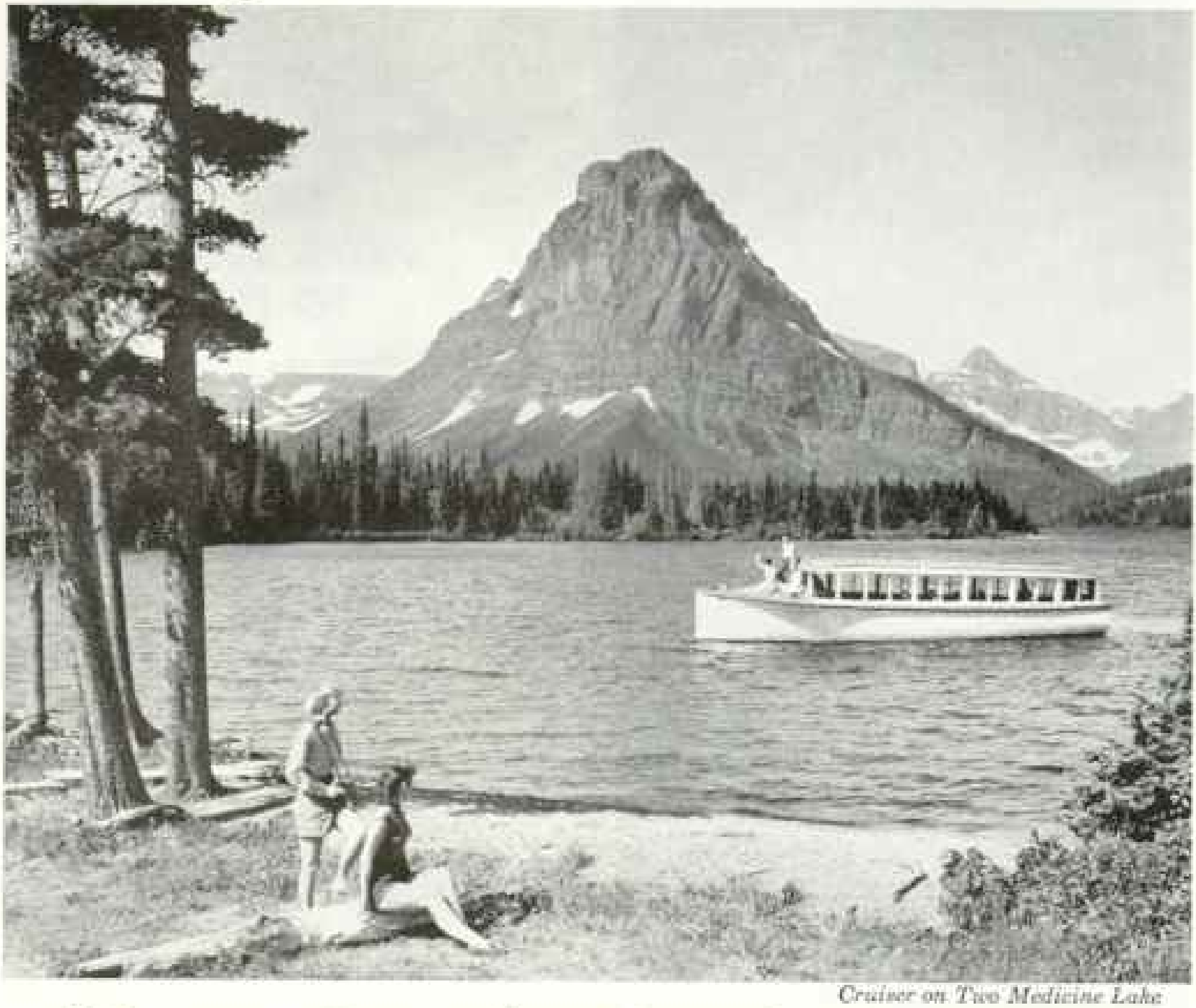

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What a vacation you'll have in this unspoiled wonderland carved by ancient glaciers. Enjoy rustic luxury, superb meals at Glacier Park's hotels. Thrill to nature's most magnificent mountain grandeur from motor launches on Glacier's sparkling lakes . . . from open-top buses on scenic mountain highways. Hiking, riding, fishing, too. Unforgettable.

