

VOLUME CIII

NUMBER THREE

THE NATIONAL GEOGRAPHIC MAGAZINE

MARCH, 1953

New 10-Color Map of Mexico and Central America

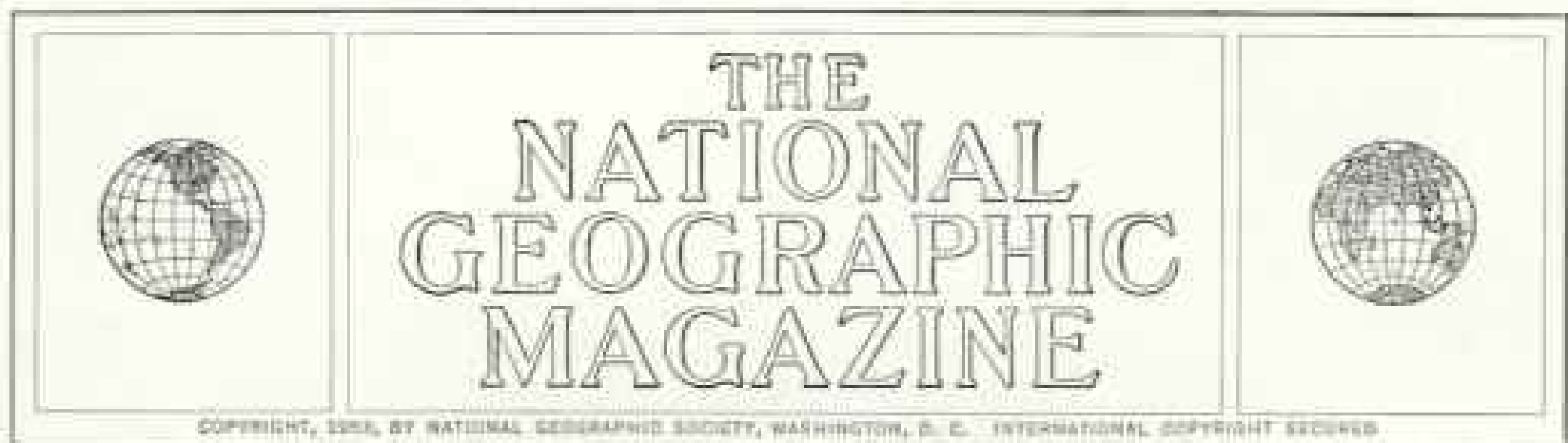
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Sixty-four Pages of Illustrations in Color

PUBLISHED BY THE
NATIONAL GEOGRAPHIC SOCIETY
WASHINGTON, D. C.

\$6.00 A YEAR

60c THE COPY



South Carolina Rediscovered

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A Native Son Finds Spectacular Changes in the "Moonlight and Magnolia" State, Scene of a Huge H-Bomb Project

BY HERBERT RAVENEL SASS

With Illustrations by National Geographic Photographer Robert F. Sisson

IN the "moonlight and magnolia" State of South Carolina a spectacular transformation is taking place.

The moonlight is still bright and the magnolias bloom as fragrantly as ever. On the broad baronies where the colonial landgraves once held sway, and on the blue waters where Blackbeard and beautiful Anne Bonny flaunted the cross-bones flag, the glamour of the past still enchants the visitor. But something more tangible compels attention.

There is, for instance, the dramatic fact that the State which founded the plantation system in the lower South is now the scene of history's mightiest industrial enterprise—the Savannah River Plant of the Atomic Energy Commission, generally known as the hydrogen-bomb plant.

The H-bomb, however, is a Federal, not a Carolinian, undertaking. More significant of South Carolina and its people is the fact that this traditionally agricultural State has made such industrial advances that it runs neck and neck with North Carolina for the textile leadership of the Nation.

Thus the South Carolina transformation does not depend upon the billion-dollar-plus atomic-energy project. The great change started years earlier, and was the product of individual initiative and free enterprise, not Federal action.

In the early 1900's two South Carolinians, Dr. W. Gill Wylie and William States Lee, persuaded James B. Duke of North Carolina to invest some of his tobacco fortune in the building of hydroelectric power plants in the Carolinas. Other daring Carolinians built

textile mills on what would now be considered a shoestring.

This was the real beginning of a Carolinian industrial revolution, which gained further momentum when, in the 1920's, New England textile mills started moving south in large numbers.

From January, 1945, to July, 1952, 993 new industrial plants were established in the State at a cost of about \$334,000,000, making a total postwar industrial growth in South Carolina of nearly 800 million dollars.

Cattle Encroach on Cotton

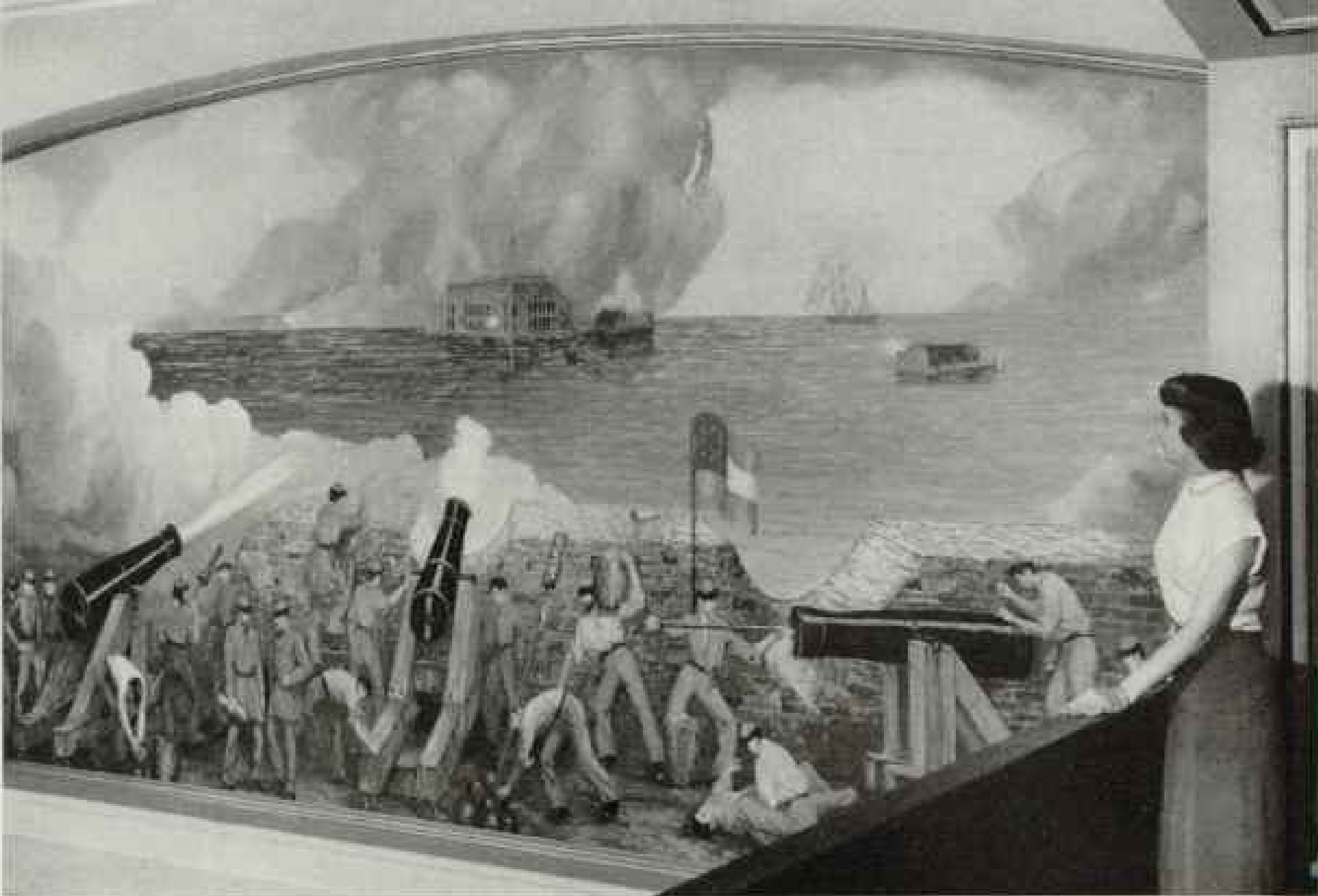
Also in the twenties a parallel revolution—against King Cotton—was launched in agriculture. This turned thousands of former cotton acres into lush pastures.

The balance between agriculture and industry, plus a tremendous development of electric power and of forest resources, together with a modern highway network of 23,000 miles, account for the newly prosperous South Carolina of today.

Most Carolinian journeys begin at Charleston, and many get no farther, for that unusual city, where I was born and reared, has allurements which can detain the traveler for weeks. I resolutely turned my back on my city's charms and set out to see the rest of South Carolina first (map, page 284).

The soaring John P. Grace Memorial Bridge over the Cooper River took me out of Charleston one spring morning (page 306).

From the span, 150 feet above high water, I looked across the narrow city at the green countryside to the northwest. There, one



Fort Sumter Burns, War Begins: a Charleston Hotel Mural Recalls the Battle

South Carolina suffered enormous losses in what it calls the "Confederate War." Economic ruin endured for years, but parallel revolutions in industry and agriculture restored prosperity. Southern forces bombarded the Union's Fort Sumter April 12-13, 1861, and forced its surrender. Alfred Hutty's painting shows gray-clad troops in Fort Johnson (foreground) manning their guns. A Confederate floating battery (right) joins the fray.

April day in 1670, after a rough voyage in which two vessels were wrecked, a band of about 140 Englishmen, a few Scots and Irish, and at least three Negro slaves planted the first permanent white settlement in South Carolina.

They had intended settling at Port Royal, some 50 miles to the south, where, more than a century earlier, French Huguenots under Jean Ribaut had established a short-lived colony. But "a very ingenious Indian," the cacique of the Kiawahs, persuaded Gov. William Sayle and his council that the west bank of the Ashley River, close to where the Kiawahs lived, was a better location.

Ten years later the town was moved to its present site: the peninsula between the Ashley and Cooper Rivers, which come together at its tip to form a spacious, landlocked harbor.

To this bustling village, in spite of Indian troubles and forays by the Spaniards, flocked new colonists—planters from Barbados, many rich in money and slaves; French Huguenots, destined for a major role in Carolina; German, Scottish, and Irish dissenters; and refugees from the rigors of New England's climate and religious zeal.

Two remarkable men launched the State—and indeed the whole deep South—upon the path it was long to follow. They were Anthony

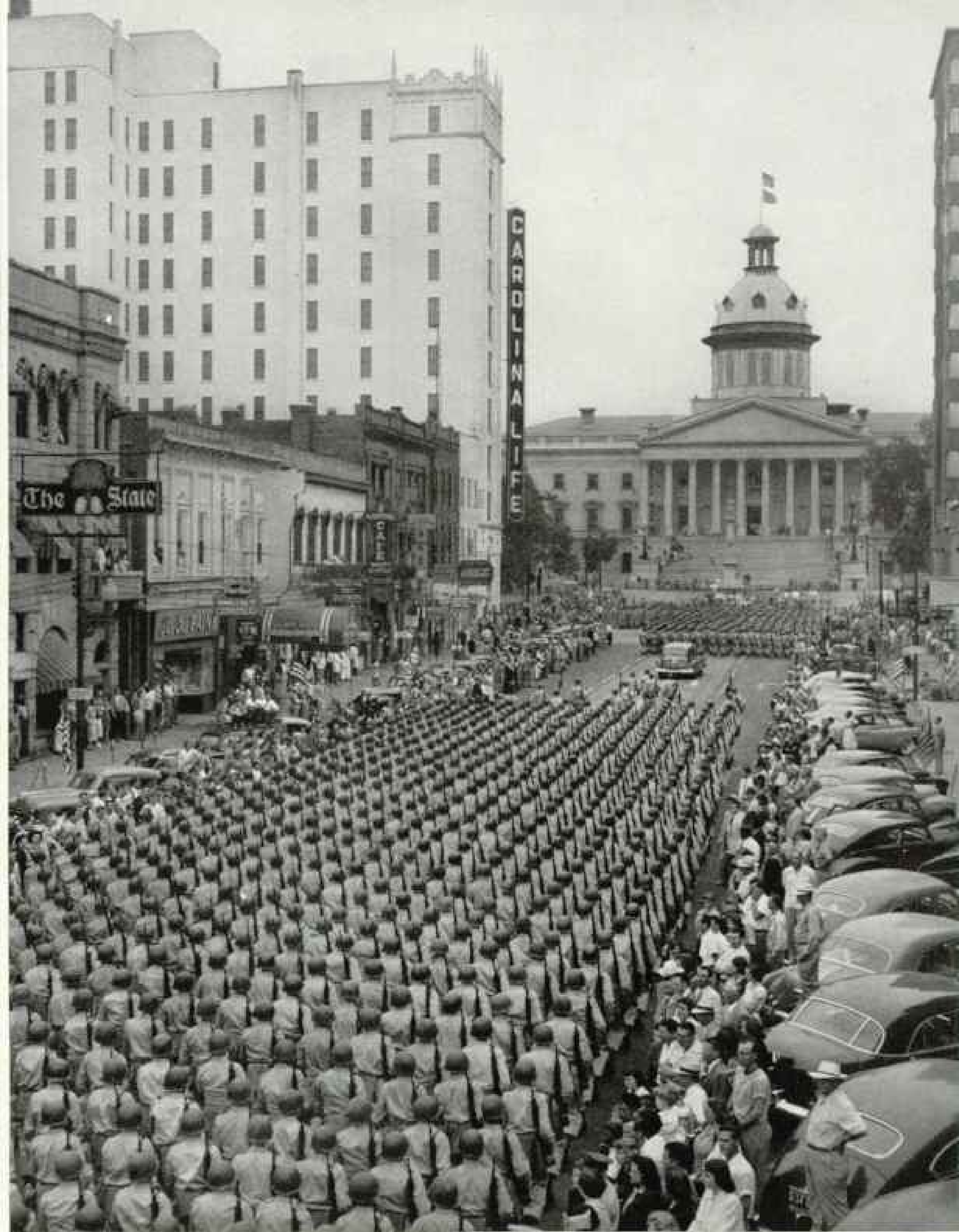
Ashley Cooper, Earl of Shaftesbury, ablest of a group of Cavalier Lords Proprietors to whom Charles II gave the tremendous wilderness known as Carolina; and Henry Woodward, an adventurous and versatile young Englishman.

Landed Gentry Dominated Colony

Shaftesbury believed that the old English society, built around an order of landed gentry, was the soundest social system ever devised. With the help of the philosopher John Locke, he planned the new colony of Carolina in accord with that conviction. Baronies and seigniories were laid out around Charleston (first called Charles Town or Charlestown), and a landed nobility was created, with the titles of landgrave and cacique.

To each landgrave four baronies of 12,000 acres each were allowed, and to each cacique two baronies. On their broad acres these privileged folk dwelt with feudal spaciousness and authority.

Titles disappeared when, after half a century, the rule of the Lords Proprietors ended and the colony was taken over by the Crown. But the landgrave and cacique system expanded easily and naturally into the "planter class," which was to dominate the State for nearly two centuries.



Soldiers 16 Abreast Pack Columbia's Main Street, Marching Toward the State Capitol

A political compromise led to the founding of Columbia in 1786. Prior to that time seaside Charleston was South Carolina's capital, but voters in the interior demanded a central seat of government (map, page 284). Unable to agree on an existing town, legislators bought farmlands and established Columbia. The city burned in 1865; 1,386 buildings were destroyed. Today the capital is a spacious, attractive community of 86,914 people.

Here, on Armed Forces Day, troops from near-by Fort Jackson march toward the columned State House. The building, only partly completed at the time of the fire, was not harmed.

That this happened was due in large measure to Woodward. His adventures with pirates, Spaniards, and savages had made him a figure of romance. His pathfinding journeys in the southern wilderness placed him among the foremost American woodsmen and explorers. But his most momentous adventure was a small agricultural experiment.

One day a New England brigantine, homeward bound from the Far East, put into Charleston Harbor. Her captain, John Thurber, delivered to Woodward a small bag of rice from Madagascar. Woodward planted it and in due time had an excellent yield. He distributed his surplus seed among his friends, who also planted it.

Rice Shaped Plantation System

That hour marked the establishment in the lower South of the plantation system which, with rice as its principal staple, flourished for 200 years on the South Carolina rice coast.

After the Revolution, the system marched westward, with cotton as its basis, to spread the plantation economy and philosophy from the South's Atlantic surf almost to the Rio Grande.

Other colorful memories of colonial Carolina came to mind as I gazed from the Cooper River bridge. Below me to the south lay a small marsh island known as Shutes Folly. There in the early 1700's many a pirate hung in chains as a warning to other sea rovers who might be planning an attack on ships carrying the colony's rice and other produce to England.

The warning wasn't always heeded. Once Capt. Edward Teach, the dread Blackbeard, with a corsair fleet blockaded Charleston and threatened to burn the town. Somewhere in sight of my high station was the spot where handsome and ruthless Anne Bonny—"Anne of the Indies"—grew up as a plantation girl before she went adventuring with Capt. "Calico Jack" Rackham under the black flag. And not far away the gentleman pirate Stede Bonnet and his crew died on the gallows.

From the Cooper River bridge I headed northeastward on the Ocean Highway. On my left was Boone Hall Plantation, with its magnificent live-oak avenue (page 307). On my right the mainland ended in wide green marshes, beyond which the barrier islands stretch along the coast.

These slim islands, covered with dense semitropical jungle, have wide beaches of smooth, hard sand. Some, like Bulls, Capers, Dewees, and Kiawah Islands, are wild places, alive with game. Others—the Isle of Palms, Sullivans, Folly, Edisto, and Hunting Islands—hold flourishing resorts (page 304).

Bulls Island is now part of the Cape Romain National Wildlife Refuge. Brown peli-

cans and other feathered folk nest in myriads at Cape Romain, and big sea turtles waddle ashore on moonlight nights to lay eggs in the sand.

Indian Canoes Head for England

Northeast of Bulls Island lies Bulls Bay. There the Sewee braves, dissatisfied with the sharp bargaining of the Carolinian traders, loaded a whole season's deerskins into great canoes and set out across the ocean, determined to do business directly with King George I himself.

Far out in the Atlantic, tradition says, a pirate vessel sighted the strange flotilla paddling bravely eastward into the oblivion of an approaching hurricane.

Large rice and indigo plantations once occupied the country north of the Ocean Highway. Now much of this area is planted in vegetables or reserved for game.

Timber value has multiplied with the swift growth of South Carolina's pulpwood industry. Products of the State's forests, which cover more than half its area, are second only to textiles in value and in persons employed.

"This here whole doggone country's growin' up so thick in young pine timber the wild turkeys can't find no open old fields to feed in," a tall, lean fellow with a shotgun over his shoulder told me when I stopped for a talk near Awendaw Creek.

"An' they won't let us burn the woods no more, an' that means plenty o' thick brush for wildcats and foxes to hide in and grab the young turkeys when they come along. Well, so long's the deer huntin' and bass fishin's pretty good, I guess we'll make out somehow."

Papermakers Teach Conservation

A pioneer of scientific forestry has been the Southern Railway, which for 27 years has maintained its 14,000-acre Lincoln Green Demonstration Forest near Dorchester to show the best methods of growing pine.

The West Virginia Pulp and Paper Company and the International Paper Company, with plants at Charleston and Georgetown, respectively, also teach conservation in their lumbering methods.

The 245,000-acre Francis Marion National Forest, bordering the Santee River, devotes a 50,600-acre wildlife refuge especially to propagation of the wild turkey. This area in Revolutionary War days often saw Marion and his men riding out from their moss-curtained strongholds to fight hit-and-run battles with Col. Banastre Tarleton, the Swamp Fox's wily antagonist.

Close to the South Santee River stands white-pillared Hampton, one of the most pictured of Carolinian plantation houses, now



Savannah River Plant Harnesses Power Like the Sun's

Atomic Energy Commission's sprawling installation near Aiken makes materials for hydrogen and atomic bombs. The H-bomb, which fuses hydrogen into helium, as do the stars, has such unlimited and terrifying force that it seemingly offers the alternatives of wiping out civilization or stopping warfare altogether. The Federal Government has uprooted 6,000 residents and spent more than a billion dollars on this South Carolina project (page 321).

Asterisk-shaped buildings house administrative offices. Guards check all persons entering or leaving.

the home of Archibald Rutledge, poet laureate of the State. Other historic houses of the neighborhood are Fairfield, Harrietta, and the Wedge.

Just beyond the north branch of the Santee I came to a road which leads off to the east to Estherville Plantation on Winyah Bay. At Estherville in 1758 a boldly imaginative planter, McKewn Johnstone, conceived the tidal system of rice culture.

Johnstone made possible enormous expansion of rice planting by showing his compatriots how to utilize the fresh-water tides in the many Low Country



rivers to irrigate, fertilize, and cultivate vast new fields.

After the Revolution virtually the whole tidewater region from the Waccamaw to the Savannah became a mosaic of richly productive rice plantations.

The long golden age of the rice civilization produced the most glamorous chapter of Carolinian history. Plantation life, with its stately balls, its elaborate chivalric tournaments, its punctilious duels, its deer hunts, and horse races, was in its heyday. It left its indelible mark upon the whole State, and it shaped the very body and soul of Charleston, the home of many plantation families for half of each year.

War Ends Golden Age

The golden age ended with the Confederate War (many South Carolinians prefer that name to Civil War). That conflict destroyed the social system of the State and ruined it financially. Rice planting received its death wound. By the middle 1920's the competition of the Southwest finally put an end to it.

But though the most colorful part of the rice story lies behind, the most exciting part may lie ahead. Today, interest is being expressed in a possible large-scale revival of the industry in the southeastern tidewater, where nearly 20 rivers—10 in South Carolina alone—provide an abundance of the necessary fresh water, and where there is land available which could easily be irrigated by the McKewn Johnstone tidal method.

From Georgetown, famous for its channel-bass fishing, I traversed Waccamaw Neck, once a fabulous land of flourishing rice plantations. On the Neck are Hobcaw Barony, Bernard M. Baruch's famous estate; George Vanderbilt's Arcadia, where I saw 11,000 turkeys in one flock; and Brookgreen Gardens, presented in 1932 to the State by Archer M. Huntington and maintained for the benefit of the public under his million-dollar fund.

It was from the Oaks, an adjoining plantation, that Aaron Burr's daughter, Theodosia, sailed via Georgetown on the tragic voyage which ended, according to persistent legend, when her ship was captured by pirates and all on board were made to walk the plank.

Just off the mainland lies Pawleys Island, long a favorite summer resort. There a veteran oysterman and shrimper told me about the Gray Man.

"Nobody knows where he comes from," the grizzled old fellow said, "and I wouldn't like to meet him on a dark night with the wind howlin'. But if he's a ghos' he's a good one. When he comes tappin' on your windowpane in his gray cloak, it's to tell you a big storm's

on the way an' you'd better light out for the mainland."

The wilder barrier islands have a storm-warning system of another kind, according to the Negro marshmen who cast their nets in the creeks for mullet and comb the jungles for raccoons. When they hear a big bull alligator bellowing his dragon-music in August or September, long after the saurian mating season, they know that old Fafnir of the Fens bears or feels in his bones a mighty hurricane roaring up from the Caribbean.

Where the Waccamaw curves inland, about opposite Murrells Inlet, I left the old rice-plantation country and drove through luxuriant woodlands to Myrtle Beach, the State's largest seaside resort. Here the barrier islands which fringe the coast have been left behind, and the Atlantic comes right up to the mainland, crashing upon a broad, unbroken strand some 35 miles long (page 300).

In summer, it seems, half of South Carolina comes to bathe and fish at Myrtle Beach. In winter more and more northern visitors find here what they want in the way of climate, comfort, and entertainment. Myrtle Beach has doubled in size in the past 10 years.

"Bays" Resemble Bomb Craters

From this pleasant shore I headed inland toward very different scenes. Many thousands of years ago, some geologists believe, a swarm of gigantic meteorites struck the Carolina Coastal Plain and formed the "Carolina Bays," strange saucerlike depressions, some of them three miles long and two miles wide. The meteoritic theory of the origin of the bays has been seriously challenged.

The bays extend in a broad belt across both Carolinas. In South Carolina they are found from the coast to the Piedmont's lower edge.

Densely covered with undergrowth and vines and often having a pond in the center, these huge, shallow pockmarks resemble a bombardment pattern (page 310).

At Conway, seat of Horry County, tobacco

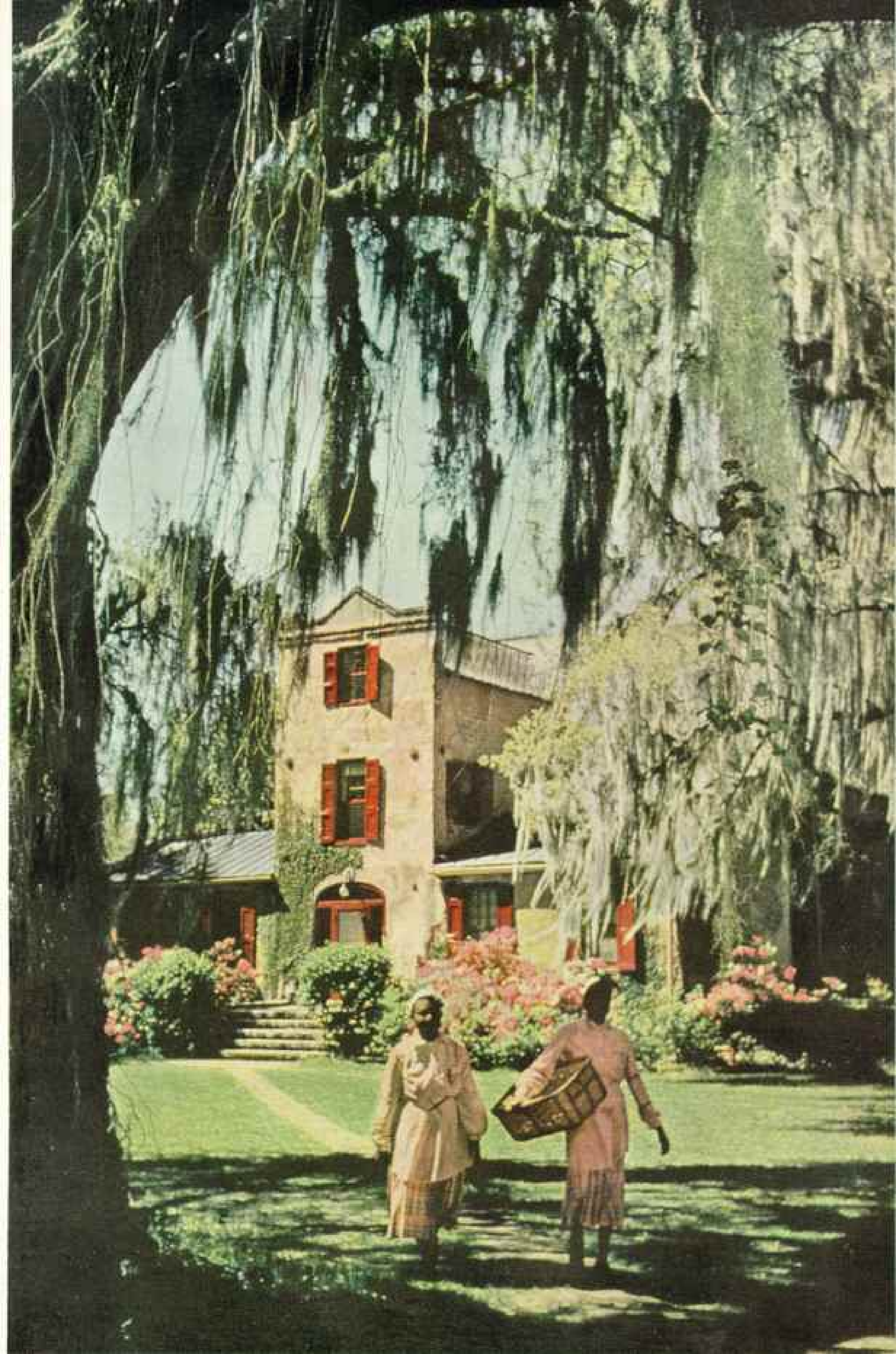
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Lithochromy by National Geographic Photographer Volkmar Weisell

Medway: the Oldest Brick House → of Record in South Carolina

Jan Van Arrens, a titled European who led a band of settlers to the New World, built Medway House in 1685. It stands on a hill above the Back River near Mount Holly. Thomas Smith, a Carolina colonial governor, is buried on the lawn. He married Van Arrens' widow.

Originally the mansion had but one story. Upper floors and several wings were added later. Artisans fashioned the bricks on the estate and faced them with a stucco mortar.

Medway is now the home of Dr. and Mrs. Carnes Weeks. These servants walk beneath a moss-hung live oak. Bright azaleas border the house.





Charleston's Old Recipes Are Famous. Guests Dine on Shrimp Supreme, Rice, and Peas in the Home of J. Ross Hamahan, Jr.

Members of the Society for the Preservation of Spirituals Sing a Melody of Early Plantation Days

Charlestonians formed the society 30 years ago to collect and record Negro spirituals in authentic form. These singers, dressed in ante bellum costume, rehearse for a concert. They meet in the paneled library of the Philip Porcher house, built in 1765. Richard G. White (center) is the owner.

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← **Actors Rehearse
on the Balcony of
Dock Street Theatre**

Charleston's original Dock Street Theatre, opened in 1736, was one of the first buildings in America devoted exclusively to dramatic productions. The present theater occupies the approximate site. It is housed in the former Planters Hotel, built shortly after 1800 and now used only as a playball (opposite).

Dock Street long ago became Queen Street, but the theater retains the old name.

Here George Hamlin studies a script while Jo Krogh practices her lines. Frilly iron grillwork frames a city landmark, the steeple of St. Philip's Episcopal Church.

→ **Street Vendors
Offer Bouquets**

Tradition allocates this stretch of sidewalk along Charleston's Meeting Street to flower vendors. Blossoms are sold throughout the year, but the bust is at its peak of color and activity in spring and fall, when visitors crowd the city.

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Dock Street Players Stage a Drama by Shakespeare

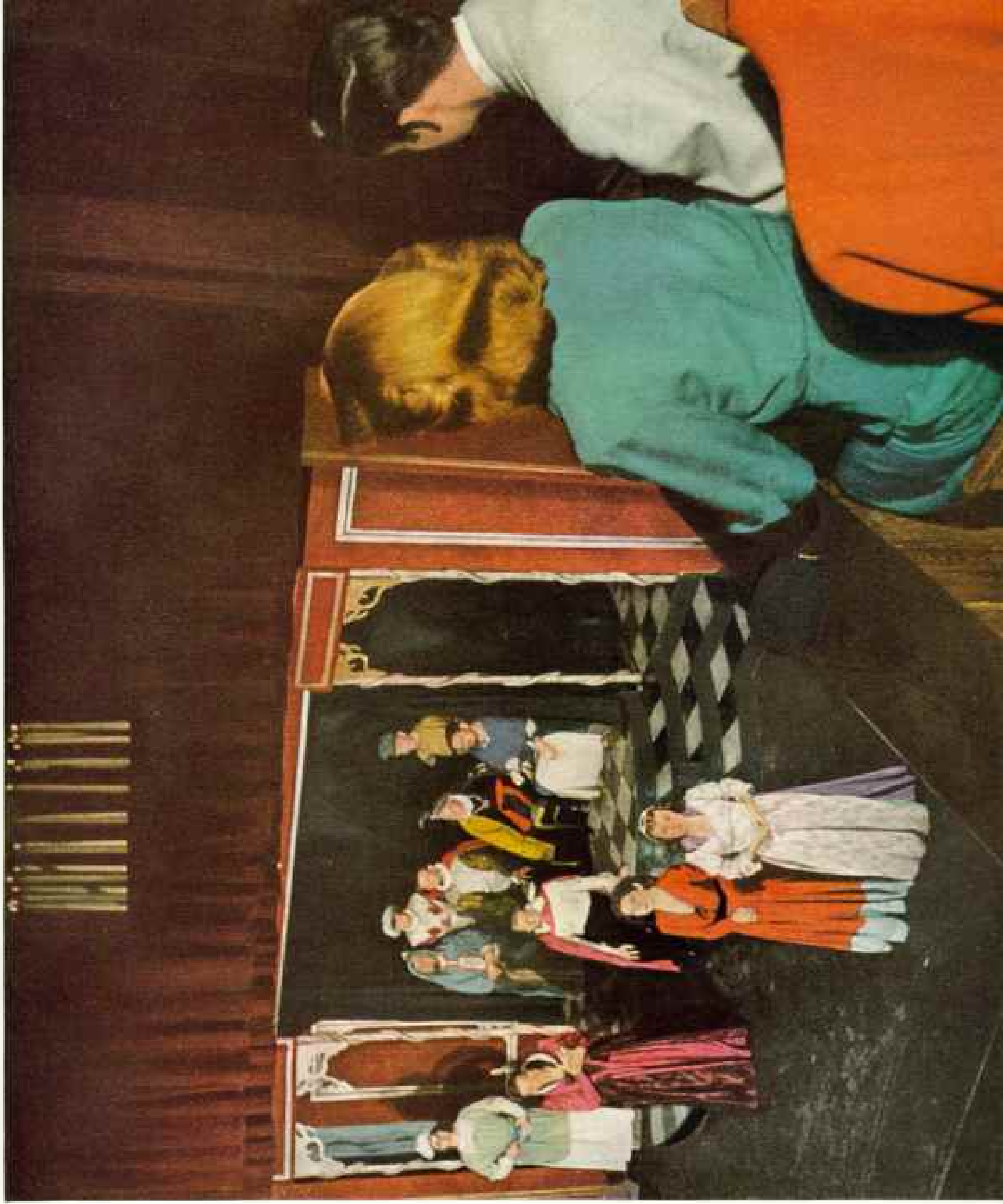
Not a trace remains of the original Dock Street Theatre; fire destroyed it in colonial days. A second playhouse, erected on the site, escaped cannon fire in the Revolutionary War only to burn in 1782.

Above the ruins Charlestonians built their famous Planters Hotel. Soon the hostelry became a mecca for wealthy plantation owners. Later the interior was remodeled to include an auditorium where southern belles and beaux met to enjoy plays.

After the Civil War Planters Hotel closed and fell into ruin. Not until modern times was the building restored. Much of the interior exists as it did in ante bellum days.

In 1937 the auditorium reopened as a theater and Charleston players offered George Farquhar's comedy, *The Recruiting Officer*, the play presented on Dock Street Theatre's opening night in 1736.

Here a scene from *The Taming of the Shrew* is enacted in the renovated auditorium.



Kocherhaus by National Geographic
Photographer Robert F. Heain



Riders and Hounds Jog Along a Country Road en Route to a Drag Hunt Near Aiken

Fashionable Aiken is noted for its hunt meets, racing, and polo. In the drag hunt, a horseman pulls a fox-scented sack through woods and fields. Hounds trail the odor and riders gallop after the dogs.



♣ **Plant Breeders Examine Wheat
in a Field Near Hartsville**

Each year Coker's Pedigreed Seed Company grows 60,000 test rows of various grains. Using crossbreeding, the experimenters develop hardier, more productive varieties for marketing to southeastern farmers. These men look for leaf rust and mildew.

♣ **A Crabber in Two-wheeled Oxcart
Hauls His Catch to a Cannery**

Chris Gadsden sets baited hand lines in the tidal creeks around Beaufort. Working from a homemade bateau, he nets crabs as they claw at the bait. Both white and Negro residents engage in commercial crabbing, usually on a part-time basis.





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▲ A Bull Attends Class at Clemson

Senior students at the Clemson Agricultural College, a State institution, inspect the stocky Hereford. Prof. J. P. LaMaster (in hat) lectures on the animal's conformation and other qualities.

✦ Students Examine an Audubon Print

University of South Carolina, at Columbia, owns a four-volume elephant folio edition of Audubon's works. These three admire a life-size painting of a wild turkey in one of the rare volumes.





Governor and Mrs. Byrnes Enjoy a Bright Spring Morning at Home in Columbia

James F. Byrnes, former Supreme Court Associate Justice and Secretary of State, became South Carolina's Governor in 1951. Here he returns to the Executive Mansion after a walk through the azaleas with Fella, his wirehaired terrier.

Iron Workers Erect a New Building in Du Pont's "Orlon" Plant Near Camden

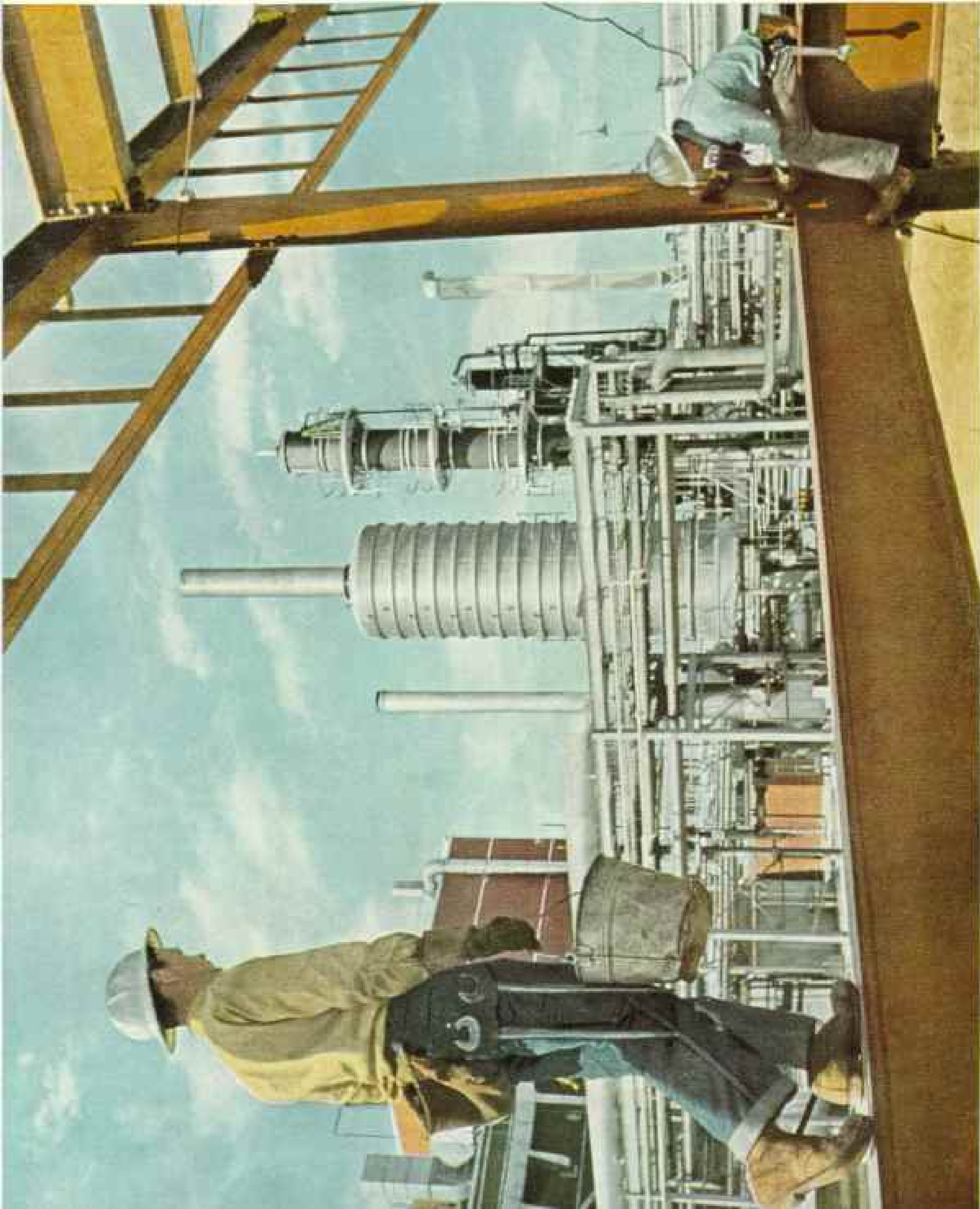
Ten years of costly research went into the development of "Orlon," the Du Pont Company's new synthetic. Its sponsors say no other fiber equals its resistance to exposure.

The durable material entered the commercial market in 1950, intended for automobile tops, awnings, and drapes. It soon became so much in demand for clothing, particularly women's skirts and sweaters, that current production has been channeled to that use. Now the armed services are experimenting with various blends of the Du Pont product for uniforms.

Four years ago cotton and pine timber grew on the 800-acre plant site. Today the sprawling installation is divided into two units. One makes continuous filament yarn; the other produces staple fiber.

These men work on the steel skeleton of a garage and labor office. Girders frame a maze of pipes and towers used in the recovery of chemicals.

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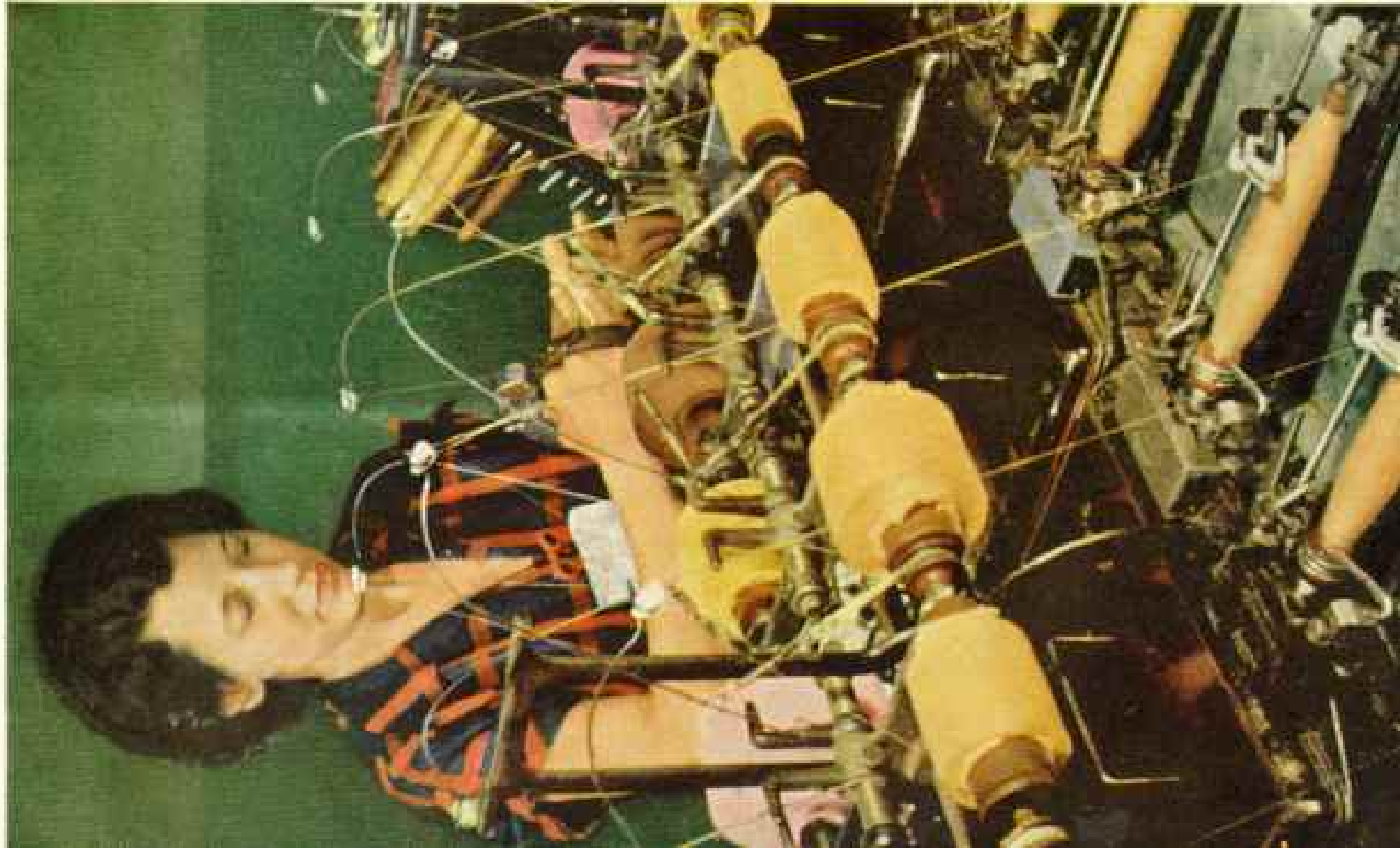
South Carolina Boasts a Thriving Textile Industry

Since the 1920's many New England textile firms have moved to Dixie. South Carolina in particular has benefited from the influx. Today the Palmetto State leads the Nation in production of finished cotton woven goods. Textile manufacture employs more than 70 per cent of the State's industrial workers.

← Judson Mills at Greenville is a leading producer of cotton and synthetic cloth. The mill operates 2,400 looms and employs more than 2,200 workers. This operator mends a yarn break on her quilling machine. Strands of yarn wind from the large package spools onto quills (bottom). Later the quills will be transferred to looms.

→ Sacony of Manning specializes in the manufacture of children's clothing. This operator uses a power knife to cut a 200-ply stack of cotton jersey cloth for blouses.

