

VOL. 117, NO. 2

FEBRUARY, 1960

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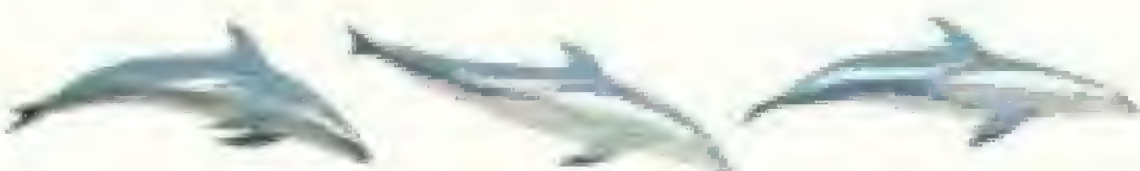




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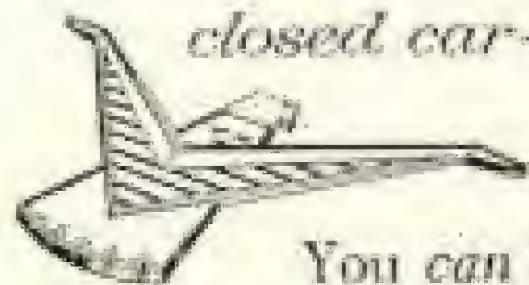




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*The sliding sun roof*  
**THUNDERBIRD**

*Now you can enjoy all the advantages of a weather-proof closed car—plus the open-air fun of a convertible!*



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The new sliding sun roof is an *all-steel* panel. The girl you see on the opposite page is taking advantage of it to photograph a recent ceremony at U.S. Marine Corps barracks in Washington, D. C.

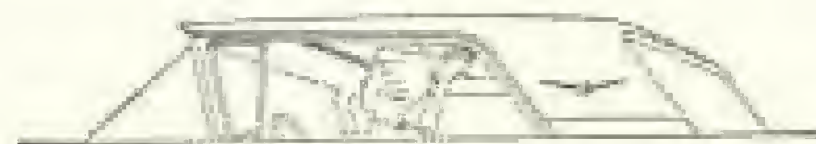
*In winter*, you'll find driving with the roof open about a quarter of the way actually *improves* the efficiency of your heater. At the same time, you can enjoy fresh, constantly changing air. You've never known such pleasant winter driving!