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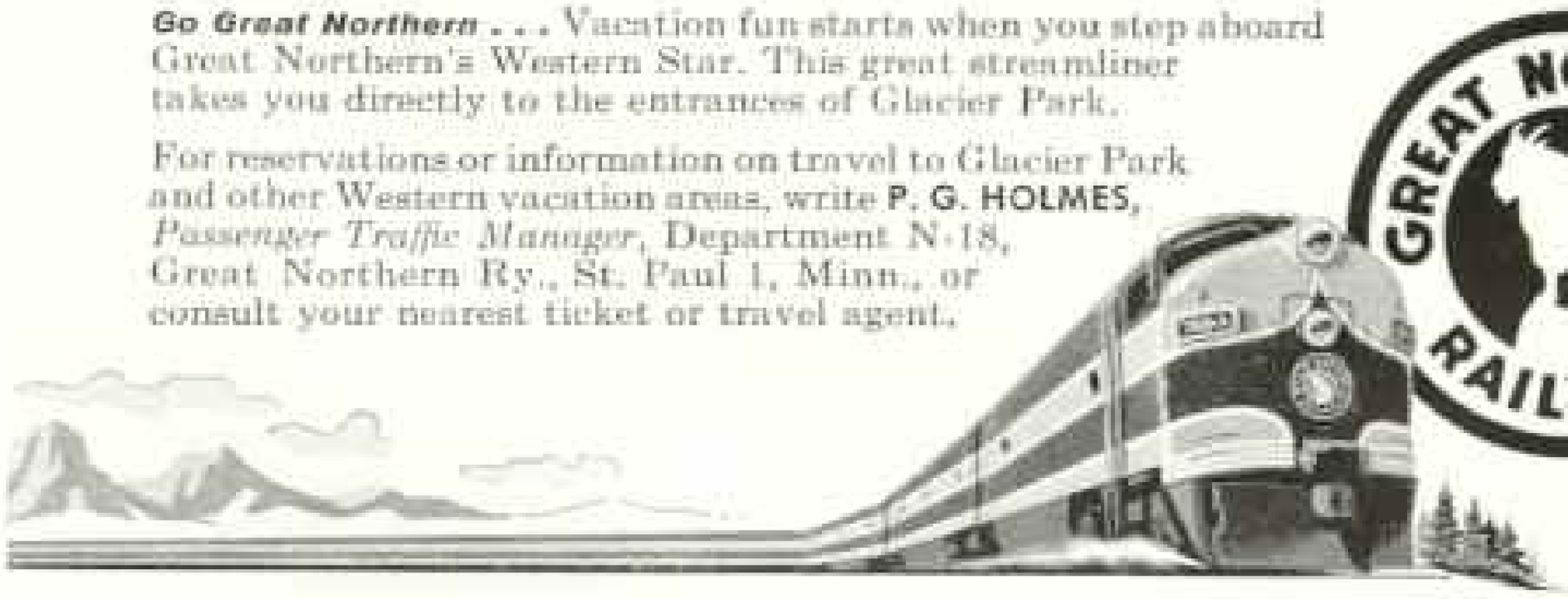

SOUTH CAROLINA

No, your eyes do not deceive you. Even those who know every magic lane and secret path of the Versailles Gardens in France might not quite guess here pictured are the Brookgreen Gardens near Myrtle Beach. South Carolina is a world in itself—settings that are the very image of England, of South Pacific, of other far off places. Come soon . . . stay long. Fabulous motels to delight you and your purse . . . luxurious hotels for carefree budgets.