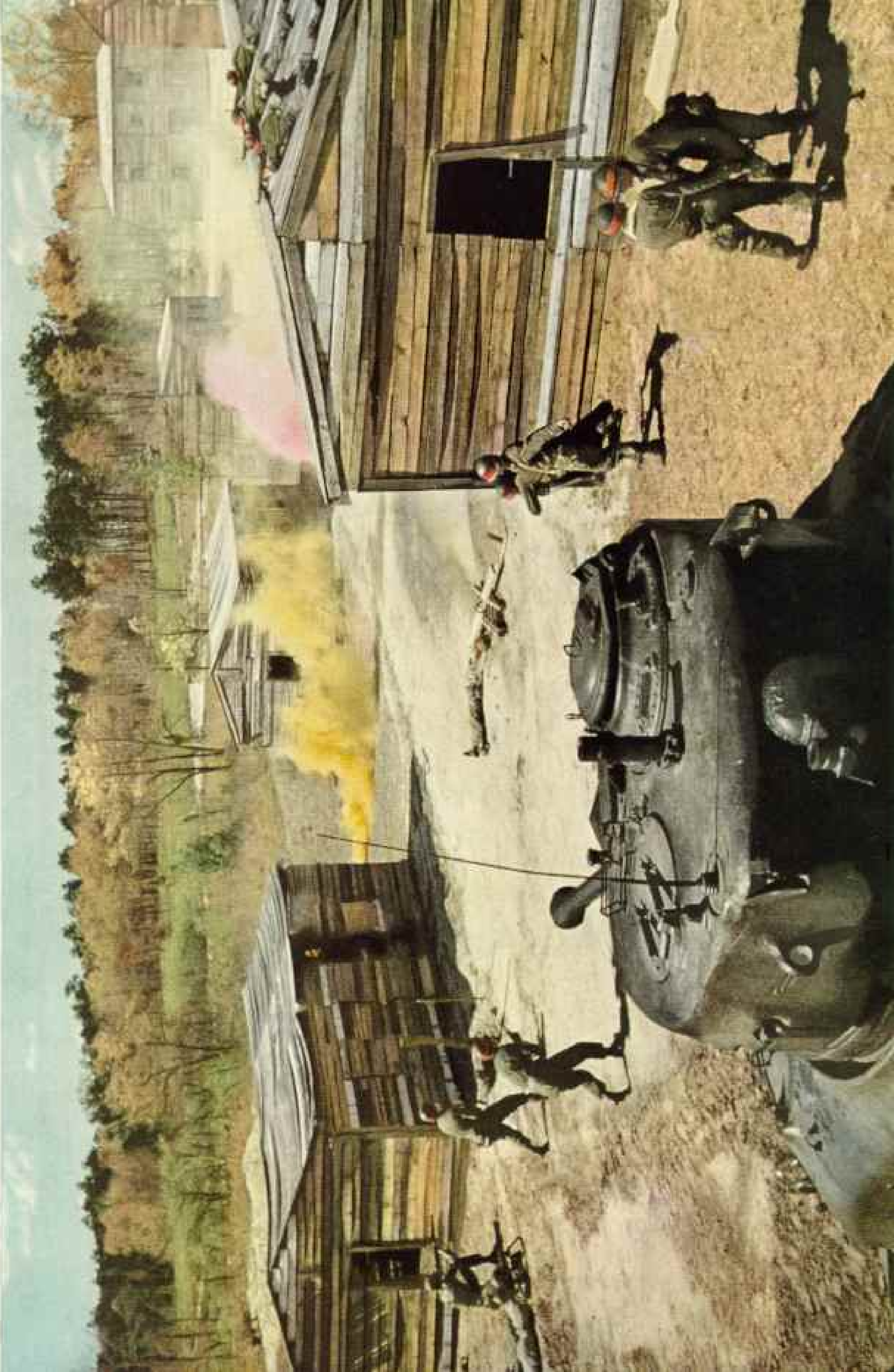
Illustrations by National Geographic
Photographer Robert F. Stone





A Show Horses Wade Through Surf at Myrtle Beach. Breastling the Waves Strengthens Their Legs and Shoulders.

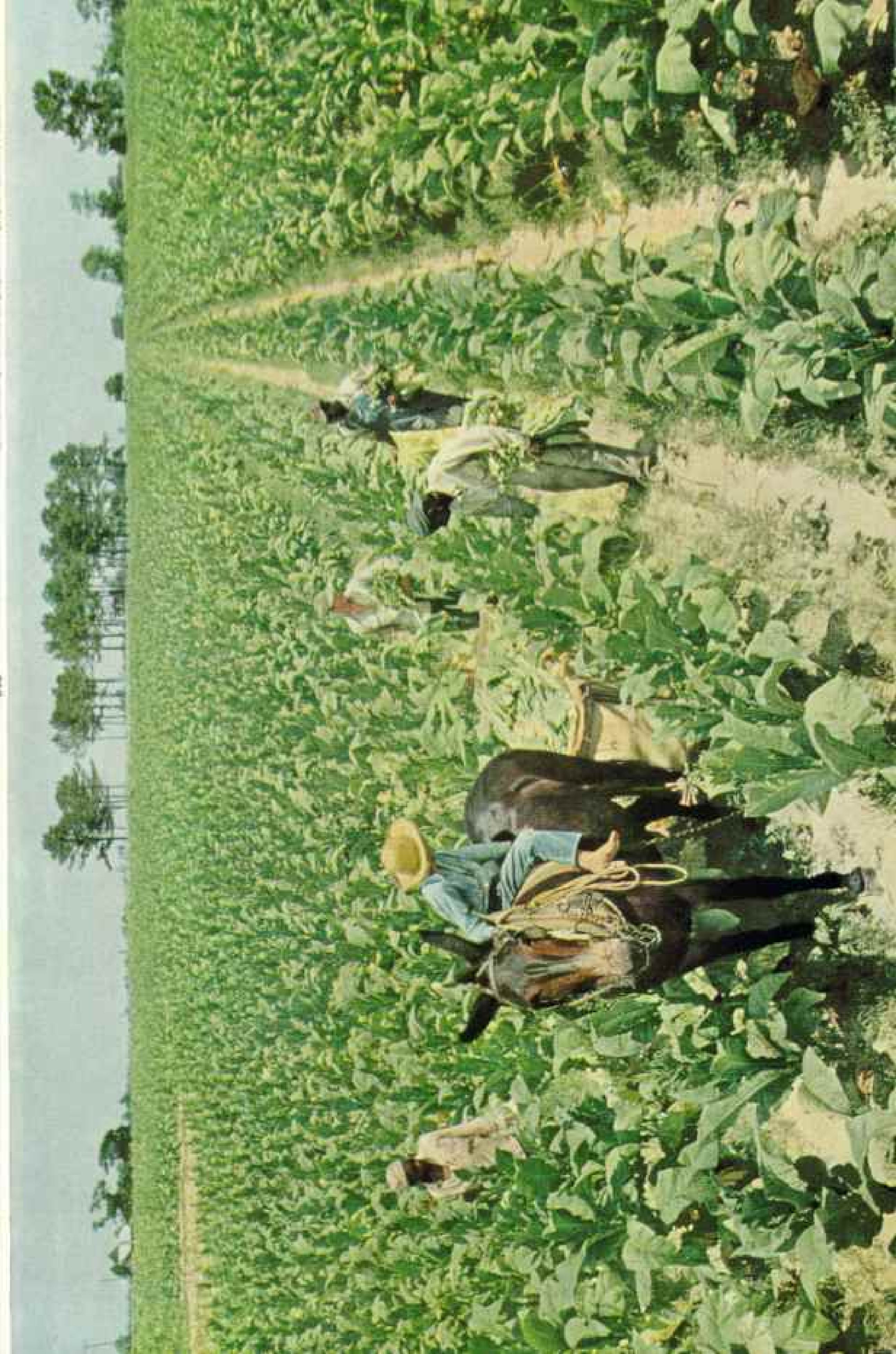
↓ Soldiers at Fort Jackson near Columbia study house-to-house combat in an Army-built town which they call Zachville. Tank-supported infantrymen here attack the village in a war game. Their objective is the two-story town hall (upper right). Smoke grenades cover the advance. A mock casualty lies in the street.





↑ A Farmer Near Greer Sprays His Flowering Peach Orchard with Lime Sulphur to Prevent Brown Rot, a Fungus Disease

↑ South Carolina's annual tobacco crop is worth 70 to 90 million dollars. In August many communities celebrate the harvest with parades, floats, and dances. These croppers, working near Rhems, gather lower leaves, which mature first. Other leaves will be plucked as they ripen.





Girl and Dog Stroll a Dune Near the Resort Town of Folly Beach

In olden days shipmasters marooned plague-stricken sailors and passengers on Folly Island, near Charleston Harbor's mouth. Today the island is a summer playground. Fronds hang from a palmetto palm, the State tree.

is the magic word, as it is throughout the Pee Dee section, named after the river which bisects it. It was "way down upon de Pedee ribber" that Stephen Foster longed to be before he changed streams and substituted "Swanee" (Suwannee River in Florida) because it was a prettier name.

Tobacco land is at its best in late summer when the golden leaves have been stripped from the tall stalks, cured in the barns, and hauled to the warehouses. Tobacco now sold each year by South Carolina farmers is worth from 70 to 90 million dollars (page 303).

To Conway, Mullins, and the other tobacco towns, early August brings feverish activity. Huge warehouses resound to the auctioneer's chant.

Still later in the month, with pockets bulging from the proceeds of their golden crop, the people of Tobaccoland celebrate their emancipation from King Cotton. Through the seething streets tobacco queens ride on decorated floats escorted by high school and military bands, National Guardsmen, and distinguished guests.

After the parade, orators dilate upon the beauty of the queens and the glory of King Tobacco. Then come the queens' pageant, the queens' ball, and square dances.

King Cotton Refuses to Abdicate

Northwestward toward Bennettsville another Carolinian revolt against King Cotton may be summed up in one word, "cattle."

"Today," former county agent Colin McLaurin told me, "Marlboro County alone counts 31 Grade-A dairy herds and 70 herds of beef cattle."

But cotton does not give up without a struggle. It still rules Marlboro, which in 1951 produced 54,500 bales on 64,800 acres—a tidy output for uplands east of the Mississippi.

About 120 miles back from the coast, and parallel with it, runs the Fall Line, which divides the State into Low Country and Up Country. Pushing across that line, I left the area of agricultural dominance and ran head on into the other great force which drives the State along the road of progress, the textile industry.

Lancaster is the seat of the textile principality founded by Col. Leroy Springs, one of the Carolinian pioneers in cotton manufacturing. His son, Elliott White Springs, a World War I flying ace, has vastly expanded the enterprises. They now include a cotton mill that has more spindles and more looms under one roof than any other in the world.*

In Lancaster and other towns served by the Southern Railway, I realized that I was seeing the bulk of South Carolina's textile

industry, which in 1951 had a payroll of \$455,941,569 (page 299).

At Rock Hill, the factory which once made the Anderson automobile has become the home of the Rock Hill Printing & Finishing Co., the world's largest producer of printed cotton and rayon cloth.

The new \$40,000,000 Celriver Plant of the Celanese Corporation of America, on a 1,100-acre site outside the town on the Catawba River, produces both continuous filament and cut filament (staple) acetate fiber.

The red brick buildings of Winthrop College, South Carolina's State College for Women, are a Rock Hill landmark. To it girls come from many States and from other countries.

Old Hotel Absorbed by Mill

York looks leisurely and old fashioned, but is an excellent example of how the dignity of white-pillared, typically southern architecture can be combined with the spirit of industrial progress. An old hotel, little changed externally, is now part of the Anchor Rug Mills.

Spartanburg and Greenville, lusty young leaders of the Piedmont, are almost close enough to each other to constitute a single metropolis of the hills. Nearly 100 textile mills make the area immediately around them the manufacturing hub of the State.

In Greenville, Eugene Stone, III, took me through one of the plants of his company in which 350,000 garments a week are made.

Stone had just returned from a trip to Europe. In a British textile plant the manager had shown him an ingenious sewing-machine attachment which automatically clips off thread when material runs out from under the presser foot. The Englishman hailed it as one of the greatest textile-machine improvements in years. The gadget, which helps to reduce the cost of clothing manufacture, was invented by a mechanic in Stone's Greenville plant.

In another Greenville plant, the Hunt Machine Works, Inc., the president, L. W. Bishop, showed me looms in the making—an interesting development in a South largely dependent on northern textile machinery manufacturers.

Labor and management have worked well together in South Carolina. Loss of man-hours from industrial disputes is low. This spells prosperity for mill owners and executives, and for workers, too.

Today, with nearly 149,000 looms and about 6,000,000 spindles in operation, South

* See "Dixie Spins the Wheel of Industry," by William H. Nicholas, NATIONAL GEOGRAPHIC MAGAZINE, March, 1949.



↑ **Charleston Juts
into Water Like
an Arrowhead**

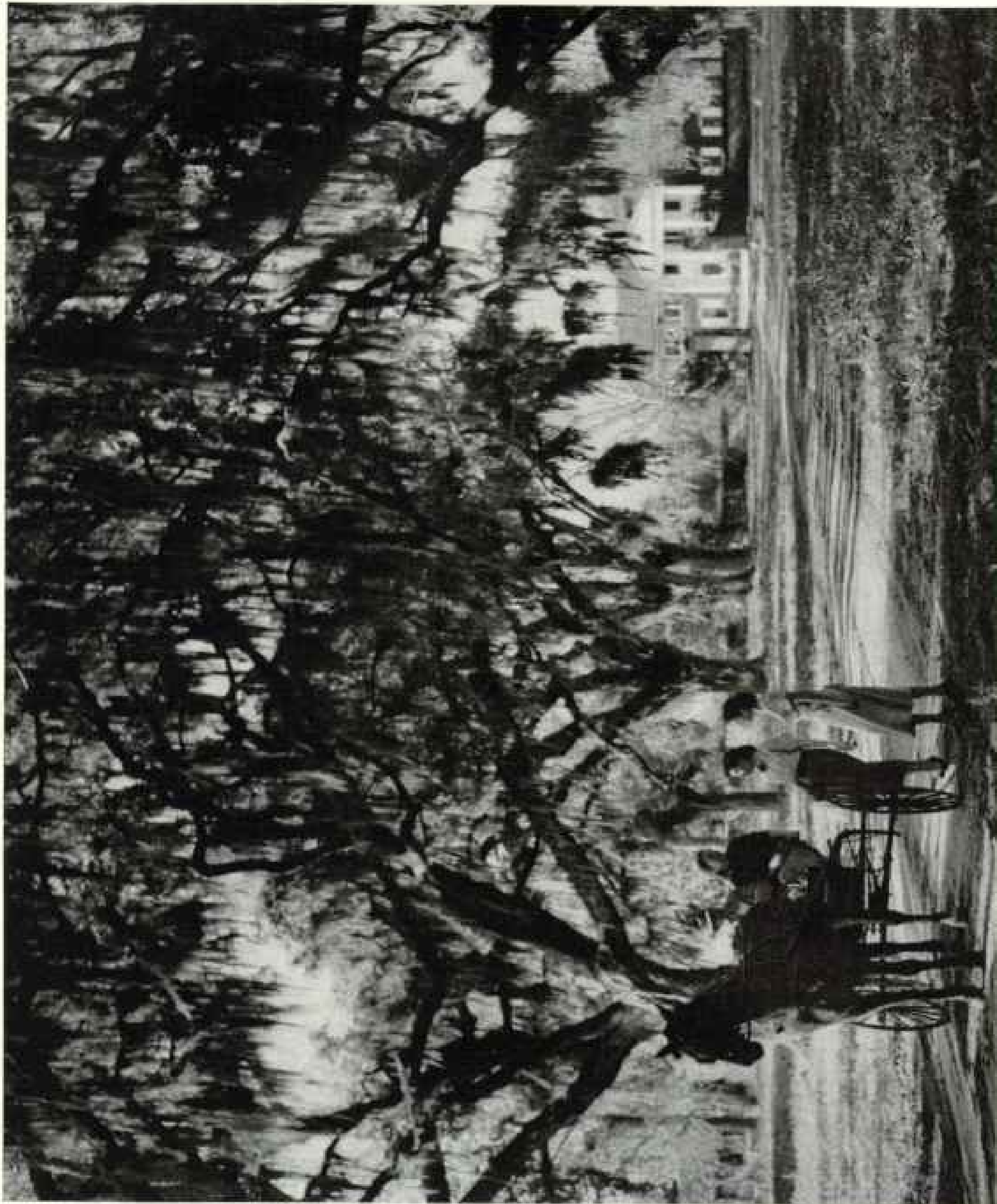
South Carolina's oldest city has known two locations in its long history. The State's first permanent colonists, who arrived in 1670, established a settlement on the west bank of the Ashley River (out of sight to the left). Ten years later the village was moved to the present location on Oyster Point, a narrow, river-girt peninsula better situated for defense and sea-borne commerce (page 282). Settlers named it Charles Town in honor of England's Charles II.

The name Charles Town continued in use until shortly after the Revolutionary War.

Twin rivers, the Ashley (bottom) and the Cooper (center) skirt the city and empty into a broad bay at the foot of the peninsula. John P. Grace Memorial Bridge links city and mainland.

← **Mossy Live Oaks
Lead to Boone Hall**

Historic Boone Hall Plantation near Charleston is named for Maj. John Boone, who acquired the property at the end of the 17th century. An avenue of stately live oaks set out in 1843 makes the plantation noteworthy. The distant house, constructed in modern times, replaces an earlier dwelling.



Carolina leads the Nation in output of finished cotton woven goods, a billion and a quarter yards in 1950-51. More than 70 percent of all industrial workers in the State are employed in the textile industry, and 75 percent of the State's industrial pay roll goes to textile workers.

Yet the State's textile belt doesn't look like an industrialized region. One reason is that here the typical mill village is disappearing.

Mill Hands Double as Farmers

In fertile valleys and coves I saw small farmhouses, each surrounded by cultivated fields or pastures; from them, I learned, workers in the textile and cottonseed-oil mills drive in their own cars 15 or 20 or 30 miles each morning. When their work shift is over, they still have time at home for garden patches or livestock.

South Carolina, in short, is developing a new type of industrial population, much of which is agricultural also, owning its homes and increasingly capable of deriving sustenance from the soil in time of stress.

Cotton is still South Carolina's principal money crop, worth about \$187,000,000 in 1951. The processing of cotton is the State's principal industry. Thanks to modern agricultural science, however, cotton today can maintain its essential place in the State's economy on much less than half the 3,000,000 acres formerly planted.

The result, as J. M. Eleazer of Clemson Agricultural College told me, is that for every acre planted in cotton today nearly two former cotton acres have been released for other uses, especially cattle raising (page 296).

Clemson has led in bringing this about. The blanket of green which now covers thousands of former cotton acres is the end product, Dean H. P. Cooper reminded me, of a liming campaign based on Clemson's study of 2,250,000 soil samples. This study revealed how the South could be transformed into a land of rich, permanent pastures.

Even more spectacular than her blanket of green is South Carolina's new coverlet of pink, the sign of a peach industry which has attained huge proportions. In the little town of Gramling, near Spartanburg, I talked with Ben Gramling, one of the men responsible for that phenomenon.

"Struggling with cotton," Gramling said, "we were so poor we had to wear patched pants. We got tired of that and wanted better clothes."

So he and a few others went over to Georgia, studied the Georgia peach orchards, and started some of their own, which did well. Seeing their success, others began to plant peach orchards, too (page 302).

Peach growing bounded ahead. According to the 1950 Census of Agriculture, for instance, Spartanburg County had two and a half million peach trees, more than any other county in the United States.

Another phenomenon of the Greenville region is Bob Jones University, based on the fundamentalist conception of Christianity. Begun on a shoestring, "the World's Most Unusual University" now has assets in excess of \$10,000,000. It lives entirely on the income from student fees (\$645 a year including tuition, room, and board), and accommodates more than 3,000 men and women students from 47 States and 26 foreign countries.

Outside the little town of Pendleton stands the magnificent new nylon and rayon mill of Deering, Milliken and Co., Inc.—a vast windowless structure, severely simple in design and yet strikingly handsome.

Similarly typical of the new mill architecture is the superb Harris plant of the Greenwood Mills, which James C. Self, one of the leading industrialists of the Southeast, has just completed near the pretty mid-State town where he lives.

Greenwood is also the home office of the 10 Abney Mills, headed by President F. E. Grier and employing 7,200 persons.

Birth of South's Modern Textile Industry

At Graniteville, in the Horse Creek Valley, I stood on industrially historic ground. Here, in 1845, the South's modern textile industry was born when William Gregg built his first cotton mill, the oldest in the State.

Gregg's mill has now given birth to five others round about it, operated by the company which he founded. The huge dyeing and finishing plant can process enough cloth each year to girdle the earth three times.

Aiken, five miles from Graniteville, was rather inhospitable to visiting Yankees when Union cavalry, on its way to destroy the Graniteville mills, was met and defeated on the main street by Confederate cavalry.

Aiken has, however, become a favorite winter resort for northerners, especially those interested in polo and drag hunting (page 294). It is now rimmed by the handsome private estates of winter people, past which workers flock to the Savannah River atomic energy plant a few miles away.

South of Aiken, not long ago, hundreds of blackened chimneys still stood as "monuments to General Sherman." Most of them have disappeared, together with the bitterness left by the struggle of the 1860's. But the almost total absence of the fine old plantation mansions and farmhouses, found in all parts of the State except in the broad tracks of Sherman's army, is tragically significant.

Capital of the State, Columbia is a virile, vigorous city (page 283). Its University of South Carolina, covering nearly 50 acres in the heart of the city, moves steadily on toward the high position it held before the Confederate War (page 296).

Columbia today is an attractive place of 86,914 inhabitants, with wide streets and avenues shaded by splendid trees and bordered by lawns and fragrant gardens.

Around Columbia and Camden, and in many other parts of the State, fanciers raise some of the finest gamecocks in the world. But South Carolina, once known to some as the gamecock state, adopted instead the little Carolina wren as its State bird.

The scene of violent battles in the Revolution, Camden raised a monument to the stout German, "Baron" de Kalb, who died there. Another memento of the British occupation is a modest stone in the old Quaker churchyard inscribed to "Agnes of Glasgow." Agnes was a 20-year-old girl who, romantic tradition says, followed her soldier lover from Scotland, and who was so fascinating that she proceeded to enslave Lord Cornwallis himself.

Camden is proud of having produced six Confederate generals, Mary Boykin Chesnut, author of *A Diary from Dixie*, and Bernard M. Baruch. But it draws most of its present prosperity from north of Mason and Dixon's line. Like Aiken, it has become a favorite winter resort for northerners. Polo flourishes, as do horse shows and other turf events.

On an 800-acre site near Camden in October, 1950, E. I. du Pont de Nemours & Company opened the world's first plant for the commercial production of "Orlon," a new fiber for clothes and for industrial purposes.

The opening of the first unit of this big northern mill—which together with the nearly



A Toothy Smile Proclaims: Crab Meat Tonight!

Crabbing augments many family incomes along the Carolina coast (page 295). Anna Mae Goodwin grins over a hard-shell she helped her father catch.

completed second unit will produce 35,000,000 pounds of yarn a year—marked a great day for Camden (page 298).

Thirty miles east, in Hartsville, the process has been reversed—a southern industry has invaded the North. It was fathered by Maj. James Lide Coker, of Hartsville, who came back after Appomattox badly wounded and with practically no worldly possessions except a rundown farm. He went to work on crutches.

In time the veteran organized a bank, a cotton mill, a railroad, a high school which became a college for girls, a company for producing paper from southern pine, and another company for manufacturing paper cones and tubes to replace the wooden ones, known as "carriers," upon which the threads and filaments of cotton or synthetic fiber are wound on textile machines.



Sand-rimmed, Tree-grown Hollows Pit the Coastal Plain with Ancient Circles

Some geologists believe the so-called Carolina Bays were formed by huge meteorites. Others say they were tidal basins. These depressions occur in Horry County; others extend into North Carolina (page 288).

This last firm, the Sonoco Products Company, now has plants in several other States, in Canada and Mexico, and affiliates in England and Australia.

Major Coker had four sons, each brilliant in his field. One, David R. Coker, may well have contributed more to the agricultural progress of the South than any other man of the last half-century.

In 1902 David Coker began cotton-plant breeding experiments at Hartsville. Their importance to southern agriculture is hard to exaggerate. George J. Wilds joined him in 1908 and Herbert Webber in 1920. Today these names are known wherever cotton is grown.

David Coker died in 1938, but his son

Robert R. Coker, Wilds, Webber, and their associates carried on. Tobacco, corn, oats, wheat, pasturage—all the crops of the South—have been enormously improved and the South's wealth immeasurably increased by the brilliant and careful work at the Coker plant-breeding farms (page 295).

Sumter Leads in Furniture

Another leading South Carolina personality is Hamilton C. Bland, of Sumter, who designed, developed, and maintained the beautiful Swan Lake Gardens with their fine display of Japanese iris. The 100-acre showplace, on land given by Mr. Bland and the late A. T. Heath, was a gift to the public. At the height of the blooming season, May 15 to June 15,

and especially during Sumter's annual Iris Festival, 50,000 people visit this beauty spot.

The first city in the United States to adopt the commission-city-manager form of government (1912), Sumter has prospered from the rich farms and pastures surrounding it, and also from its position as the State's furniture and woodworking center.

In the southernmost part of the State, where the hot wind of war passed in '65, I found no old dwellings or old churches; just here and there a remnant. Largest of these, and thought by many to be the most beautiful of its kind in the State, is the ruin of Prince William's Parish Church, generally called Sheldon Church. Burned first by the British, it was rebuilt by the parishioners, only to be burned again in the Confederate War.

Among many settlements of the neighborhood is Pocatigo. There, in the spring of 1715, the Yamasee Indians struck the first blow in an uprising of many Indian tribes planned by the great Creek, Emperor Brims. A red rebellion of the wilderness rolled almost to Charleston, nearly putting an end to South Carolina before she had got well started.

Except for the Cherokees and the Chickasaws, all the tribes from Florida to the Cape Fear River were in arms. Four hundred South Carolinians were killed, the colony's whole inland commerce was destroyed, and most of its farms and plantations right up to Charleston's walls were burned before at last the white men won a hard-bought victory.

Twenty miles south of the old Yamasee country lies Beaufort, next to Charleston the oldest town in the State. Founded in 1710, Beaufort was almost wiped out in the great Indian war five years later. A disheartening beginning, but Beaufort men rebuilt their town, and in time it became a small metropolis for the indigo and sea-island cotton plantations surrounding it.

Beaufort's Mansions Spared

By the 1850's Beaufort was one of the most fortunate and delightful communities of the State, the center of an affluent and cultivated society. In 1861 an irresistible Union fleet drove into Port Royal Sound, past two small Confederate forts. Instead of burning Beaufort, however, the Federals used it and Port Royal Sound as a base of operations against Charleston. Thus the town's many fine mansions escaped destruction.

Winter residents are of primary importance here. Many of the ante bellum plantations near by are now winter homes and hunting preserves. A large acreage, however, is devoted to truck farming, and important factors in Beaufort's economy are the U. S. Marine Base on near-by Parris Island and

the magnificent new U. S. Naval Hospital.

For one delirious hour, tradition says, Beaufort believed itself the scene of a mighty scientific discovery. A planter who in his spare time had long experimented with perpetual motion was seen seated in the stern of his skiff which, without oars, sail, or other visible means of propulsion, was dashing at terrifying speed up and down the river.

From the crowd gathered on the shore the cry went up, "Jones has discovered perpetual motion at last!" Actually Jones had harpooned a huge devilfish, which finally towed him out to sea before he could cut the line.

He didn't know it at the time, but he had started something which brought fame to Beaufort. Harpooning the devilfish, or manta ray, became a favorite diversion of the Beaufort planters, and a century ago a book, *Carolina Sports by Land and Water*, by William Elliott, told the world about it.

Down to the Sea for Shrimp

In Beaufort, as in all the State's coastal towns, shrimp is the basis of most of the wealth taken out of the sea. In South Carolina waters, some 600 trawlers caught 7,746,000 pounds of shrimp valued at \$2,169,000 in 1950, the last year for which complete figures are available.

At the docks hundreds of gaily chattering Negro women and children behead the shrimp, then pack them in ice to be shipped by truck to the big city markets.

At sea scores of sharks follow the trawlers to feast on the myriad small fish thrown overboard when the nets are hauled. Fishing from a trawler's stern, rod-and-reel anglers have good sport with these sea prowlers. Capt. Thomas Backman, the Negro skipper of the *Folly Queen*, may be the only man in the world, however, who catches sharks the way a cowboy catches calves.

"I lassoes 'em," he told me. "I jis' drop a shubbelful o' fish off de stern an' drop a noose rope in front o' de fish. De sha'ak dash in to git um an' I pull de noose. I ketch one nine-footer dat-a-way, an' anudder day I lasso t'ree sha'ak at de same time in one noose tergedder."

Captain Backman spoke a language relatively easy to understand. But in its pure form Gullah, the dialect of the Low Country Negroes, is incomprehensible to strangers.

"Enty yuh shum, bubuh?" I heard an Edisto Island Negro ask another as he pointed out a blue jay in a tree. "Uh sway Uh yeddy um duh cry out like he bex puntopuh dat simmon tree behine de shemuckle bush. Mek'ace, man, en' cum yuh ea yuh binnuh sho for shum fuss ting."

Translation: "Don't you see him, brother?"

"I swear I hear him crying out as if he were vexed, up in that persimmon tree behind the sea-myrtle bush. Make haste, man, and come here and you will be sure to see him first thing."

I had left Charleston by way of the Cooper River bridge. I returned over the bridge across the Ashley, the other of the twin rivers named for Shaftesbury.

Naval History Made at Charleston

Looking northward, I could see the handsome, castlelike buildings of The Citadel, the Military College of South Carolina. To the south of me lay the U. S. Naval Minecraft Base, where a half-dozen warships lay side by side. Beyond, the harbor was dotted with the white sails of racing craft.

Along the city's western water front big wood ibises, tall white egrets, varicolored Louisiana herons, and blue herons fished in the shallows, while brown pelicans, royal and Caspian terns, and red-billed black skimmers wheeled overhead.

Charleston, I thought, made a fitting climax.*

Guarding the sea gate of Charleston stands Fort Sumter, where the Confederate War began (page 282), and across the narrow channel from the fort lies Sullivan's Island. Here, at the beginning of the Revolution, stood an unfinished fortification of palmetto logs, later named Fort Moultrie.

The stretch of water between these two forts and just to seaward of them is worth a good look, for in that spot not one but four momentous events in naval history took place.

Seven days before the Declaration of Independence was adopted in Philadelphia, a British fleet of about a dozen vessels under Sir Peter Parker, backed by an invading army under Sir Henry Clinton, attacked the palmetto fort on Sullivan's Island. In command of the Americans was Col. William Moultrie, a Cooper River rice planter.

In a fierce 10-hour action Moultrie's small force mauled the British fleet into impotence, thereby saving the American Revolution from possible collapse.

Eighty-seven years later, at the same spot, another memorable naval chapter was written. On April 7, 1863, southerners manning the guns of Fort Sumter flung back the first large ironclad fleet ever used in war. Of the nine Union ironclads engaged, five were disabled, one so badly that she later sank, and, though Fort Sumter in succeeding months was often heavily battered by both the Union Army's siege guns and the Union fleet, the latter never again attempted to smash its way past the fort into the inner harbor and up to the city.

Six months after that, the same stretch of water witnessed the first successful torpedo attack in history, when the cigar-shaped semi-submersible Confederate torpedo boat *David* damaged the armor-clad Union flagship *New Ironsides*, the most formidable war vessel in the Union Navy.

Four months later still, in virtually the same spot, the Confederate submarine *Hunley* sank the Union gunboat *Housatonic*. This was the first feat of its kind and one which, with the *David's* earlier achievement against an armored ship, signaled the revolution in warfare wrought by the torpedo and the submarine. For the *Hunley* it proved a suicide mission; its entire crew was lost.

On the harbor's landside, as one walks northward up the East, or High, Battery promenade, are some of the finest of the ante bellum residences. Despite their exposed position, they survived the long Federal bombardment, mainly because the steeples of St. Michael's and St. Philip's were more usual targets for Federal siege guns.

Next on the west is Church Street, gemmed with small, intimate, beautiful old houses, with here and there a grand mansion. Following Church Street one passes Cabbage Row (the original of Catfish Row in DuBose Heyward's *Porgy*). The street reaches its climax where St. Philip's Church, the French Huguenot Church, and the beautiful Dock Street Theatre stand close together (pages 292 and 293).

Here the Old South Lives

Tradd, lower Meeting, and Legare Streets, too, present the typical "picture-book Charleston." Here are ancient houses whose pillared piazzas face south to catch the summer breeze and whose wrought-iron gates lead to gardens gorgeous in their seasons with flowers and blossoming trees.

In Charleston on a scale exceeded nowhere else the physical body of the Old South survives and is visible today, not a restoration but the thing itself. But there is a new Charleston, too.

Today the former capital of the plantations seems to her admirers not only more beautiful but more buoyant than at any time since the Confederate War. She rides the same wave of prosperity that carries the whole State forward. And of all Carolinian cities she may have the most thrilling future—thanks to the Cooper River Water Project.

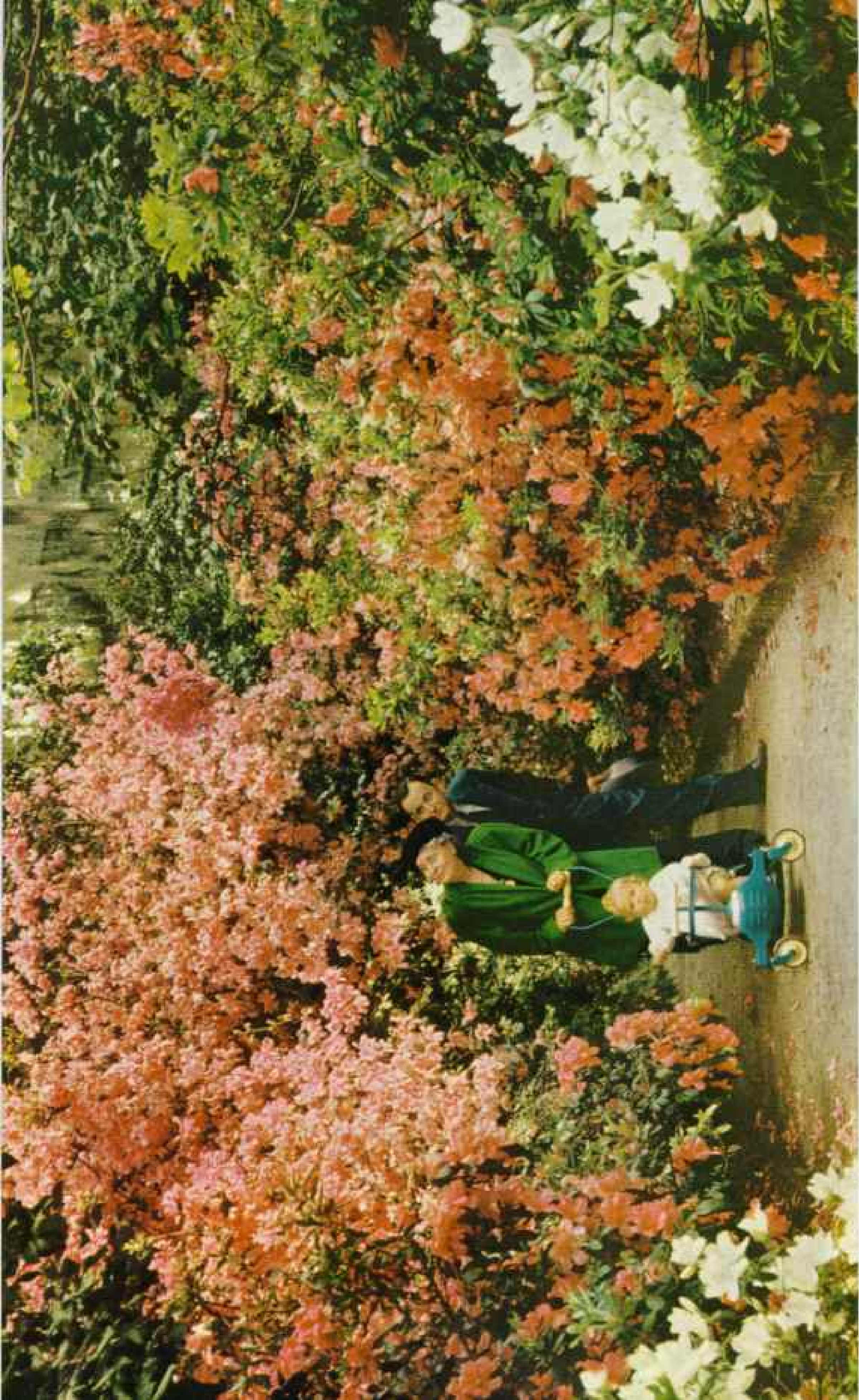
From the huge 805-billion-gallon reservoirs of the Santee-Cooper hydroelectric development 40 miles north of the city, 10 billion

* See "Charleston: Where Mellow Past and Present Meet," by DuBose Heyward, NATIONAL GEOGRAPHIC MAGAZINE, March, 1939.



Boy and Girl Share the Beauty of Flowers and Forest Giants in Cypress Gardens

Dark waterways of Cypress Gardens date from colonial times. Originally they were part of a reservoir system for the irrigation of rice fields on Dean Hall Plantation, near Charleston. Abandoned more than a century ago, the reservoir became a forest of towering cypress trees. Benjamin R. Kittredge, father of Dean Hall's present owner, converted the swamp into a 250-acre garden. Workmen built footpaths and planted shrubs. Most visitors tour the gardens in boats paddled by guides. Atamasco lilies line the pathway; azaleas bloom in the background.



Azaleas Lift Delicate Petals in Magnolia Gardens

Despite the implication of its name, Magnolia Gardens is best known for the beauty and profusion of its azaleas. More than 100 varieties of this brilliant flowering shrub are found in the 25 acres of landscaped grounds. Many other blossoms contribute color and fragrance, among them camelias, wisteria, climbing roses, spirea, dogwood, and forsythia.

In its present form the garden dates back to 1830. It lies within the grounds of historic Magnolia-on-the-Ashley, a riverside plantation near Charleston. Thomas Drayton, founder of a distinguished South Carolina family, acquired the property about 1700. His descendants have owned it in unbroken succession.

Aged magnolia trees, many of them still flourishing, suggested the name of the estate and its garden. Those trees, however, are not in bloom until after Magnolia's open season, Thanksgiving through April.

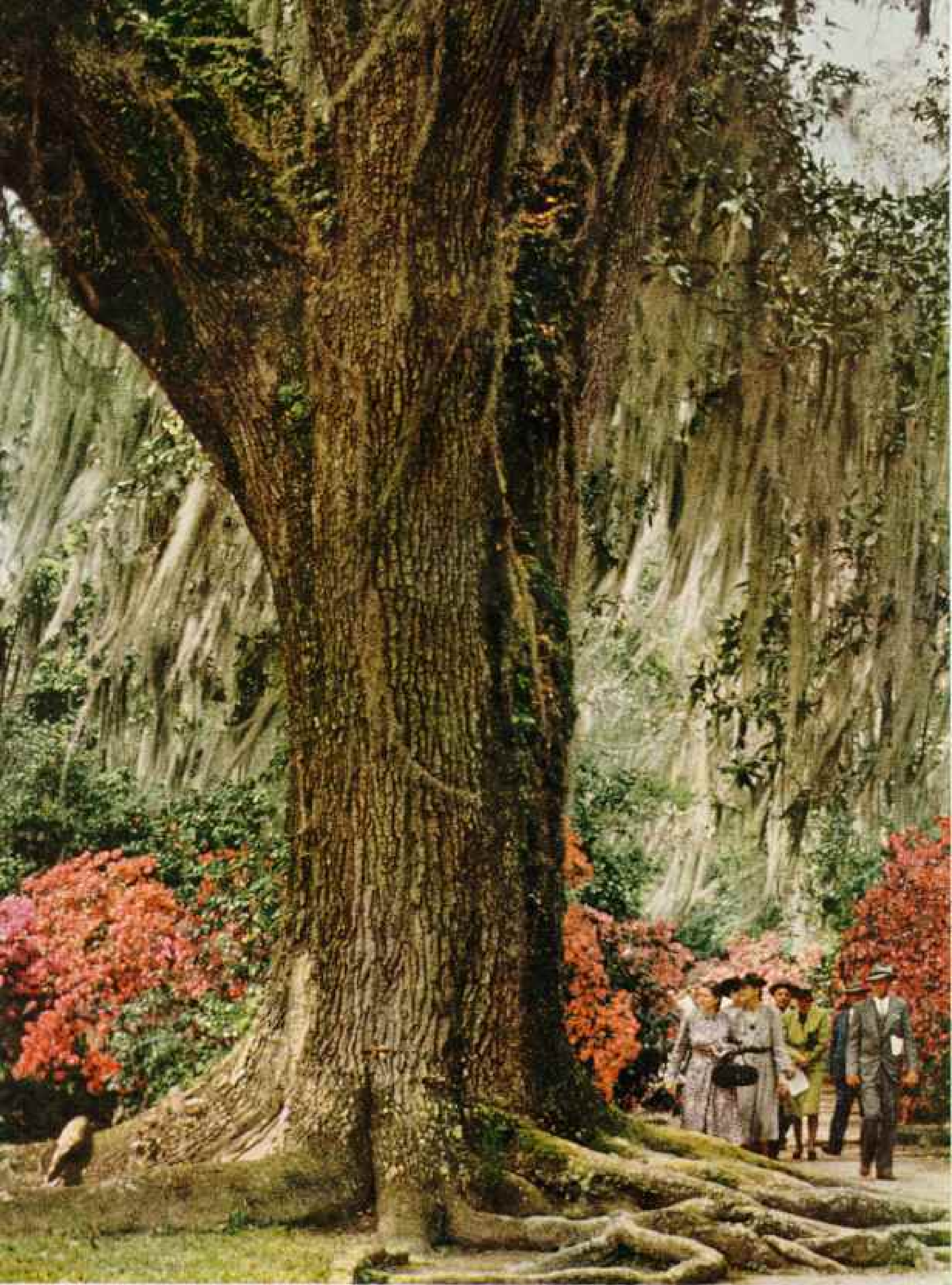
All of the flowers on this page and the opposite are varieties of *Asalea indica*.

◀ Close-ups reveal the pastel pink of *elegans* (above) and the deeper blush of an unusual *formosa* (below). The latter variety normally is purple.

▶ Matted elegans form a coronet above a visitor.

Reclines by National Geographic
Photographers R. Anthony Bryant
and Justin Locke





Silvery Spanish Moss Drapes a 400-year-old Live Oak in Magnolia Gardens

Many old live oaks shade the garden. All bear swaying banners of moss. Resurrection ferns, which curl up when dry and open when damp, climb the side of this massive trunk. Gnarled roots writhe across the path.



Azaleas in the Glory of Full Bloom Flaunt Vivid Petals Above the Garden Path

Some azalea bushes in Magnolia Gardens are a century old. Their blossoms show up best from mid-March to mid-April. Shiny foliage from a neighboring camellia (right) mingles with these flowers.



Dark Waters Mirror the Flame of Azaleas in Cypress Gardens. A Boatman Paddles Sight-seers Beneath a Rustic Bridge

319

Photographs by National Geographic Photographers B. Anthony Bennett and Justin Laska





Moss Beards the Branches Above a Flower-lined Corridor in Magnolia Gardens.

These young people stroll in Magnolia Walk, which takes its name from the towering trees along its borders. Azalea bushes wall the lane with clouds of red and pink blossoms.

gallons or more of fresh Santee River water discharge each day into the Cooper River to flow on into Charleston Harbor and the sea.

Unfortunately, this vast volume of fresh water is unfit for industrial use in factories along the ship channel; salty sea water running up the Cooper on each incoming tide contaminates it.

Outwitting Nature to Aid Industry

But now a brilliant engineering scheme will divert the upper Cooper's uncontaminated fresh water into Back River, a short stream lying parallel to it. Back River will be closed by a dam at its lower end, converting it into a huge fresh-water reservoir adjacent to factory sites directly on the ship channel. Charleston will be able to offer a portside supply of two and a half billion gallons of fresh water a day to thirsty modern industry.*

World War II gave impetus to Charleston's business development; in the postwar period nearly 200 new industries or substantial expansions have been established. As a result, the city has spread far beyond its official boundaries and now extends for miles up Charleston Neck, site of many fertilizer factories, and across both rivers.

A little below the \$30,000,000 Port Terminals on the Cooper River side of the Neck lies the Charleston Navy Yard. Employing at full capacity some 25,000 workers, this is the home yard for a large fleet of destroyers and other ships.

Higher up the Neck is the city's fine Municipal Airport, where an Air Force troop carrier wing is planned as this is written.

Heading south down Meeting Street, I stopped at Marion Square to look at John C. Calhoun atop his towering granite shaft. He gazes out over the proud Cavalier Low Country city which thought so highly of that rugged Up Countryman that when he died it claimed the honor of laying him to rest in St. Philip's churchyard.

From the Square I drove toward the oldest part of the city, past the white-pillared ante bellum Charleston Hotel; the Roman Doric Market Hall, now a Confederate museum; the site of Institute Hall, where the Ordinance of Secession was signed; the Hibernian Hall with its Ionic columns, where the St. Cecilia Balls are held; Washington Square, with its monuments to Gen. P. G. T. Beauregard, to Henry Timrod, Charleston's poet, and to William Pitt; and St. Michael's Episcopal Church and churchyard where, among other famous Carolinians, "Dictator" John Rutledge holds first place.