*In summer*, slip the panel back and

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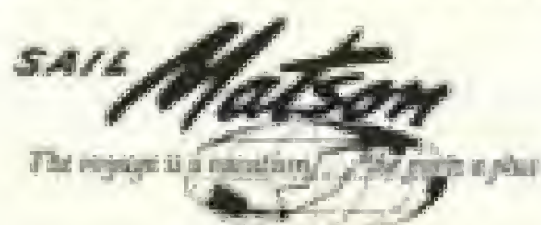
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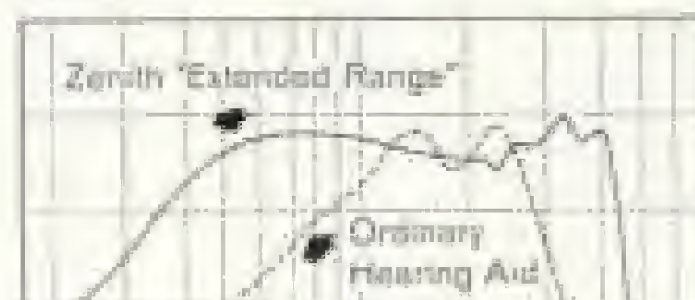
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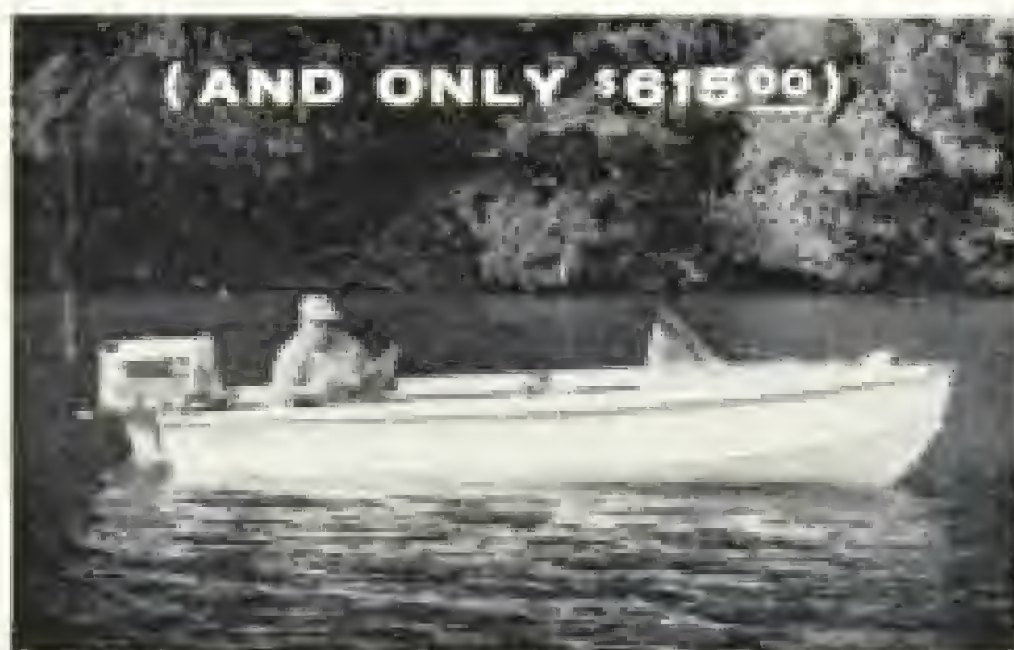
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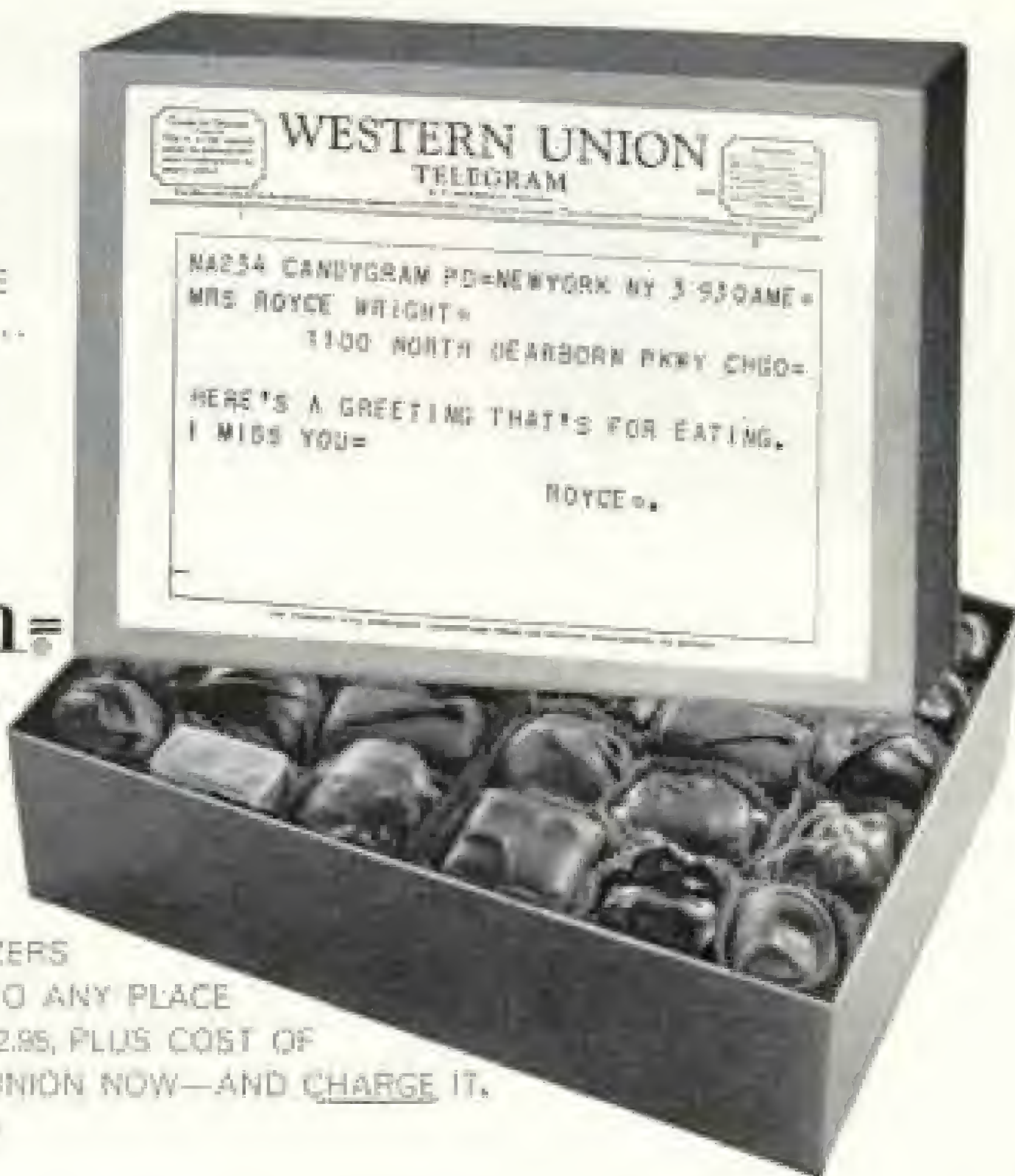
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The normal heart is a remarkably strong and durable organ. But to protect its strength for years to come, you should guard against certain "enemies" of the heart.