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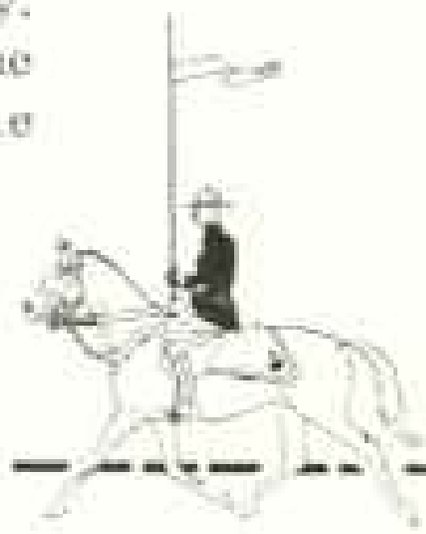

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OUR WINTER SIGHTS always flabbergast visitors. Poinsettias wave red blooms big as hats. White and crimson geranium lawns, camellias common as back-yard lemon trees!

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Out on the Pacific beaches, dour pelicans watch as you beachcomb for sea souvenirs...sleek seals bark from their rocky perches, world travelers board ocean liners.

Meanwhile, in the lush valleys, our oranges are growing plump and golden. For strange contrast, drive an hour over the mountains...come upon a ghost town asleep in the warm desert.

All the while keep tabs on Hollywood premieres, visit sleepy Spanish missions, dine Chinese style practically in City Hall's shadow.

IT'S WINTER, BUT ONLY ON THE CALENDAR. So escape cold, gray days—plan *your* Southern California winter vacation *now*. On arrival, visit All-Year Club Tourist Information Center at 628 W. 6th St., Los Angeles for aid in planning your stay.

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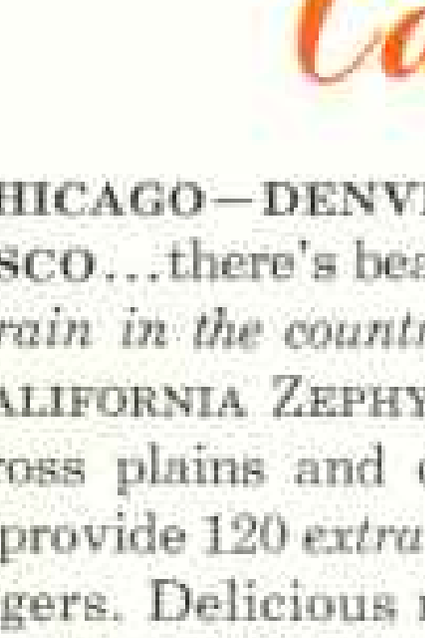

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Will you "weather the winter" in good health?

During the stormy, disagreeable winter months, colds, pneumonia and influenza may strike with increasing frequency. And this winter brings another variety of influenza—"Asian flu."

The symptoms of "Asian flu" are much like those of other "grippy" colds . . . fever, marked tiredness, and aching. Should these symptoms occur, call your doctor, go to bed . . . and stay there until he tells you that the likelihood of complications is over. Barring complications, doctors recommend home care rather than hospital treatment.

"Asian flu," like a severe cold, can lead to pneumonia. Medical science, however, has become increasingly skillful in treating pneumonia. Today, all but a very small proportion of pneumonia cases are saved. But treatment must be started promptly to bring pneumonia under control quickly.

How you combat any respiratory disease depends a lot on your physical condition. While it is wise to maintain your general health in every way, it is equally wise to take preventive measures which may help guard against all respiratory infections.

Keep away from crowds as much as you can.

Guard against chilling and dress warmly.

Avoid people who have respiratory disease.

Cover your coughs and sneezes with paper tissues.

Dispose of used tissues immediately.

Wash your hands thoroughly before eating.

Isolate any member of your family who has cold or flu-like symptoms.

Your doctor may also advise vaccination against "Asian flu."

Be sure to stay in bed as long as your doctor recommends.

Metropolitan's new Home Nursing Handbook explains what you can do for a sick person's comfort, contentment and recovery. Use the coupon below for your free copy.

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—and Mooremack takes you to it!

You're in Rio, one of the great continental cities, on your Mooremack Luxury Cruise to South America.

Here is one of the most beautiful walks you'll ever take! At left is shining Copacabana Beach . . . at right, the glittering city itself. You arrive tanned and refreshed, from sailing the smoothest of seas under a summer sun.

Mooremack puts in at so *many* exotic ports! Give yourself that long-deferred look at South America—and do it the easy, comfortable way!