On either hand fine ante bellum and colonial houses grew more numerous as I pressed on, until at last Meeting Street opened upon the

celebrated Battery. South Battery, officially White Point Gardens, is a grassy, oak-shaded park occupying the extreme tip of the peninsula. It is the best starting point for a tour of old Charleston.

I had put Charleston off until the last; yet not quite the last. The unknown and unknowable ultimate in South Carolina today is the stupendous atomic energy enterprise in the Savannah River Valley—the mightiest effort of applied science in all human history.

Its estimated cost is a billion and a quarter dollars, more than double the cost of the Panama Canal. Nothing ever before undertaken by man holds so much of potential benefit or potential menace for the human race.

Fifteen miles south of Aiken a tract of 208,000 acres was selected in late 1950, and the 6,000 persons living on its 1,130 farms and in its seven towns were faced with the stern necessity of giving up their homes and moving out of the area.

I saw what had been a quiet countryside of farms and woodland, with here and there a small town or village, transformed into a seething hive of workers, 39,000 in the fall of 1952, as the huge task of building the plant went into high gear. E. I. du Pont de Nemours & Company holds the contract for the design, construction, and operation of the Savannah River Plant (page 287).

Workers Live in Trailer Homes

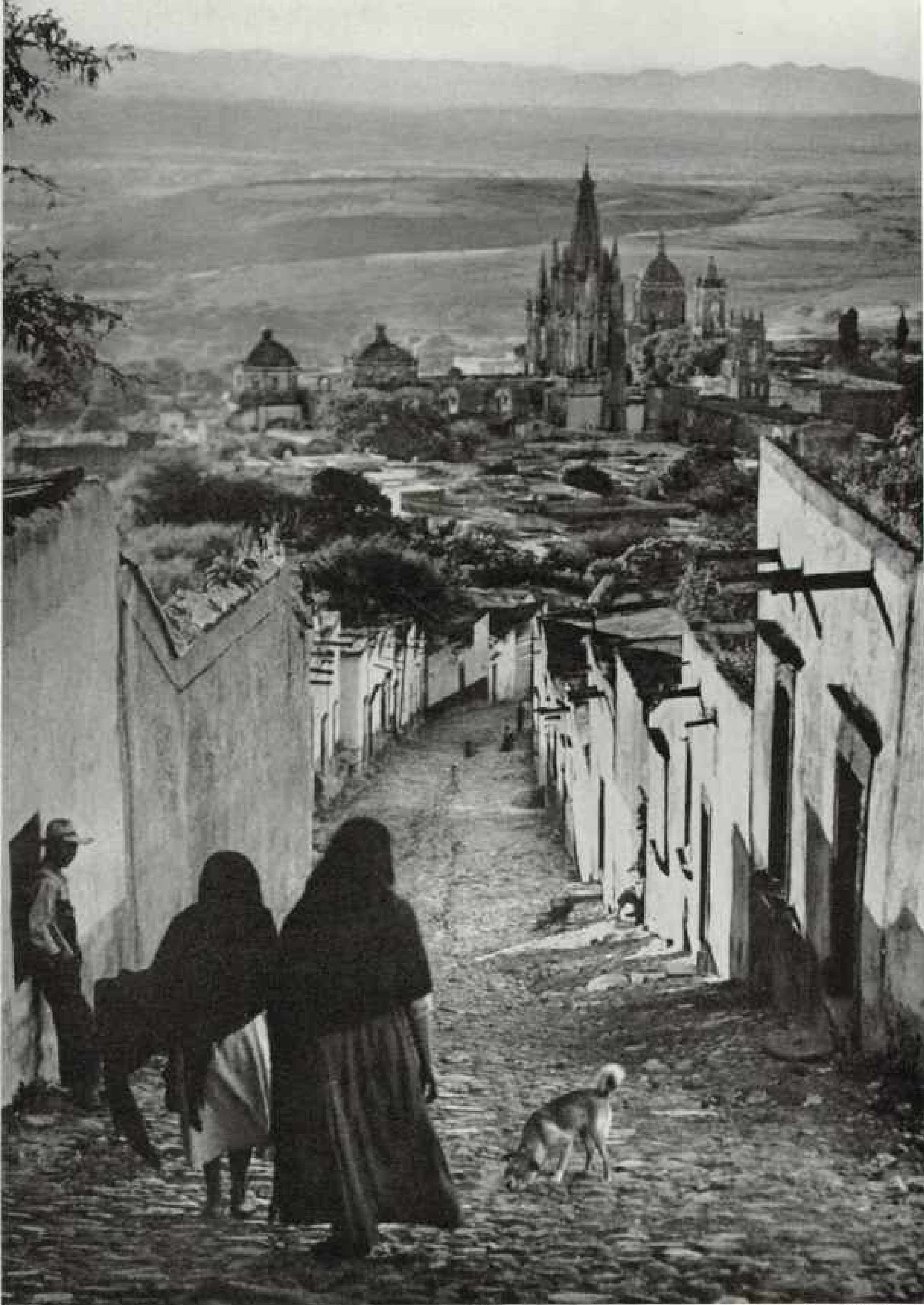
No bombs will be made here, only certain materials which can be used in making either A-bombs or H-bombs. Some of these materials, it is hoped, will prove of enormous value in the peacetime application of nuclear energy.

Scores of trailer colonies have sprouted around the project's 70-mile perimeter. In them, with their families, live aluminum-hatted workers—migrants who follow the big construction jobs from coast to coast. Other workers, from every State, crowd surrounding villages and towns. Twice daily their cars create monumental traffic jams on Highway 28.

Bulldozers clatter and snort, clearing and leveling land that once afforded fine quail hunting. Odd-looking buildings, accessible only to those who pass the tightest of security checks, rise above the denuded landscape. So "top secret" is the project that airliners must give it a wide berth.

Thus South Carolina, for 250 years a preponderantly agricultural State, is now the scene of the Industrial Age's climactic effort. That is one of the most dramatic facts in the State's story.

*See "Water for the World's Growing Needs," by Herbert F. Nichols and F. Barrows Colton, NATIONAL GEOGRAPHIC MAGAZINE, August, 1952.



Cobbled Streets, Soaring Spires, Misty Valley: San Miguel de Allende Wears the Mexican Aura

American College Students, Mexicans for a Summer, Become Members of Households in Colonial Guanajuato

BY HUGH M. HAMILL, JR.

With Illustrations from Photographs by the Author

I ANSWERED the telephone in my Mexico City hotel room and heard a voice say in Spanish:

"Hugo? This is Enrique Romero. I just got in from Guanajuato."

"Good! Wait for us. We'll come right down," I replied.

Enrique was one of the two local representatives of the Experiment in International Living with whom I, as leader of a group of American college students, was going to work. He had come to escort us to colonial Guanajuato and help ease our transition from life in the United States to that in Mexican homes.

The three men and four women in my group had arrived to spend the summer living with Mexican families, adapting themselves to their customs, food, and language.

School Spanish Was Never Like This

Having come this far, some were a bit uneasy about the prospect. Would they do the right things? Would they like and be liked by their new "families"? And, most of all, would they understand and be understood? The language we had heard since crossing the border was a far cry from high-school and college Spanish.

I assembled the group. Hardly had introductions been made before Enrique was besieged by queries.

"How many 'brothers' and 'sisters' will I have in the Ávila family?"

"What part of the city will I live in? Will it be near the others?"

"Is Señora Cortés as nice as she seems in the letter I got from her before I left?"

Enrique patiently answered their questions and with his engaging manner quickly won our friendship.

Early next morning we were off by bus on the last leg of our journey to Guanajuato, capital of the state of the same name (see map "Mexico and Central America," a supplement to this issue).

For many of us this was our seventh day of travel since leaving home. We had had a two-day layover in Monterrey where the leaders of the other Mexican groups of the Experiment and I had carried out an orientation program. It had included talks on Mexican

customs, etiquette, and health problems which we would face because of uncertain water systems and "delicate American stomachs."

Since the Experiment was founded in 1932 its headquarters at Putney, Vermont, has sent some 5,000 young men and women to live in homes of 25 countries in Europe, Asia, and the Americas.

The purpose of the plan is to break down the barriers of national pride and prejudice in order to promote international understanding at the personal level. Most participants have had successful summers. Only a few have failed, because of inability to adjust themselves sufficiently to new living conditions, standards, and food; or, in rare cases, because of a lack of congeniality.

No one could predict how well it would work out for us. Each individual made his own "experiment," with himself as guinea pig. The big question for each was, "Will I be a good Experimenter?"

The 8-hour bus ride to the northwest gave everyone a chance to talk to Enrique. I was going to spend the summer living with this young law student and his family. Although I was familiar with Mexican home life after two previous summers in the Republic, going to a strange city and family posed the same challenge to me as it did to the others.

Extra Problems for the Leader

As leader, I had additional worries. It was my job to coordinate groups and to act as "diplomatic representative" between our Mexican hosts and the Americans.

The bus turned off the Pan American Highway and headed west toward the Sierra Madre Occidental foothills. Alfred ("Alfredo") Bigelow from Harvard and Nell ("Elenita") Burton from Illinois (we all adopted the Spanish equivalents of our names) studied a book of Spanish conversation while Enrique helped them with pronunciation.

I worked on group finances with my assistant, Rosalyn ("Rosita") Cox, one of two girls in the group from Florida State University.

Darkness came and rain fell as we turned off the main road at Silao and headed northeast into the mountains around Guanajuato. At journey's end the bus door swung open and revealed a sea of expectant faces all



Author Hugh Hamill and Enrique Romero, His Mexican "Brother," Map a Week-end Tour

Since its founding in 1932, the Experiment in International Living has sent some 5,000 students on summer visits abroad. Staying with foreign families, the Experimenters strive to build good will. They work on the theory that if individuals understand one another more, nations quarrel less. Here Señor Romero, a law student, points to Guanajuato, his home town, on a National Geographic Society map.

trying to glimpse the *norteamericanos* who had come to live with them.

"Welcome to Guanajuato," said a voice beside me. It was Señorita Elena Yerena, the other local representative. With Enrique's help we introduced the Experimenters to the representatives of their new families.

Good Will Hurdles Language Barriers

Elenita tried valiantly to get out the Spanish greeting she had rehearsed. Señora Cortés understood and quickly put her at ease with a friendly smile and kind words.

"Don't you worry," she said. "Our house is yours, and we are truly happy to have you with us."

Before long all were leaving with their new companions for home. Enrique and I climbed into the truck of a friend who drove us to the Romero house.

I could hear voices as Enrique swung open the gate and we strode up the cement walk. A girl's voice cried, "Mother, they're coming!"

As we climbed the steps to an L-shaped veranda, a tall, handsome woman in a neat print dress came out to greet us.

"Hugo, I want to present you to my mother," said Enrique with obvious pride.

Señora Romero's smile and firm handshake told me at once that my summer would be a happy one (pages 329, 331, 346).

She then introduced her two dark-eyed daughters. María Eugenia was 20 and Magdalena 17. Ernesto, Enrique's 14-year-old brother, also appeared.

When the formal presentations had been completed, Señora Romero made me feel at home by calling me by my first name.

In the center of my room was a brass bed and beside it a wooden wardrobe. Above



Americans Ride Laughing and Singing Toward Foster Homes in Mexico

Twenty-one Americans took this sleeper bus from Nuevo Laredo to Mexico City, where they split into groups bound for several provincial towns. The five-day trip, including a two-day stopover in Monterrey, gave them an opportunity to practice Spanish, learn Mexican songs, and see the country. Enrique Castro (center foreground), a onetime Experimenter in the United States, now goes home to Morelia.

the bed was a small picture of the Virgin of Guadalupe, beloved Mexican saint. On another wall was a portrait of the late Manólete, famous Spanish bull ring star.

Enrique opened the door to the bath.

"You have to be careful with the water," he said. "It is scarce in Guanajuato. There are a number of reservoirs in the hills, but they get low during the winter dry season. The city conserves the summer rains now by shutting off the water supply two days a week. We keep the emergency tank on the roof for those days. If you want hot water for a bath, call Clemencia, the cook, and she will bring fagots to light the heater by the tub."

"We have supper waiting for you both," said Señora Romero as she led us into the dining room. Soup, hot chocolate, and hard rolls were most welcome. The whole family sat with us while we ate. They were eager to

know all about my family, my home in Philadelphia, my college (Amherst), sports, and so on.

Later Enrique and I talked on into the night before going to bed. Noticing some heavy volumes in a bookcase, I asked what kind they were.

Mother Handles Two Jobs

"They're French medical works. You see, my father was a doctor, a self-made man. He had a drugstore in conjunction with his practice. So Mother took over the store and has managed it ever since he died in 1936. She divides her time between the house and the pharmacy."

Next day the group met to exchange impressions and work out problems of adjustment. I could see that enthusiasm varied with linguistic ability.



Mexico's Boy Heroes Take Shape in Clay

When American troops stormed Mexico City in 1847, military cadets in the Castle of Chapultepec held out until defeat became inevitable. Rather than surrender, several boys died at their posts; at least one wrapped himself in his country's flag and jumped from the castle wall. Mexico still honors them as *Los Niños Héroes*, the Boy Heroes. Rosalyn Cox, visiting San Miguel de Allende, here watches sculptor Pedro Martínez finish the model for casting.

"It's so wonderful to understand what people are saying again," said Alfredo. "Everyone in my family speaks so fast to me that it might as well be in Chinese. I know I'll learn if I keep at it, but it's awfully discouraging right now."

"Just ask them to speak more slowly," I advised.

"I couldn't be happier with my family," said Beverly ("Beba") Goodnight, who had just graduated Phi Beta Kappa in Spanish

from Florida State University.

"Aren't you having any trouble speaking?" inquired Robert ("Paco") Keyes from California.

"Oh, yes," replied Beba. "Colloquial expressions throw me off a lot. For instance, I overheard two men talking on the bus coming here. One of them said, '*Estoy muy bruja*,' or 'I am a very witch.' Carlota, my 'sister,' was riding with me, so I asked her what that meant. She said it was slang for 'I'm broke.'"

Embarrassing Moment

"I was embarrassed last night at supper," said Elenita. "Señora Cortés asked me if I would like a cup of tea. The maid placed a cup of clear hot water before me. I thanked her and waited for the tea bag to appear. It didn't.

"Finally the meal ended. The Señora looked at me and said, 'Elenita, don't you want your tea?'

"I replied that it was just hot water. The family laughed, and Señor Cortés said, 'Taste it.' It turned out to be tea made from mint, which is colorless."

Our two major problems of physical adjustment were altitude and food. Guanajuato, at 6,700 feet, was far different from level Illinois or the low hills of Connecticut. At first we found ourselves out of breath after walking the winding hilly streets. Hikes and climbs in the mountains around the city soon acclimated us (pages 332, 342).

Stomach upsets were common for the first week, until we got used to liberal seasoning and to food cooked in deep fat. We learned that we could safely drink only water which



George Pictor, Three Lions

Colonial Edifices Stand Everywhere in Guanajuato, a City Off the Beaten Track

To the author, Guanajuato is "one of Mexico's most fascinating and unspoiled cities. Centuries-old homes, some of them boarded up, are unmarred by clashing modern structures. I often think of our explorations of the city's lantern-lit alleys, our hikes into the hills, and the quiet talks with my 'family.'" The Church of San Francisco (center), begun in 1671, guards a celebrated statue of the Virgin.

was either bottled or boiled and filtered, as in all the homes.

The unfamiliar meal schedule caused confusion. Nancy ("Anita") Camp, from California, told me the stretch from breakfast (*desayuno*) to the *comida*, or dinner, at 2 or 2:30 was too long and that she was forced to eat *pan dulce* (sweet sugared rolls of various types) at noon to stave off her pangs of hunger.

"Then when it does come," Anita continued, "I feel that I have to eat all six courses or I'll hurt my family's feelings. Afterward a siesta is most welcome!"

"Now you understand why stores here are closed from 2 to 4 every day," I said. "First comes the big dinner and then a rest."

"I like Mexico's idea of the *cena*, or supper. In my house it is very informal. We rarely take anything more than *pan dulce* or a sandwich and boiled milk or chocolate. We eat when we feel like it—any time from 8 to 10. Señora Romero says that it is much better to eat lightly before sleeping and to have your heavy meal in the middle of the day."

We agreed that dinner was really worth waiting for. This was the meal that showed

off Mexican culinary art to full advantage. In my house, as in most, it was quite a formal affair. A separate set of plates was used for each of the six courses.

The meal began with a soup, usually a rich vegetable or meat broth. Following that was a dish also called "soup," but not a liquid. It consisted of browned rice mixed with other vegetables or covered with sliced avocados or bananas. The third course was the most widely varied but usually included meat in some form. Then came *frijoles*, or beans. A green salad was next and often contained sliced cucumber or avocado.

Tortilla Appears in Many Roles

For dessert, Señora Romero made such dishes as vanilla and egg puddings cooked with cinnamon sticks. We ate mango custards and pancakes made with wheat flour which were soaked in a rich syrup of goat's milk and burned sugar. To finish off, there were bananas, peaches, pears, mangoes, apples, and oranges.

The tortilla, a thin pancake made of ground corn, is an extremely versatile food. It can be eaten alone like bread, but with salt rather than butter. It is something of an art to hold a tortilla flat in one hand and then roll it into a tight, compact cylinder with a sweep of the other hand.

Tortillas really come into their own when combined with other foods. They are torn into pieces and dropped into soup, or served as *enchiladas* with chicken, beef, or vegetables rolled inside, the whole covered with chile sauce. Fried tortillas become *tacos*; they are folded around cold meat or cheese and held with toothpicks.

Every household seems to have at least one expert who can pat the *masa*, or dough, into tortillas. Often tortilla making is part of a little girl's training; it takes about three months of practice to acquire real skill.

Masa Becomes a Mess

I tried many times to shape the dough by patting it rapidly between my palms. All would go well for a while; then, because of my uneven clapping, the dough would assume an oblong shape. As I tried to rectify this error, holes would appear in the dough (page 337), and soon the mess would be stuck to my hands.

One morning Señora Romero promised me a special treat, *pavo con mole*.

I had heard of this turkey dish with its rich, complex sauce.

"How do you make it?"

"Clemencia and I will spend all morning mixing the sauce. Four or five kinds of chile, chocolate . . ."

"Chocolate!" I broke in. "Chocolate mixed

with chile?" The thought made me shudder, until I remembered that bananas sliced into scrambled eggs had not sounded appealing, but had turned out to be delicious. And so did the turkey in chocolate sauce.

The Romero home presented a striking contrast between the old-fashioned and modern ways of life. Kitchen equipment, excepting the faucets, was just as it would have been a century earlier—charcoal-burning stoves, metates, the *comal* (earthenware griddle) for tortillas, and a huge porous stone hollowed out and used to filter the drinking water.

In the adjoining dining room was a modern gas range with four burners and an oven, supplied by a tank outside. Here Señora Romero did her baking and occasionally a little cooking. Not once did I see Clemencia the cook touch this stove.

Supper was so informal that the family rarely ate together. Invariably, however, Señora Romero would join me in a cup of hot *atole* (a thin corn gruel) and a chat. One evening she told me about the city as it was in her childhood.

"You should have seen the street in front of this house during the old days, Hugo. Carriages carried women in silks and satins. Dashing horsemen passed up and down the broad street on Sundays. The homes along here used to belong to the wealthy mine owners and merchants."

Once a Mining Center

"But why are many of the homes boarded up?" I asked. "And this street is now so quiet. I read somewhere that the city's population used to be 40,000. Now it is not much more than half that. What happened to cause the decline?"

"For centuries Guanajuato was one of the chief mining towns in the New World," she replied. "Then the mines began to give out; only poorer veins of ore remained. There were serious labor difficulties and many miners left the city. Many of the old families went, too, leaving their fine homes to crumble away."

"I suppose that being the State capital still keeps Guanajuato important," I remarked.

"Yes," she agreed. "And there are still a few mines which produce. There is little modernization, though—nothing like Mexico City. The old families cling to their memories of the past and resist change. The city has the same old colonial appearance that it had when I was little."

"Also, with no main highway running through the city, there is less tourist traffic," I suggested.

"It is better this way," said the Señora. "With relatively few automobiles, it is quiet and peaceful here. We all know each other,



"Welcome to Guanajuato!" The Romero Family Receives Hugh Hamill as Their *Yanguí*

An experiment in international living gets off to a good start as this Mexican family meets the author, an Amberst student. Speaking Spanish and adopting Mexican customs, he lived as a son for six weeks in Señora Romero's home.



Guamajuato's Young Visitors Forget the Fast Pace of Living North of the Border

Norteamericanos students in a tiled patio compare experiences in their foster homes. Some wear bright Mexican costumes; all practice Spanish. Left to right: Nell Burton, Nancy Camp, Hugh Hamill, Rosalyn Cox, Robert Keyes, Beverly Goodnight, and Alfred Bigelow.

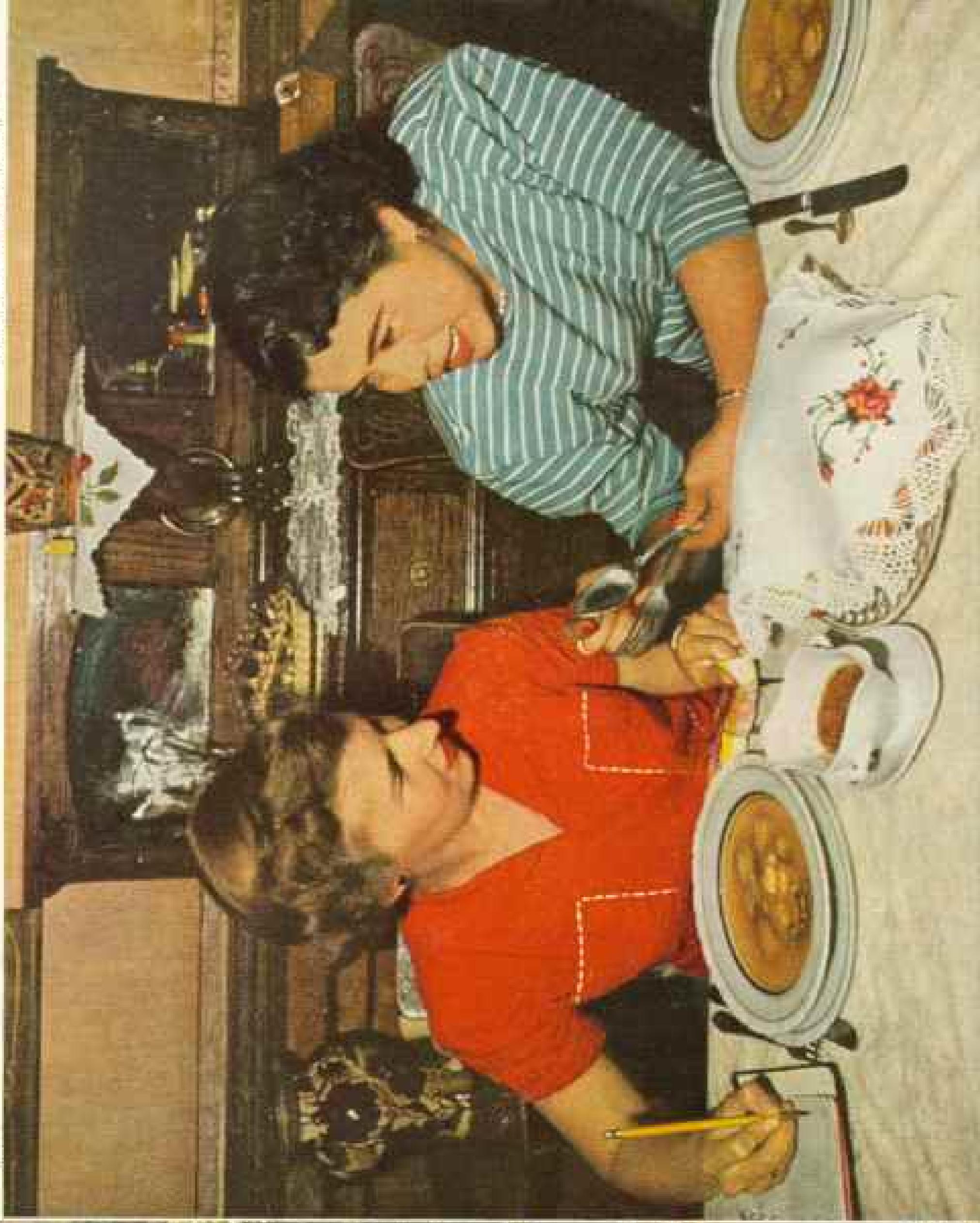
"La Cuchara—the Spoon." Coco Boria Teaches Spanish to Nell Burton

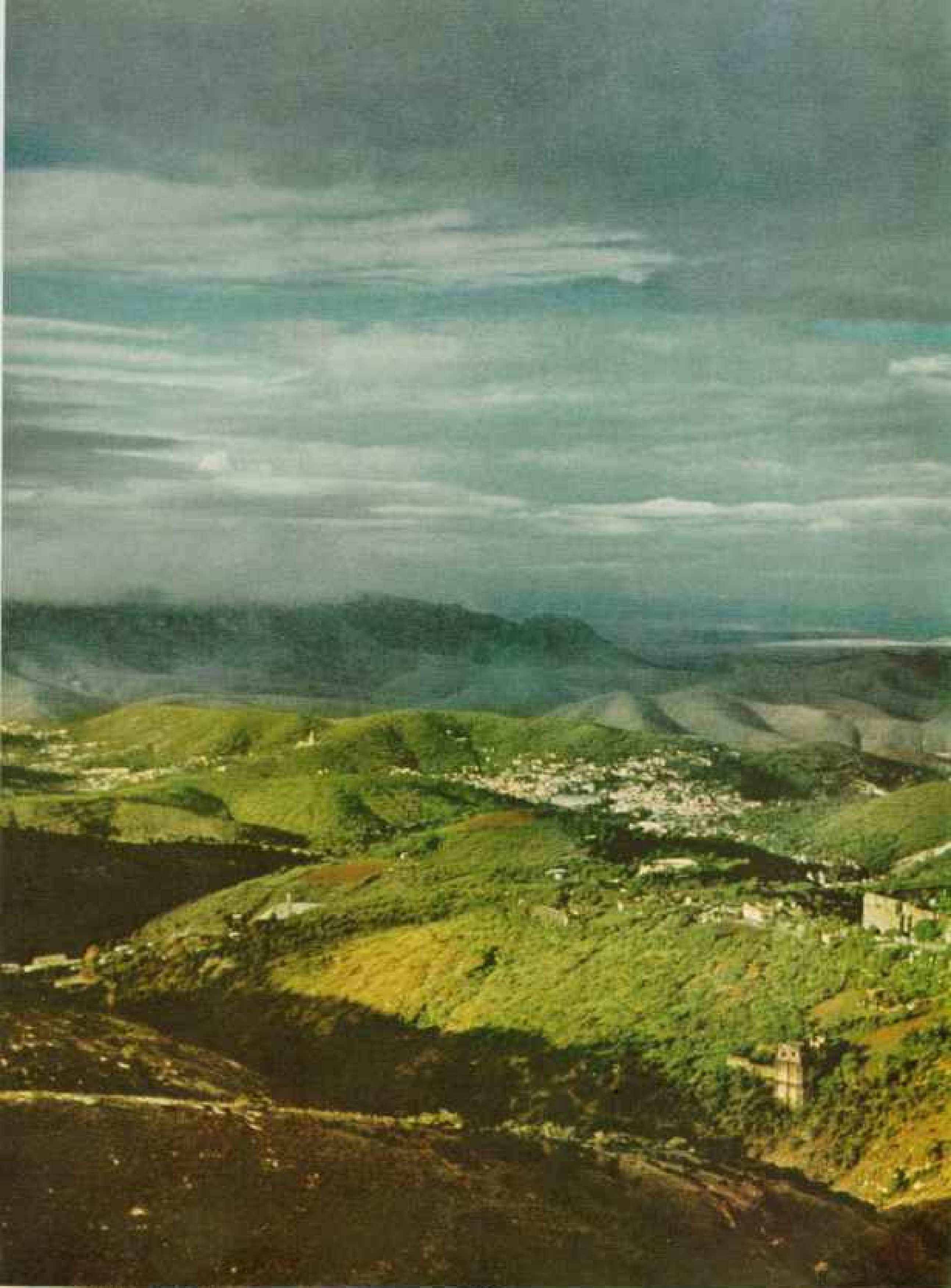
Many of the Experimenters discovered that the family dining room was the best classroom for improving their Spanish and learning to understand Mexican customs. In this well-to-do home soup is served as the first course in the big early-afternoon meal, *la comida*, or dinner. Fresh tortillas lie under the napkin; the host holds a hot sauce of chile peppers and tomatoes. Actually, many Mexicans do not eat food as peppery as it is commonly believed to be.

Señora Romero (left), the author's Mexican "mother," displays two of her many pets. Guamujuato's steep hills rise beyond the flowering poinsettias and the wall of her garden.

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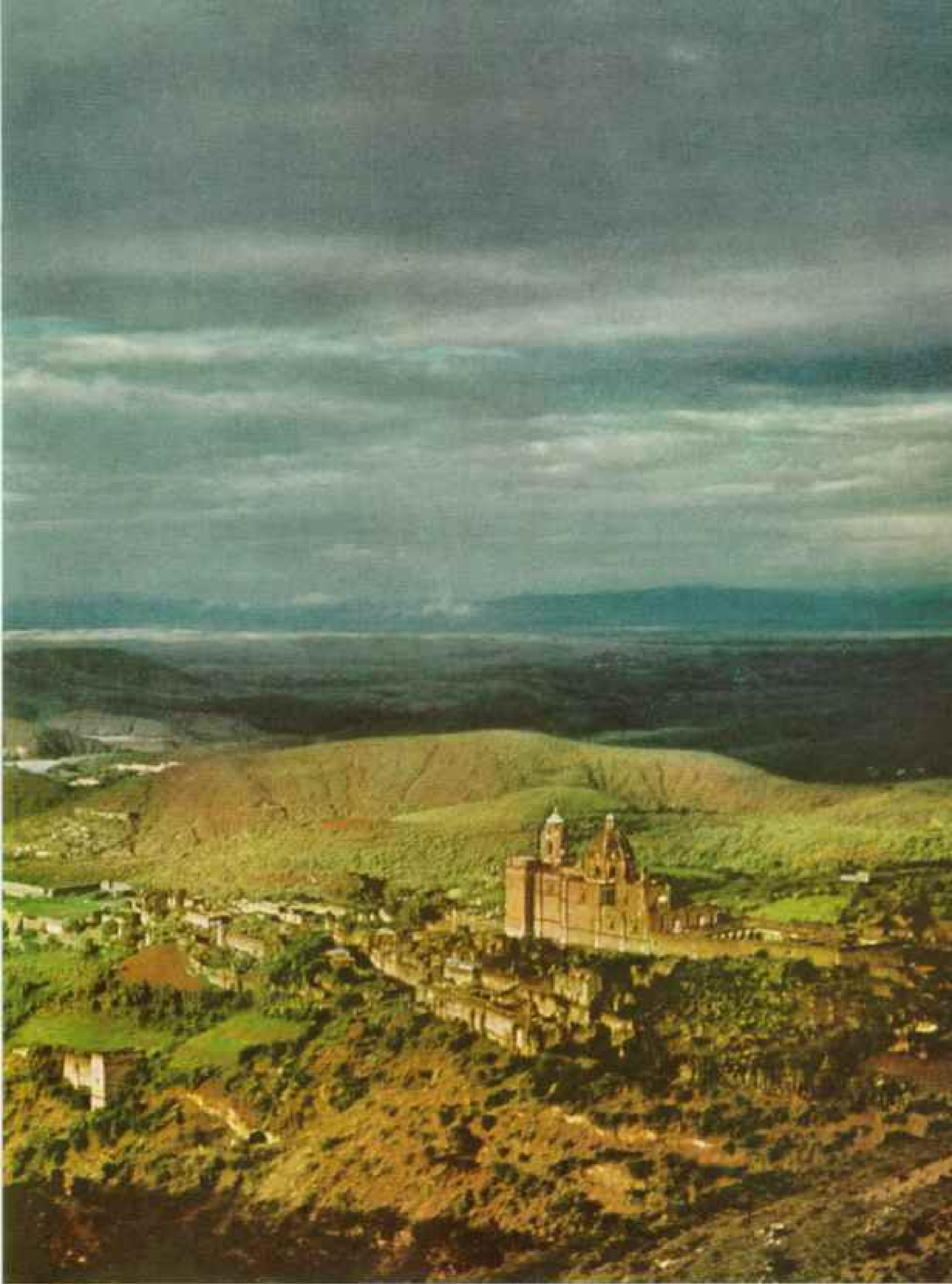
Contributed by Harb M. Hamill, Jr.





Guanajuato Sparkles in the Morning Light Like the Silver in Her Tumbled Hills

In colonial times the city's vast silver deposits kept Spanish coffers overflowing. Many mines have closed, and population has dwindled, but much of the architectural splendor remains.



Legend Says La Valenciana's Massive Church Was Mortared with Wine and Powdered Silver

The church, standing near one of the richest silver mines in the colonial world, supposedly covers a valuable ore deposit. The Count of Rul, who built the church, refused to exploit the bonanza lest he harm the edifice.



Young Guanajuatenses Love to Explore Their City's Narrow, Twisting Streets

Ornate balconies and lanterns add to Guanajuato's Moorish atmosphere. Few streets can accommodate cars. Some cramped and crooked passageways force pedestrians to proceed single file.



♣ **Corn Means Life in Mexico, Even as It Did Before the Spanish Conquest**

Corn has fed Mexico for thousands of years. Many Indians still eat little else. Today demand for the grain compels the country to import it. Nell Burton cooks for the Experimenters in the Indian village of Nochistepoc, near Mexico City.

♣ **Old-time Indian Art Takes Modern Form in a Tinsmith's Shop**

Long before the Spaniards came, natives used masks for ritual, ceremony, and festival. Many dances still require faces of deities and animals. Robert Keyes watches this artisan make ornamental wall masks in San Miguel de Allende.





▲ **Uruapan Lacquers Owe Their Quality to a Lowly Plant Louse**

Famed lacquer of Uruapan covers gourds and woods. Men scratch designs in the original coat; women laboriously rub colors into the grooves with their thumbs. Secretions of the tiny *aje*, a parasite on plants, make the finish hard and waterproof.

✦ **Bright Sands Pressed into Tile Lend Color to Mexican Architecture**

Tile craftsmen preserve many of the symbols and designs prized by Indian tribes of bygone days. Mexico uses many of these colorful slabs to decorate hotels, motor courts, and patios. Mexico City's House of Tiles is an example in the Moorish-Spanish style.



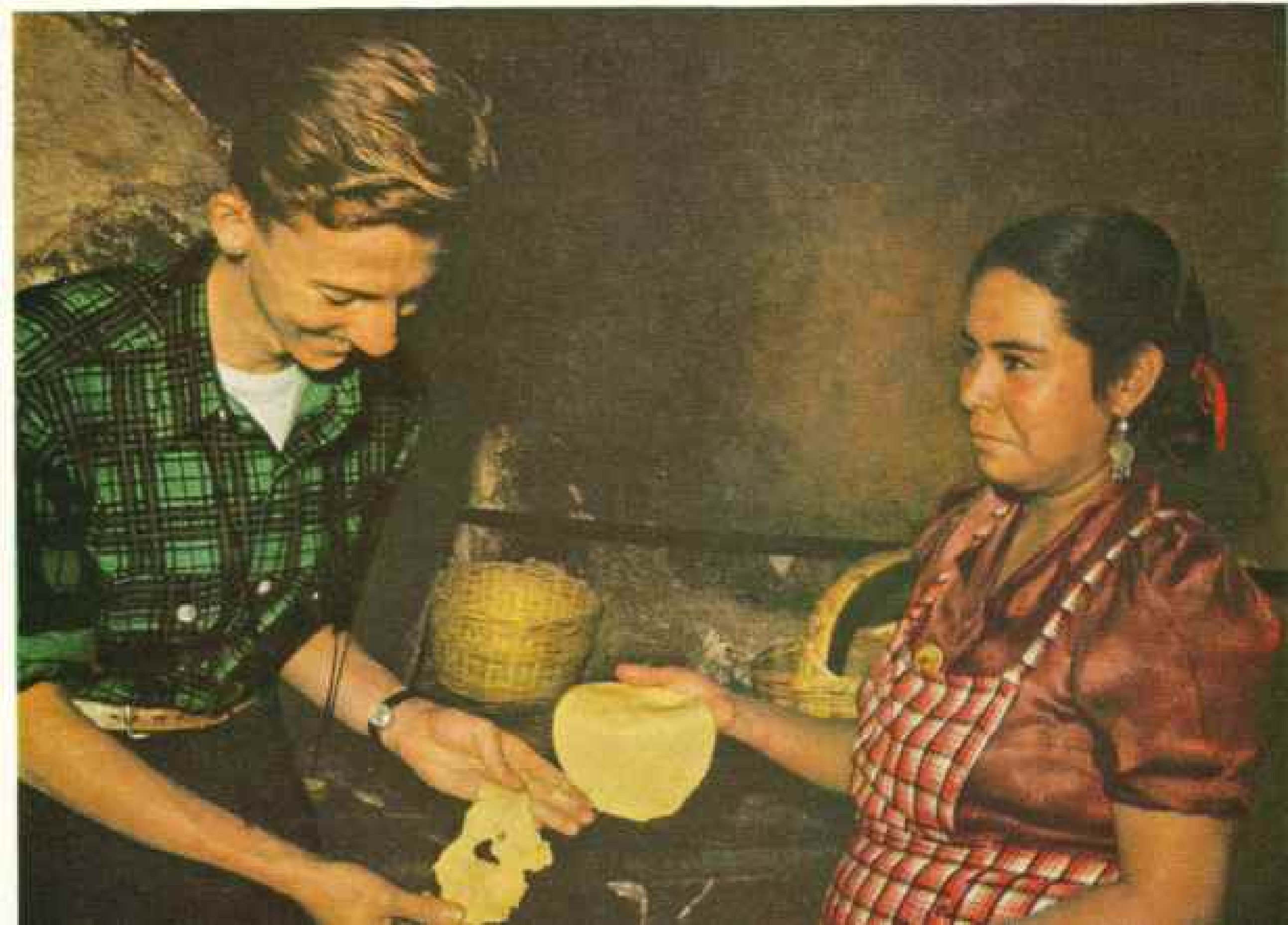


▲ **Charcoal Glows and Pot Simmers:
Alfred Bigelow Fans a Brazier**

Indian kitchens, with stone tables, clay pots, and charcoal stoves, have changed little over the centuries in Nochtepec (page 335). In Guanajuato the Romero's cook preferred the old-fashioned brazier to the family's modern gas range.

▼ **Tortilla Making Is a Tricky Process,
Robert Bialek Discovers**

Indians say a girl is ready to wed when she can make the corn-dough pancakes that accompany every Mexican meal. Tortillas must be flattened wafer-thin by rapid patting between the hands, a skill that takes months of practice.





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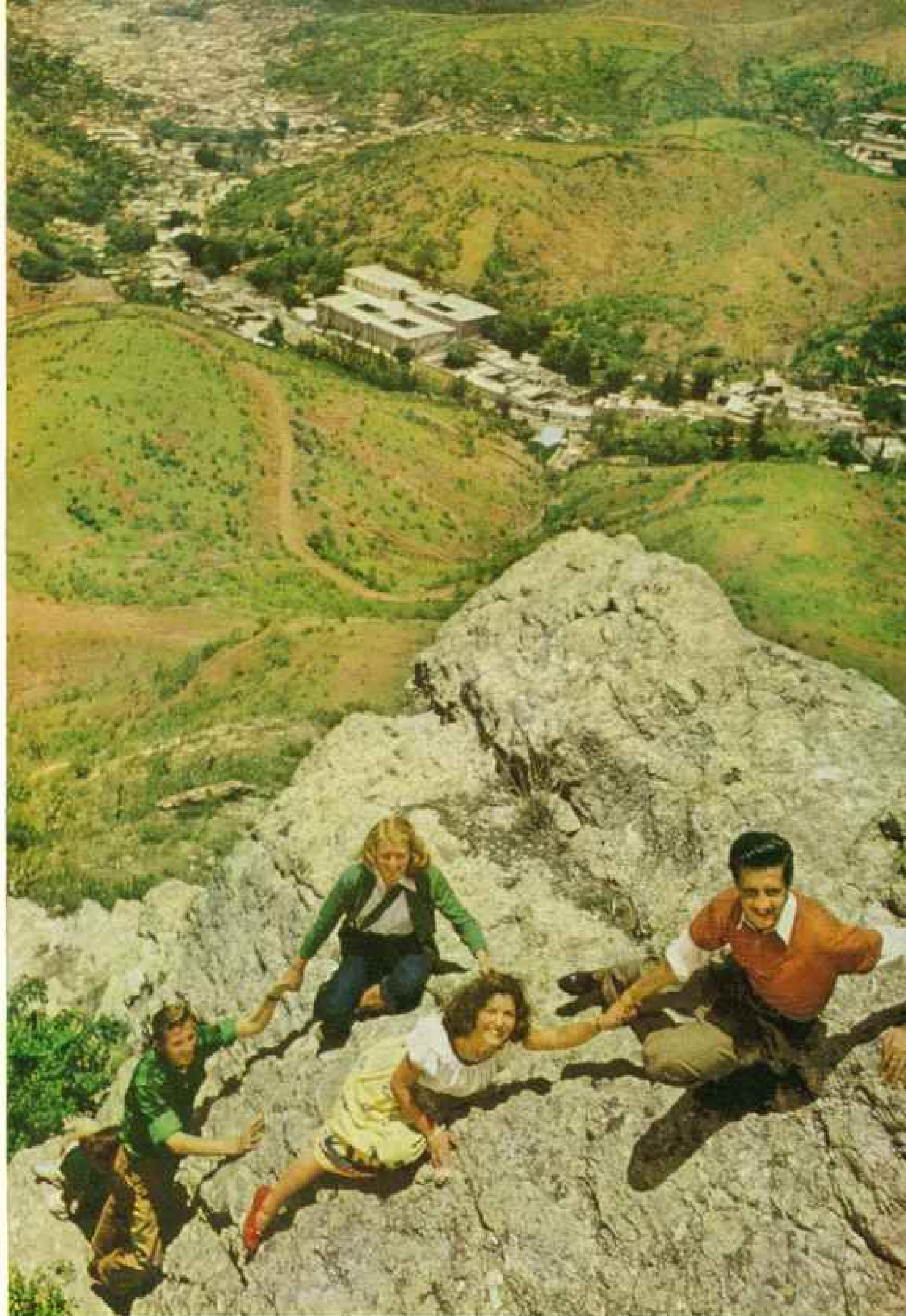
♠ **Hikers Atop a Eucalyptus Trunk
Survey the Rainy Season's Greenery**

These hunters sought game in the high country of central Mexico. Rosalyn Cox's broad-brimmed sombrero, offered as a target, proved the only casualty. Mesquite (center) and *nopal*, prickly pear (right), grow at 8,000 feet. Rains last from June to October.

♣ **Beverly Goodnight and Ofelia Mora Get
a Botany Lesson from Enrique Romero**

Scores of cactus varieties thrive on the Mexican plateau; they range from tiny balls of spines to huge spires the size of organ pipes. Besides producing brilliant flowers, the cacti provide food, shade, and living fences. Prickly pear (top of page) makes a tasty candy.





Guanajuato Flows Like a River Through the Canyon of Ivory

Robert Biniek, Rosalyn Cox, Ofelia Mora, and Enrique Romero climb a peak for an eagle's-eye view of the city and its General Hospital. Mines, tunnels, and shafts honeycomb hills and even city foundations.



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Taxco de Alarcón's Fabulous Silver Mines Enriched José de la Borda, an 18th-century Frenchman, Who in Gratitude Built Its Church
William Sprattling, a New Orleans artist, converted old Taxco into today's thriving silver-craft center; Mexico preserves it as an unspoiled colonial town. Modern builders may not deviate from old-style effects such as red tile roofs and overhanging balconies.

← A Painting in a Golden Frame: Two Ladies Leave Church

Works of folk art on this church wall depict the granting of miracles by patron saints. Guanaquatemenses created them to express thanks for escape from mine disasters or recovery from illness. Wooden hands and a crutch (at top) symbolize the healing of injuries.

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Restatement by Brian M. Hamill, Jr.





Guanaajuato Inspires Mexican Patriots; Here Their Forefathers Won a Famous Battle for Independence

In 1810 embattled Spaniards made a desperate stand in Alhóndiga de Granaditas, the huge pile of masonry at left center. To revolutionary Mexicans the onetime granary appeared impregnable until the hero "Pipila" shielded himself with a flagstone, ran through a hail of bullets, and set fire to the door, allowing his comrades to storm the fort. A museum occupies the place today. A statue of Pipila in the distance overlooks the valley.

Experimenters Sample a Sidewalk Cook's Wares in Morelia.

Having lived six weeks in Guanajuato, the author's group decided to see other parts of Mexico. In Morelia, a cathedral city 135 miles west of Mexico City, they found the main street's arcaded sidewalks crowded with portable restaurants.

This woman, who prepares *buñuelos* for Nell Burton and Beverly Goodright, bakes the big wheat-flour wafers at home and carries them to her stand. There her charcoal brazier warms each crisp cake in a brown-sugar syrup. She serves *afófo*, a corn gruel, to neutralize the sweetness.