**Above all, control your weight.** Overweight is probably the worst and most insidious enemy of your heart. Excess weight serves no useful purpose. It is simply a burden—and the more overweight you are, the more likely you are to impair your heart's efficiency.

Eat sensibly. If you do put on unnecessary weight, let your physician prescribe a diet that will take it off slowly and safely—at the rate of two to three pounds weekly. And after you've brought your weight down to normal, make every effort to keep it there—permanently.

**Work off tension.** Many people who develop high blood pressure—which puts a strain on the heart—are tense, hard-working individuals. They should learn to work off tension.

When you feel tensed-up, try physical activity—work in the garden, take a long walk or do something that you

really enjoy. Any diversion helps relieve tenseness. In fact, anyone who works under constant strain should probably have a definite schedule for daily relaxation.

So, get enough rest and try to learn to take it easy. Every bit of relaxation you get gives your heart a chance to relax, too.

**Avoid over-exertion and fatigue.** After middle-age, it's wise to avoid sudden or strenuous activities to which you are unaccustomed. But reasonable activities—things that you enjoy and that don't leave you huffing and puffing are usually good and safe for your heart.

Even when the heart has been damaged, it usually mends itself through rest and skilled medical care. In fact, about four out of every five people recover from their first heart attack—and many of them recover fully enough to enjoy many useful, active years.

If you give your heart the care that it deserves—including regular health examinations—it may serve you well for many long years.

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*Diving in dark Jamaican waters, the Geographic-Smithsonian-Link Expedition maps a buccaneer city swallowed by an earthquake, recovers a wealth of 17th-century artifacts—and discovers a watch that fixes the instant of the disaster*

## Exploring the Drowned City of Port Royal

By MARION CLAYTON LINK

*Kodachromes by LUIS MARDEN, National Geographic Senior Staff*

THE SUN WAS NEARING its zenith over Jamaica that June day in 1692, and Port Royal on its long sandspit basked in the somnolent heat of the Caribbean. The still air shimmered with heat waves, distorting the hazy blue silhouette of the mountains of Jamaica. A feeling of suspense, of waiting, seemed to permeate the atmosphere of "the world's wickedest town."