And when you're talking comfort, ease, and luxurious living at sea—you're talking Mooremack's language! If you feel worked out, tired of the same old daily grind—a cruise in the soft salt air—under the warm summer sun—will make you feel 20 years younger!

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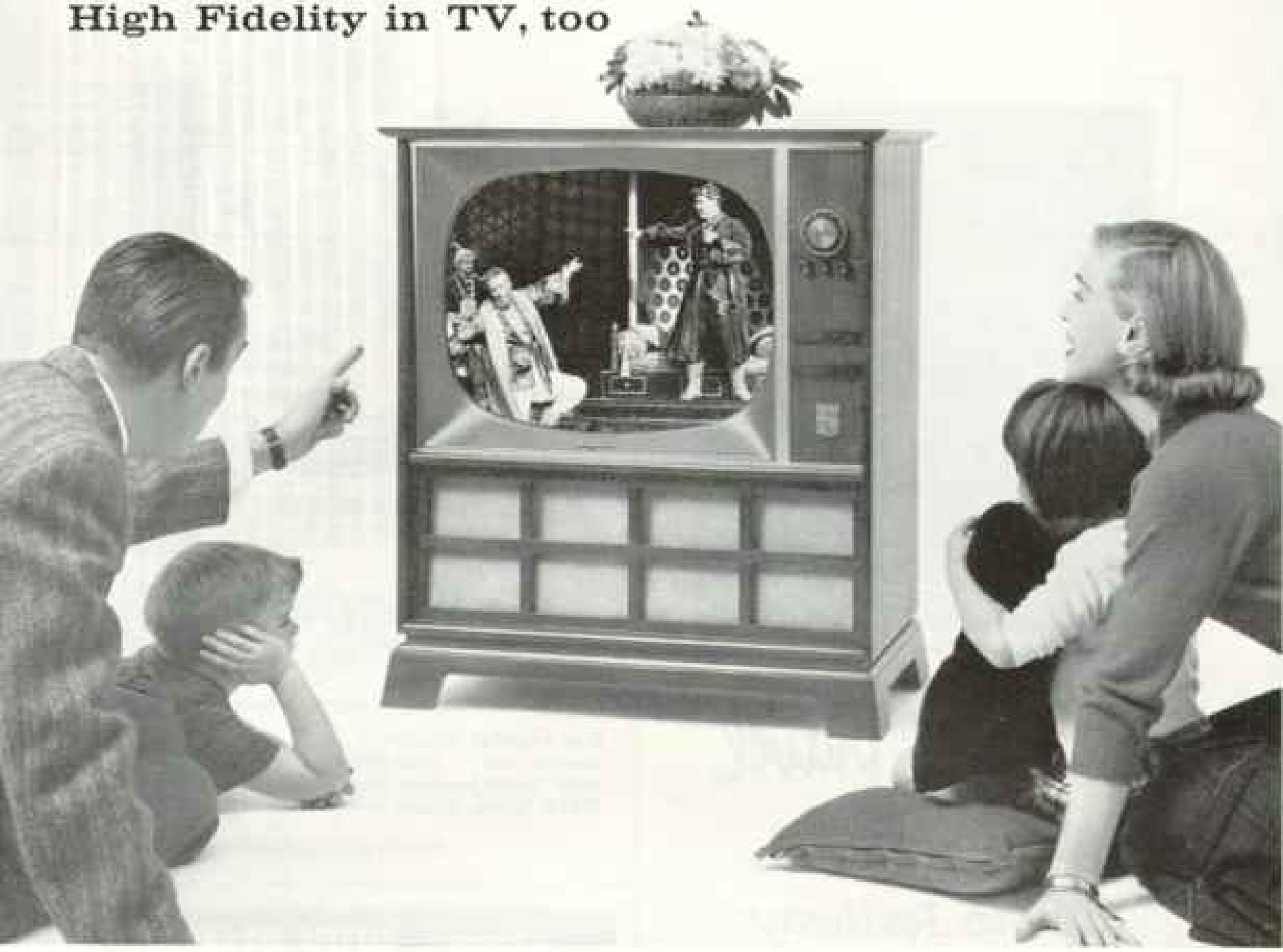