At nightfall the proprietress will light the kerosene lantern in her pedastaled oilcan (right).

Kolachunas by
Joan M. Busby, Jr.





♠ Nell Burton Spreads a Pleated Halo Across Glowing Tiles

This flowered dress came from the Isthmus of Tehuantepec in southern Mexico. Tehuana women have been celebrated since Spanish times for their beauty, costumes, and heavy gold necklaces. They use colors a macaw would envy.

♣ Green, White, and Red Spell Freedom to Every Mexican

Legend says the god Mexitli ordered the wandering Aztecs to build their capital at the spot where they found an eagle clutching a serpent above a cactus. That place became Mexico City. The Republic's flag commemorates its founding.



and it is a fine place for children to grow up."

One day, after a group meeting, I asked Elenita Burton how she was getting along with the Alberto Cortés family.

"Chelo (you know that's a nickname for Consuelo), my 'mother,' and I go everywhere together," she said. "Yesterday was Sunday, and after Mass we went to the big tin-roofed market. I asked why Sunday was selected as market day. She said that at the end of the week all the neighboring small farmers and rural craftsmen bring in their produce and handiwork. Of course, many of the stalls are open daily, but they are run by those who live in the city.

Big Day for Rural Folk

"Chelo told me that most of the excitement and pleasure of market day, especially for the rural folk, is in seeing friends, gossiping, and having a good time. If you met a potter carrying a huge load of bowls to market and offered to buy everything from him on the spot, he would refuse to sell; otherwise he would have no excuse to go to market!"

"Yesterday you went to some religious fiesta, didn't you?" I asked. "I saw you with Chelo at the churchyard celebration in the afternoon."

"Well, with our house right next door to the church, I felt an intimate part of the fiesta from 4 in the morning on," she replied.

"Ah, the skyrockets!" I laughed.

"Not only fireworks," Elenita went on, "but a band, too! Both of them kept going most of the day. The trip to market was a welcome relief from the noise. I did enjoy the Indian dancers in the afternoon with their bright-red skirtlike costumes and feather headdresses, their intricate steps, and the little man with the many-stringed guitar who supplied the music and called the figures."

"Did you see them light the *castillo* last night?" I asked.

"Yes. I went out with Chelo and the Señor to see it. Señor Cortés told me that there are men who do nothing but make castillos and other fireworks for church festivals. He said it requires careful planning to link up all the pinwheels and flares on the 30-foot frame of a miniature castle so that they go off in sequence and not all together."

Fun in the Narrow Streets

One starlit night, as I was working at my desk, Carlos, our next-door neighbor, and Enrique suddenly appeared at my window.

"Let's go, man, we're going to *callejonear*," said Carlos.

"Going to what?" I demanded in puzzlement.

There was no time to explain as we hurried

through the patio to the street. There we met a group of some 30 Mexican youths and Experimenters. I began to realize that *callejonear* had something to do with the *callejones*, the narrow little lanes and walks (page 334).

We started off arm in arm, singing lustily. It turned out that to *callejonear* was simply for a large group of young people to explore the city's byways at night while singing, laughing, and joking.

We turned off the main street into a cobbled lane lined with small homes. As we followed it up the hillside, the *callejón* frequently opened out into small courtyards lined with doorways and balconies.

"Where are we going?" asked Alfredo.

"We're climbing up to a terrace to look at the lights of the city and to go up inside Pipila," replied Enrique.

"You mean the statue of Guanajuato's local hero is hollow?" I asked.

"Yes. He's like your Statue of Liberty," said Enrique as we paused to rest on some steps.

"I've been wondering about Pipila," said Alfredo. "Could you tell us about him?"

Pipila's Deed of Heroism

"Well, when Padre Hidalgo started the revolution against Spain in 1810, he gathered a huge army of countryfolk armed with little more than hoes and sickles. They attacked the Spanish garrison in Guanajuato in late September. In the first battle of the war the Spaniards fortified themselves in the Alhóndiga de Granaditas, the big building near the market that was once used to store grain.

"With the withering fire of the Spanish troops keeping the insurgents away, the place was virtually impregnable. It was then that a miner, nicknamed 'Pipila,' appeared from the ranks with a huge paving stone strapped to his back. In one hand he carried a torch. He turned his back to the Spanish bullets and backed toward the door of the Alhóndiga.

"With the stone to protect him, he reached the entrance unscathed and set fire to the wooden portal. The door burned down and allowed the army of Hidalgo to enter and kill all the Spaniards. It's little wonder that his bravery and ingenuity made him a folk hero of the nation as well as of the city."

"You might call Pipila the first tank in modern warfare," chuckled Carlos.

We resumed our climb. From the summit we admired the length and breadth of the Cañon de Marfil (Canyon of Ivory, page 339), then turned to the huge statue of Pipila.

A guard showed us to the narrow winding stairs. Enrique and I hurried up ahead of the others and came through a trap door to a stone platform by Pipila's shoulder. The



"Señora Romero Was Kind and Understanding; We Could Go to Her with Any Question"

The author admired his widowed Mexican "mother" because of "her fortitude in carrying on a business and bringing up four children." Here he samples sweet rolls and *café con leche*. This drink mixes cold concentrated coffee (cruet, left) with hot milk that has been effectively pasteurized by boiling.

figure stands in a dramatic pose with its right arm in the air. Built in 1939 by sculptor Juan F. Olaguibel, Pipila is the pride of historic Guanajuato and may be seen from almost any spot in the city (page 342).

Little Street of the Kiss

We started down the hillside by another series of callejones. The singing continued and drifted into a series of lilting love songs. Carlos shouted to me that we were approaching the Little Street of the Kiss. This callejón was so narrow that we had to pass through it in single file. At the top were two flower-decked balconies, one on either side, which almost touched.

The street received its name from a colonial legend about a beautiful girl who tried to flee from her tyrannical father across the balconies to her waiting lover. The father caught her and in his rage stabbed her. Dying, she stretched her hand across to her lover for him to kiss.

"You haven't been to La Valenciana yet, have you?" Enrique inquired of me one day.

"No," I replied. "Isn't that the little town with the beautiful old church high on the mountainside above the city?"

"Yes. It was once a thriving mining town, but now it is nearly deserted."

"Haven't I heard that the mine at La Valenciana used to be one of the richest producers of silver in this area?" I asked.

"'Used to be' is right! Thirty or forty years ago the main shaft was flooded by an underground river. The owners tried pumping the water out, but the cost of pumping eventually reduced the profits to nothing, and Valenciana was abandoned.

"Probably the thing of most interest at La Valenciana today is the church, El Templo de Valenciana. Its architecture is magnificent, and the amount of pure gold used in the interior decorations makes it, even today, one of the most richly adorned churches in the world."

Next morning we began the hike through the narrow streets, climbing rapidly into the hills. After several pauses to rest, we came to the foot of the last steep grade up to the ghost town. To our left was a narrow canyon with a tall smokestack and some oddly shaped ruins at the head of it.

"There is what is left of the mine works," said Enrique, pointing. "We'll go up to the village first and see the Templo before we go to the ruins."

A shawled woman opened one of the carved wooden doors, admitting us to a vaulted nave resplendent in gold leaf and baroque design. Altar and baptismal font were plated with pure gold. We marveled at this memento of the half-forgotten days of Spanish colonial rule (page 353).

In a Mine Four Centuries Old

Elena Yerena, the other local representative of the Experiment, worked as a secretary at the office of the Rayas silver mine, the biggest and oldest still in operation around Guanajuato. She arranged for us a trip to the mine which clearly revealed the nature of one of Mexico's most important industries.

The chief engineer conducted us through the plant where the ore is pulverized and refined before going to the smelters at San Luis Potosí. Our guide explained the rock-crushing machinery and showed us huge tanks where a chemical flotation process separates gold- and silver-bearing sand from waste material. Since the rich veins have long since been exhausted, the present ore is low grade and requires this complicated refining process to make it pay.

We found real adventure in going down the shaft into the 400-year-old mine. A tiny electric train bore us to a high walled structure bulging out of the side of the mountain. Ahead of us was a tunnel through the wall into the mountain.

I noticed as we got off that a miner who had been assigned to accompany us was speaking quietly to Carlos and looking at the girls in the group. Soon Carlos turned to me.

"Hugo, it isn't possible to take the girls with us into the mine," he said.

"Why?" I asked. "They've been counting on it."

Girls Yield to Superstition

"The miners consider it bad luck for a woman to enter the mine. The last time a woman went down the shaft, they had a cave-in and a number of men were killed. You will find that miners are very superstitious."

Carlos and I persuaded the girls to wait.

We were given miners' lanterns and shown how to light them. Then we bade the girls

goodbye and trudged into the tunnel. Immediately we felt the dank subterranean air. A few minutes' walk following car tracks brought us to a platform in the side of the main shaft.

Here was an awesome sight. The shaft, some 20 yards in diameter, was hewn out of solid rock. Below us was nothing but blackness and misty vapors rising or hanging in the still air. About 100 feet above us the top of the shaft framed a reassuring patch of blue sky.

Without warning the open-sided elevator began its long descent. Down and down we went; at last we stopped at another platform and got out. I looked up the shaft and could just see a little patch of light like a dim lantern on a foggy night.

"This is the mine's lowest level, about 820 feet from the surface," said a miner.

We turned from the shaft and spent the next two hours trudging along dripping tunnels, across huge caverns, and worming our way up rope ladders.

In one passage we saw a small shrine, neatly kept and decorated, dedicated to the Virgin of Guadalupe. Carlos told us the miners were extremely religious, because of the perils of their occupation, and that such shrines were scattered throughout the mine.

Our guides pointed out various tunnels that had caved in or had been blocked off. One closed off by rubble was the grave of several trapped miners. Propped up against it was a sign in lampblack with the word "*Peligro*"—"Danger."

Back to Surface by Another Route

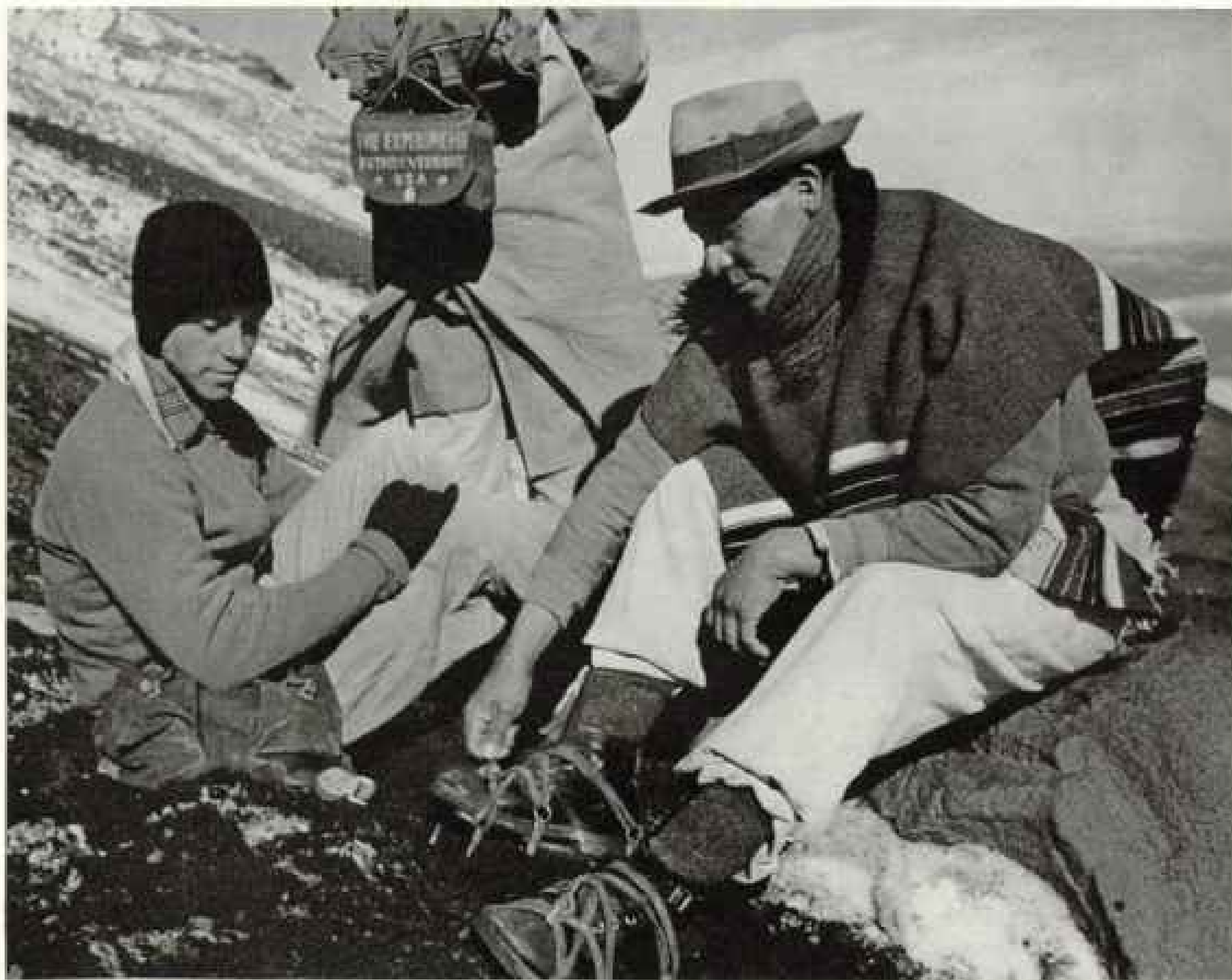
The miners we encountered rarely wore more than shorts and sandals. About 800 worked in the mine.

At last we came to a place where men pushed ore carts toward a loading platform. We thought we had made a big circuit and had arrived back at the shaft by which we had descended. An elevator whisked us to the surface. Then we found we had gone more than a mile underground and had ascended by an entirely different shaft.

We hiked back overland and surprised the girls by appearing on top of the earth rather than out of its depths.

While the Experiment places major emphasis on the life in an individual family, the program includes week-end and longer excursions to give everyone a broader notion of the Mexican people and countryside. My group made one trip to León, an industrial and agricultural center of the State of Guanajuato.

Another week end took us to San Miguel de Allende, colonial art center and a cradle of Mexican independence (page 322). On our



A Guide Shows Robert Keyes How to Lace Up Crampons for an Assault on Popocatepetl.

Four boys reached the volcano's 17,887-foot summit; three girls turned back. "Toward the last," says the author, "I was taking 10 steps, then resting 10 minutes. We came down three times as fast."

way we stopped in the hamlet of Dolores Hidalgo at the home of Father Miguel Hidalgo, who, on the night of September 15, 1810, gave the rousing "Cry of Dolores" which precipitated the revolt against Spain.

In San Miguel de Allende we visited several of the famous handicraft shops and the fine-arts school where artists from all over the continent study Mexican arts and crafts (page 335).

Life in an Indian Village

Our long trip included Morelia, the volcano Parícutín (page 350), Acapulco de Juárez, Taxco de Alarcón (page 340), a climb up Popocatepetl, and a visit to Mexico City. But the highlight was the five days we spent in the tiny village of Xochitepec, a dozen miles south of the Mexican capital.

Here we sought to learn at first hand what it is like to live in one of the countless rural Indian settlements. This experience afforded a contrast with Guanajuato, where we lived with middle- and upper-class families.

Xochitepec, we were told, dates back to pre-conquest days, when it bordered on the Aztec capital of Tenochtitlán, now Mexico City. With a population today of 400, it seems to have changed little in either size or appearance during the last four centuries.

A single taxicab carried all eight of us, with our belongings and camping equipment, from Mexico City. (On a strict budget, we economized whenever possible). Arrangements had been made in advance for us to occupy a two-room adobe house with a stone-walled kitchen attached.

Despite its proximity to the capital and to the tourist center of Xochimilco, we found the village unspoiled. We went first to its only store. The proprietress, who was also our landlady, led the way up a rocky hillside. The gate to the yard swung open, and an aged Indian woman appeared.

"This is my grandmother," said the storekeeper to me. "She lives here in the kitchen house."

A broad grin spread across Grandmother's



"Hurry or We'll Be Late." American and Mexican "Sisters" Dress Each Other's Hair Working to become better acquainted, Nell Burton and Socorro Borja quickly became "Elenita" and "Coco" and frequently exchanged sisterly kindnesses. Here they preen for a fiesta.

face. Obviously she was pleased by the prospect of visitors, especially North Americans.

Having resolved to live according to the conditions we encountered, we hauled our water from the public faucet at the bottom of the hill a hundred yards away. All our cooking was done in pottery bowls over a charcoal brazier (pages 335 and 337).

Grandmother showed us how to keep the fire going with a fan and how to grind corn into dough for tortillas. She taught us to make rich stews of meat and vegetables and to mix frothy hot chocolate with a *molinillo*, a sort of egg beater operated by twirling its stem rapidly.

Army cots were our only luxury. Grandmother slept in the kitchen on a woven fiber mat. We were happy to have heavy wool serapes for the cold mountain nights.

The stock in our landlady's store was limited, so each day four of us hiked a mile to the main road and took a bus to the market at Xochimilco for supplies.

Milk we obtained from a man who lived

down the dirt path that serves as a street. The amount we were able to get was unpredictable, always dependent on the mood of his two black cows.

Through the milkman we came to know his next-door neighbor, Vicente, Xochitepec's postman, a thin, alert Indian of about 35. Vicente, much interested in the Americans who had suddenly appeared in the village, announced that he was on vacation for a week and would like to do anything to help us.

The Postman Provides a Treat

Vicente proved a godsend. He procured horses for us to ride in the hills above the Valley of Mexico and got us a boat at Xochimilco's Floating Gardens at a reduced rate. He accompanied us everywhere, always proudly wearing his postman's cap.

One day Roberto and I stopped at Vicente's house. He was busy painting a wall bright blue when we entered.

"Ah, my friends! How is it going with you?" he called. "I am very happy that



William G. Preston

"And All That Came Out of My Cornfield," Said the Farmer Who Saw Paricutin Born

"It was raining and cold at 5 in the morning when we Experimenters mounted mules and rode out to this mound," says the author. "Like our Tarascan guides, we wrapped ourselves in serapes and sat shivering. Showers of sparks lit up the night; rivers of molten lava poured from the volcano. Dawn changed the fire to smoke and the lava's red glow to steam." Born near Uruapan in 1943, Paricutin subsided a year ago.

you've come. You're just in time to enjoy a treat."

Vicente disappeared for a moment, then returned with several freshly cut pieces of cactus. He was cleaning the spines off with his pocket knife.

"They're the newly grown tops of the *nopal* cactus," he announced. "I'm going to cook them for you." (Page 338.)

We followed him into the kitchen where his 10-year-old daughter was busy making tortillas. He gave the pieces of cactus to her, and she put them over the fire with the tortillas. Soon they were sizzling in their own juice. Vicente flipped each onto a hot tortilla and then sprinkled them with chile.

Roberto and I each took one and bit into the "treat." Our eyes bulged and our mouths felt aflame. The tortilla and cactus were good, but the chile was hotter than anything we had ever experienced in a Mexican home.

Back in Guanajuato, we spent a busy last week with our "families." It is the custom of every Experiment group to give a farewell party in honor of its families and friends. For this occasion we built up a repertoire of Mexican songs and rehearsed in a group presentation of a Mexican dance. We rented a hall, hired a little orchestra, and made decorations. The day of the fiesta we slaved making refreshments.

When we sang that night for the more than 200 friends and "relatives," it was with lumps in our throats. One plaintive song was Luis Mars's arrangement of "La Barca de Oro" (copyright Peer International Corporation, New York City). It well expressed our feelings:

I go now to the seaport where is found
the golden ship that will carry me away.
I am going now. I only come to say good-
bye . . .

Sailing the Aegean in a Sturdy Caïque, the Authors Find Adventure and Hospitality in Storied Isles of Greece

BY JEAN AND FRANC SHOR

With Illustrations from Photographs by the Authors

VIOLENT, unpredictable, the winds of the Aegean have been the despair of mariners since man first sailed these island-dotted waters. Legends record that they buffeted the tall ships of Agamemnon at the siege of Troy, drove Ulysses from his homeward course, and troubled Jason's quest of the Golden Fleece. Through the centuries they harassed the flotilla of Xerxes, the galleys of Imperial Rome, and the navy of Suleiman the Magnificent.

Neither time nor modern methods of transportation have lessened their power. Two summers ago they blew my wife and me, flying high in an airliner, into a new and exciting adventure—a cruise through the historic Dodecanese.

From Fast Plane to Slow Boat

Ordinarily we would never have seen this scattered archipelago that sprinkles the southeastern Aegean off the coast of Turkey (map, page 358). But a storm forced our Constellation to change course on its Cairo-Athens flight.

Suddenly, through a break in the clouds, we saw the islands far below. Rocky shores, ringed with foaming surf, rose abruptly from white-capped water. Green forests crowned steep mountains; pink-roofed houses clustered around protected harbors that sheltered fleets of small craft.

"The ancient Greeks guided their lives by omens," said Jean. "Perhaps we should spend our vacation exploring the Dodecanese."

Swooping low over Piraiëvs, Athens's harbor, we passed over dozens of white-sailed caïques, sturdy little vessels that have carried Aegean cargoes for centuries.

"For years I've wanted to sail in one of those," I told Jean. "Let's combine omen and wish, hire a caïque, and cruise through the islands."

In Athens (Athínai) we arranged to fly to Rhodes (Ródhos), the islands' capital, and to be met there by a caïque. A few days later we were sitting in the office of R. Ar. Agathocles, then Governor General of the islands, overlooking the windmill-lined harbor of the city of Rhodes (page 363). Over cups of thick Turkish coffee he told us about the Dodecanese.

"Americans are always welcome here," the governor began. "Thanks to your assistance we have repaired most of our war damage.

"It seems to be the fate of the Dodecanese to suffer war and invasion," he went on. "Many nations have prized them for their strategic location. Greece, Rome, Persia, the Byzantine Empire, and other powers have ruled here in ancient times.

"Suleiman the Magnificent captured the islands from the Crusaders, and the Turks remained until the Italians drove them out in 1912. During and after World War II we had German and British military governments. Only in 1948, after centuries, were the islands returned to Greece."

A note of pride crept into the governor's voice.

"Think of it," he said. "Since the 5th century B.C. alien rulers tried to tear these people from their Greek ways. Yet today they speak Greek, worship in Greek Orthodox churches, and keep their old Greek customs."

A Dozen Islands—Plus Two

Dodecanese is Greek for "twelve islands," but actually there are 14 in the chain, with numerous islets and reefs. They are home to 116,000 people, more than 55,000 living on Rhodes, the largest island. A few till the rocky soil, but most are fishermen, sailors, and sponge divers.

With John Vamvlakaris, an Athenian, we set out to see the ancient city of Rhodes. Streets were ablaze with bougainvillea, hibiscus, and oleander. Automobiles honked a path through narrow cobblestoned streets, their horns echoing from ancient walls. The Palace of the Grand Master of the Knights of Rhodes towered above the city.

Almost completely destroyed during nearly 400 years of Turkish domination, the castle was rebuilt as a summer palace for Mussolini. Fine mosaics from the island of Kos cover the floors, but there is little else that is old. Italian architects installed Hollywood-style bathrooms and modern furniture for Il Duce's comfort. But war intervened and he never occupied the island retreat.*

* See "Rhodes, and Italy's Aegean Islands," by Dorothy Hoimer, NATIONAL GEOGRAPHIC MAGAZINE, April, 1941.



Baby's Portable Cradle Leaves Mother's Hands Free for Work in Field or Home

Though Dodecanese people were ruled by non-Greeks for centuries, this young woman is as true to her Greek heritage as a mainlander. Like women's boots, the sling is characteristic of Embona, Rhodes (page 365).

Walking the medieval Street of the Knights, we found it easier to recapture the feeling of another age. Here, during the rule of the Crusaders, warriors from various nations had their separate quarters.

"Houses of the Tongues" these buildings were called. Their weathered walls stand undamaged, the proud insignia of French, Italian, English, German, and Spanish knights still visible.

As our steps rang on the stones we imagined that fateful day more than 400 years ago when Crusaders, armor flashing and banners flying in brave defiance, marched through these very streets to meet the assault of Suleiman the Magnificent.

In the Hospital of the Knights, now a

museum, we saw relics of a far earlier life. Hundreds of classical Greek statues and friezes fill its rooms.

Here stands a magnificent marble Aphrodite. Little known except to a few scholars, it is one of the finest works from Greece's Golden Age.

Waters Sailed by the Apostle Paul

The city of Rhodes, however, has no monopoly on the island's attractions. In Lindos we scaled a steep stairway to the Acropolis (page 368).

We gazed down on a shimmering blue bay. "It is called locally the Bay of St. Paul," John told us. "The Apostle sailed to Rhodes on his way to Jerusalem" (Acts 21: 1).



Rhodes City Sets Windmill Sails to Catch Not the Breeze but the Traveler's Eye

Electricity having proved more reliable than wind, these old towers fly their sails only for effect (page 363).
But old-style mills still do a job on small islands lacking power.

In Lindos we found a house built hundreds of years ago and still occupied by descendants of the original owners. An 80-year-old matriarch welcomed us at the door (page 386).

Beautiful plates, many of them the famous Lindos ware, covered the walls of her home; some were of 17th-century workmanship. The city's pottery has been admired since the 16th century, when according to one legend Persian potters en route to work for the Sultan were shipwrecked near by. They found suitable clay near the city and settled there.

The family's eldest daughter, a widow in her fifties, proudly showed us the dowry she had brought her husband 30 years before. From a huge chest she drew dozens of hand-spun linen sheets and stacks of towels, cur-

tains, tablecloths, and dress materials, all delicately embroidered. John pointed out that a Dodecanese bride retains title to her dowry. With household furniture and treasured plates it is handed down to her eldest daughter.

Visiting Embona, an ancient village on the island's western side, we passed hundreds of white-sailed windmills. Around them were rich irrigated fields of vegetables and grain.

Oracle Warned of Tragedy

Embona's villagers were dressed in gaily colored costumes, men and women alike wearing soft knee-length leather boots (page 365). When we remarked that we were reminded of holiday dress on Crete, John told us the legend of Embona's founding.

Castle Ruins Crown the Acropolis on Léros

Driving past this spot, the authors met a housewife shepherding two children (shown) and six live turkeys.

"Tired of fish," the Shors report, "we offered 100,000 drachmas for one of the birds. That sum, the equivalent of \$6.60, represented a week's wages on Léros, but the woman refused it, explaining that turkey was her husband's favorite dish, and she feared his wrath if she sold a single one.

"Later, while touring the village, we found ourselves pursued by a white-coated barber excitedly waving a shaving brush in one hand, a razor in the other. He turned out to be the husband; word of our offer had reached him. Leading us to his shop, where he had left an irate customer half-shaved, the barber accepted our 100,000 drachmas and promised us a tender turkey.

"Cooked the next day aboard our boat, the bird proved tougher than the proverbial crow eaten the day after election."

Huge letters on the distant castle spoke "Welcome!" to the King and Queen of Greece when they visited Léros.

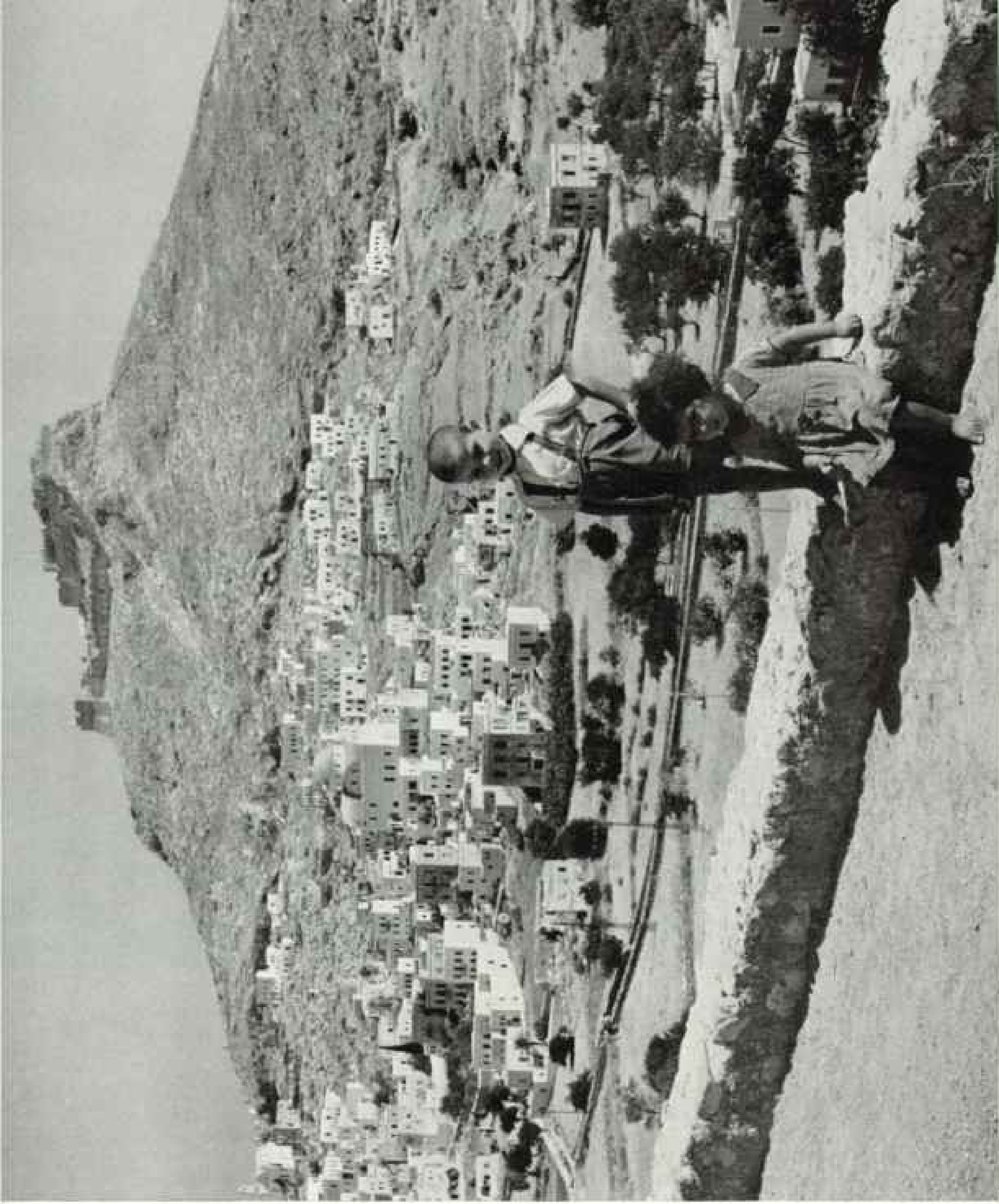
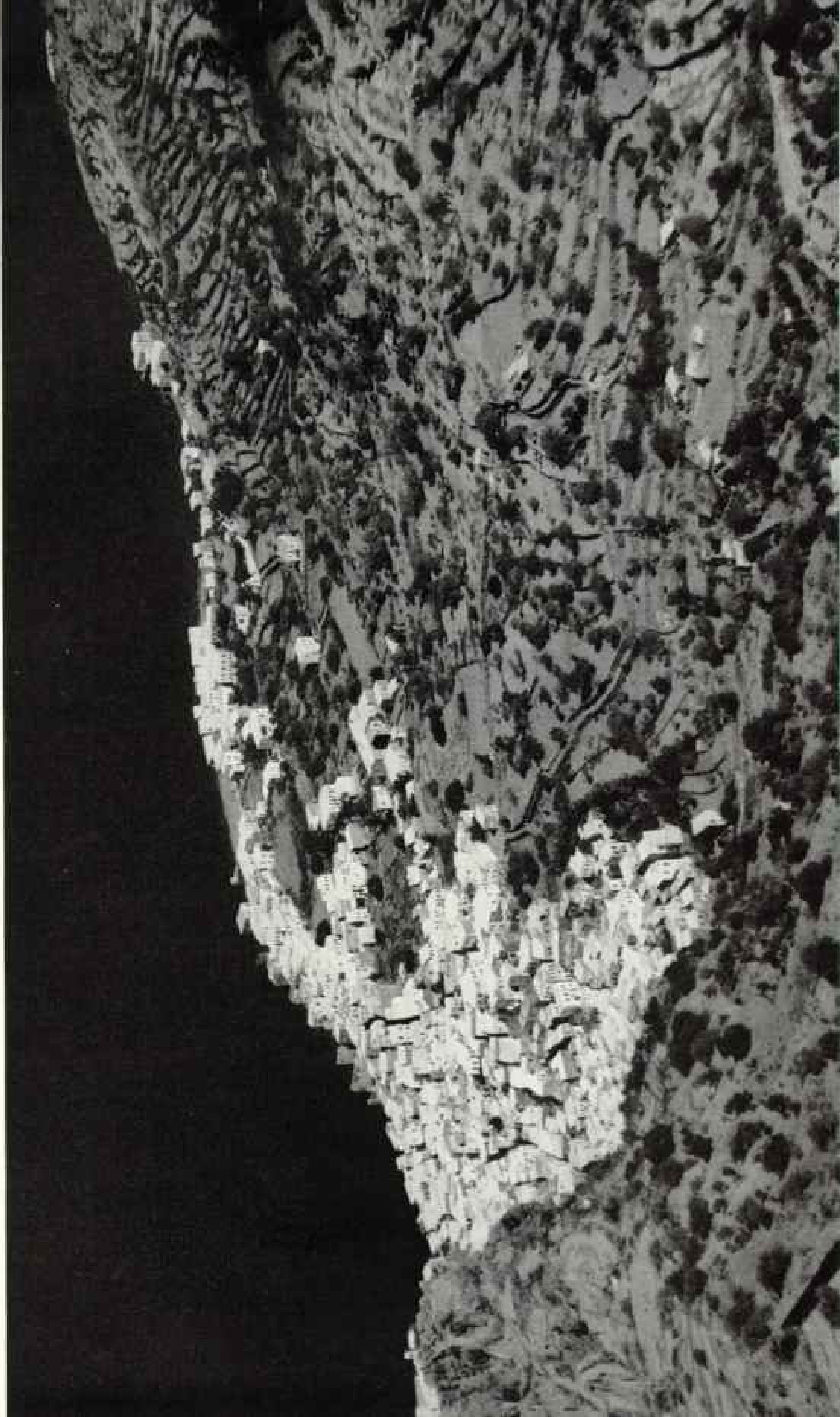


Fig Trees Dot the Terraced Landscape of Nisíros, a Volcanic Island.

The town of Mandráki faces the open sea. *Éléni*, the authors' caïque, made three attempts to dock before she finally succeeded (pages 360 and 380).

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Artists: Xenophon





Greek Priests Board *Eleni* as the Authors' Guests on a Three-day Voyage

The caique was already crowded on leaving Pátmos, but the Shors could not resist the wistful pleas for passage by five homesick graduates of the island's seminary. In fair weather the priests taught Franc Shor to sing old Greek chants. During a gale they helped man the boat (page 389).

"Three thousand years ago," he said, "an oracle warned the son of a Cretan king that he would someday kill his father. Hoping to escape his fate, he took his servants and sailed to Rhodes. Here he established Embona, on the slopes of Mount Attávirov, from which he could sometimes see his homeland.

"The village prospered, and the prince was happy. His aging father, longing to see his son once more, took his court and sailed to Rhodes. He landed at dusk, and a lookout mistook the ships for pirate craft. The villagers rushed down to the beach and attacked in the gathering darkness. Before the mistake was discovered the son had killed his father. One cannot escape fate."

The next morning, as we breakfasted on our hotel balcony in Rhodes, a graceful white caique sailed past. Through binoculars I made out her name—*Eleni*. It was our caique. Hurrying to the harbor, we were in time to catch the mooring line.

The captain introduced himself and took us around the vessel. She was a 48-foot 20-ton

craft, clean and comfortable. Her single-cylinder diesel could drive her at seven knots. Under full sail she could make nine. White-haired Captain Mike, Manole the engineer, and Toni the deck hand were Dodecanesians from the island of Simi.

Before dawn we were awakened by the regular chug chug of the engine. Soon we cleared harbor and set our course for Simi, five hours' sail to the northwest.

Captain Wary of Turkish Guards

The channel was rough, but *Eleni* took the choppy seas with little pitch and no roll. Off our starboard bow rose the wooded coast of Asia Minor; I motioned to Captain Mike to sail closer to the Turkish shore. He shook his head.

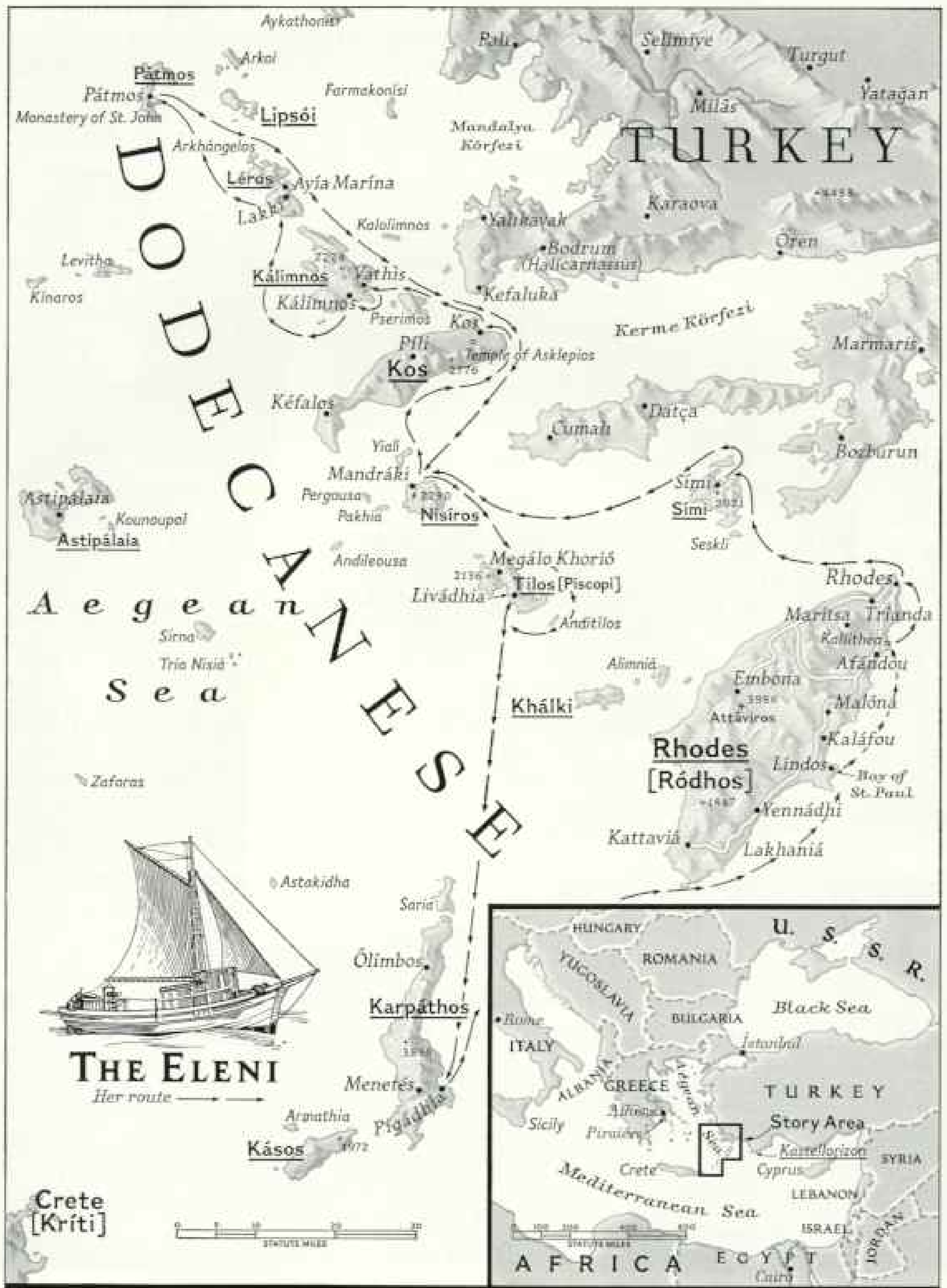
"Turkish guards shoot first and ask questions later," John explained.

Half an hour outside Simi's harbor we passed a sponge boat, close beneath the cliffs. John hailed the crew and asked if they had lobsters. Two spongers came alongside in a small



A Racing Sloop under Full Sail Approaches Her Berth in Kálimnos Harbor

Each year as the island's sponge divers set sail for the fishing grounds off north Africa, Greek Orthodox priests come down to the harbor and bless the fleet. The authors were surprised to find a pleasure boat in Kálimnos, an island largely given to working vessels (pages 374 and 375). Two brothers, one in Kálimnos, the other in America, pooled their funds to build the yacht.



Dodecanese Means "Twelve Islands" but in Fact the Chain Numbers Fourteen

Settled by Greeks in prehistoric times, the isles endured centuries of foreign rule before their reunion with the motherland after World War II. Almost half the 116,000 inhabitants live on Rhodes, largest of the group. Principal islands are underlined. Kastellorizon, the fourteenth, lies off the map area to the right.



Squealing Little Pigs on Kos Regularly Go Down to the Beach to Get Scrubbed

"Why?" asked the authors. Two Kos men replied, "To keep the animals from catching a disease." Another said, "To keep them clean, of course." A fourth volunteered, "But *everybody* bathes his pigs!"

boat, holding two large lobsters and a basket of bright-red oysters. I asked the price.

"A pack of American cigarettes," came the answer.

As *Eleni* entered port, a dozen sponge boats were setting out on their long voyage to the African coast, where they would stay for six months. On the dock a crowd of weeping women waved farewell. Each wore a dark scarf on her head and carried a brightly colored one in her hand.

"They wear the bright head scarves when they come down to say goodbye," John explained. "As the boats sail, the women exchange them for the black ones, which they wear until their men return. Sponge fishing is dangerous, and every year some women who put on the black scarf never change it."

Times are hard for the Simians, John told us. Fishing in near-by waters is bad, and

World War II depleted the sponge fleet. The 4,600 inhabitants barely make a living from their fields (pages 370 and 371).

"I'd think they'd resent being called Simians," I said. "Does it mean 'monkeylike' in Greek, too?"

"According to one legend this is where the word originated," said John. "Here Prometheus is supposed to have created man from clay and to have given him fire. Zeus was jealous and changed Prometheus into a monkey, hence the name."

At dawn *Eleni* sailed for Nisiros, 40 miles west. Captain Mike had squinted unhappily at the sky the night before, predicting bad weather. As we cleared harbor one of the Aegean's sudden blows struck us.

Shortly after noon Nisiros loomed ahead, but Captain Mike was afraid to risk its tiny harbor. Taking shelter an hour away at Yiali,

he tried Nisiros again the next morning, but the waves were still too high. Then he turned our bow toward Kos, second largest Dodecanese island.

The mayor of Kos welcomed us warmly. His island, with a population of about 18,500 farmers and fishermen, has played an important role in Greek history.

"Tradition says that Hippocrates held his first classes in medicine here," the mayor told us. "The plane tree beneath which he may have taught is still standing."

The huge trunk and spreading branches of this hallowed tree dominate the center of the town. It was easy to imagine the father of medicine sitting in its shade lecturing to his eager students.

Where Organized Medicine Began

In the Temple of Asklepios, a few miles away, organized medicine had its beginning. The temple-hospital was built on three levels. A patient entered the lowest, where minor priests took his case history. Then he was placed in one of a hundred tiny cubicles on the second level. At night the chief priest-physician entered his cell and identified himself as Asklepios, god of medicine. He prescribed herbs, fresh air, or medicinal baths and assured the patient of quick recovery.

If this combination of medicine and psychotherapy had a favorable effect, the patient was moved to the third level, where he spent his convalescence inscribing on marble tablets his symptoms, diagnosis, and treatment. Only successful treatments were recorded, and the tablets were used as texts in the temple's medical school.

Later we watched Greek Orthodox priests dedicate a new housing project built with United States Mutual Security Administration assistance. The ceremony concluded when the head priest dipped a bouquet of flowers in holy water and sprinkled the crowd.

Greeks are noted for talking with their hands, and Dodecanesians are no exceptions. I have seen an excited businessman lay his telephone on the desk to free both hands for gestures, and a driver who had to stop his car whenever he got excited so he could wave his arms without interference. A woman about to move into one of the project's houses, however, furnished a classic example of this national trait.

Dissatisfied with the house, she protested to the mayor. In her arms a baby nursed from a bottle. As the mother warmed to her subject, the arm holding the bottle began to twitch. Finally, snatching the bottle from the pursed lips, she began to wave it back and forth. Each time the bottle passed, the child made a desperate lunge, snapping frantically

at empty air, until at last the mayor yielded.

Captain Mike said the weather would get rough after midnight; better reach Kálimnos, our next island stop, before it changed. At midnight we docked at Vathis, on Kálimnos's eastern coast; half an hour later a gale was blowing. I asked the mariner how he knew. He wrinkled his nose.

"I can smell it," he said.

Next morning we hiked to Vathis's famed tangerine groves. From almost every home we passed, women came out to ask if we were Americans. They pressed upon us gifts of fruit and flowers. Through John they told us that Vathis had benefited greatly from American aid. A new dock and breakwater had made its harbor usable, and Americans had taught them new methods of tending their orchards. In two years tangerine production had jumped from 400 to 900 tons.