A score of ships with furled sails floated lazily at their moorings in the glassy harbor; a few were discharging cargo at the docks. On the careening ground the frigate *Sloan* lay prostrate as her crew scraped indolently at her fouled planks.

Sailors ambled along dusty Thames Street, hugging the meager shade, while inside the brick and plaster walls servants moved languidly about, preparing the noonday meal. In the cookhouse at James Littleton's, behind Fort James, a savory stew of beef and turtle simmered in a copper pot.

Along Humphrey Freeman's wharf walked a prosperous citizen. His elaborately decorated, leather-covered brass watch showed the

time was a little past 10 minutes to twelve.

Then a shudder of the earth shook the wooden wharf. From the direction of the mountains came a hollow rumbling noise like distant thunder—and a violent earthquake shock. It was followed almost immediately by a second and a third.

### Earth Convulsion Takes 2,000 Lives

In the space of a few moments the whole waterfront was launched into the sea. Stout Fort James and Fort Carlisle vanished as if they had never been, and, for several blocks behind, houses crumpled and disappeared as the land beneath them slid toward the water (see fold-out painting, next pages).

The bell tower of St. Paul's Church fell with a crash. Its bell jangled madly, then was silent as water rose around the ruins.

Deep crevices rent the earth, devouring broken buildings and panic-stricken people. A great wave formed and swelled and rolled in from the sea, flooding the section of town that still survived.

*(Continued on page 158)*



## Port Royal: "Shaken and Shattered to Pieces, Sunk . . . and Covered . . . by the Sea" ▶

From an eyewitness account  
by the Rev. Emanuel Heath

On June 7, 1692, a series of violent tremors shook Jamaica's buccaneer capital so that "the earth heaved and swelled like the rolling billows." Within two minutes the land sank, the sea swallowed two-thirds of the town, and two thousand persons perished.

In 1959 Edwin A. Link's *Sea Diver*, a new vessel built especially for undersea archeology, sailed to Port Royal. In more than two months of diving, expedition members recovered several hundred relics.

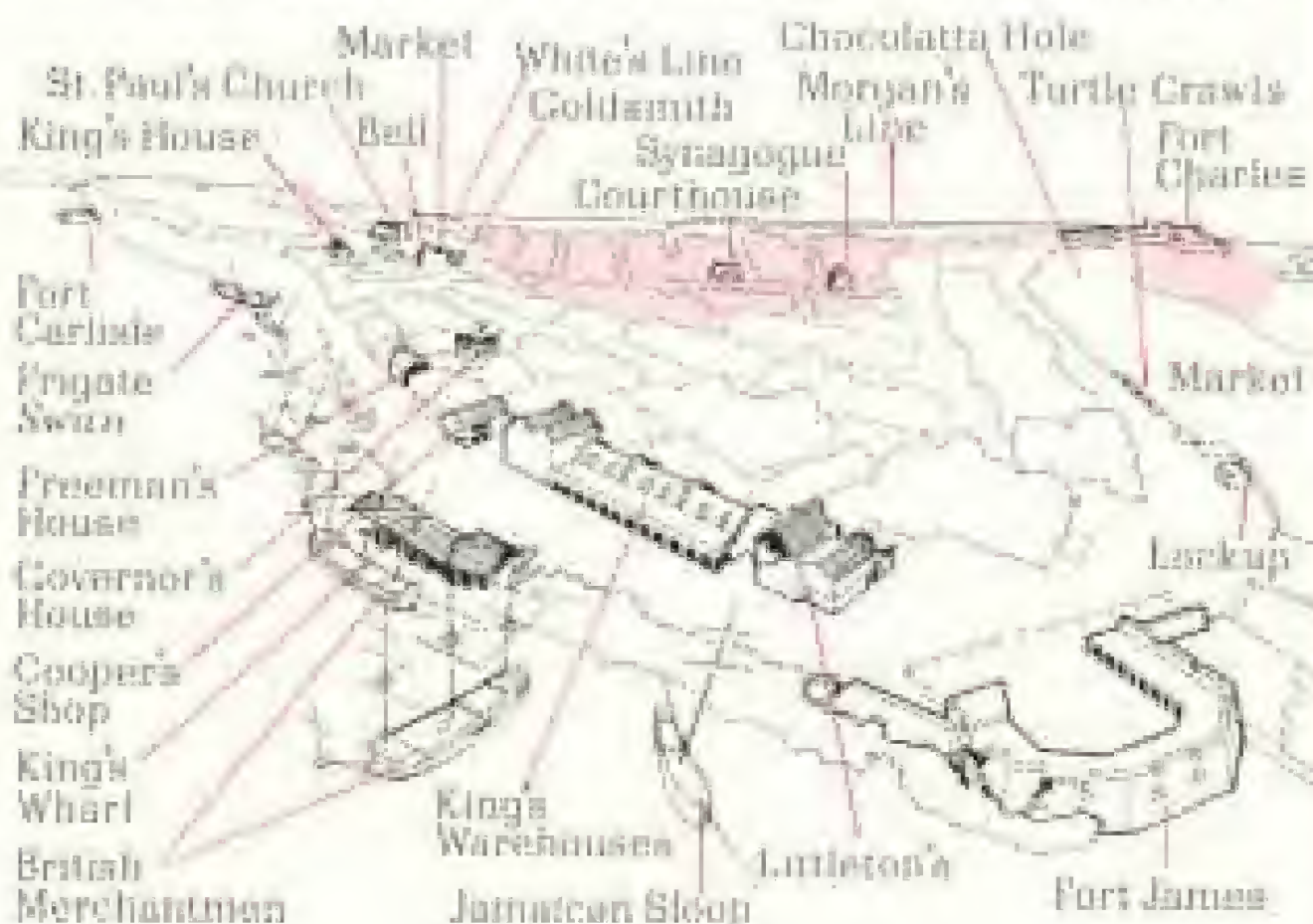
The painting, product of two years of research, shows Port Royal at 17 minutes before noon, when the first shocks struck. (Open the fold-out.)