The Diplomat 24. *10-watt, 4-speaker HiFi sound system superbly re-creates the realism and excitement of every program, adding the breath of life to magnificent Chromatic picture. In a variety of genuine woods. In mahogany, $399.50.*

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1. The Constellation. *Big picture TV, in a selection of finishes. In cordovan, $199.90.* **2. The Continental.** *Superb HiFi radio-phonograph, 25-watt dual channel amplifier, exponential treble horn and 15" bass speaker. In a variety of woods. From $389.50.* **3. The Duette HiFi.** *3-speaker automatic with Diamond pickup. In mahogany, $229.90.* **4. The Videorama.** *Chromatic picture with 4-speaker stereosonic realism. In mahogany, $299.50.* **5. The Magnasonic 410.** *Magnificent music from powerful 4-speaker sound system. 15" bass, 8" and 2-5" treble speakers. Diamond pickup record changer is concealed by gliding glass panel. In mahogany, $199.50.*

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Prices and specifications subject to change without notice. The Magnavox Company, Fort Wayne, Indiana

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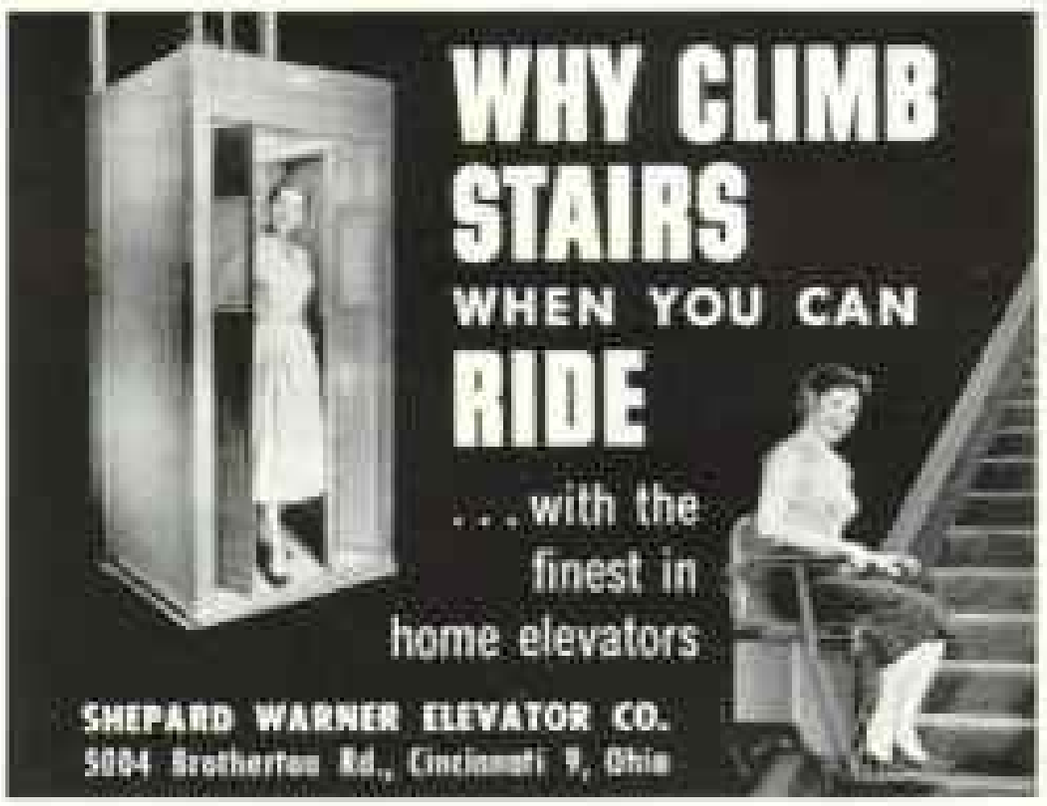