Laden with gifts and gratitude, we sailed to the town Kálimnos. No sooner had *Eleni* docked than Nick Koundouris, the mayor, leaped aboard to greet us.

Mayor Once Studied in Brooklyn

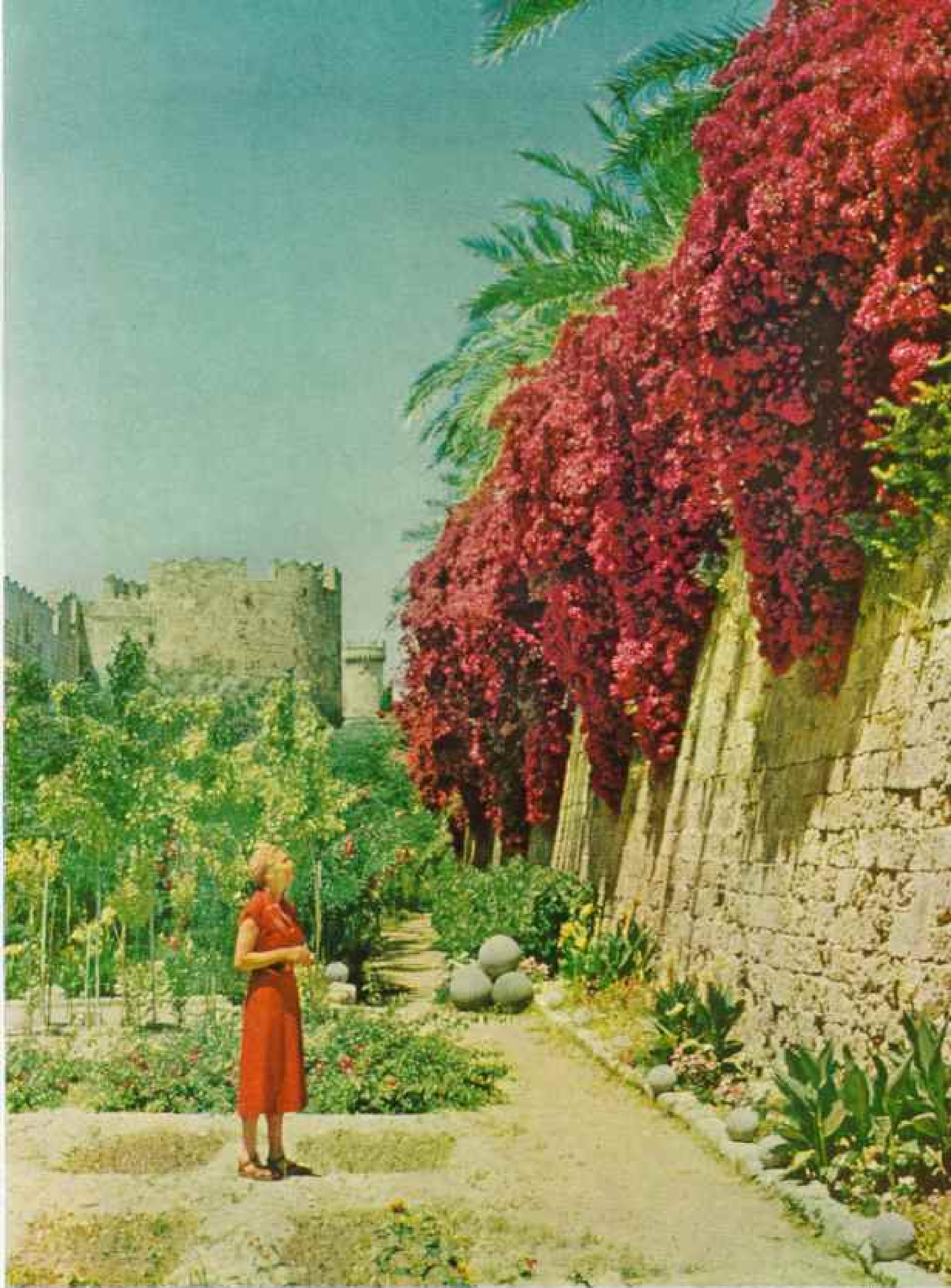
Nick had studied two years at Brooklyn's Pratt Institute and spoke fluent English. To us his title was not half so impressive as another he held—vice-president of the Kálimnos Branch of the Society for the Protection of Fathers of More than Five Children. The group makes sure that deserving papas get all they are entitled to under a Greek law providing special benefits for fathers of large families.

Kalimnians, fiercely independent, are proud of their Greek ancestry and language. Classical Greek words still come thick and fast in local speech. With a population of 12,800, the island is the center of the Greek sponge-fishing industry. Its war-ruined fleet has been restored to 180 vessels, and in 1950 they produced an income of \$1,500,000.

Waters around Kálimnos have been fished for so many centuries that few sponges remain, and the bulk of the island's fleet, like other Dodecanese spongers, works off the African coast. A few vessels, however, still fish the local waters (page 372). Wanting to see this rigorous business at first hand, we spent two days on one. Captain Petrides welcomed us aboard *Saint Paul* and showed us a picture of a handsome young man in the uniform of an American naval lieutenant.

"My brother," he said proudly. "He is an American citizen and owns his own boat at Tarpon Springs, Florida. He helped me buy this boat. Next year he plans to visit here."*

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



Granite Cannon Balls and Dry Moat Suggest the Days When Rhodes Stood Siege

In 1480 the Turks vainly fired thousands of "great and mighty stones," but the city did not yield until 1522, when Suleiman the Magnificent defeated the Knights of St. John. Bougainvillea crowns the wall of the moat.

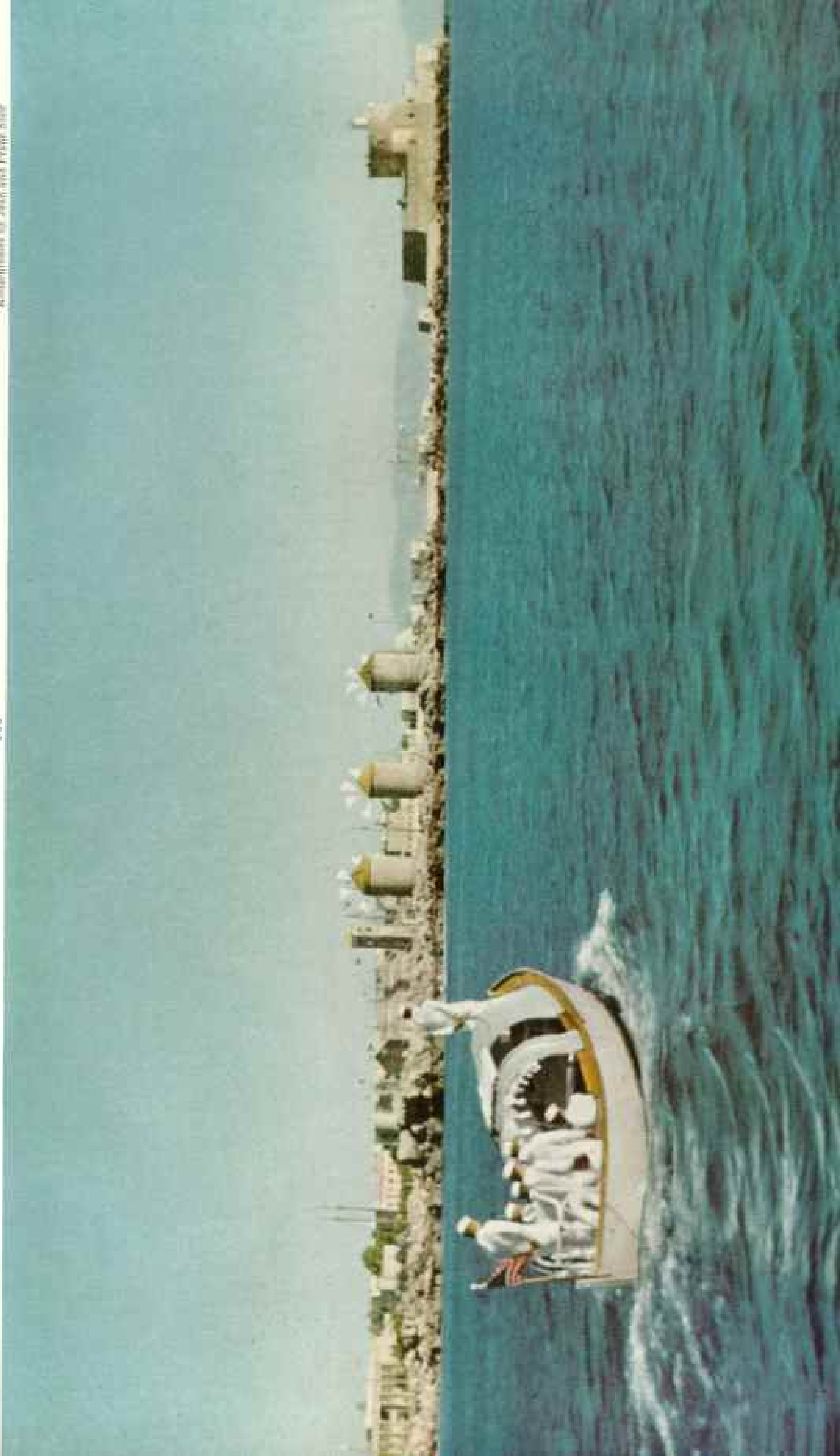


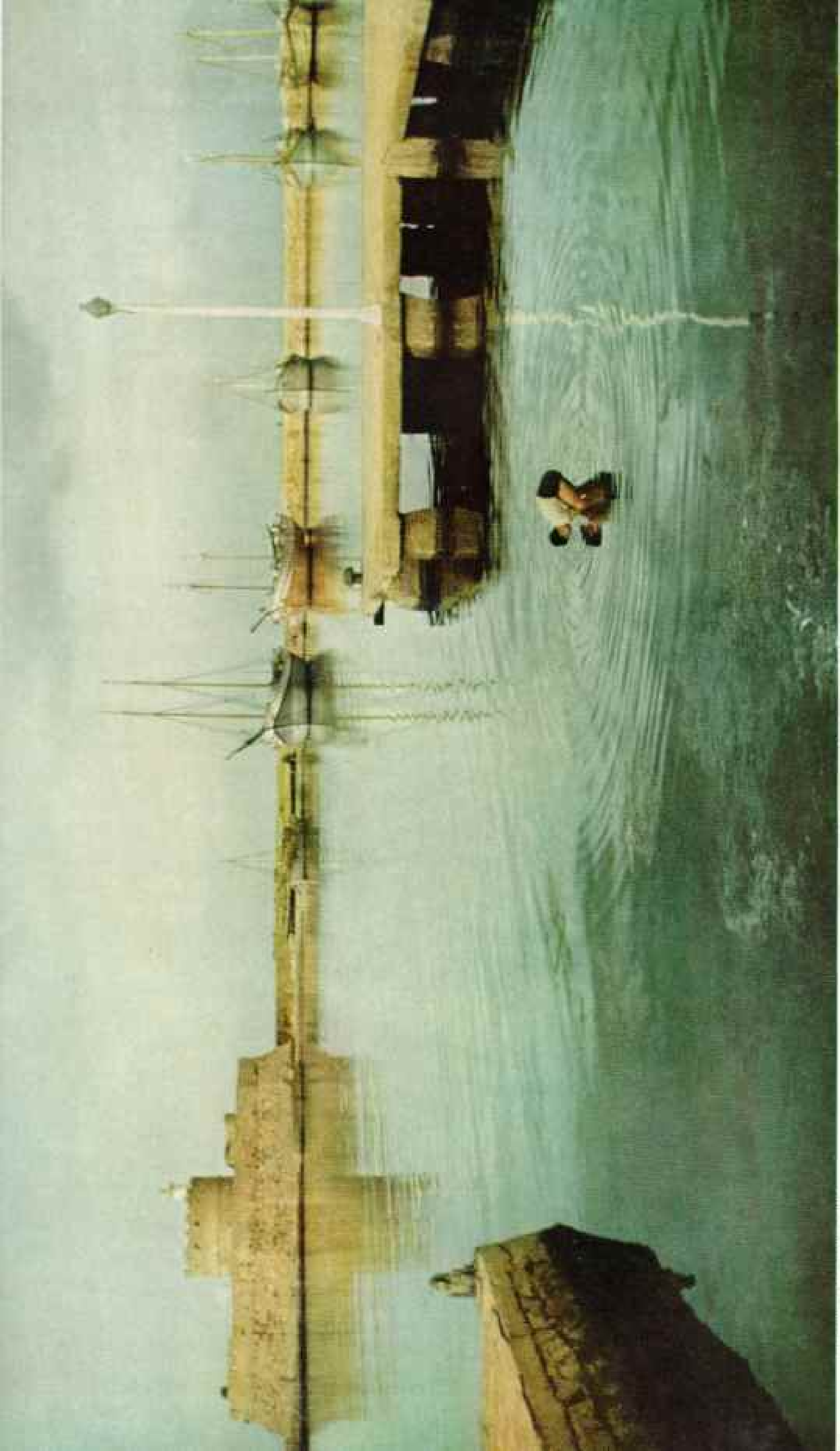
‡ Lattice Shadows and Pebble Mosaics Weave Patterns at Kallithéa, a Watering Place in Rhodes

‡ A liberty party from the United States Navy's Mediterranean fleet heads for the city of Rhodes. Old windmills on the water front grind grain no more; the fresh white sails revolve in honor of visiting Americans.

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Illustrations by Jess and Frank Albee





Colosses in Rhodes Harbor Furl Sails and Tie Up Near the Tower of St. Nicholas. A Light Tops the Medieval Fort

Colossus of Rhodes, a huge bronze statue to the sun god, is believed to have stood near the fort site. One of the Seven Wonders of the ancient world, it was built about 280 B.C. An earthquake in 227 B.C. tumbled it to the ground, and the pieces were sold as junk several hundred years later.

People of Embona Are Famed for Boots and Leggings

For the photographer in search of folk customs and costumes, Embona appears a made-to-order village.

Men favor knee-length trousers cut with a roomy pouch in the rear to facilitate movement (right). Colorful kerchiefs, white blouses, and jumpers with circular stripes identify the women on festive days. And below this ensemble, they, like the men, wear boots or, as on the left, low-heeled shoes topped with soft leather leggings. This style, they believe, comes down from the days when legs needed protection against snakes.

The authors, noting that Embona costumes resembled some of those seen on Crete, learned that the village attributed its founding to Cretans.

Embona's little whitewashed houses hug a bald slope of 3,986-foot Mount Attivros, highest point on Rhodes. Most of them possess no more than one room; an elevated platform serves as sleeping quarters.

Costumes by Jean and Françoise



The Marshall Plan Showboat Visits Rhodes Harbor

Greece stands as a shining example of the Marshall Plan's success. American aid has restored damaged harbors and shattered fishing fleets.

Grateful Greeks know whom to thank, for the Showboat spreads Uncle Sam's story with motion pictures, exhibits, and speechmaking. One year she carried her message to 535,000 persons in 100 ports. Her showings attract many islanders who never saw a movie. They cheer newsreel scenes of America and burst into patriotic frenzy over Greeks fighting in Korea.

After this picture was taken, the Showboat changed her name from *Floating Exhibition* to *Samuel Gridley Howe*. Her new title honors an adventurous and idealistic American who, barely out of medical school, fought in the Greek Revolution 150 years ago. Unlike England's Lord Byron, who gave his life to the Greek cause, Howe survived six hazardous years of service. Returning home, he married Julia Ward, who wrote *The Battle Hymn of the Republic*.

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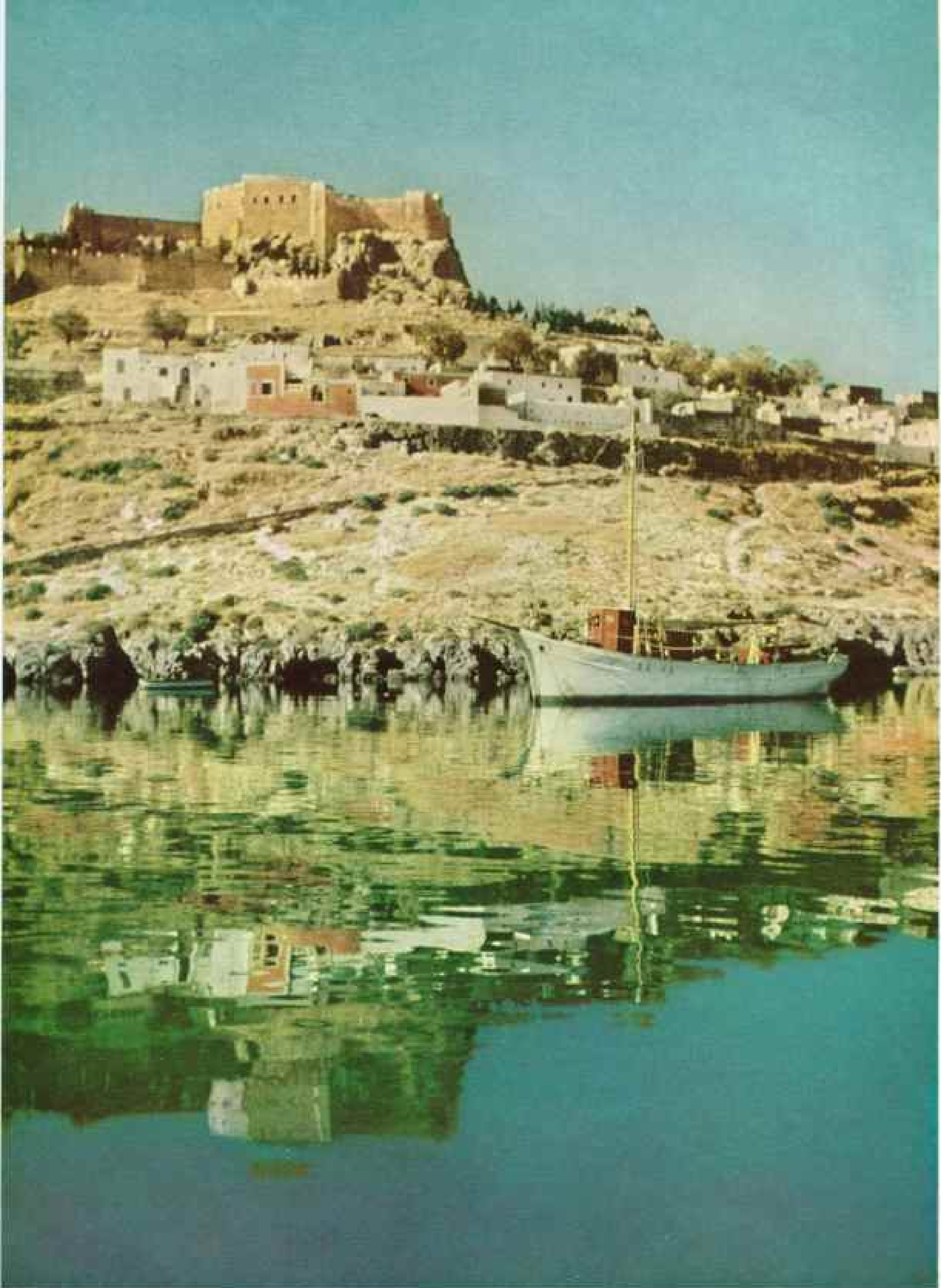
A Converted Windmill Makes an Airy Apartment with a Panoramic View of Rhodes and Its Harbor

The circular living room stands above a round bedroom and a round entrance hall. Its dimensions are so limited that the photographer, to capture any effect of roundness, hooked a foot on the staircase rail and leaned out the window. Twelve dollars a month pays the rent.

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Contributed by Jean and Pierre Sorel





Eleni, the Authors' Caïque, Moors in Lindos Harbor Beneath an Ancient Acropolis

Legend says Helen of Troy visited the hilltop Temple of Athena. Two of her ancient priests helped sculpture the famous Laocoön, now in the Vatican. Knights turned the temple into a castle; Italians restored it.



◆ **Flaming Bougainvillea Climbs
Pale White Marble on Kos**

This wall surrounds a garden close to the spot where, tradition says, Hippocrates, a native of the island, held classes in medicine 24 centuries ago. Statues and friezes from Kos ruins provided material not only for the wall but for private homes and even some windmills.

✦ **Bellying Sails Speed a Galley
Across a Piece of Rhodian Ware**

Rhodes has been famous for its ceramics since olden times. Many houses in Lindos preserve antique examples on their walls (page 386). A modern pottery in Rhodes city carries on tradition with plates so beautiful that no one dreams of covering them with food.

Kinohitones by Margaret Owen Williams, National Geographic Staff





Simi's Houses Cling Like Barnacles to Bare Rock. Hollow Shells (Right) Reflect Bomb Damage of World War II

Island men are famed as boatbuilders. A repair crew set this heavy cradle and rolled it inland on tree trunks.

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Reproduced by James and Frances Stuart





A Shiny Black Mass on *Angeliki's* Bow Identifies Her Crew as Sponge Fishermen

A Kálimnos diver emerges in a pressure suit. Others prefer the "iron nose," a breathing mask. Some, carrying stone sinkers, dive naked to depths of 100 feet and stay five minutes. Black sponges are bleached before sale.



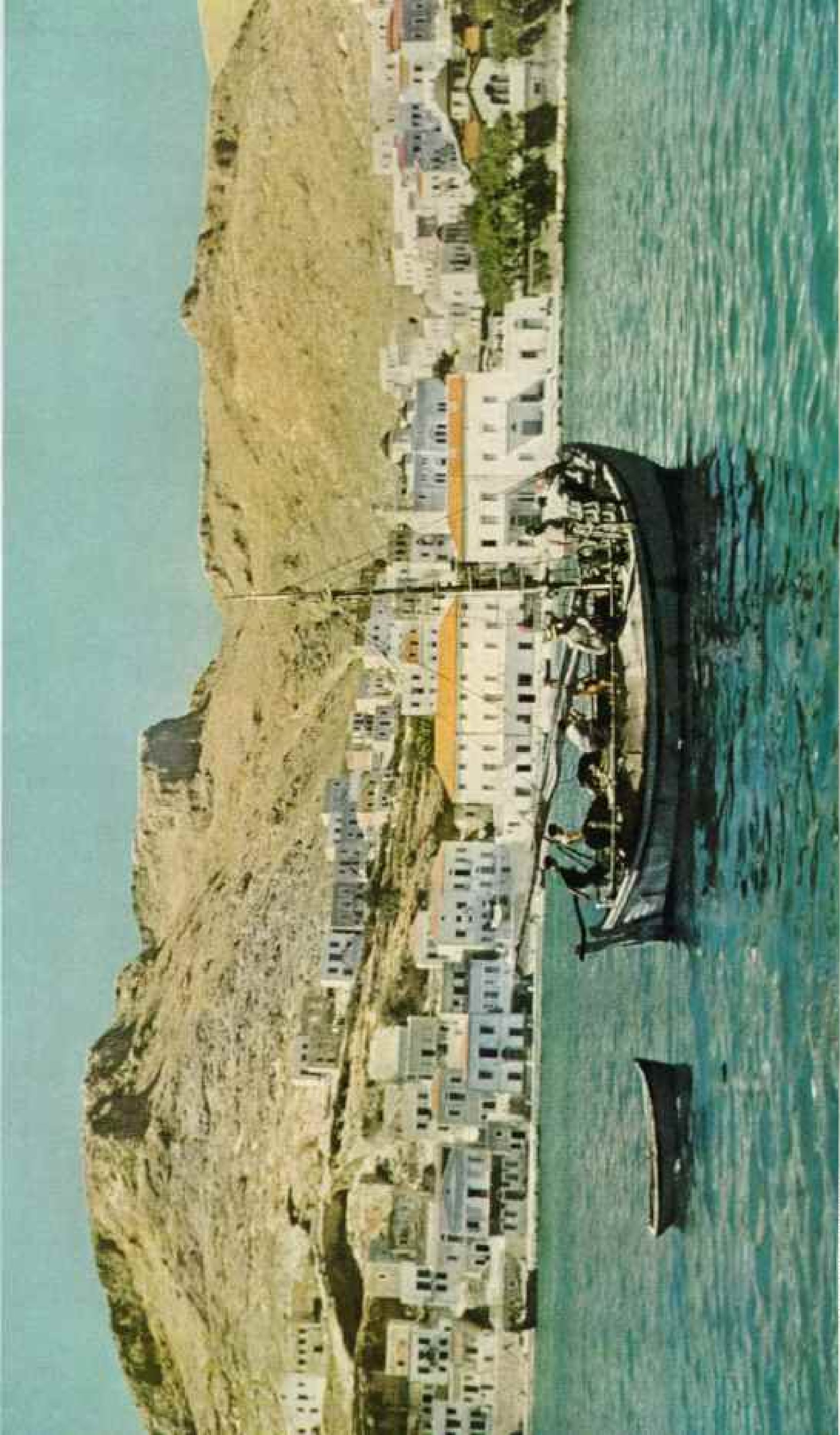
✧ **As Moslems, These Turks Refuse
Wine from Their Own Grapes**

Turkey, having expelled the Christian knights, controlled the Dodecanese some four centuries until Italy seized the islands at war in 1912. Some Moslems remain as farmers. This family, living on Kos, grows tobacco as well as grapes.

✦ **Donkey and Cart Simplify Moving Day
with a One-way Trip Across Kos**

Many houses on the islands have just enough bedding, chairs, and tables to furnish a one-room house. These scanty possessions contribute small comfort, but they prove a blessing when a family has to pack its belongings and move.





Kallimnos Harbor Squeezes Between Hills So Harsh They Appear to Lack a Single Sprig of Green

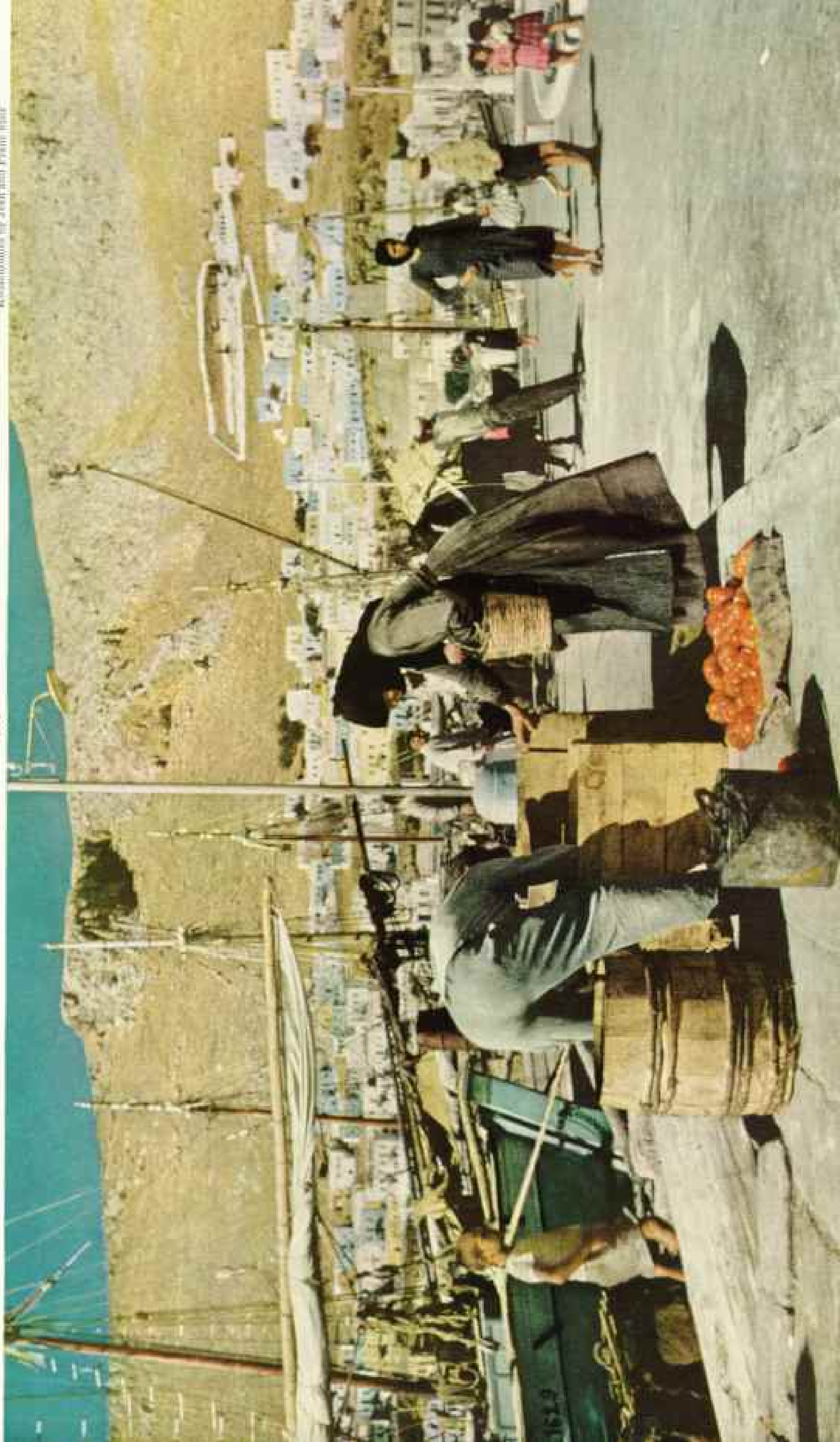
Sponge fishers on this island have many relatives in Tarpon Springs, Florida. For their catches, Kallimnos men sail to the African banks. This trailing boat, manned by youngsters eager to learn the trade, operates above depleted grounds close to home.

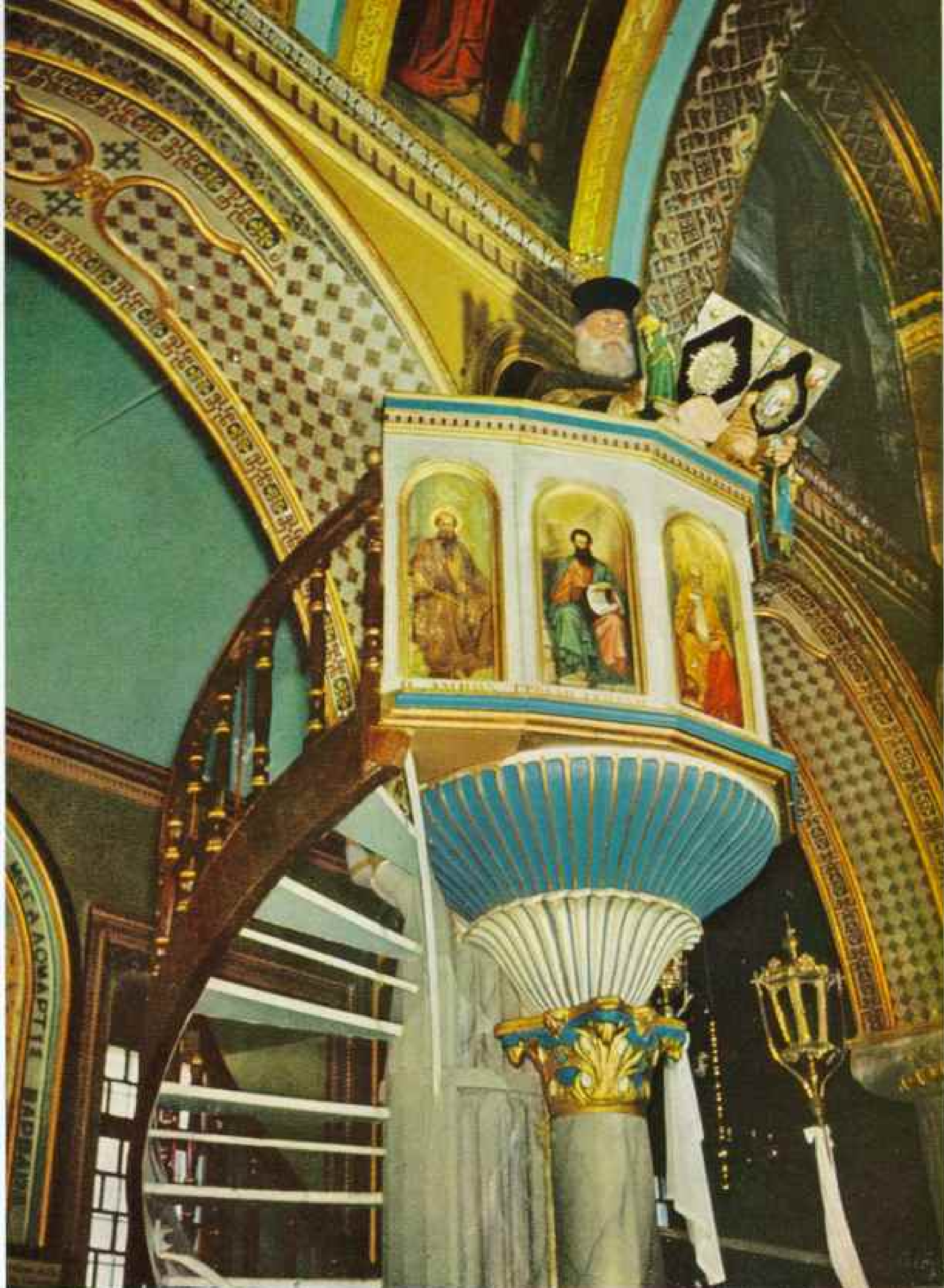
Kálimnos Markets Center Around the Water Front. Even Vegetables Come Down to the Fishermen's Quay for Sale

Most islands in the Dodecanese display a characteristic color. Just as Pátrmos likes white (page 334), Kálimnos paints its houses a pastel blue. A church cemetery fills the walled area on the hillside.

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Photographs by Leonard Fromm/Photo





High in His Brilliant Pulpit, a Kálimnos Priest Chants a Gospel in Greek

Welcoming the authors as "fellow Americans," the Reverend Anastasios Corfius spoke excellent English, which he learned during eight years' residence in Campbell, Ohio. He has a son living in the United States.

Saint Paul had two divers. Gabriel, the older, was in his sixties. He was an "iron nose" diver, one who goes down without a diving suit, using only a breathing mask.

"I don't know what he'll do with you aboard," the captain told Jean. "He usually dives with nothing on."

"Longies" Solve a Problem

Gabriel solved the problem nicely. He disappeared into the cabin and reappeared clad from neck to ankle in a well-patched suit of long woolen underwear. The shirt interfered with the diving harness, so he stripped to the waist and went over the side modestly attired in his long drawers.

Carrying a net bag, Gabriel descended into 60 feet of water and remained below for 15 minutes while two youngsters worked at the pump. So clear was the water that we could see him outlined against the white bottom. He emerged in a cloud of bubbles, his bag filled with shiny black sponges.

Crewmen spread the catch on deck, tramping the sponges with bare feet. With the milky liquid spurted out from the sponges, they scrubbed the planking.

"Best cleaning fluid in the world," said the captain. "It keeps the deck spotless and prevents decay."

The other diver, Theophanus, was a deep-chested young man in his early twenties.

"I'm lucky to have him aboard," the captain said. "Usually he goes out with the big fleet, but he was sick when they left this year. Theo is a skin diver—goes down without gear. Kálimnos divers are famous. Not many others can dive so deep or stay down so long. Some of our men go down 100 feet and stay as long as five minutes."

Young Theo, in deference to Jean, wore brief trunks. He went over the side clutching a heavy rock to take him to the bottom. I started holding my breath when his head went beneath the water. In less than a minute, I gave up and gasped for air.

Far below, Theo moved deliberately along the bottom, filling his sponge bag. Two minutes passed, then three, and Jean and I felt we were purple from the mere thought of his endurance. Just as I released my fourth breath he emerged—four minutes and five seconds after he had gone down. He too had a full bag of sponges.

"There's a third type of diver," Petrides told us. "Those on the next boat use full diving suits. They bring in more sponges, but this type of diving often kills the divers. They stay down too long and get the bends. Some have it so badly they can't walk. Have to be carried down to the boats. Once under water, though, they're all right."

On shore raw sponges are dried, then dipped in a solution of potassium permanganate and bleached in an acid bath. They emerge creamy white and are washed in sea water, which turns them the yellow color of the finished sponge. A final trimming with hedge clippers and they are ready for market.

In Kálimnos John Asher, on an inspection trip for the MSA, caught up with us. As we sat on the deck of his boat, the town crier walked the water front, shouting the day's news.

"Dredges are in the outer harbor and will remain for two days," John translated. "The MSA boat is here, and movies will be shown in the public square at 8:30. Two American millionaires have arrived on a caïque and are taking thousands of pictures."

We had John ask the crier how we rated "millionaires."

"Anyone with so many cameras must be rich," he answered.

We explained that cameras were the tools of our trade, just like sponge boats were for Kálimnians, and that we were far from rich. He listened politely, thanked us, and went shouting up the street.

"What is he saying now?" we asked.

"Two modest American millionaires have arrived on a caïque and are taking thousands of pictures," John translated.

Greek Soldiers in Korea Cheered

The MSA movies were popular. The crowd cheered every appearance of American troops and went wild at scenes of Greeks fighting in Korea.

From Kálimnos island to Léros is only a watery hop, skip, and jump; *Eleni* made it in a few hours. The harbor of Lakki is one of the world's finest, and before World War II Italians turned it into a large naval base. Allied bombers wrecked its installations, and most of the island's 6,200 inhabitants were out of work when we were there.

In a war-relic German *volkswagen* ("people's car") we toured the little island. On its other side is another harbor, Ayía Marina, almost as good as Lakki. Nature was generous with harbors when she made Léros, but she skimped on everything else. The fishing is poor, its thin soil yields scanty crops, and life is hard for those who can't emigrate.

Next morning the captain headed for Pátmos, northernmost island of the Dodecanese on our itinerary. Small islands stud its harbor, and as we threaded the maze of inlets, the sprawling Monastery of St. John, built in 1088, seemed to dominate the whole island.

It is believed by some that on Pátmos St. John the Divine saw his vision and wrote the Book of Revelation (page 383). Visitors may

still enter the cave in which he is supposed to have lived and to have written. The monastery, crowning the highest hill, holds some of the most precious treasures of the Greek Orthodox Church. Hundreds of pilgrims visit the island every year; scholars come from all over the world to study in the monastery's magnificent library.

While we waited for donkeys to carry us up the steep path to the monastery, we sat in a coffeehouse, and John translated the conversation around us.

A Case of Typhoid—and a "Miracle"

Men near us were discussing the misfortune of a local fisherman. His only son, a boy of 10, was dying of typhoid. The island doctor had pronounced the case hopeless unless he could get proper medicine. But the nearest supply was in Rhodes, and a shipping strike made delivery impossible.

The doctor entered. He came over and welcomed us. When I asked him if there was hope for the boy's recovery, he shook his head.

"If I could get the proper medicine he might have a chance," he said. "But there isn't a capsule of Chloromycetin on the island."

Jean and I looked at each other in amazement. A moment later we were racing for our caique. We returned with a bottle of 100 Chloromycetin capsules our doctor had included in our medicine chest.

The doctor stared at the bottle.

"It is a miracle!" he exclaimed, and strode rapidly up the street with the medicine.

At the monastery after lunch the chief priest guided us through the thick-walled building, proudly showed his garden, then took us into the dimly lit treasure vault.

Behind glass doors, shelves sagged under objects of fantastic value—gold crowns, chalices, crosses; Bibles with golden covers studded with precious jewels. Vestments embroidered in gold thread and incrustated with pearls filled another chamber.

When I asked to photograph the treasures, our guide said permission was never granted.

The library's massive oak door has three locks. Each key is carried by a different monk. The contents were worthy of such precautions. Medieval manuscripts, many beautifully illuminated, lined the walls; the magnificent Porphyrios Codex, a portion of a Bible, said to have been found in the 4th century, is written in silver ink on purple vellum.

Here too requests for pictures were politely turned down. Reluctantly we left the monastery and started down the hill. Two-thirds of the way down we visited the grotto of St. John (page 383). The cave is small, with a sloping ceiling. Icons and crosses brighten its walls. In one corner is a small hollow in the

rock. Here, tradition says, St. John used to rest his head.

Back in the village news of our gift of medicine had spread, and everyone spoke as we passed. Many stopped to shake hands. The sick boy was responding favorably to his first dose, we heard.

At dawn, as we warmed *Eleni's* engine for departure, an excited priest came striding across the dock, shouting to Captain Mike. John translated his message. The head priest of the monastery had heard about the medicine. To show the gratitude of the people of Pátmos, he invited us to photograph anything we wished in the monastery.

We hurried up the hill as fast as donkey legs could carry us. Library and treasure vaults were opened, and for an hour we photographed their store of priceless treasures.

The doctor was waiting at the bottom of the hill. "Our patient is improving rapidly," he said. "You must visit him."

Thanks to *Amerikani*

We walked to a whitewashed stone cottage. A handsome couple greeted us at the door. The father held both my hands in his; his wife kissed Jean's and wept. Inside, the boy lay on a narrow cot, his face tragically thin, cheeks flushed with fever. As we looked, he turned his face toward us and smiled.

"*Amerikani*," he whispered. "*Ephxaristo*."

We didn't need the "thank you." His smile was enough.

The father led us to a corner where a faded icon of the Virgin Mary hung. At its base, plain in the flickering light of a candle, was our small brown bottle of Chloromycetin.

"When the doctor told him there was no hope, he lighted the candle and prayed for a miracle to save his son," John said softly. "He says your arrival with the medicine was the answer to his prayer."

Back on the dock we found five priests, black-robed and bearded, standing near our gangplank surrounded by a small mountain of baggage. One asked John if we would give them a ride to Kálimnos, Kos, or wherever you are going.

Eleni wasn't large enough for all; we offered to take two. The two oldest came aboard, and we moved out into the harbor for the long run south to Karpáthos. I asked our passengers their destination.

Is This Hippocrates, Father of Medicine? →

Kos people believe the unknown sculptor intended to portray their island's most famous son, the pioneer Greek physician who gave his name to medicine's Hippocratic Oath. A plowman uncovered the marble near the ruined Temple of Asklepios, god of medicine. Its age is estimated as 1,800 years. Mrs. Jane Asher admires the figure in Kos's civic museum.



"Karpáthos," they said. "We are returning to be priests in our own villages."

Very few ships call at Karpáthos, 30 miles southwest of Rhodes. It might take the three other priests weeks to make the journey, and we would reach there in three days (page 356).

Back to Port for More Priests

Uncomfortable as it would be to carry so many passengers, it didn't seem right to deprive the others of such an opportunity. I told the captain to put back into port, and a boy was sent racing up the hill to catch the priests. Half an hour later we were sailing south, decks piled high with luggage, and the happy priests chanting on the afterdeck.

The oldest priest thanked me. "In return for your kindness to His servants," he said, "our Lord will make the boat seem larger."

I made no reply. Privately, I felt it not unreasonable to expect a little better weather than we had been experiencing. Nor was I disappointed. A smooth sea and a brisk breeze enabled us to make the 50-mile run to Kos that afternoon.

Next day, as we entered the harbor of Mandráki, Nisíros, six men met us at the dock, and to our surprise they all spoke English. All six had lived in the United States for years. Amazingly, more than 600 of the island's 2,500 people have been there.

Nick Frank, one of our welcomers, had a husky physique that bespoke his former occupation—that of a "meet-all-comers" wrestler in an American carnival. He led us to the mayor's office, where coffee was served. Then we called on the bishop of Nisíros.

The island is proud of Bishop Alexandros. During the Greek civil war he led government troops against Communist guerrillas, a pistol on each hip, a Tommy gun under his arm, and his bishop's cross on his breast.

In a battered truck we saw Nisíros and visited its active volcano a few miles from the port. Hot springs bubbled and smoked in the seething crater, but the volcano refused to stage one of its frequent eruptions for our cameras.

Tilos Had a Brief Bonanza

Captain Mike took *Eleni* out of the narrow harbor with a sure hand, and a following breeze drove us southeastward toward Tilos over a calm sea. It had been that way since we left Pátmos. I began to look at our five priests with new respect.

At Tilos's harbor we were greeted by a young Greek who introduced himself as the postmaster, customs official, telegraph operator, and tax collector. We invited this one-man bureaucracy aboard and gathered a little information about his island.

Tilos is half again as large as Nisíros, but only 1,100 people live on its rocky slopes (page 388). They have enjoyed, our friend told us, only one period of relative prosperity in modern times—and that one short-lived.

"In 1944," he said, "a German supply ship loaded with clothing and rations was wrecked on our coast. By morning every inhabitant of Tilos wore new clothes, had eaten more food than he had seen in months, and had stocked his house with provisions. Unfortunately, a week later a German landing craft put in, soldiers took over the island and every piece of clothing and bit of rations were collected.

"They took clothing right off people's backs. It was hard for those who had thrown away their old garments."

Alexander the Little Gets Godparents

Theodosios Athanasios had another cup of coffee.

"I have come to ask a favor," he said. "My son is to be christened tomorrow, and I have not yet chosen a godfather. We of Tilos are very grateful to America for what she has done for Greece. I would be proud to have Americans as godparents for my child. Would you and your wife do us that honor?"

Jean and I decided to accept. Mr. Athanasios thanked us warmly and rushed ashore. We sent John to buy the soap, olive oil, and white cloth which godparents must contribute to a christening, put a money gift in an envelope as a present, and considered the problem of a name for our godchild.

We asked the father to suggest a name, but he insisted that was up to us. We settled on Alexander.

Next morning our passengers and the local priest made an impressive array as we stood around the baptismal font in the bomb-torn church. The ceremony was long and tiring for little Alexander. His mother kept him quiet by nursing him, and when he was delivered to me he seemed to expect the same treatment. Disappointed, he screamed lustily and tried to tear the shirt off my back.