Thames Street, on the waterfront, is shown sliding into the sea as underlying sand and gravel give way. Collapsing land pushes back the sea. Yawning cracks in the ground swallow fleeing men and women. Heavy masonry walls of Fort James (right) shift seaward. "Several Ships and Sloops," according to a 1692 account, "were over-set and lost in the Harbour. Amongst the rest the Swan Frigate . . . was forced over the tops of many Houses. . . . She did not over-set but helped some Hundreds, in saving their Lives."

To prepare this painstaking reconstruction, the National Geographic Society consulted experts in many fields. From seismologist James F. Lander, of the U. S. Coast and Geodetic Survey, it learned that earthquakes form X-shaped cracks in brick walls that are about to collapse. Capt. Harold E. Saunders, U.S.N. (Ret.), a hydrodynamicist, described the peculiar wave action caused by the collapsing shore. Howard I. Chapelle, of the Smithsonian Institution, one of the world's foremost experts on sailing vessels, checked rigging and other nautical details. Worth Bailey, U. S. National Park Service, a specialist in British colonial architecture of the 17th century, authenticated the design of the buildings. Most of all, the artist depended on the Link-Weems map (pages 166-7) and on drawings and descriptions copied from documents at the Record Office by the late Mrs. Hazel Hall, of the Institute of Jamaica.

Pink shading on the key below shows the area that survived the earthquake.