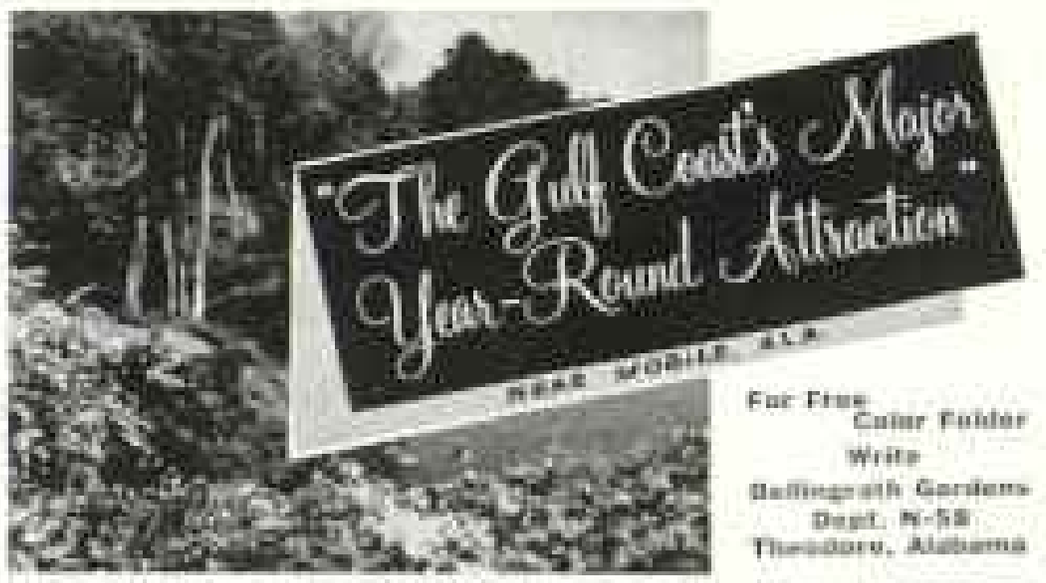

You get more for less in South America because

YOUR DOLLARS GO FURTHER

You go for less because there's a 30% reduction in air fares to South America. And you live for less during your stay because favorable exchange rates stretch your dollars.

Day-by-day itinerary of a typical tour tells you how much you can see and do in the continent of contrasts. All packed and ready? Then let's go!

Leave New York after lunch. Fly by way of Miami to Panama. You'll be there in the late evening. You'll find a room with bath waiting at deluxe Hotel El Panamá.

Next morning, a car will pick you up to drive you through Panama City, out to the ruins of Old Panama, along the seafront to Ancon and Balboa and to the Miraflores Locks in the Canal.

That night, you'll leave Panama and fly to Lima, Peru, arriving in time for breakfast. On your way from the airport to the Hotel Bolivar, you'll discover that you're in one of the loveliest cities in the world. Wide avenues with beautiful homes, narrow streets overhung with wooden balconies . . . great plazas with imposing old Spanish architecture.

Lima is exciting, and you'll be there several days. A sightseeing drive will take you to see the Bull Ring, Tomb of Pizarro, Hall of the Inquisition, mansions, suburbs and Inca Museum. You'll have extra time for golf, swimming, shopping. You'll find fabulous bargains in silver. Though in the tropic zone, Lima is cooled by the Humboldt Current, has a year-round average temperature of 70°.

On the morning of the 7th day, you wave farewell to Lima and take off for Santiago, Chile. This flight will show you some of the greatest peaks of the Andes. And after you've lunched you can watch for the first appearance of modern Santiago, nestled in a valley between walls of peaks. Streamlined houses sit in flower gardens. You'll drive from the airport to the splendid Carrera Hotel via beautiful Avenida O'Higgins. Its name is one of many traces you'll find of British and Irish ancestry in Chile.

In the next 3 days, you'll have a sightseeing drive to see buildings, parks, gardens, the shopping district, Opera House, and to the top of San Cristobal Hill at nightfall just as the city lights go on. Another day, you'll have first-class rail tickets to Valparaiso, seaport next to Viña del Mar, the "Monte Carlo of Chile."