The Tilos priest chanted the service and swung a censer over the font. The baby was undressed, the priest rubbed him generously with olive oil, and handed him to me. I rubbed a little more on his cold body, announced the name we had chosen, and handed him back. The priest made the sign of the cross on the baby's head and anointed various parts of his body (page 390).

Alexander, fighting every inch of the way, was then immersed in the font, dried on the new white cloth, and dressed in a finely embroidered christening gown. The priest placed the baby in my left arm, a lighted candle



Pátmos Girls of School Age Embroider a Lifetime's Linen to Fill Their Hope Chests

A school attended by these two accepts part of their work in payment for tuition. The anchor in the window's ironwork indicates that a ship's master once owned the house.



Desert-brown Pátmos Can Scarcely Grow a Crop, but It Rears Lovely Daughters

No costume worn in the Dodecanese commands more renown than that of Pátmos. These girls stand on a terrace of the Monastery of St. John (opposite).

St. John's Memory Lives on Pátmos

Exiled by the Roman emperor Domitian, Christ's disciple, St. John, some believe, saw his vision and wrote the Book of Revelation on this rocky island. And high above Pátmos harbor the Monastery of St. John still preserves the Golden Bull, a red-inked manuscript by which a Byzantine emperor granted lands to the monks in 1088.

➤ An assistant abbot stands in 300-year-old vestments which, he said, were given to the monastery by an empress of Russia. Seven pounds of gold and hundreds of precious stones ornament the episcopal crown.

✓ The cave of St. John is cherished as the spot where the apostle wrote: "I John . . . your brother . . . was in the isle that is called Pátmos . . . and heard behind me a great voice, as of a trumpet, saying . . . What thou seest, write in a book, and send it unto the seven churches . . ." (Revelation 1:9-11). A silver arch (lower right) marks a niche in the rock where the saint is believed to have rested his head.

Kachibonias by Joan and Priscilla Thor

383





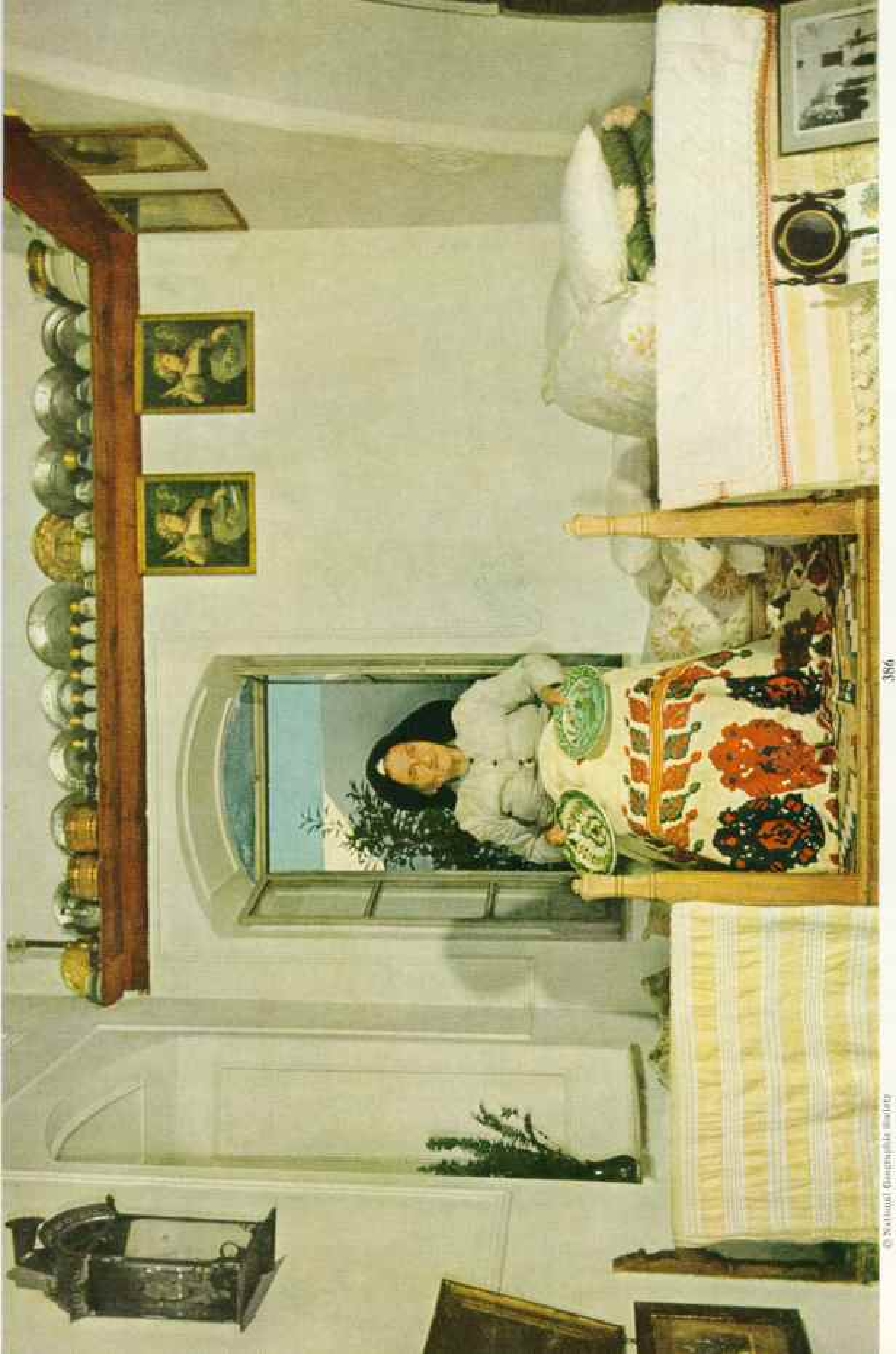
Houses Surrounding Patmos's Sheltered Harbor Are as White as the Aegean Is Blue

Many residents of the island have American relatives who aid them with gifts of money. Arid lands have been painstakingly terraced to retain every drop of moisture.



Jean Shor Admires the View from the Road Leading to St. John's Monastery

The guide's clever donkey paused at every sharp rise in the road as if inviting Jean to dismount and survey the scenery. When she did so, he scampered happily ahead, leaving her to catch up afoot.



✦ **Grandmother Proudly Displays Heirloom Plates and Needlework from Her Daughter's Dowry**

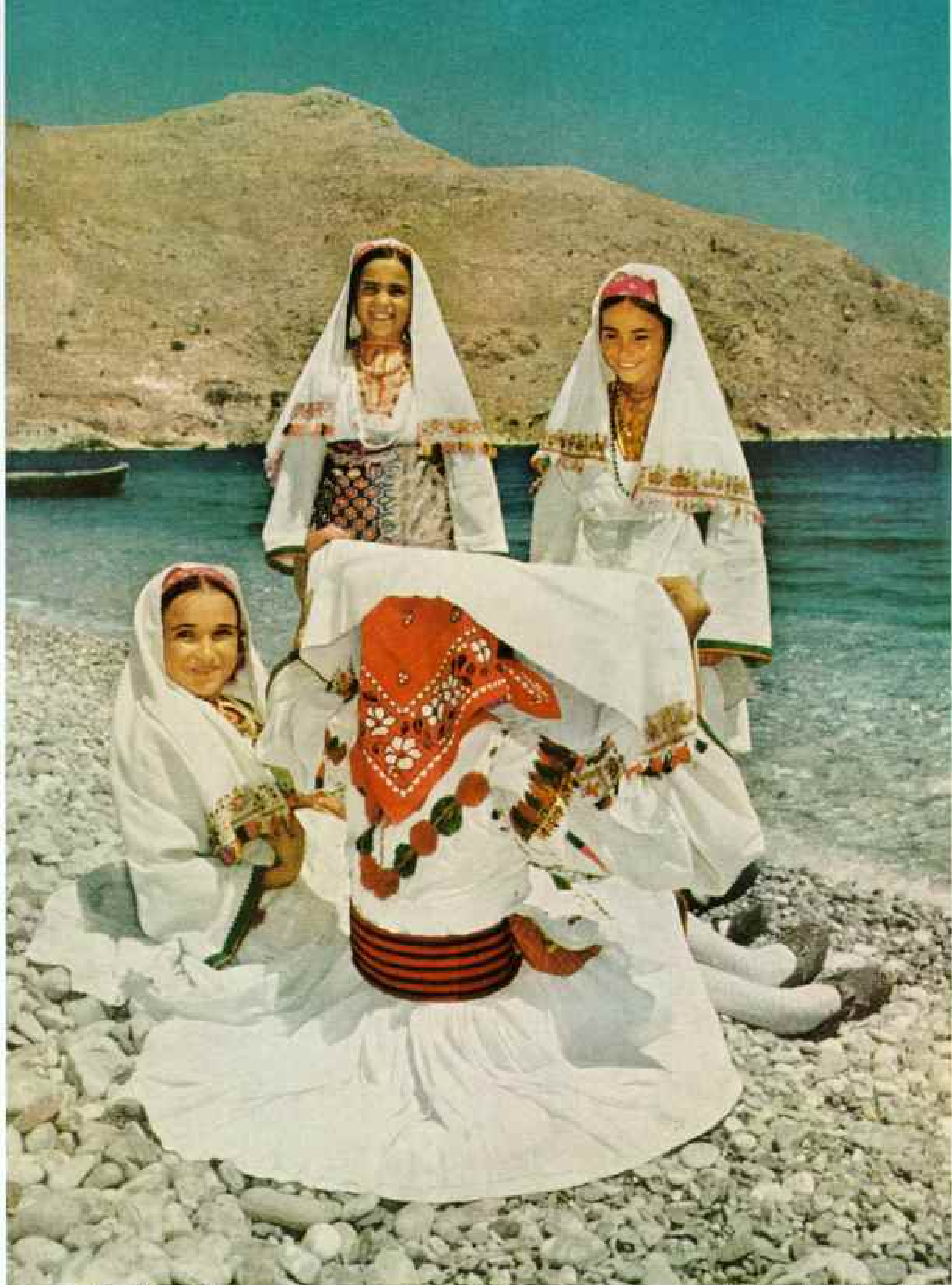
Owners said this home in Lindos had been in their family's hands hundreds of years. Only a short flight of steps separates this bedroom section from the living room. A lamp rack (left), metal plates, and china cups brighten the walls. Identical pictures (upper right) reflect the local taste. Anything colorful, even if duplicated, is regarded as a fit subject for the walls in Greek island homes. The plates are Rhodian antiques.

✦ Greek Americans helped renovate this church on Karpsthos. Right: A girl of Ólimbos draws spring water in an amphora of classic style.

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Modelhomes by Jeanne and Frank Star



Tilos Girls in Spotless Embroidery Enjoy a Holiday on the Beach

On this island the authors found farm people wearing the styles of hundreds of years ago. The schoolgirls danced at a feast following a christening at which the Shors stood as godparents.

in my right hand, and I led a singing procession through the streets, ending up at the Athanasios home.

Here a feast had been spread, and Alexander was put to bed while we all ate and drank a toast to his success in life. Young girls in heavily embroidered island costumes danced native figures. Most of the village joined in the merriment.

In confidence I had told the father I would open a small savings account in a New York bank and add a little to it at Christmas and the boy's name day. After a few more toasts Theodosios announced this to all his friends, and there was much cheering.

That afternoon we spent walking over the island. Men and women working in the fields wore costumes of a style 400 years old, and farming methods were primitive. Ruins of ancient walls, many of them dating from classic times, told a story of a prosperous civilization gone to ruin.

Dawn Brings a Storm

A hard day lay ahead. It is 50 miles from Tilos to Karpáthos, mostly across open sea. After a conference with Captain Mike we decided to sail at 2 a. m. and turned in early. When we awoke, our boat was at sea, running south at nine knots under full sail.

With the dawn came heavy seas. For the next few hours, driving for the lee of Karpáthos, the sturdy little craft took a beating from the pounding waves. About 7 o'clock a real blow hit us.

Toni was at the wheel, Manole astern at the engine, and Captain Mike amidships, lashing a barrel of fuel oil, when a sudden gust struck. Toni let *Eleni* come off the wind, our sail whanged over hard, the sheet fouled atop the cockpit housing, and our horn was torn loose and hurled over the side.

Frantically the captain waved his arms and shouted at Toni, blaming him for the mishap. Toni screamed a denial, blaming Manole. Manole yelled a furious protest, left the engine, and raced amidships to explain. Toni started waving his arms, found the wheel too much of a hindrance, dropped it, and raced back to join Manole and Captain Mike in the argument.

Thereupon *Eleni* yawed violently; the sail jibed and snagged the top of the cockpit housing, tearing it loose with a rending crash and tossing it into the sea.

This brought the crew to their senses, and everyone, including the priests, rushed to stave off disaster. Toni righted the wheel, Manole rushed to his engine, the captain and I fought the sail back over.

One priest braced an oil drum, two held down the jib, and the others were on their

knees, praying fervently. Soon we were out of trouble. Manole rigged a makeshift canvas cover for the cockpit, and we sailed into the lee of Karpáthos.

Shortly before noon we docked and said goodbye to our five passengers, promising to look up their relatives in the United States.

Both governor and mayor of Karpáthos met us, and we were soon squeezed into a 1930 Ford touring car, visiting the little villages which climb the island's terraced slopes. Its 7,400 inhabitants appeared prosperous. The harbor was in excellent condition, the roads good, and the houses well kept. I remarked to the governor that his island must have valuable exports to achieve such prosperity.

"We do," he said.

"What is your chief export?" I asked.

"Children," he replied.

He laughed at my puzzlement.

"More than a third of our people emigrated to the United States when young, saved their money, and came home to retire," he explained. "Nearly every family has a brother or son in America, and they all send money home. Our crops are good, and a lot of our people are fishermen, but our principal income is remittances from the United States."

As we made the rounds of the villages, it was apparent that the governor had not exaggerated. In every coffeehouse old men came up to shake hands, and ask how things were in Pittsburgh or Youngstown or Wheeling. We stopped to chat with a teen-age girl; she spoke English with a Brooklyn accent.

"My father and mother brought me back only last year," she said. "I was born in Brooklyn, and how I miss it! It's so dull here; no movies, no dances, no television. How are the Dodgers doing?"

Later we journeyed to the mountain hamlet of Ólimbos. The inhabitants live much as their ancestors did in classic times. Women still wear embroidered costumes, draw water in jars from a community well, and harvest crops by hand.

A Race with Appendicitis

When we returned to *Eleni* night was falling. At the gangplank an excited villager stopped us with a tale of tragedy.

His sister had been stricken with acute appendicitis. The island doctor could not operate and had told him that his sister must be taken immediately to Rhodes, but there was no transportation. She was in danger, and the doctor feared her appendix might burst at any moment. Could we help him?

Our plans called for another day on Karpáthos, but this was more important. We conferred with Captain Mike, who said he couldn't sail before one o'clock.



Young Alexander Athanasios Bawls at His Christening in the Baptismal Font on Tilos

"Alexander was angry when the ceremony started and angrier when it was over," says white-clad Franc Shor, the child's American godfather, "and I was covered with olive oil, water, and confusion" (page 380).

"The wind will change after midnight," he said. "I wouldn't risk it before then."

The stricken girl was carried to the boat, and we made her as comfortable as possible in our cabin. The doctor came and told us to keep her quiet and to apply ice packs. Toni cracked the few pounds we had, and Jean held it to her swollen side.

At one o'clock the wind shifted, and *Eleni* put to sea. Our little engine had a governor which would not let it run above cruising speed. Manole worked frantically to remove it in order to gain another knot or two.

Through the dark hours of the night Jean sat beside the moaning patient, changing ice packs as they melted. Anxiously we watched and waited. At dawn Manole came on deck, smeared with grease, to announce triumphantly

that the governor was removed and that we were now making 10 knots. We felt like cheering. Another knot or two meant an hour less at sea—an hour sooner at the hospital. The margin might make the difference between victory and defeat in this race with death.

At 8 o'clock we ran out of ice, and the girl's pain increased. Jean took two cold bottles of wine from the chest, wrapped them in my shirt, and held them against the throbbing side.

Slowly the hours passed, and we prayed for our patient. At 11 o'clock *Eleni* raced into Lindos harbor. John dashed ashore, found an automobile, and within a few minutes our patient and her brother were on their way to an excellent hospital in Rhodes. Exhausted, we all turned in and slept till evening. Next day we learned our race had not been in vain.

Daring French Speleologists, Exploring Frozen Underground Rivers at 10,000 Feet, Find Danger, Silence, and Strange Beauty

BY NORBERT CASTERET

With Illustrations from Photographs by the Author

HIGH in the Pyrenees on the border between France and Spain, "through caverns measureless to man," a subterranean ice river slowly squirms its way.

Eons ago, tumultuous waters carved this hidden stream bed. In a far warmer age the waters danced and murmured as they tore along. Today, congealed with the cold of a much-changed epoch, the "fossilized" river seems dead, its sluggish movement perceptible only to the scientist.

With my two sturdy daughters I returned to this wonder world and thought back to the summer day when my mother, my brother Martial, my late wife Elisabeth, and I first knew its strange appeal.

It was July 28, 1926. We had just crossed the Brèche de Roland, a pass at 9,200 feet, about 30 miles south of Lourdes. Below us spread the Cirque de Gavarnie, a majestic natural amphitheater (page 397).

Impeded by a snowy tempest, we wandered among the icy boulders of the Marboré massif, looking for possible caves. Suddenly, between two wind-chased clouds, we saw, separated from us by a steep mass of glacial ice, a natural porch in the cliff.

Lack of Spikes Increases Peril

Was this a cave entrance or simply a recess behind an overhanging ledge? Seeking the answer, we struggled upward against a high wind, cutting footholds in the ice with our axes.

Our obstinacy was rewarded with discovery of the most fantastic and extraordinary cavern that one could imagine.

Beyond the semicircular entrance, from an imposing chaos of rocks we looked down on a frozen subterranean lake, beyond which a river of ice, emerging from darkness, flowed forth from the recesses of the mountain.

Setting out on this underworld glacier in the feeble light of our candles, our roped party was forced to turn back by a towering ice-sheathed wall.

Two months later my wife and I returned, better equipped with flashlights but lacking crampons, or spikes, on our shoes (page 399).

Without their aid we found it dangerous to walk on the ice slopes, to squeeze around corners, or to scramble up the ice cascades. So steep was the cave wall that we had to use

all our acrobatic skill to crawl into narrow holes or to lift ourselves along.

After hours of delicate maneuvers we were surprised to see daylight above. We emerged from the cavern through a natural well massed with snow.

Having entered from the west face of the mountain, we came out on the east slope, amid a formidable clutter of boulders. The eastern face wears a savage scowl, masked by snow nine months of the year.

Snow Builds Up in Tall Cones

This snow, which hides the rocks, melts very slowly, even on the surface. Sheltered from sun, wind, and rain a few feet underground, it remains throughout the summer and adds to that rare phenomenon, a glacier in the womb of the earth.

Once one has made his way down such a snow well, he is surprised to discover that he can wander in great empty halls, each with a towering snow cone rising toward the opening through which the snow fell.

Puddles of water, coming from breaks in the roof, spread basinlike traps so clear that one could not see them against the surface of the glacier.

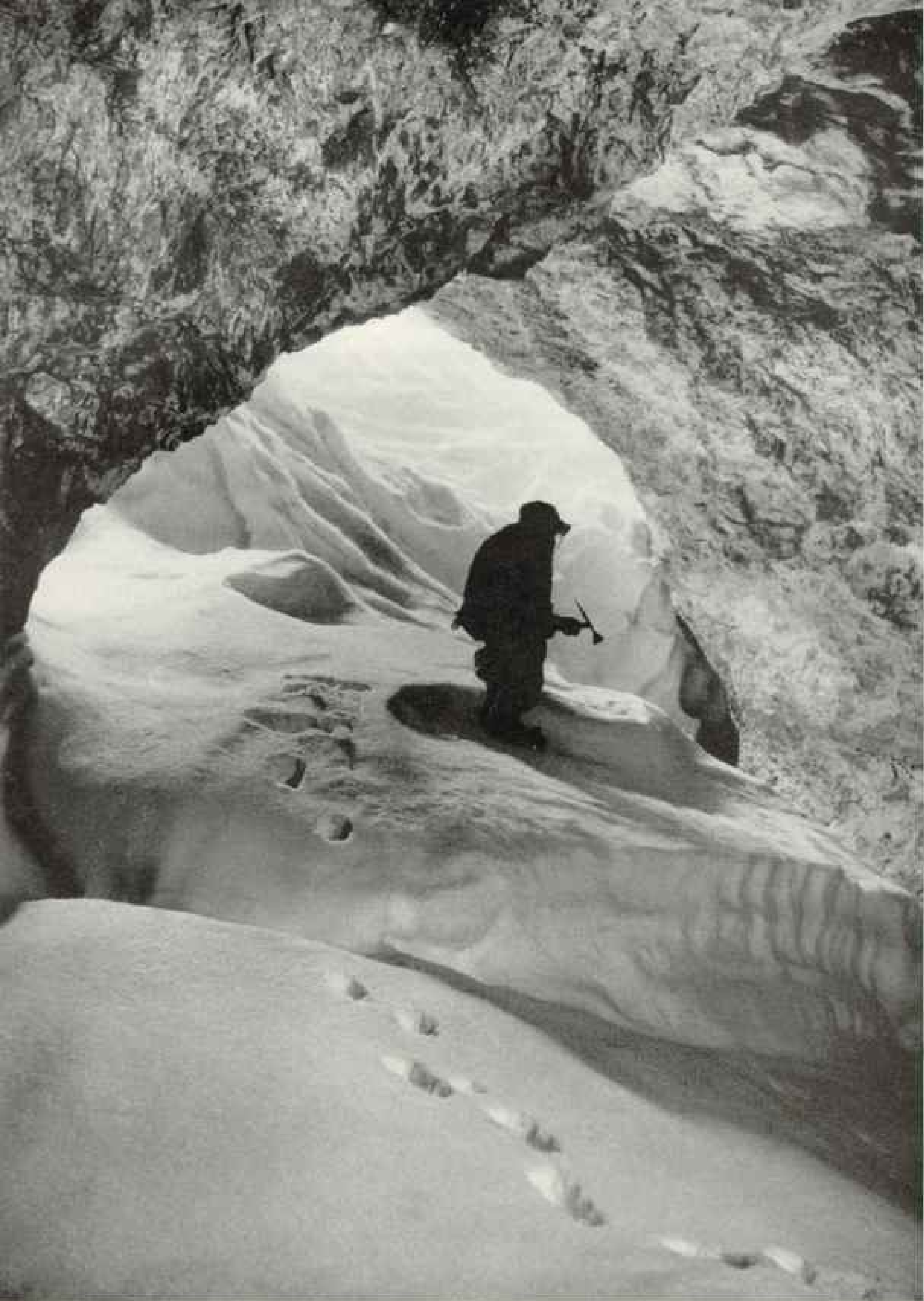
Sometimes the snow is so deep that one must bend low to pass from one hall to another. And, at times, the subterranean river piles up to the very roof, but there is every indication that it continues under the tumble of boulders on the ground's surface.

To clear out the passages and halls defies every effort, since the work must be begun again each year. But the interest of this glacial underworld does not lie in clearing a passage through it.

In this steep gut hidden from the world snow is turned into ice, and a glacier slowly grows. The narrow hall where one can watch this process ended in a vertical translucent cascade, up which our party could climb only with great difficulty.

Such were the trials of exploring this extraordinary cavern. But in the end I knew the satisfaction of having geographers call it "Casteret Grotto."

In August, 1950, twenty-four years after my discovery, I again took the Marboré trail, seeking new caves which I thought must exist in this range.





In the Pyrenees Lies an Icy Underworld

Rivers of a warmer age honeycombed the Marboré massif with caves and corridors. Today the waters are congealed into aged ice. Lakes like skating rinks floor underground chambers (page 398); motionless cataracts hang from crags (page 401). To date, six Pyrenees ice caves have been found by the author and his family. Casteret Grotto, the first discovered, is named in their honor. Cave entrances lie in Spain at altitudes of 9,000 to 10,000 feet.

→ Though the caverns are huge, their mouths are often small and hard to find. This yawning crevasse between mountain wall and glacier forms the entrance to a subterranean hall.

My wife had died ten years before. But our two older daughters, Maud and Gilberte, were eager to know the Marboré caves, especially the highest found up to that time, the Casteret Grotto.

They entered into the adventure enthusiastically, having heard the story since their childhood. To me, my silver wedding anniversary recalled many memorable hours of cave exploration shared with my wife.

After crossing the subterranean lake and scrambling over the underground glacier, I stood motionless, recalling happy memories of the past. As if in a dream, I saw my daughters moving about, very much occupied in their own affairs and doubtless seeking to find something which we had missed.

Maud, a few paces away, threw herself flat on the ice and began to crawl under a low, rocky ledge. She worked her way through this narrow opening until her legs and boots were about to disappear. Suddenly her slow struggle changed to so rapid a movement that I instinctively grabbed her feet.

With her head still hidden by the low roof, Maud explained that an icefall had started her in a slide which she was powerless to stop.

Seizing a hunk of ice near her hand, she





tossed it ahead of her into the abyss. To our amazement, followed by an understandable shock, we heard this projectile fall straight down and break into bits as it stirred echoing roars which indicated a huge, deep cavern.

This treacherously dangerous passage, which we had not noticed in 1926 and in which Maud had so narrowly missed death, now put our gymnastic skill to a thrilling and novel test: the descent, by lightweight metal ladder, of a vertical wall of ice, smooth as glass, nearly 70 feet high and 170 feet wide. We named this the "Frozen Niagara." Beyond it lay important and unsuspected extensions of the Casteret Grotto.

Next morning, having climbed even higher along the steep terraces of Marboré, we discovered several other hitherto unknown ice caverns of fairylike beauty.

Here hardened snow was compressed into hidden glaciers, forming seven-league staircases under giant domes, which necessitated difficult scrambling over slippery ice. We hacked our way past frozen waterfalls and sought toeholds where our path disappeared in ice-sheathed depths. Such is the life to which, for long periods away from the light and air of day, a cave explorer dedicates himself.

With entrances 9,000 to 10,000 feet above sea level, even higher than the Casteret Grotto, these caves are the site of the highest speleological research we know of anywhere.

It would take a volume to describe the splendor of this world of crystals now displayed before our eyes. Here, in the heart of great mountain peaks, where a vague sense of wonder permeates the scene, all is congealed in unbroken silence.

All that breaks the spell is an icy breeze moaning through the caverns. No one has ever followed these dark aisles to the end. No man dares linger there too long lest, at the end of this icy underworld trail, he find death.

395 Maud Casteret Descends →
a Frozen Niagara on a Wire Ladder

With his late wife Elisabeth the author discovered Casteret Grotto in 1926. In 1950 he returned, accompanied by daughters Maud and Gilberte, and found five more caves deep in the frozen earth.

"The caverns are like some gnome land from Grieg's *In the Hall of the Mountain King*," says Mr. Casteret. "Weird ice statues form a maze of pillars. At their base is a frozen river, silent and dead. Vertical wells perforate the ice floor. An icicle dropped into these voids is dashed to bits far below."

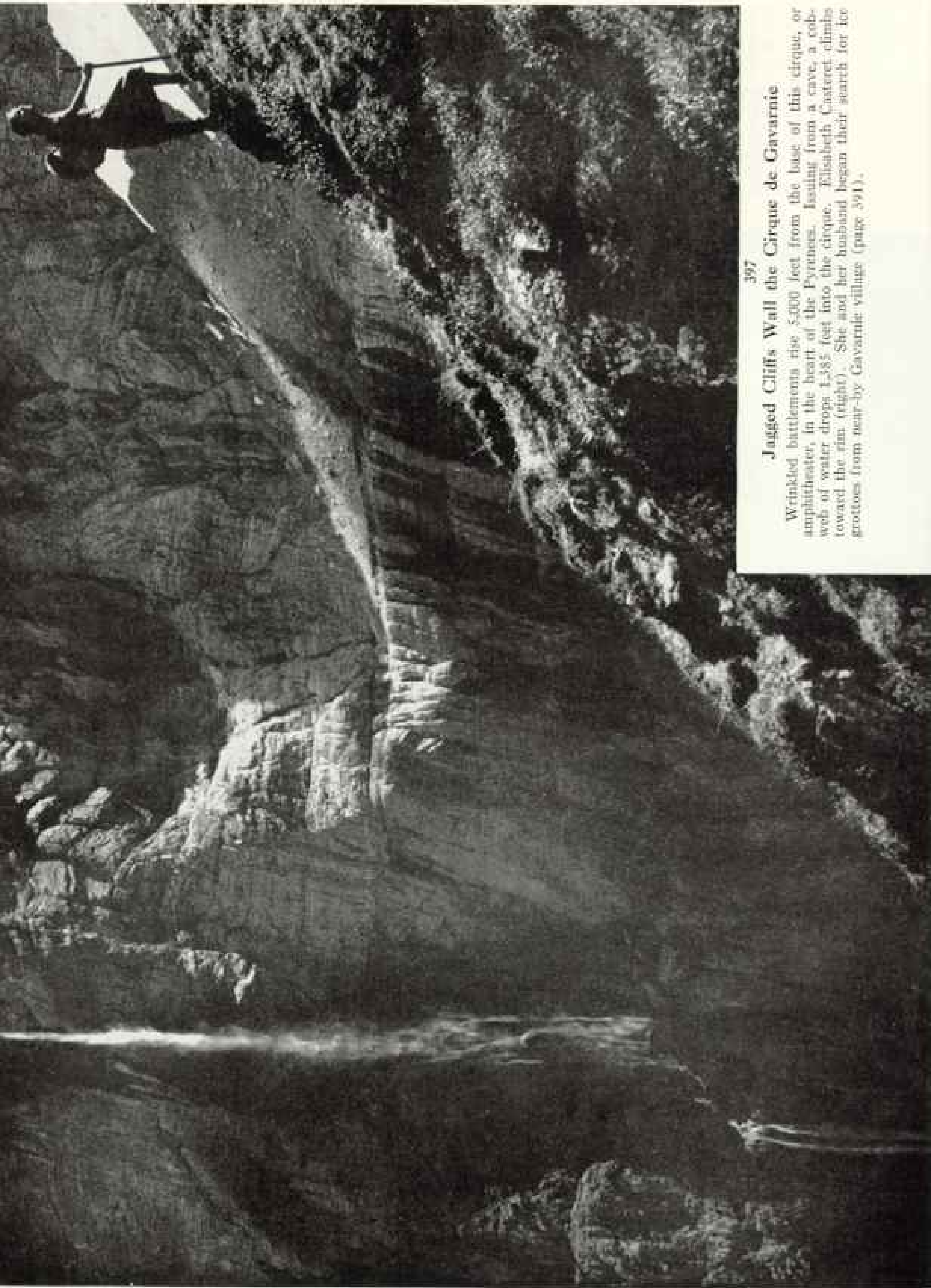
Maud nearly met death in Casteret Grotto while poised on the brink of an unsuspected iccfall 70 feet high and 170 feet wide (page 399). Father and daughters named it the "Frozen Niagara." At its base lay unsuspected extensions of Casteret Grotto.

← Maud Backs Down a Lesser Cataract

Clutching a slender life line, Miss Casteret steps in shallow footholds hacked in the ice. Her rope is tied to an iron spike driven into rock.







Jagged Cliffs Wall the Cirque de Gavarnie

Wrinkled buttlements rise 5,000 feet from the base of this cirque, or amphitheater, in the heart of the Pyrenees. Issuing from a cave, a cobweb of water drops 1,385 feet into the cirque. Elisabeth Casteret climbs toward the rim (right). She and her husband began their search for ice grottoes from near-by Gavarnie village (page 391).

Father and Daughter Explore a Cavernous Skating Rink

Though awesome in size, the Pyrenees ice caves are not the largest known. Austria boasts more extensive frozen grottoes in the mountains near Salzburg. One, called the Eärtesenwelt, or World of the Ice Giants, contains nearly 20 miles of labyrinthine halls and passages.

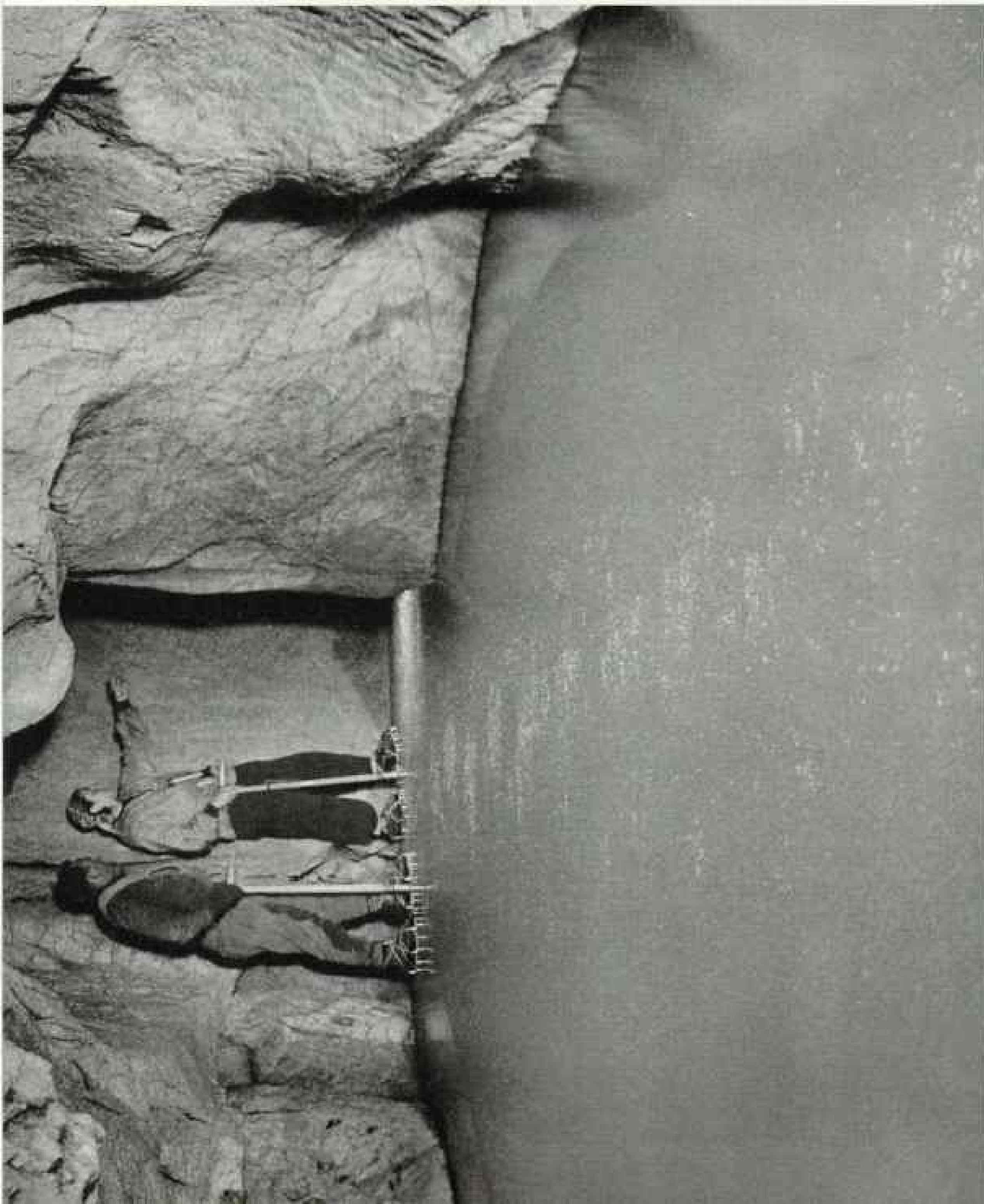
The Austrian caves, however, occur at altitudes of less than 6,000 feet, whereas the Pyrenees grottoes begin at 9,000. They are the highest yet discovered.

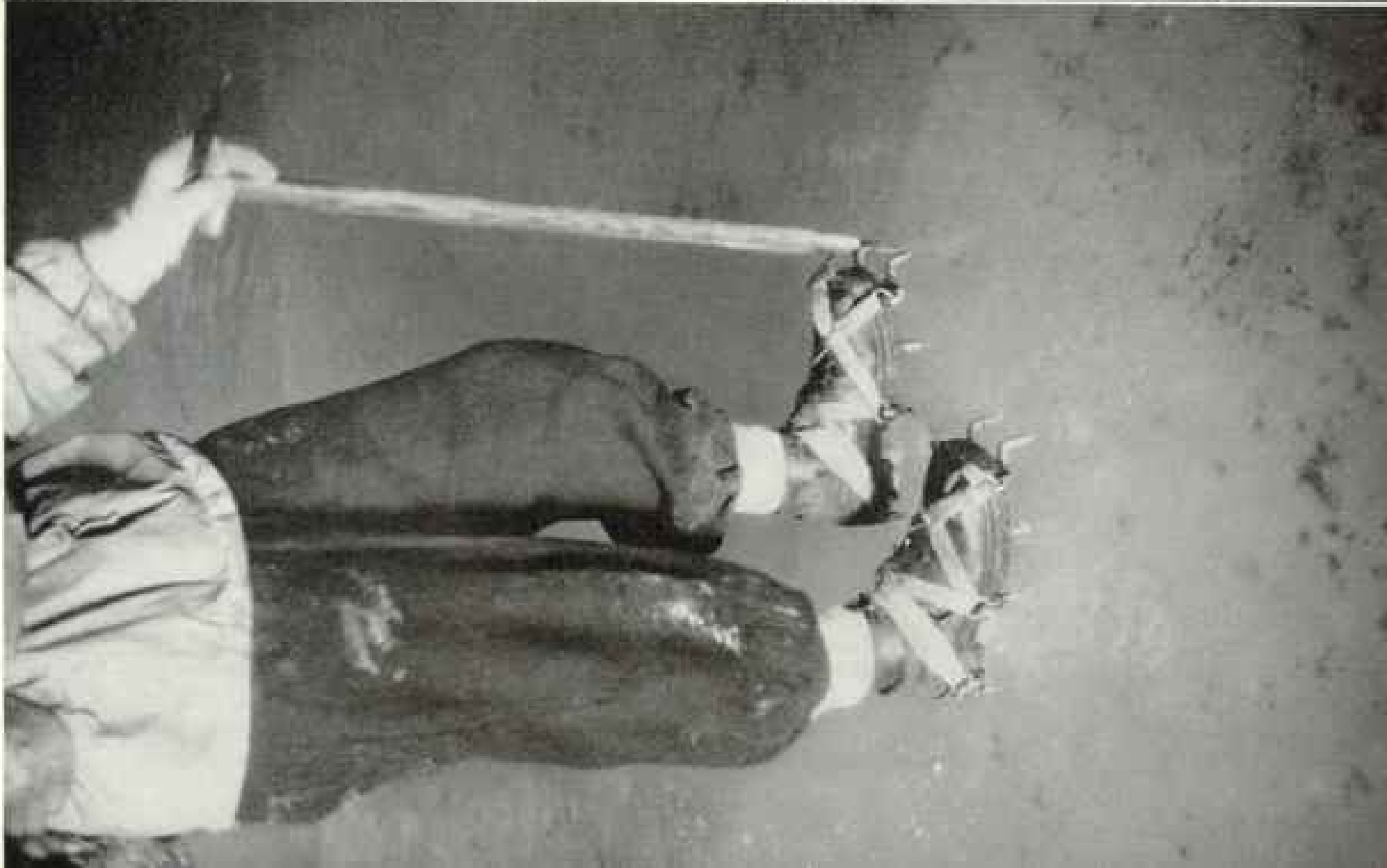
No breath of summer heat penetrates these natural iceboxes. Cold winds moan incessantly, and wet clothing freezes almost instantly.

Because of the cold and high humidity, the Castarets were unable to remain underground more than 10 hours. They emerged panting and exhausted, chilled feet aching.

To the weary explorers the icy maze seemed endless. At times broad corridors connected the halls, but frequently the passages were mere slits beneath overhanging ledges (opposite).

Hero Norbert and Maud Castaret discovered the entrance to a dark tunnel. It led them to new rooms in the mountain underworld.





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Steel Teeth Grip the Glazed Floor; No Step Is Safe Without Them

Exploration would have been impossible had the little party failed to wear crampons, sharp spikes strapped to boots. If cinched too tight, the straps slowed circulation, inviting frozen feet. Above: Explorers crawl through a "cut hole," a low passage in the rock. Below: Only Maud's steel-shod boots are visible as she wriggles on her stomach onto the ledge opening above Frozen Niagara (page 395).





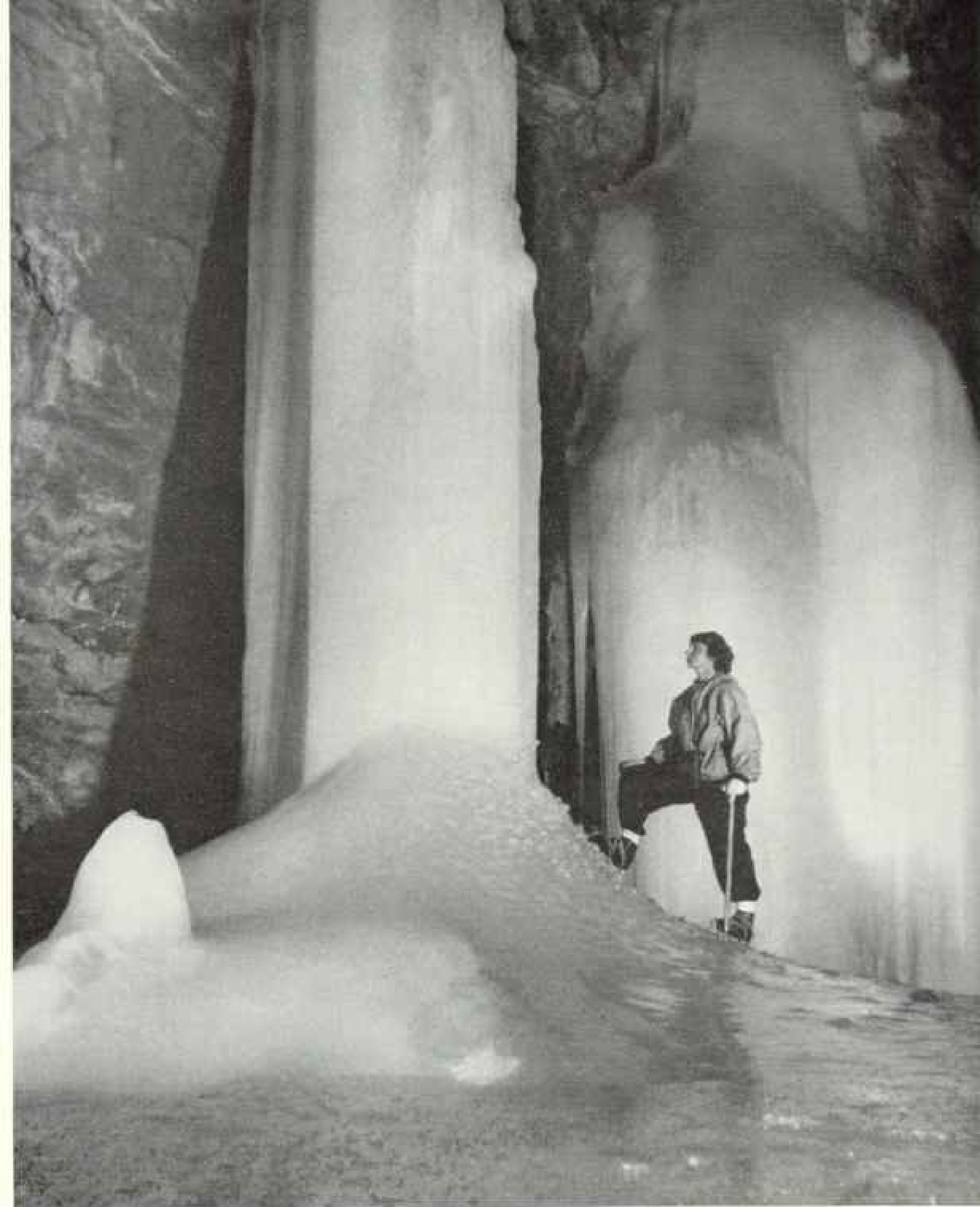
Glittering Icicles Deck a Crystal Mound Built by the Patient Drip of Waters

In each cave the explorers made an exhaustive search for traces of life. They observed not a single plant nor any living animal. But deep in the recesses of one grotto they found an ermine and two bats frozen to death, perhaps centuries ago, after having strayed into the corridors.

"We looked in vain for living organisms," says the author. "I believe that not even a highly specialized animal could adapt itself to the conditions or survive them.

"Humans can invade these realms of death only briefly and with the help of special equipment, which they must use with the utmost caution."

Here the author examines the ice through a magnifying glass. With him is Gilberte.



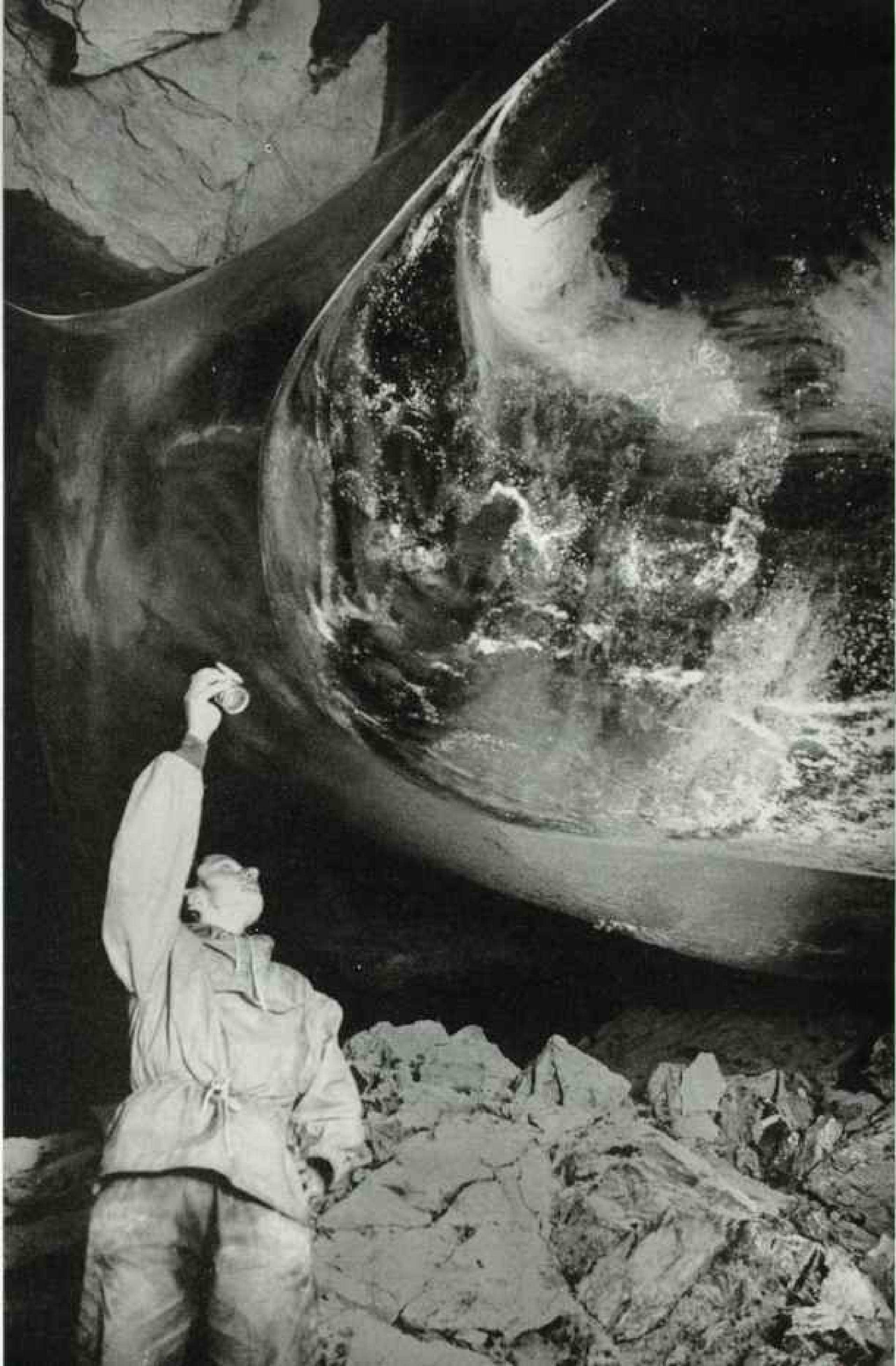
A Pillar of Milky Ice Soars Toward the Ceiling of an Underground Vault

Hundreds of bizarre ice formations encrust the cavern walls. Each turn of the winding corridors promises some new discovery, perhaps a cataract or a weird figure imprisoned by the unchanging cold.

"Many of these formations are so amazing that they seem figments of a dream," says the author. "All are so unchangeably static that their very stillness and solitude become disturbing. The only sound is the mournful cry of the wind sneaking through dead caverns, where no man had ventured before us and none may linger long.

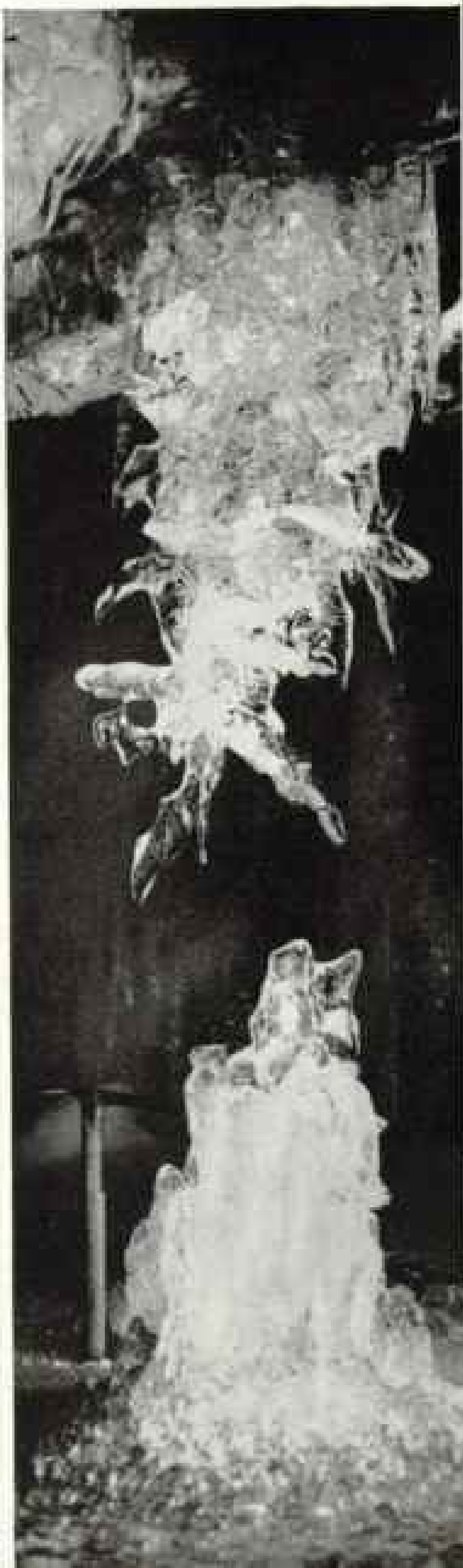
"Underground glaciology is still too little known. So rare are these subterranean laboratories, so difficult to enter and explore, that they do not attract the studies they deserve."

This shaft rises like some graceful monument fashioned by underworld gods. Maud admires its perfection of line.



← Tiny Stars Gleam
in a Ball of Ice

Countless air bubbles were trapped within this transparent mass when the waters froze. Reflecting light, they shine like winking pinpoints in the Milky Way. The ice hangs suspended above the frost-covered floor of a deep moat. In the light of Gilbarte's torch it shone an emerald green.



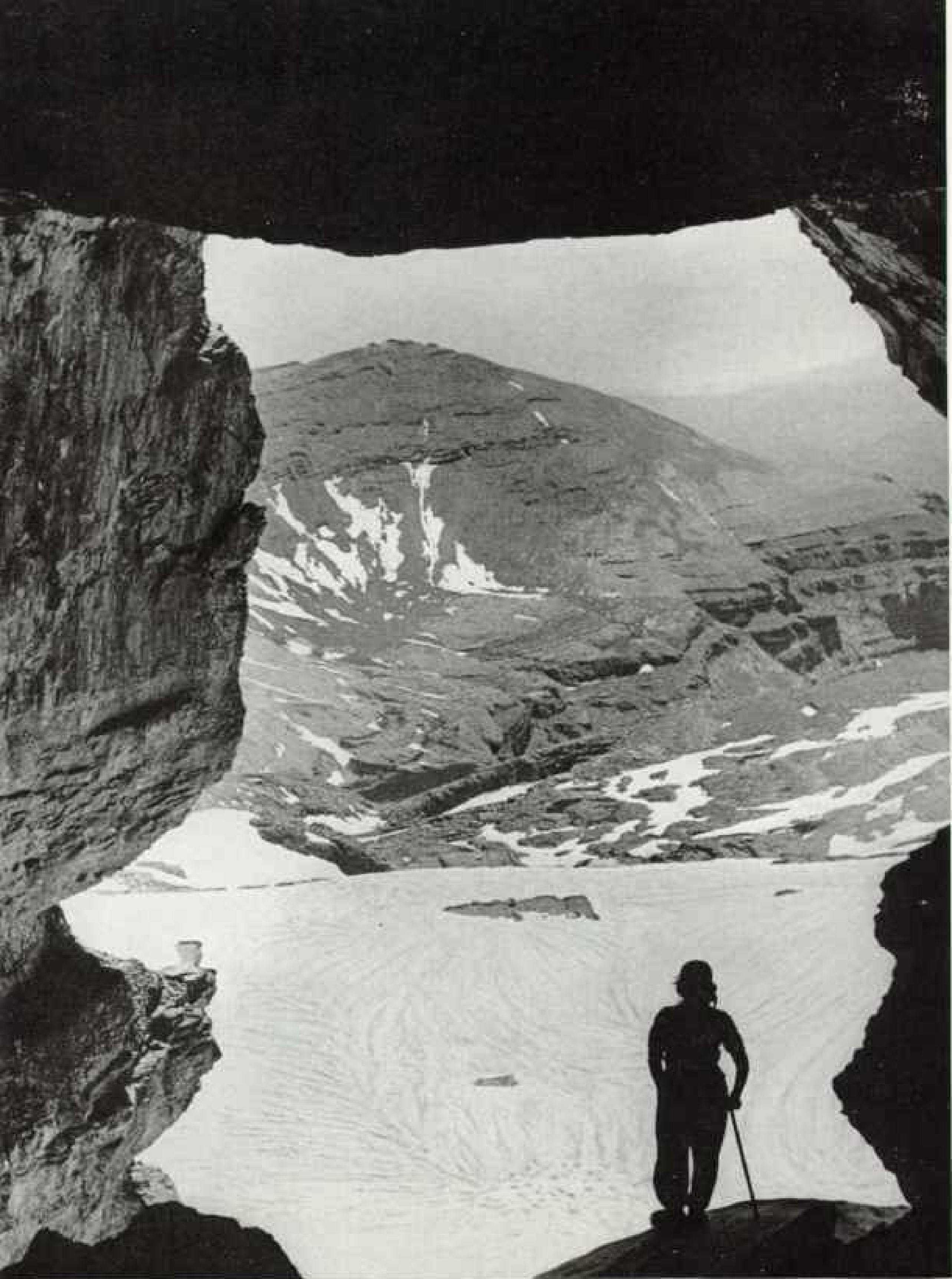
403

↗ A Crystal Tongue Acts as Magnifying Glass

Because of its transparency and variable curvature, this stalactite enlarges Maud's hand and watch.

← At times cave explorers find eccentric calcite masses and crystals which branch out in all directions. These strange icicles follow a similar growth pattern, defying the law of gravity.

In these shadowy halls the temperature never rises above freezing. It is possible that some of the ice was formed thousands of years ago.



An Ice Cave's River-hewn Doorway Frames the Pyrenees

This opening looks out upon Spain at an altitude of more than 9,000 feet. Somewhere in the world, the author believes, higher ice caverns remain to be discovered.

North America's Only Pouched Mammal, Slow-moving Survivor
of an Ancient Order, Leads a Relaxed, Solitary Life

BY AGNES AKIN ATKINSON

With Remarkable Life-study Photographs by Charles Philip Fox

THE solitary opossum, one of our strangest animals, is also one of the finest examples of complete relaxation and lack of push.

His very ability to take it easy may account for the fact that his is one of the oldest living families of mammals. His parents were roaming our continent cheek by jowl with the now extinct dinosaur some 70,000,000 years ago. Not that he seems to care a snap of a pink toe for his illustrious ancestors.

Since we belong to a species which reached the earth millions of years later than the opossum family, we are curious about how this placid creature has managed so well in the eternal race for survival. Many years of observation of the animal in our own side yard have given us some answers to the question.

Wild Visitors Come to a Banquet

About 15 feet from the glass wall of the living room of our home in Pasadena, California, the earth drops off into a wide, brush-covered canyon. Along the edge we built a low rock wall. In the center of the wall we left a large flat rock which we use for an animal banquet table. Each evening we serve there a variety of food to entice the wild creatures from the canyon below and the mountains beyond.

Throughout the past quarter of a century we have made friends with handsome gray foxes, curious raccoons, dominating skunks, dainty ringtail cats, slinking coyotes, and the opossums. All were good actors—clowns, gentlemen, ladies. Many of them made friends easily and seemed to like us.*

But in almost every accomplishment the opossums were at the bottom of the list. These elusive, shy, and always solitary creatures were also, we thought, the homeliest of beasts.

Yet in spite of their peculiarities, these age-old animals intrigued us greatly. "Old Poss" became one of our favorites, and, like all his kind, was as fine an example of relaxation and lack of haste as we have ever met.

And thereby hangs this tale.

We first spotted Old Poss waiting in a hole in our wall, looking as if he were asleep standing up. He seemed to feel that he had a hundred years to come up our rough wall by short starts and long stops, and another

hundred to decide to eat the food that was spread almost in reach of his nose.

Although the feast included bread, meat, cake, fruit, and a variety of leftovers from the family table, Old Poss waited with the calm patience of the silent woods from whence he came. He seemed as much a part of hill and rock and brush and grass through which he shuffled as the trees up which he climbed.

"Old Poss certainly takes life in his stride," my husband said. "Perhaps that's one secret of his ripe old age. Do you suppose that time means anything to a possum?" He chuckled. "Reminds me of the farmer down South who walked his swine several miles to the market. When asked why he didn't save time by hauling them in a truck, the farmer answered, 'What's time to a hawg?'"

From the looks of Old Poss just standing there, waiting, it seemed he had more time than there is in all the world.

My husband chuckled again. "Human folks with a table like that in front of them would 'Giggle, gabble, gobble, and git!'"

Slowly Old Poss climbed to the table and stood there looking around. If any other animal had been near, he would have turned and ambled off; he wouldn't share his table with anyone.

Pink Toes Peep from Fur Mitts

His body was about the size of a large house cat's; his flesh-colored snout was much like a pig's; his tail was scaly, like a rat's. But he wore his own beautiful coat, cream at the base of his throat and on his face, fawn colored on his belly; the tips of the long guard hairs on his back were of brown so dark they seemed black.

From the dark fringe of fur on his legs pink toes extended like ladies' fingers from black lace mitts. His round shoe-button eyes were large and as black and glossy as jet (page 407). Slowly he moved his leaf-shaped, brownish-gray ears. Hairless, they looked as if the wind had tossed them, one on each side of his face, where they had stuck.

Without even a blink, his dark-socketed eyes stared straight ahead. Now and then his

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Be-friending Nature's Children," February, 1932, and "Where Birds and Little Animals Find Haven," August, 1936, both by Mrs. Atkinson.



Windows and Mirrors Aid Animal-watching, the Author's 25-year Hobby

Nightly, raccoons, skunks, and opossums take food set on the picture-window ledge of Mrs. Atkinson's home near Pasadena, California. In return, they unfold much of their private lives. The author-naturalist is reflected (right) by a large outdoor mirror which increases the range of her view.

eyelids slid shut, only to open and deliberately stare again. He stood tall, as if stretching. He opened his long slit of a mouth and yawned widely; then, as is the way of opossums, he yawned again.

Finally he began eating. With his long snout he pushed aside a piece of this and a piece of that. Propping himself up with his long prehensile tail, good as a foot or hand to a possum any old day, he picked up a chunk of stale cake, held it in one front paw, and bit off a mouthful. Head high to keep from drooling, he smacked his lips in a sideways movement. In the stillness we could hear his open-mouth chewing.

Old Poss and his family, true scavengers, will eat anything. Once, in the South, my husband saw Mrs. Possum and her family of newly weaned babies making a meal on a dead horse.

Possums also like mice, beetles, snails, birds, eggs, chickens, berries, fruits, and palmetto roots. In Dixie persimmons and chinquapins are their special delight.

Having dined well, Old Poss took a leisurely bath, still sitting on the table. Making a three-legged stool of his hind legs and tail, he washed himself much as a cat does. He began with his white face and went from there to his head, then his neck, his body, finally his feet, running his long tongue expertly between his pink toes.

Mrs. Possum's Baby Carriage

One night an unusually heavy possum waddled to our rock table and ate so much its sides bulged. It was not until the creature sat back on its hind legs to begin bathing that we discovered it was not Old Poss at all, but Mrs. Possum.



Shoe-button Eyes, Narrow Snout, and Low IQ Mark This Primitive American

Slow-witted compared to most mammals, the lowly opossum has what it takes to survive 70 million years. His ancestors saw the dinosaurs quit the earth. Compared with him, man is but an upstart.

Mrs. Possum is different from every other animal in our country in that she has a pouch. But she is not like the kangaroo, for the opening of this pocket is vertical instead of horizontal. A small upside-down head stuck out of Mrs. Possum's pocket and turned curiously from side to side.

Another evening one of the largest possums we had ever seen ambled up. Instead of being the regular mangle-with-the-scenery color, he was white, or, rather, pink. His snout was pink and tender looking, almost the texture of a baby's skin. His pink face shone in the light of the small lamp on the outside of our plate-glass window where we had rigged a more intimate feeding station (pages 406, 418). His white fur was so fine and sparse that it was scarcely discernible.

We looked at him in wonder, unable to explain his coloring. It was not until he had eaten and ambled away that we realized we had been looking at an albino opossum.

How to Survive with a Little Brain

The opossum's scientific name is *Didelphis virginiana* (Greek: *di*—double, *delphys*—womb; Latin: *virginiana*—of Virginia). It is a relic of the ancient order of pouched mammals and is the only marsupial found in the United States. The female possum carries her prematurely born offspring in a pouch or incubator on the outside of her belly; being a mammal, she nurses her young.

Marsupial history dates back to the ages of the dinosaur and dinothere. Before these larger reptiles and proboscidean mammals were extinct, marsupials appeared. The dinosaur was unable to endure the march of progress, but the opossum has changed very little and yet has survived in spite of a changing world. Of present-day mammals, it is one of the least advanced from primitive ancestors in structure.

Some authorities believe the larger animals of that early age laid their eggs on the ground, pulled sand over them, and went about their business. Perhaps the opossum came along and feasted on many of those eggs before the sun could hatch them.

Time passed. The dinosaur disappeared; the scavenging opossum, who takes her children with her wherever she goes, lived on. In its own way the opossum led an efficient, self-supporting, comfortable, contented life, sleeping during the day as it now does, prowling the forests and fields by night, eating anything and everything.

Finding it easy to live in warm climates, the creature survived from year to year, century to century, age to age.

Opossums range over our country as far north as the Hudson River Valley and the

Great Lakes. They are occasionally found farther north, even in Canada.

Though opossums are thought to be dull, stupid creatures, they sometimes show what looks like sense. Mr. Possum has been known to hitch a ride by automobile. Motorists have found him curled up under the hood of the car, keeping warm from the engine. One reported taking a comfortable hitchhiking possum from the front axle of his car.

The late Vernon Bailey, long a naturalist with the Fish and Wildlife Service, told me that the brain cavity of an adult male opossum's skull will hold 25 small white beans; the cavity of the skull of a raccoon of the same size will hold 150. If ideas were beans, it is plain to see the possum's brain couldn't hold too many of them, at least at the same time.

And there never seems to be room in this small brain cavity to hold any idea of danger brought about by the trickery of others. In the South, where Mr. Possum is hunted with dogs, he will climb a tree. When he is shaken down, he will play dead, giving the hunter a chance to put him into a sack.

If there is no sack handy, the hunter may catch the top of the possum's tail under a forked stick, wrap the end of the appendage around the stick, and Mr. Possum will allow himself to be carried to the hunter's home.

Supple Possum Climbs Its Own Tail

If you carry him by the tail, it is well to remember that the supple animal can climb his own tail to your hand and may bite. However, he will never think to untwist his tail and make a run for his life.

If a possum is caught in a trap one night and is able to escape, the next night it will step again into exactly the same trap. Like human beings, some creatures live and learn, while some just live. Mr. Possum is of the latter variety. If the same trap isn't available, he will step into another one.

Even if the trap is a steel-jawed one, Mr. Possum will often free himself. Some naturalists say that possums haven't enough sense to get out of such traps, but in our yard we have had one three-footed and one three-legged opossum to dinner.

Perhaps the animal, just standing there staring at the trap holding its paw or leg, has a bewildered feeling of not having enough wits even to lose his head by getting angry. He watches and waits while the caught member becomes numb; then he gnaws off the trapped foot and limps away to a warm hide-out to let Nature heal the injury.

One of the most familiar tricks of Mr. Possum is "playing possum." Whether he has figured out that the best way to escape being killed is to make his pursuer think him



A Nocturnal Prowler Bares His 50 Teeth in a Daytime Yawn

Rose Mary McGrath demonstrates that the Atkinsons' young pet is gentle. But beware! In another month his nature will change and his teeth will tear meat, crack bones, snap chicken-wire fence, and gnaw timber. Adults weigh 8 to 15 pounds and measure about 20 inches, not counting their long, scaly tails.

already dead, or whether it is easier to lie low than to run, is hard to say (page 417). At any rate, his pretense is so good that more often than not the hunter will go on his way, leaving the animal to go *his* way.

When Mr. Possum plays dead, you can twist him, kick him, swish him about by the tail; he will just lie there slumped on his side, his body limp, his mouth open in a silly grin.

When I was about 10 years old I went on my first possum hunt. We shook from a small tree what looked to us like the old great-granddad of all possums. The animal plopped to the ground and immediately slumped. We thought he had killed himself.

One of us picked him up by the tail, and, taking turns, we lugged him to grandmother's. It was miles, too! He grew mighty heavy by the time we got him home and dumped him by the spring.

Tearing into the house, we excitedly proclaimed our hunting success. Grandmother advised us to run quickly and bring the possum to her. When we returned to the spring, there was no sign of our prize. He had come alive and left for parts unknown, at least to us.

One of my friends had stored odds and ends in a box at the back of his garage. One morning he went out to find some of the children's discarded stuffed animals to give to a toy drive. He reached his hand into the box, and one of the animals moved. He got a flashlight and focused the beam into the box.

The sight was one of the most fearsome things he had ever seen in his life—an ugly slit of a mouth, with 50 gleaming white teeth, some as sharp as a needle, snarling and hissing at him.

The same 50 teeth which made Mr. Possum such a fearsome sight are his tools for chewing

A Built-in Incubator Carries Opossum's Blind, Naked Brood

An extraordinary series of pictures beginning on this page shows the growth of our common opossum through the first three and a half months of life.

Opossums bear embryonic young after only 13 days' gestation, weeks before the infants are ready for the outside world. A litter of as many as 21 bean-sized babies weighs about one-eighth ounce at birth. A human mother in the same proportion to her 6-pound infant would weigh 42 tons.

Clutching with oversized forepaws (clearly shown on this page), the newborn possums instinctively pull themselves through the mother's belly fur to her pouch. Their growth for the next eight weeks corresponds to that of other mammals in the womb.

Top—May 6. A blind doorman, one of a litter of 12, clings to a teat in mother's incubator. Four days old, it is already several times its weight at birth. No more than 13 can fasten themselves to the 13 nipples of the oval breast in the pouch. All others perish. Holding on continuously for nearly two months, the survivors drink for dear life. Through a third month they remain close to the pouch, nursing when hungry.

Center—May 20. Eye sockets, legs, and body show visible development.

Below—June 3. At four and a half weeks a trace of hair softens the shiny, embryonic appearance of the skin. Four of the dozen tails can be seen.

Opposite—June 17. At seven weeks the infants begin to crowd their tenement. Faces are covered with white fur, backs with long, dark hair. Ears stand erect, but eyes are not yet open and each youngster clings grimly to its fountain of life (see also pages 412-417).

Didelphis virginiana, subject of this series, is a true marsupial and the only opossum species living north of Mexico. Common to the southeastern United States, it has been introduced to the west coast in the 20th century. Its habitat extends to many central and northern States. *Didelphis* (from the Greek) means double-wombed.





himself out of traps and almost any confining pen or cage. Four teeth are tusks which he uses for tearing meat, cracking bones, or breaking wire and gnawing boards.

The opossum has more teeth than any other of our land mammals. In spite of his small size he has a larger mouth than man (p. 409). He might be living proof that small brain capacity and a big mouth go together.

Hard to Tell Sexes Apart

We have always been interested in the domestic life of Mr. and Mrs. Possum, but possums keep their private life private. The fact is, there is no evidence except the large litters to show that there is any love life.

The naturalist Ernest Thompson Seton wrote: "The possum is a strictly solitary animal; no one has yet reported two adults together, even during the breeding season."^{*}

Never in our observation have we seen two grown opossums side by side. Once we got a picture of two on the same negative, but they gave no sign of being acquainted or even

remotely interested in being introduced to each other.

Except for the times when the mother's pouch is so full of children that it almost drags on the ground, it is impossible for us to tell the male from the female, even though from long observation we know each face and form and can always tell when we have a new visitor or when one long absent returns.

When Mr. Possum walks, his gait is slow, deliberate, and heavy; he trots awkwardly along. But he can hurry if he has to. Once we saw a full-grown animal go lickety-split. His entire foot rests on the ground, making a track similar to that of a baby's footprint. This classifies him as a plantigrade.

Each foot has five toes; with the exception of a well-defined "thumb" on each hind foot, all toes have claws. Thumbs and claws, with the aid of a suction pad on each foot, help him to grasp limbs and branches on which he makes his way to the very tops of trees.

^{*} *Lives of Game Animals*, Vol. IV, Part II, Doubleday & Company, Inc., New York, 1929, page 884.



Opossum's Vertical Pocket Differs from Kangaroo's Crosswise Slit

July 15. Wide-eyed children are too big for all to hide in the pouch, so they take turns visiting for a snack or sheltered nap. Mother's pink toes suggest fingers protruding from black lace mitts.



"Look, Ma, No Hands!" "Look, Hans, No Ma!"

July 21. Eleven-week-old youngsters test their courage and prehensile tails away from the maternal pouch. Heavy adult opossums cannot easily hang in this fashion, but they find tails extremely useful as props for sitting upright and as emergency brakes in treetop rambles. Some lose tail tips to frostbite.

Although it is possible for Mr. Possum to hang by his tail from any horizontal object strong enough to hold his weight, he hasn't been seen doing this for pleasure, as do some monkeys, for example. In the South we have seen him with his tail wrapped around a higher branch, his forefeet resting on a lower branch, while he reached with his snout for the choice persimmons which would otherwise be out of his reach.

The most remarkable use Mr. Possum makes of his tail is as a kind of carryall for nesting materials. He has been observed gathering leaves with his forepaws, passing them back under his tummy, and then using his hind feet to slide them along to a convenient loop he made in his tail. When the loop was filled, he calmly extended his tail and thus carried the load to his hole.

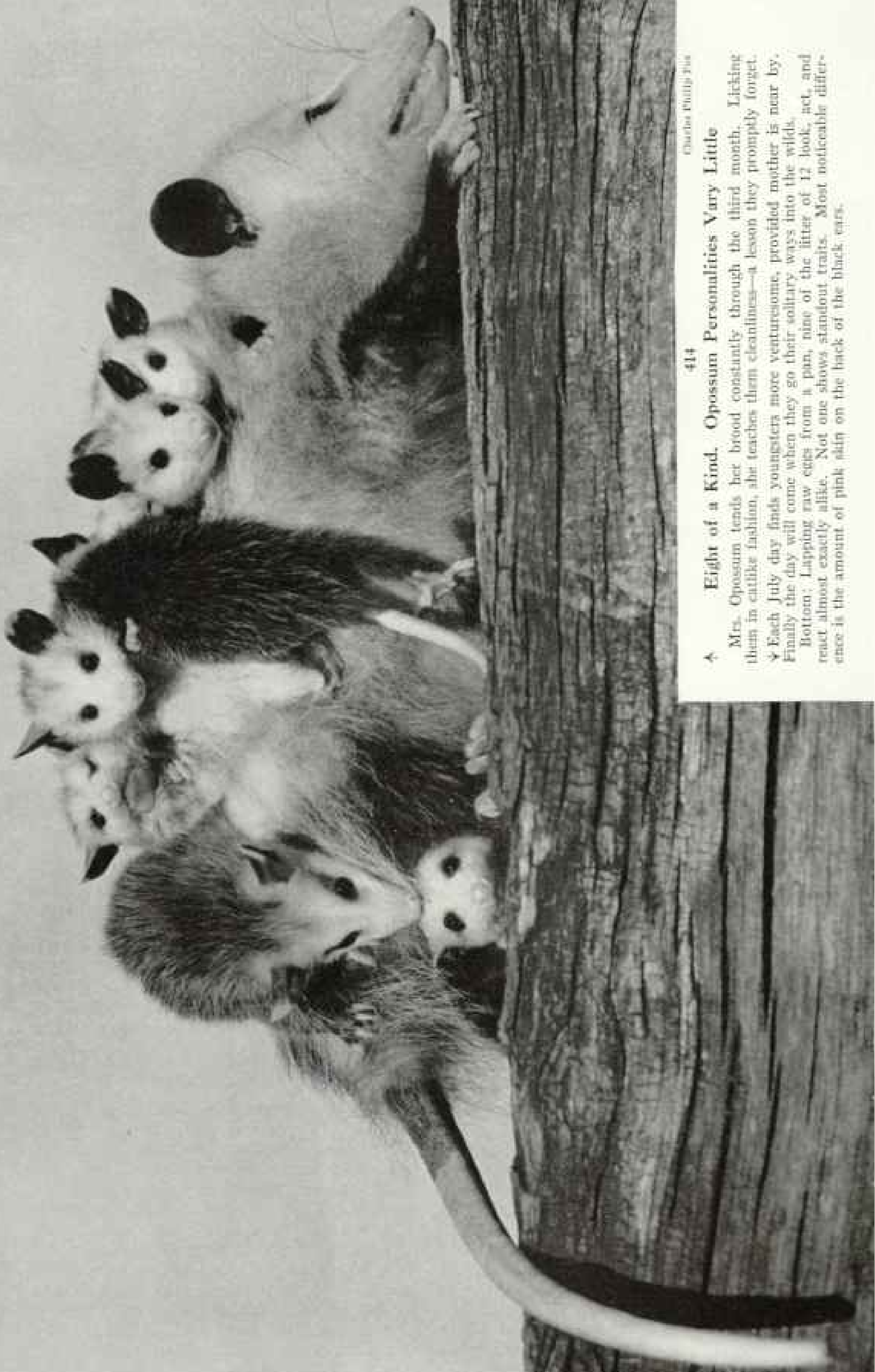
Mrs. Possum is a most indifferent house-

keeper. Possibly this is because her mate is a polygamist, and no amount of careful homemaking could keep him true to her. Probably, like the old woman in the shoe, she has so many children she doesn't know what to do.

Every Possum an Incubator Baby

Until Mrs. Possum is about to give birth, any old place that is dry and warm will do for sleeping quarters. When she feels a new litter imminent, she will seek a nest. She almost never builds a new one, but will appropriate a deserted nest built by an owl in a hollow tree, or perhaps even a skunk's den.

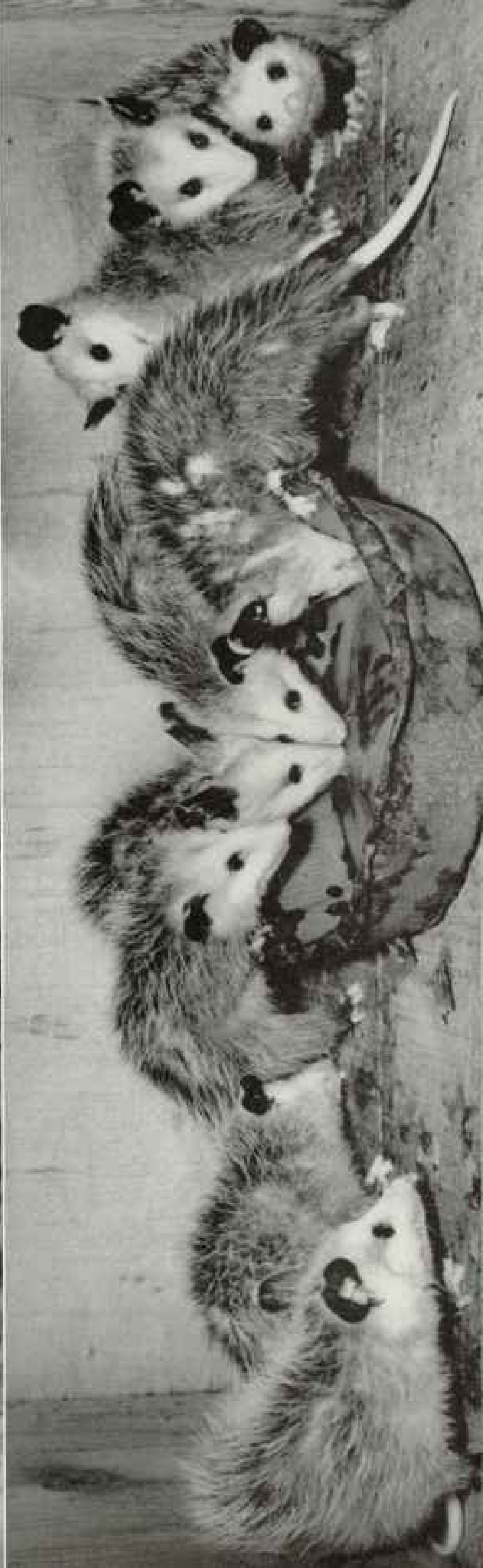
Being a marsupial gives Mrs. Possum certain advantages. Other unborn animals are supplied nourishment through the placenta. In the opossum, during the 12 to 13 days of gestation in the uterus, no food directly from



↑ Eight of a Kind. Opossum Personalities Vary Little

Mrs. Opossum tends her brood constantly through the third month. Licking them in catlike fashion, she teaches them cleanliness—a lesson they promptly forget. ↓ Each July day finds youngsters more venturesome, provided mother is near by. Finally the day will come when they go their solitary ways into the wilds.

Bottom: Lapping raw eggs from a pan, nine of the litter of 12 look, act, and react almost exactly alike. Not one shows standout traits. Most noticeable difference is the amount of pink skin on the back of the black ears.





Half-pint Possum Finds Haven in a Quart Jar

July 21. This sharp-nosed fellow, an interesting pet at 11 weeks, will change soon. Nesting in tree or burrowed den, he will roam the woods by night with lumbering gait. Hunted for his fur, he will show no sense about avoiding man's traps. If a paw should be caught in jaws of steel, he will gnaw it off (page 408). While he will raid farmers' chicken coops, he will be equally diligent in destroying rats and noxious insects.

the blood stream of the mother is provided for the little fellows. There is a membrane known as the chorion which envelops the embryo. This membrane appears to provide sufficient food for this short period.

At birth these infinitesimal bundles of pink flesh and pliable bone, scarcely bigger than a navy bean and weighing from thirteen to sixteen one hundredths of a gram, come into the world in a most immature form. By instinct these wee things make their way to the waiting pouch, or incubator, on the outside of the mother's belly. Every possum has once been an incubator baby.

Human babies seem small to us, but if a newborn human and its mother were in the same proportion to each other as are the newborn opossum and its mother, an average woman would give birth to a baby that weighed a seventh of an ounce. Or, an average 6-pound baby would have a mother weighing 84,000 pounds—42 tons!

There are many tales about how these tiny living things get into the pouch. Prof. Carl G. Hartman, who has done tireless research in the life of *Didelphis virginiana*, was probably the first to find the facts about possum embryology.

When the opossum is born, it does not have honest-to-goodness feet and legs; only nubbins

from which feet and legs will grow. The front nubbins are more nearly developed than the hind ones, having tiny yet efficient claws.

With these claws the babies pull themselves up through the mother's hair to the pouch. The lengthwise slit of Mrs. Possum's pocket, in contrast to the crosswise opening in the kangaroo's, makes the trip to this incubator slightly shorter.

Within the pouch are 13 nipples. As soon as an embryo reaches the warmth of the pouch and crawls inside, it attaches itself to a nipple and hangs on for dear life, literally for dear life. If it loses the nipple there in the warm darkness, it may be crowded out by another bean-sized baby. There it will remain attached to the nipple for about 60 days, and for another 30 it will remain close to the pouch and nurse when it is hungry (pages 410-412).

There may be as many as 19 to 21 fetuses in a litter; so the weakest ones are doomed to die. Probably this early weeding out of the weak helps to account for the survival of the opossum down through the ages.

Mrs. Possum will have each year one litter; in warm climates she may have two. She almost always has some sort of family. Either she is pregnant, or she has a pocket full, or she has a dozen little creatures trailing her, depending on her to find them food; or, even



Nobody Plays Possum Better than an Opossum

August 14. One of the litter, nearly full-grown at three and a half months, demonstrates with barely a twitch that he is ready to meet life's dangers by practicing a time-honored trick of his kind. Slumped on his side, body curved and mouth open, he feigns death in hope that the human hand will leave him alone. Nothing disturbs his shocklike trance. Final picture of the remarkable series by Charles Philip Fox.

worse, she may have a family in her pouch and one at her heels.

One wonders why, when her children keep her so busy, she mates so frequently and with such inconstancy. Carefree Mr. Possum goes his way, but Mrs. Possum carries her responsibility with her.

Most other animal children are left at the mercy of hunters and birds and beasts of prey while their mothers are out foraging, but opossum babies are snug and warm and safe.

Mouse-size Babies Ride Mother's Back

When the babies are about the size of full-grown mice, they begin to crowd the pouch and leave their upside-down home. At this time they pull themselves up on their mother's back and see the world from this vantage point (pages 414 and 415).

In all our observation we haven't been fortunate enough to see opossum babies being carried in this manner. We have placed them along their mother's back and taken photographs, but it was our idea, not Mrs. Possum's.

Each day these youngsters gain in strength; each day they become less timid. When their legs are strong enough to hold up their fat little bodies, they wobble to the ground and toddle along ahead of, behind, or beside their mother. They don't play as other young

animals do, but are even-tempered and docile.

At one time we had a particularly good opportunity to get acquainted with a possum family. A friend of ours found an opossum under his house and brought her to us. Her pouch was filled with babies almost at the weaning stage.

We put her in our "hospital," a screened porch which we keep equipped for the care of sick or injured animals, so that we could take close-up photographs.

The mother was most cooperative. Sometimes she hissed; sometimes she made a blowing or snorting sound. Once she grunted. But she allowed us to handle the children, and they curled in our hands, spat a little, and settled down to their poker-face attitude.

Though they were almost silent and always agreeable, how they smelled! We had no desire to keep them for pets; our feeding table was close enough, after our camera work.

At three months the youngsters are weaned. They have now learned to eat solid foods— insects, beetles, roots, and other goodies rich in possum calories. When well into the yearling stage their eyes seem to stand right on top of their ugly little faces. Their wind-blown ears and long snouts, usually dripping, make them look like the patriarchs from which they have descended.



Feeding Antics on the Window Ledge Amuse the Author and a Young Friend

Opossums relish any food. Mice, beetles, snails, chickens, eggs, and fruits please their palates. Scavengers, these marsupials eat meat even in a decaying stage. Adults lead a hermit existence; no two have appeared side by side at Mrs. Atkinson's feeding station (page 411).

It is at this stage that they begin to wander away from their mother, returning less and less frequently, until finally they do not come back at all. They have become hermits like their parents.

Hunters and trappers are constantly after their skins. Opossum fur has long been used, especially in inexpensive garments.

Even though trapping is forbidden in our own canyon, we are constantly on the alert for lawbreakers and their gear. We would rather see the gleaming fur on Mr. and Mrs. Possum than on anybody else.

Mr. and Mrs. Possum may unwillingly

serve man in another role, too. "Possum and taters" is a popular dish in certain regions of the South. The meat is greasy and to me unpalatable, but there are those who like it.

Baby Possums Aid Research

The use to which the little opossums can now be put is in the study of embryonic development. In any other animal, to reach the living embryo requires anesthesia and surgery. To place the opossum embryo on the laboratory board requires merely reaching into the mother's pocket. And Mrs. Possum, even in a laboratory, adjusts to whatever life brings.

INDEX FOR JULY-DECEMBER, 1952, VOLUME READY

Index for Volume CII (July-December, 1952) of the NATIONAL GEOGRAPHIC MAGAZINE will be mailed upon request to members who bind their copies as works of reference.

New National Geographic Map Shows Neighbor Lands South of the Border

419

TEN years of the most intensive air-mapping in the history of our southern neighbors bear fruit in the new National Geographic Society map, "Mexico and Central America," distributed with this issue to more than 2,150,000 member families throughout the world.*

During and since World War II, all of Central America and almost half of Mexico were photographed from the air by United States agencies in an ambitious mapping project undertaken in cooperation with other American Republics. Much of the new detail on this latest 10-color National Geographic map was obtained by these map-as-you-go photographic planes.

Pilots flying from modern airports looked down on the ruins of Indian civilizations that were centuries old when Columbus came. In minutes they accomplished feats of mapping that would require years on foot, for most of the long wasp-waist of the Western Hemisphere is mountainous or wrapped in jungle growth.

Home of 35,000,000 People

Into "Mexico and Central America" went a distillation of all the cartographic knowledge acquired since the days of the Conquistadors. Outstanding among the many sources used were maps from a notable collection assembled by the International Geographical Union for its memorable Seventeenth Congress in Washington, D. C., last August. The National Geographic Society's cartographers also obtained valuable up-to-date information directly from the countries shown.

Besides Mexico the map shows the six Republics of Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, and gooseneck-shaped Panama, the Crown Colony of British Honduras, and the Canal Zone. This area, stretching from the Rio Grande southward to the Panama-Colombia border, totals 989,585 square miles—more than half the size of Europe, excluding Russia.

In these lands live 35,483,000 people, 26,332,000 of them in Mexico.

To show the area on the largest possible scale on a 37-by-27¼-inch sheet, Chief Cartographer James M. Darley planned the map in two sections. The southern portion of Central America appears in an inset on the same generous scale as the main map—1:3,500,000, or 55.24 miles to the inch.

This method permits the presentation of 5,967 place names, nearly twice as many as have ever been shown in this area on a National Geographic map.

Printing all these place names with maximum clarity is made possible by The Society's unique photo-composing machine, invented by the late Chief Cartographer Albert H. Bumstead and further developed by his son, Newman Bumstead, of the cartographic staff. Each place name is reproduced photographically from hand-drawn type designed by Charles E. Riddiford, staff cartographer.

All areas are shown in their true proportion, since the map is drawn on the Albers Conical Equal-Area Projection.

San Benedicto Changes Its Shape

Completing the picture of Mexico, two insets show its remote islands. One portrays the Revilla Gigedo Islands, a desolate volcanic group about 250 miles south of the tip of Baja California. The other presents Guadalupe Island, Mexico's westernmost possession, about 160 miles off Baja California.

Two recent events directed attention to the uninhabited Revilla Gigedos.

Literally earth-shaking, the first event occurred in July, 1952, when a volcanic eruption built a new roof on San Benedicto, easternmost of the Revilla Gigedos. Belching ash, vapor, and gas, the volcano in six weeks reared its summit 1,050 feet above the sea. The cone spread until it radically altered San Benedicto's shape.

The second was Mexico's award of a concession to exploit sulphur resources on Socorro, largest of the group's four islands. Deposited by a volcano, this sulphur supply has been described as one of the world's largest.

A final inset shows the Canal Zone with its trans-isthmian waterway linking Atlantic and Pacific. Its scale is 1:750,000, or 11.84 miles to the inch.

During the fiscal year 1952 the canal transited 9,468 vessels, a record for its 58 years of existence. Work on a third set of locks, begun early in World War II, was suspended because of shortages of labor and materials.

Red Artery Linking Two Continents

Of all recent developments in Latin America, the most exciting to motorists is the Pan American Highway. The Inter-American Highway, as the Mexico-Central American section is called, is truly the artery of the lands below the Rio Grande.

* Members may obtain additional copies of the Mexico and Central America map (and of all standard maps published by The Society) by writing to the National Geographic Society, Washington 6, D. C. Prices in the United States and elsewhere, 50¢ each on paper; \$1 on fabric; Index, 25¢. All remittances payable in U. S. funds. Postpaid.

Where it is shown as a heavy red line on your map, the highway is a reality. In just a few places now is it only a vision and a vow, marked by a dashed red line representing uncompleted sections. When these are completed, motorists will be able to drive all the way to South America.

Driving southward from the United States, one encounters the first gap, of 25 miles, in northern Guatemala. Two gaps in Costa Rica total 199 miles, and there are two in Panama, one extending 14 miles from the Costa Rica-Panama border and one of 197 miles from Chepo to the Colombian frontier.

In Mexico the Pan American Highway System, formerly a single road from Nuevo Laredo to the south, has branched out and made contact with the United States at six points.

On your map, however, only one road is shown with the heavy red line. This was the highway officially designated in United States legislation granting aid toward construction of the Nuevo Laredo-Panama City portion.

Road builders are opening new vistas in Middle America. Every republic has plans for expanding its highway system and looks forward to the day when improved communications will permit the tapping of mineral resources now untouched. For much of Central America, better roads will mean the end of time-honored dependence on such crops as bananas and coffee.

Nicaragua, lacking an accessible Atlantic port, is developing a river port at Rama for connection with the interior. Honduras plans a road system to connect Tegucigalpa, the capital, with Puerto Cortés on the Caribbean. Guatemala is laying a highway from Guatemala City to Puerto Barrios, also on the Caribbean.