Across the Andes on the 11th day. You'll leave Santiago after lunch and arrive in Buenos Aires, Argentina, at dusk. This flight takes you within sight of Aconcagua, highest mountain in the New World. Crossing the Andes is the most dramatic 20 minutes you could have anywhere in the world.

Buenos Aires, called "The Paris of South America," will woo you with its beauty, gaiety, sophistication . . . and with Argentine beef that is thick, juicy, tender and costs next to nothing. Filet Mignon, 50¢; Sirloin, 47¢; Tenderloin, 45¢. You'll stay at the Hotel City for five days with time to explore on your own. And you'll have a guided sightseeing drive to the Opera House, Capitol, Casa Rosada, Rosedal, Palermo Park Racecourse, Paris-like boulevards and suburbs.

The morning of the 16th day, leave Buenos Aires and take an hour's flight over "The River of Silver" to Montevideo, Uruguay. You'll stay at the Victoria Plaza. Sightseeing will take you along the riverfront, to Carrasco and near-by beaches, to the Capitol and the top of the hill which gave Montevideo its name. You'll have time to drive to ocean beaches.

On the 18th day, fly on to São Paulo, Brazil. You'll arrive at the Hotel Othon Palace at what you might consider dinnertime. But in South America, cocktails start about 9. And dinner can last until midnight. In the next two days, you'll visit the famous Butantan Snake Farm. And travel first-class rail to Santos to visit the Coffee Exchange, Vila dos Passaros, Orchid Farm and near-by Guaruja.

On to Rio, on your 20th day. It's an hour's flight from São Paulo. Time will race as you admire the scenic coastline and reach the climax of your flight with your air view of the heavenly harbor. In Rio, you stay at the Hotel Miramar Palace. Your sightseeing will take you to beaches, the government and residential sections, to bayfront boulevards, and to the top of breath-taking Sugar Loaf.

On the 25th day, you'll fly overnight to San Juan, Puerto Rico. You stay at the Condado Beach Hotel with two days for sightseeing—as well as a drive to Morro Castle, Marine Gardens, old Spanish sections and School of Tropical Medicine. On the 28th day you fly to New York.

This is a typical tour. What does it cost? $926.80 from Miami . . . $988.40 from New York. Cost includes round trip by air, hotel accommodations, sightseeing.

Your flights are by pressurized DC-6Bs with Panagra (Pan American-Grace Airways) on the West Coast and by Pan American World Airways on the East. For slightly more, you can fly deluxe *El InterAmericano* DC-7s. Radar on all flights.

The stops and length of this trip are given as an example of what you can do down there with a dollar. There are many tours you can choose from. You can go with an escorted group of congenial travelers. Or you can travel independently, leaving any day you like. You can get a handful of free folders and read the whole story. Ask your Travel Agent or write to Mr. Don Wilson, **Panagra,** Room 4426, Chrysler Building, New York 17, N. Y.

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She helps people find the products and services they want. Vonna Shelton, telephone representative in Minneapolis, Minn., checks the advertisements business men have placed in the classified directory.

PHOTOGRAPH BY ANSEL ADAMS

This telephone girl is a big help to businesses

When you think of a telephone woman you probably think of the operator. But there are many other women in the telephone company who do interesting and important jobs for you. And they, too, have the "Voice with a Smile."

For example, Vonna Lou Shelton handles a very necessary service in the business man's world. She contacts hundreds of concerns in the Minneapolis area—helps them plan and place their advertising in the Yellow Pages of the telephone directory.

Friendliness, good judgment, and follow-through have won for Mrs. Shelton the confidence of business men who appreciate good, competent service and painstaking efficiency.

Vonna Lou's life is filled with people. Among her principal off-the-job interests are her husband and Sunday School class. She's a program chairman of a missionary society. Sparks many a fund-raising campaign. Goes to college to study piano and takes lessons to improve her golf.

Like so many folks in the telephone company, Mrs. Shelton has made a lot of friends—on her own, and on the job. "I don't know of any other work," she says, "that would bring me so close to all my neighbors. Our customers get to think of us as their personal representatives. I like that a lot."

YELLOW PAGES

Working together to bring people together . . . **Bell Telephone System**

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