New Projects in Mexico

One Mexican project, the road from Toluca to Taxco de Alarcón, proceeds at a snail's pace. For fear that dynamite blasts might damage the spectacular formations in the nearby caverns of Cacahuamilpa, builders are chipping away a 15-mile section by hand.

A monumental change in the Mexican terrain will be former President Miguel Alemán's pet project—the Papaloapan. This program, comparable to the Tennessee Valley Authority in the United States, calls for development of 17,582 square miles of the Papaloapan River Basin in Veracruz, Oaxaca, and Puebla.

Your Society's map is the first to show the transformation of Baja California, formerly a Territory, into Mexico's 29th State, leaving a Territory of reduced size.

A spectacular growth in population, caused by a boom in agriculture, fisheries, wine production, and small industries in the Tijuana-

Mexicali region, gave impetus to the establishment of Baja California Norte, or Northern Lower California. The new State extends from the 28th parallel to the United States border.

The sparsely settled adjoining area is called Territorio de Baja California Sur (South). Capitals remain at Mexicali in the north and La Paz in the south.

A map feature of special interest to those absorbed by the sea's mysteries is the recording of a newly determined depth of 14,358 feet in the Gulf of Mexico. This depression occurs in Sigsbee Deep, which straddles the Tropic of Cancer 200 miles north of Yucatán.

The new sounding is 2,000 feet deeper than any previously determined in the area, but falls far short of matching 35,640-foot Challenger Depth and other great "holes" in the western Pacific.

The map depicts the new Coronado National Memorial, near Nogales, Arizona. This 2,745-acre park was named in honor of Spain's Francisco Vasquez de Coronado, who explored the southwestern United States in 1540.

Mysteries Still Beckon Explorers

Exploration in 1950 shed new light on Chihuahua's gigantic Barranca de Cobre, or Canyon of Copper, previously known only to Tarahumare Indians and a few outsiders.

Barranca de Cobre follows the gorge of the winding Urique River for an estimated 100 miles. Scientists of the Los Angeles County Museum, who packed into the Sierra Madre Occidental wilds to study bird life, described the chasm as deeper than the Grand Canyon of the Colorado.

Contrasting with modern cities and star-marked airports are the antiquities found by Matthew W. Stirling, director of the Smithsonian Institution's Bureau of American Ethnology. Leading eight expeditions into Tabasco, Chiapas, and Veracruz for the National Geographic Society and the Smithsonian, Dr. Stirling discovered treasures of jade, giant stone beads, and the earliest dated work of man in the New World, a Mayan stone carving interpreted by the Spinden correlation as November 4, 291 B. C.

Subsequent National Geographic Society-Smithsonian expeditions have taken Dr. Stirling into Panama, where he made notable discoveries at Barriles, in the El Volcán region, around Parita, on the Azuero peninsula, and along the north coast of Panama from Colón, Canal Zone, to Coclé del Norte River.*

*For articles on these discoveries, on the pre-Columbian civilizations of the Mayas and Aztecs, and on modern Central American countries, see the two-volume National Geographic Magazine Cumulative Index, 1899-1952.

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To carry out the purposes for which it was founded sixty-five years ago, the National Geographic Society publishes *The National Geographic Magazine* monthly. All receipts are invested in *The Magazine* itself or expended directly to promote geographic knowledge.

Articles and photographs are desired. For material *The Magazine* uses, generous remuneration is made.

In addition to the editorial and photographic surveys constantly being made, the Society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, the Society's researches solved secrets that had puzzled historians for three hundred years.

In Mexico the Society and the Smithsonian Institution, January 16, 1930, discovered the oldest work of man in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November 4, 291 a. c. (Spinden Correlation). It antedates by 200 years anything heretofore dated in America, and reveals a great center of early American culture, previously unknown.

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

A notable undertaking in the history of astronomy was launched in 1949 by The Society in cooperation with the Palomar Observatory of the California Institute of Technology. This project will require four years to photomap the vast reaches of space, and will provide the first sky atlas for observatories all over the world.

In 1948 The Society sent seven expeditions to study the sun's eclipse on a 5,320-mile arc from Burma to the Aleutians.

The National Geographic Society and the Royal Ontario Museum in 1951 explored and measured newly found Clark meteor crater, 11,500 feet in diameter, in northern Quebec.

The Society granted \$25,000, and in addition \$75,000 was contributed by individual members, to help preserve for the American people the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California.

One of the world's largest icefields and glacial systems outside the polar regions was discovered in Alaska and Yukon by Bradford Washburn while exploring for The Society and the Harvard Institute of Exploration, 1938.

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Sunnyside, the home of Washington Irving, near Tarrytown, N. Y.

BACHELOR'S RETREAT

When George Washington was inaugurated as President, Washington Irving's nurse managed to gain the General's attention and besought his blessing on the child. Many years later, Irving returned the compliment by making the General the subject of his last and most exacting book, "The Life of George Washington."

Born in New York in 1783, Irving spent his youth in a house on William Street and was greatly

and heard local legends which he was later to weave into his own stories.

Although Irving was a lawyer, he much preferred travel and writing but did not at first make serious use of his literary talent. After the death of his fiancée, the lovely Matilda Hoffman, he turned to his pen more earnestly.

Irving acquired Sunnyside, his estate on the Hudson near Tarrytown, when he returned to this country in 1832 to settle down after many years' residence abroad. He remained a bachelor but the house was often filled with numerous nieces and grandnieces and with other authors and notables of the day.



Through the generosity of John D. Rockefeller, Jr., Sunnyside has been restored and is open to the public. Besides being the home of one of America's best loved writers, it reflects a period that was

highly important in the development of the United States.

It was in this same period, in 1853, a time of vast national expansion and progress, that The Home Insurance Company was founded in order to provide sound insurance protection for the owners of the country's many new homes and business enterprises. The Home's centennial heralds the beginning of its second century of service to the insuring public.



Ichabod Crane pursued by Headless Horseman in the "Legend of Sleepy Hollow"

influenced by life in the growing city. He used to slip away from family prayers to make his way over the Dutch gabled roofs and attend performances at the John Street theatre. When visiting a brother, who lived near Tarrytown, he explored the countryside

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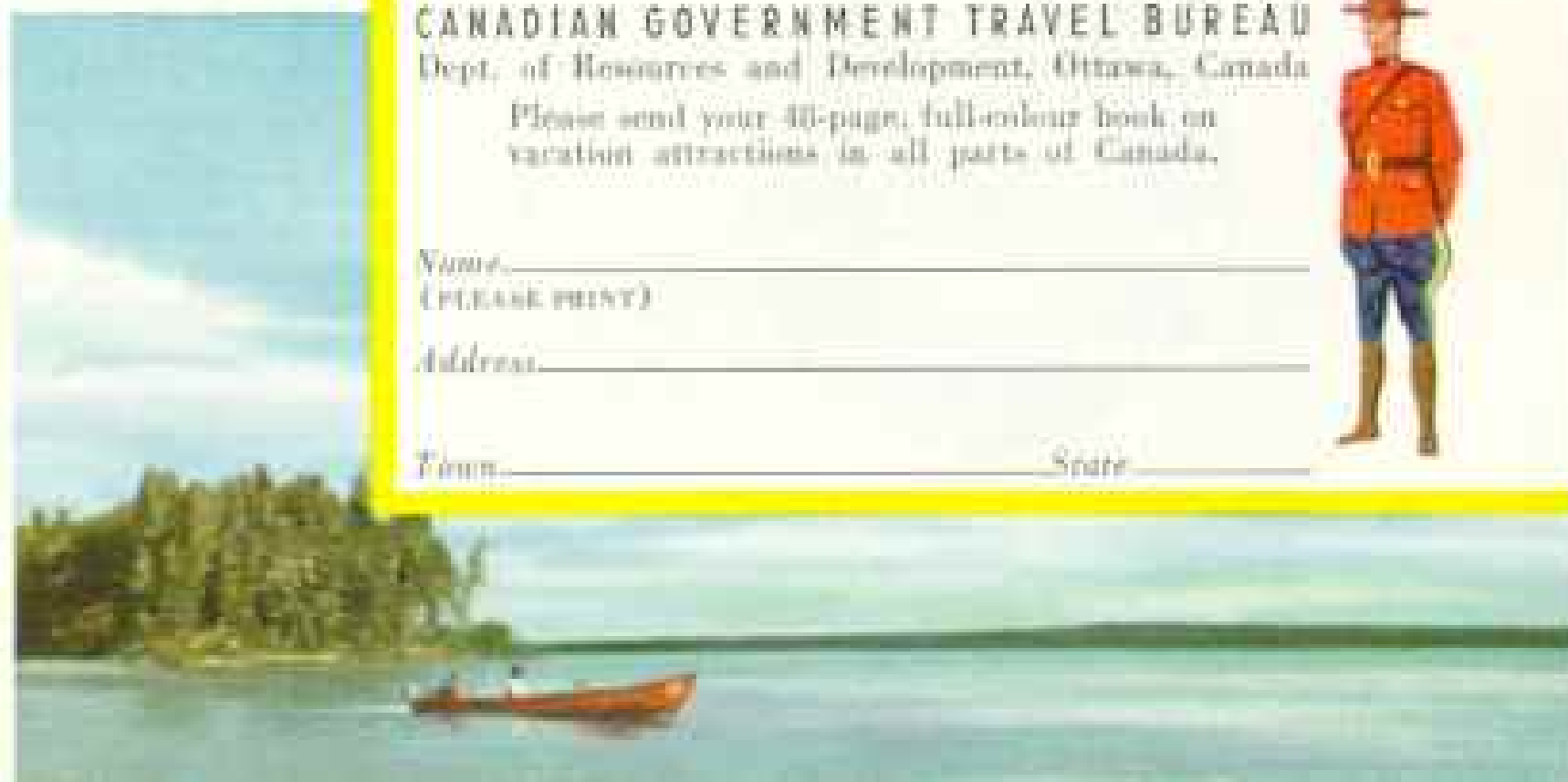
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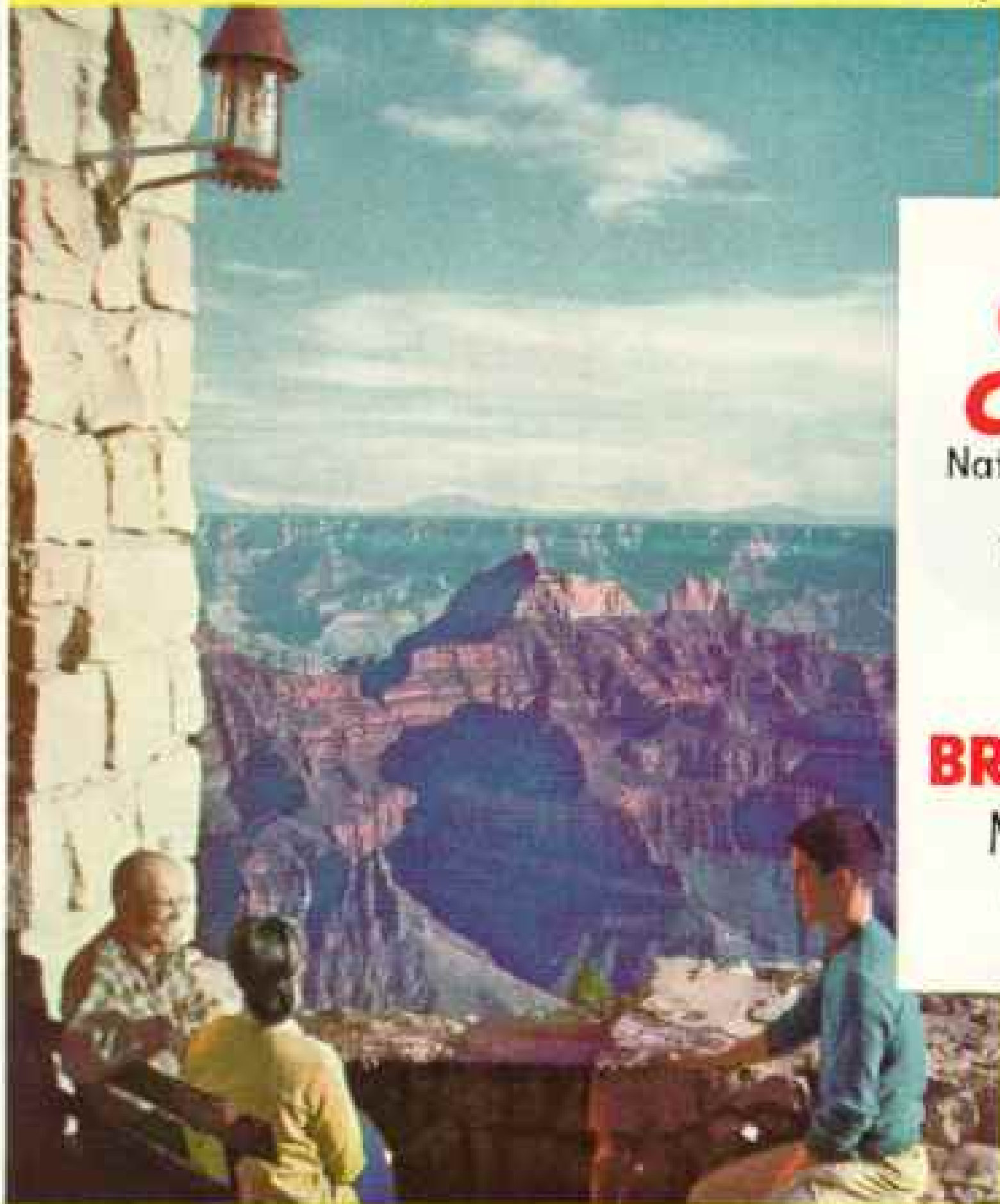
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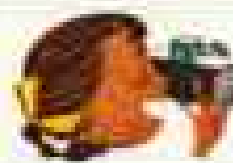
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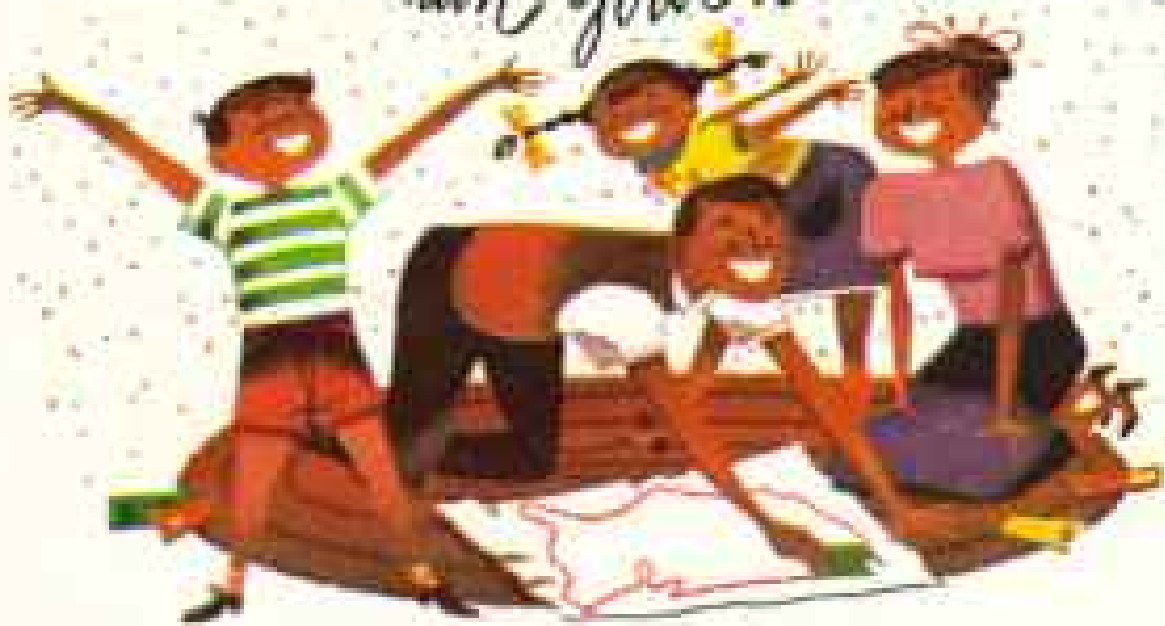
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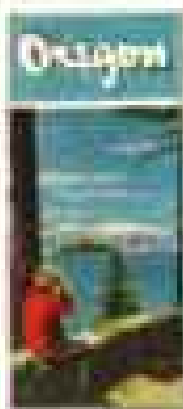
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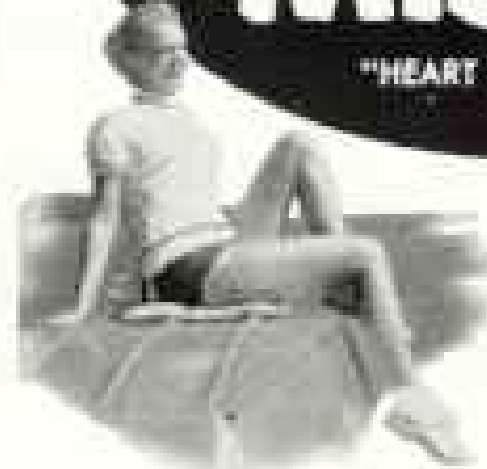
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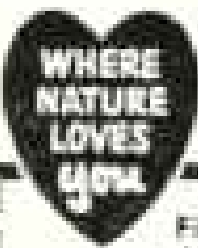
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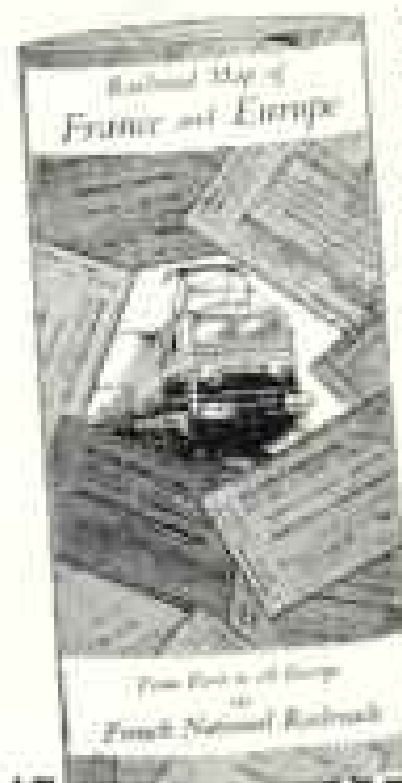
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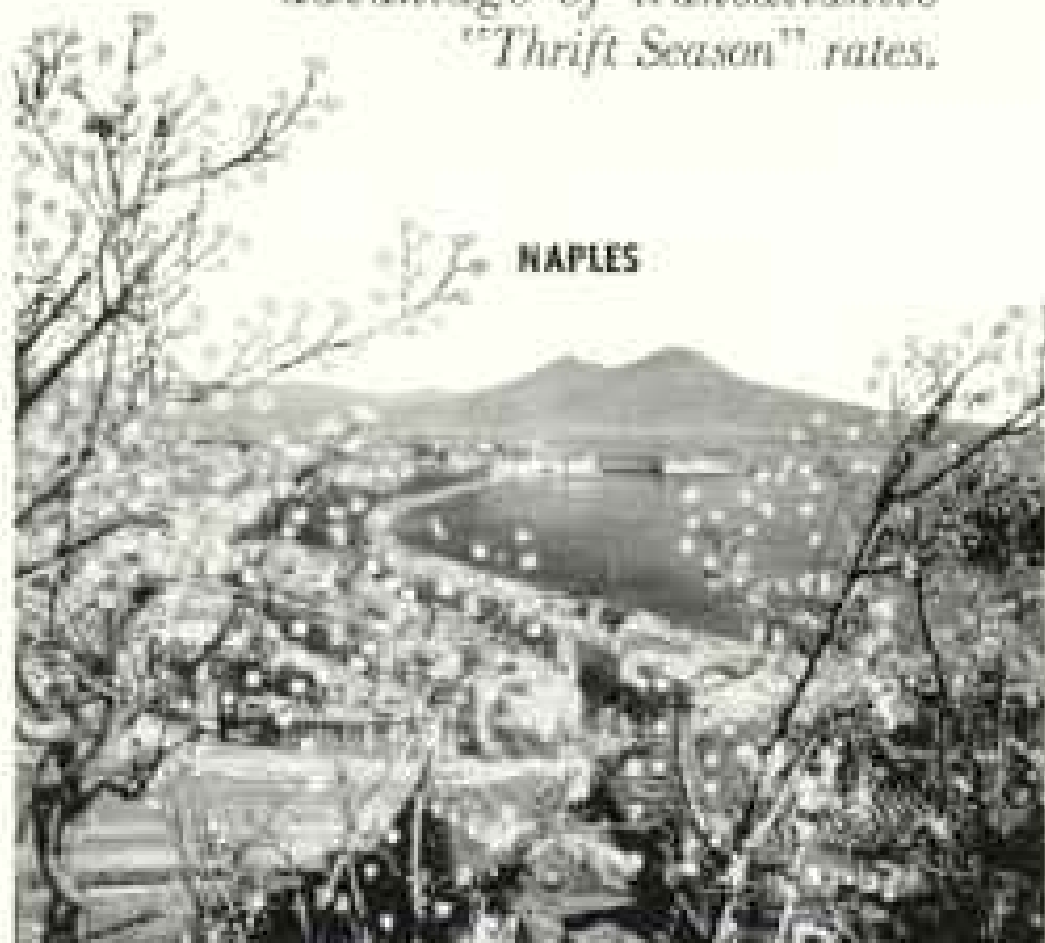
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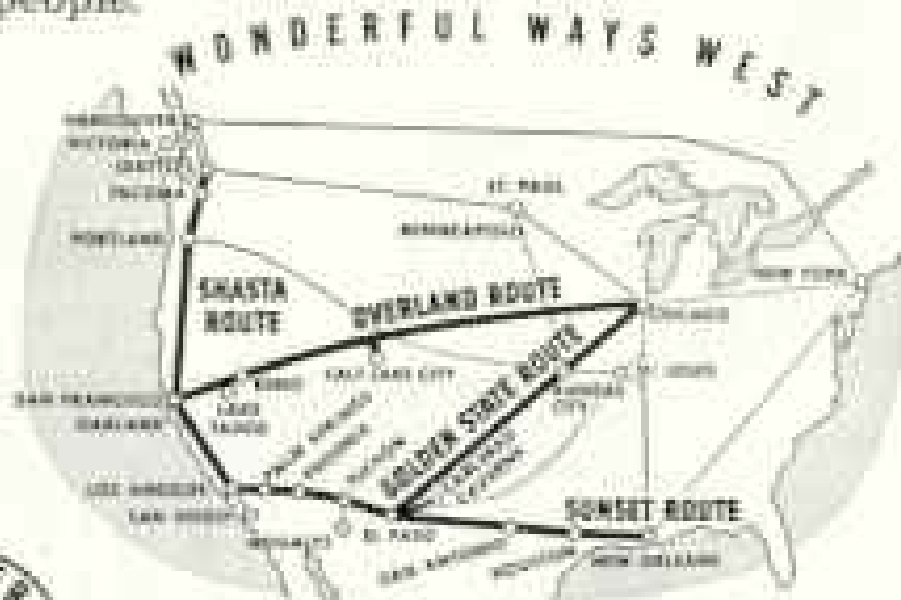
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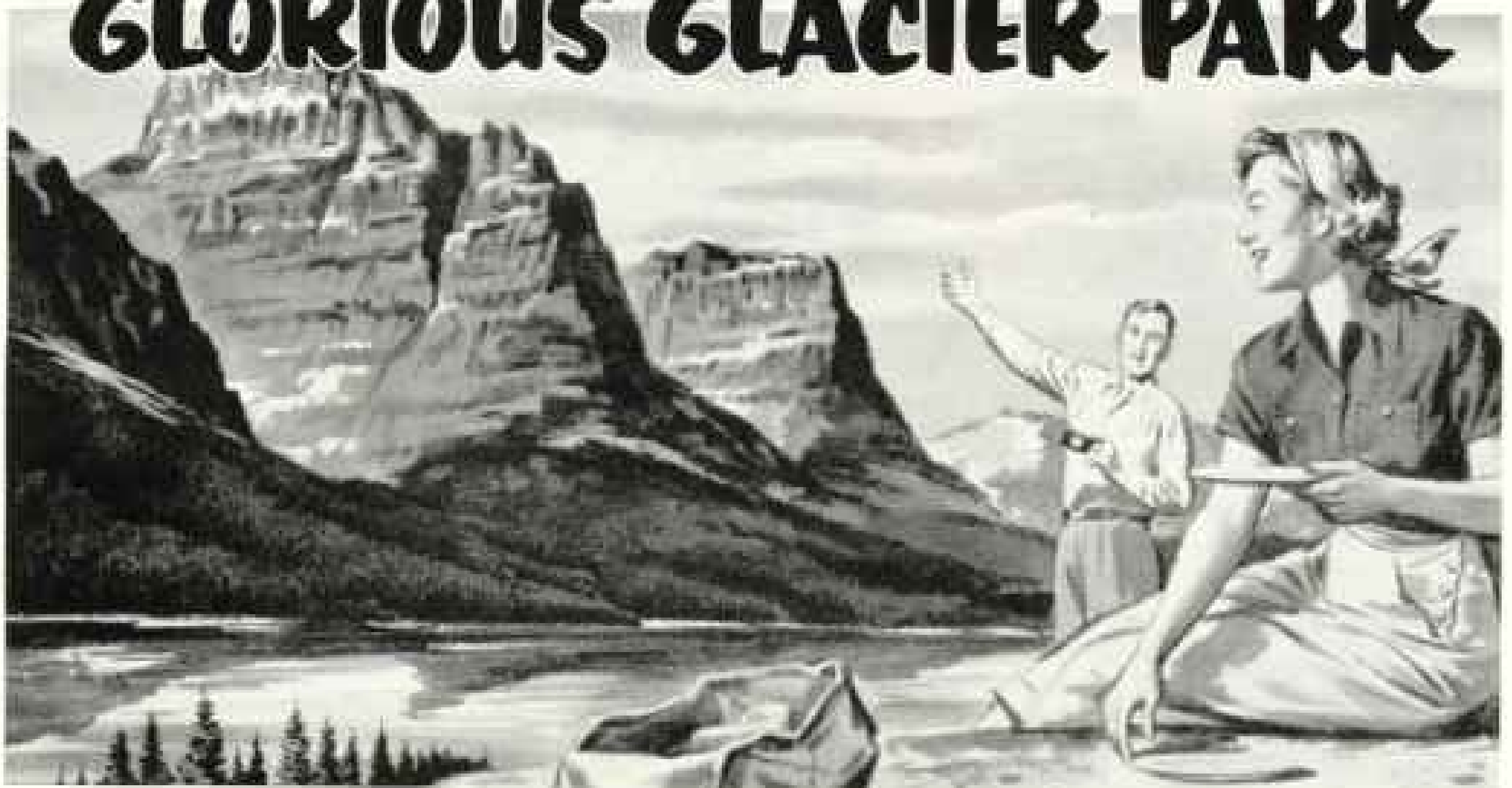
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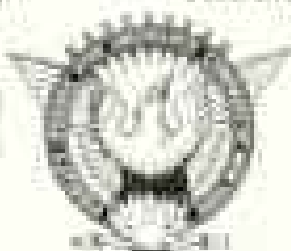
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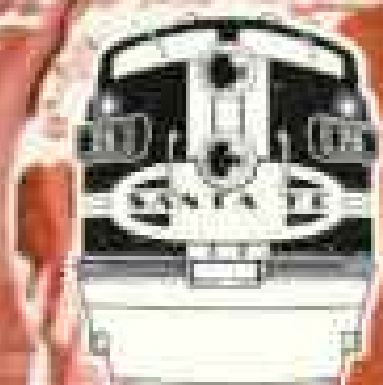


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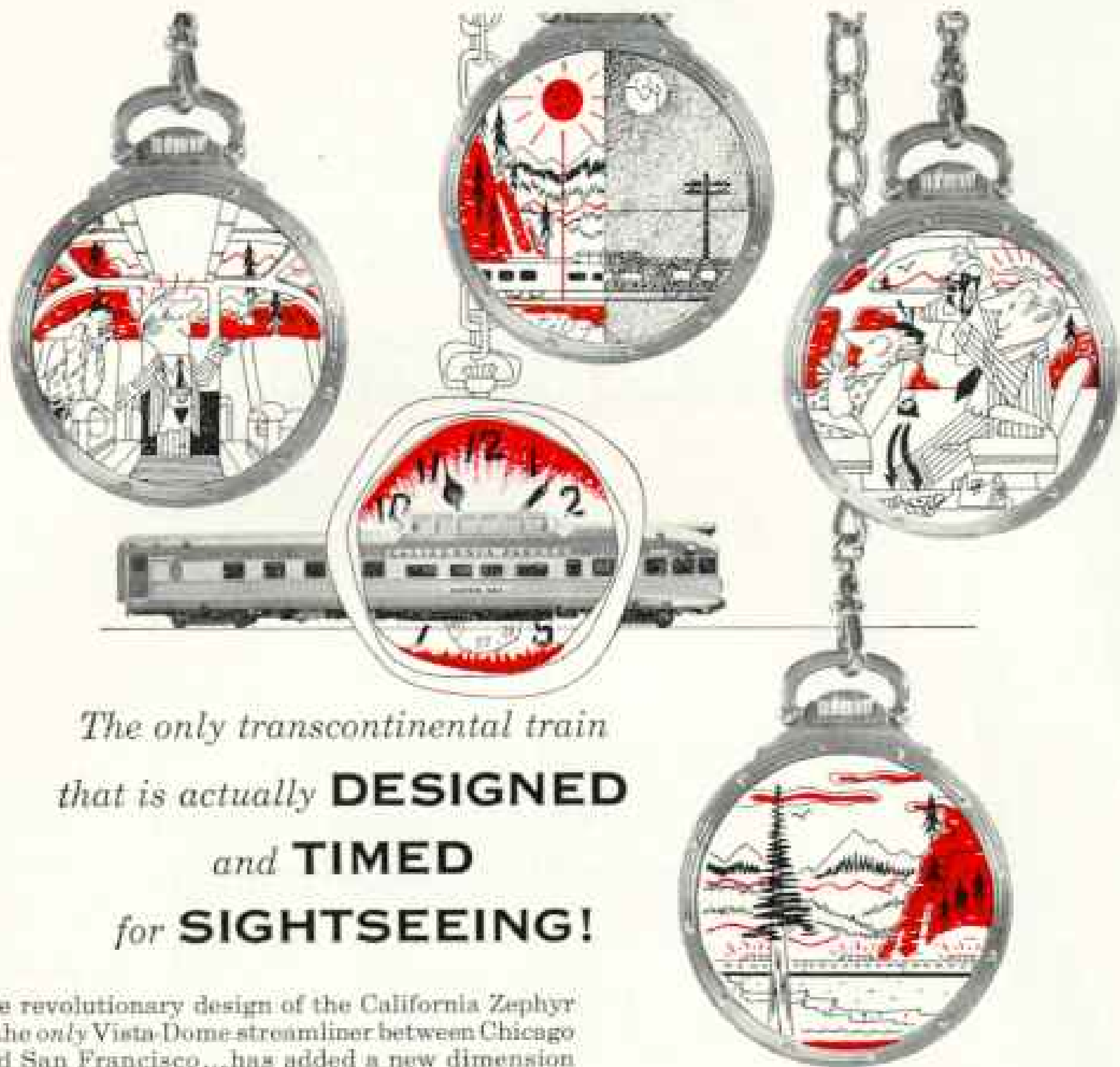


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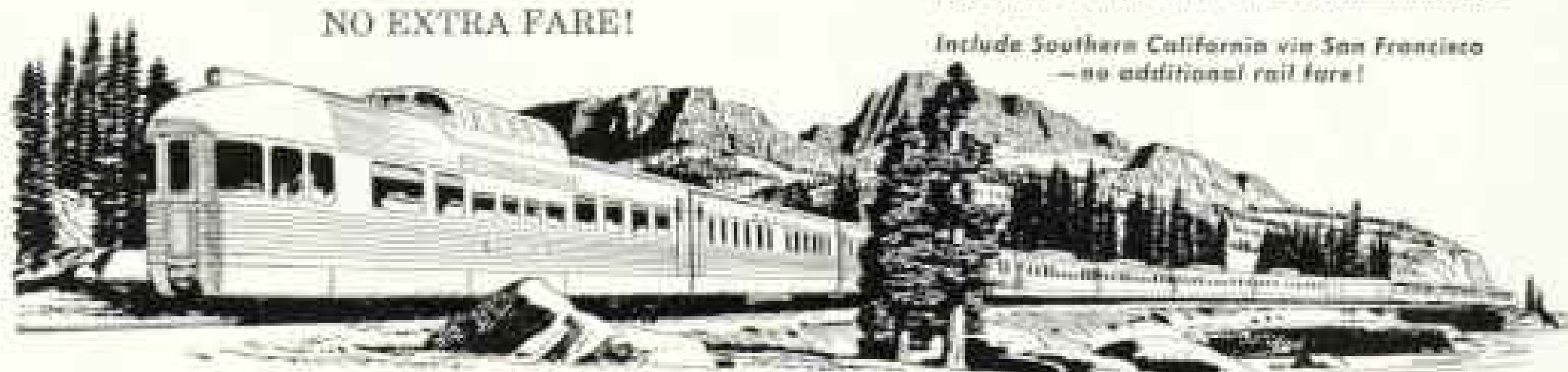
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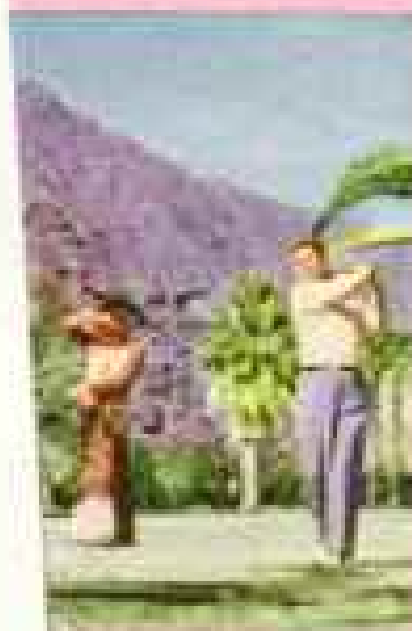
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One reduced sensibly . . . he consulted his doctor, and followed a properly balanced diet to bring his weight down gradually, and keep it at a desirable level.

OVERWEIGHT is our country's Number One health problem today. In fact, it is estimated that there are about 25 million Americans who are burdened by excess pounds.

Medical authorities stress the health hazards of overweight more than ever before. The reason for this is simple:

Continuing studies show that overweight people do not live, on the average, as long as those who keep their weight at a desirable level. This is because excessive fat tends to increase a person's chances of possibly developing one or more diseases of the heart and blood vessels, diabetes, liver and gall bladder disease and other disorders.

Overweight may reduce physical efficiency and often is a serious handicap in the event an operation is needed, or an acute illness occurs. In addition, overweight is apt to place an unnecessary strain on many vital organs, especially the heart. So, it is important to watch your weight and start reducing as soon as any unwelcome pounds appear.

Safe and sensible weight reduction should always begin with a visit to your doctor. He will examine you and suggest what weight is best for you. His decision will be based, in part, on your height and age, as well as your bone structure and the kind of life you lead.

Nearly all cases of overweight are due to eating too much. There are various reasons for excessive eating—emotional difficulties, for example. Whatever the cause, the doctor can usually help you to develop a sound weight reduction program. This will usually include a properly balanced diet; one which will bring about the desired reduction slowly, usually at the rate of about two pounds a week, and also supply the body with the necessary protective food elements.

With the doctor's advice and a firm resolution to cooperate wholeheartedly, an overweight person can usually attain the desired weight—at which he will look, feel, and act best.

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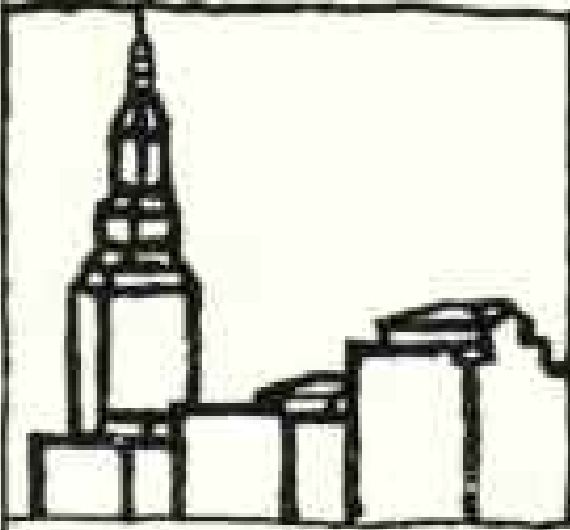
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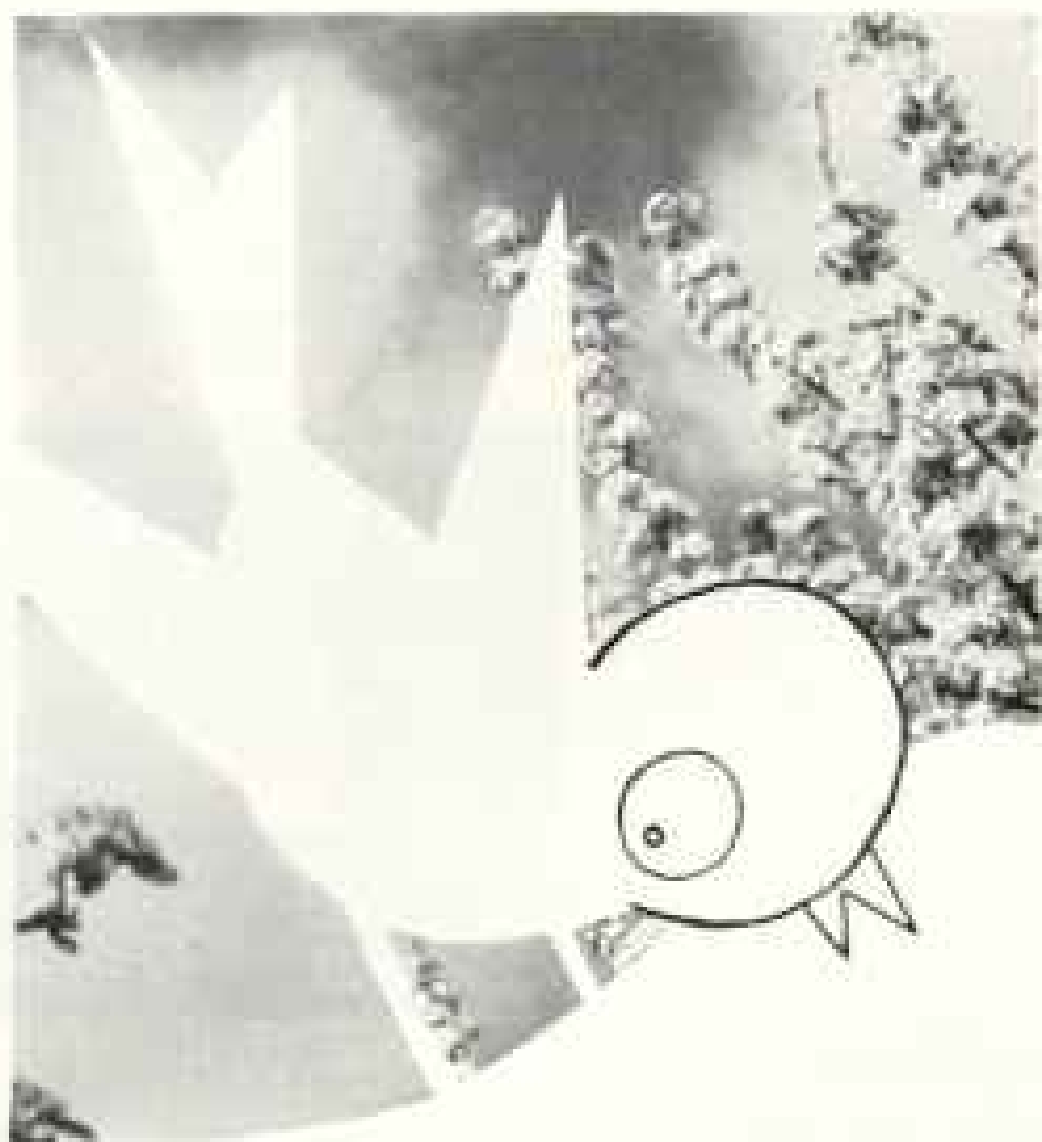
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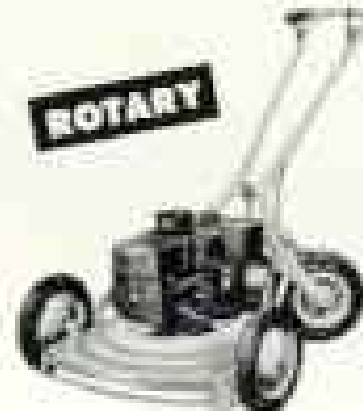
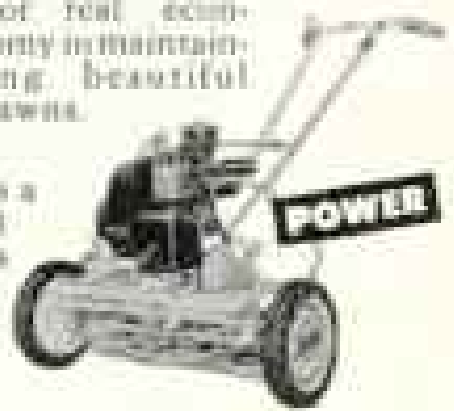
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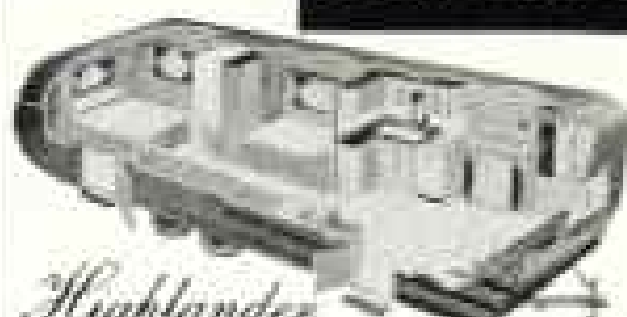
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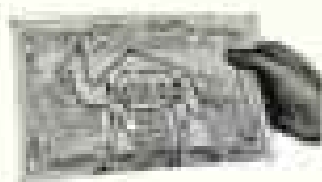
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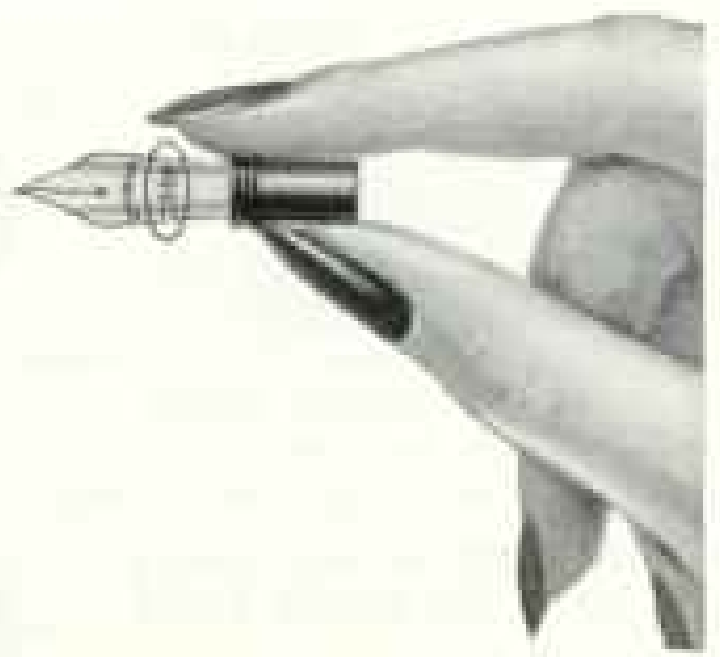
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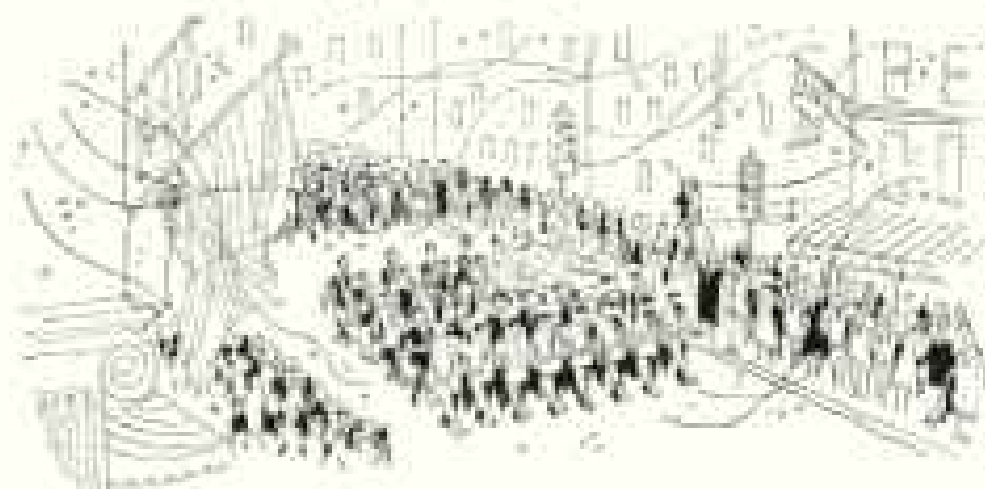


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