152 ILLUSTRATION BY ROBERT W. NELSON FOR THE NATIONAL GEOGRAPHIC SOCIETY



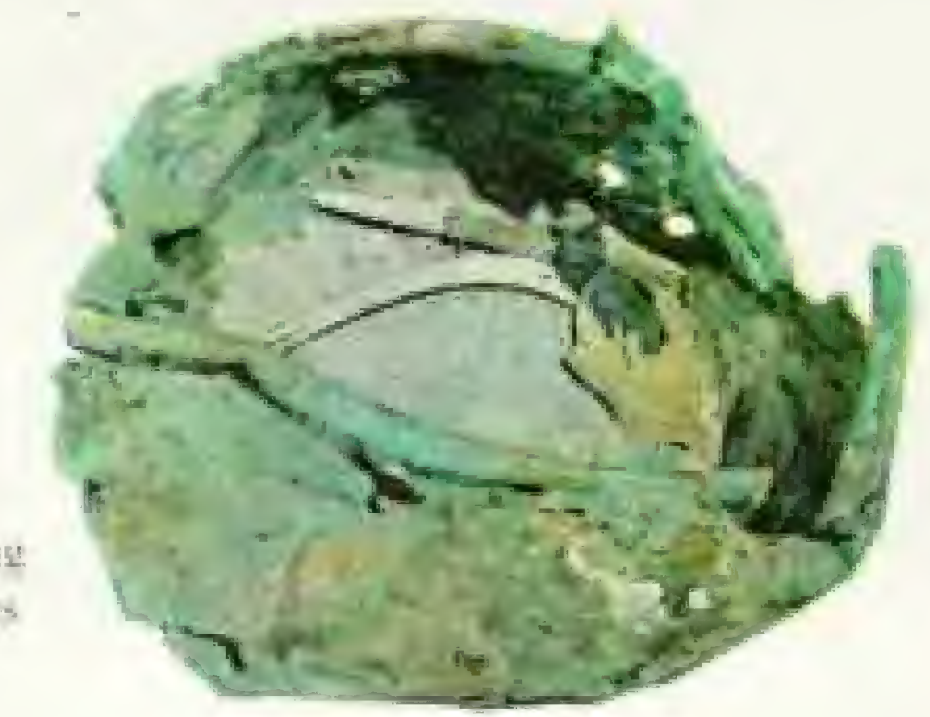








Copper pot containing  
beef and turtle bones



Pewter spoons

Brass skimmer



Glass linen smoother



Corroded pewter dish



**Drowned History: Wine Bottle on a Fissured Wall**

For nearly three hundred years the remains of the buccaneers' capital lay covered by silt and 20 to 40 feet of murky water. The expedition's divers, swimming over the sea bed in semi-darkness, saw no standing walls, streets, or buildings because the earthquake shocks of 1692 had reduced the city to rubble. Groping in the ooze, they located standing brick and mortar. By playing high-pressure water jets against the bricks, then sucking up debris and silt with an air lift (pages 164-5), the salvors uncovered straight and curved brick walls (above and page 177).

In the harbor's clouded waters, divers usually could barely see a hand held before the face. During more than two months' work the water was clear enough for submarine color photography on only two or three days. When hydrojets and suction hose stirred up harbor muck, the men worked by touch alone.

Here a bulbous wine bottle and two clay pipes (near diver's hand) lie 33 feet below the surface; they were found buried under several feet of silt. A wide crack in the masonry speaks eloquently of the earthquake's force.



Copper lantern

Held fast in a matrix of limestone, a wine bottle overhangs a brick wall. Bottle and fragments clung so tenaciously to a long iron plate that they could not be removed without shattering. The divers left them in place.



Brass candlestick  
found on the bottom





Octopus crawled out when bricks came to the surface

Brass pocket watch  
(page 173)



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Pewter porringer



Churchwarden pipes

With a hypodermic needle, Dr. Charles Aquadro draws liquid through the cork of a sealed onion bottle. The content tasted like sea water mixed with gall. Any spirits disappeared with the years.



15th-century swivel gun  
and breechblock





More than two thousand people lost their lives that day, June 7, 1692. And when the narrow spit of land finally ceased its terrifying convulsions, almost two-thirds of the town had disappeared beneath the sea.

#### Sealed for Centuries by Quake

Last spring, nearly three centuries later, my husband Edwin A. Link and I stood on the deck of our newly completed diving and salvage ship *Sea Diver* and gazed at the empty blue-green waters. It was hard to believe that beneath our keel lay the remains of that unfortunate town. We were anchored close to Church Beacon, which marks the outer limits of the sunken city, and only a few hundred feet from present-day Port Royal.

The arrival of *Sea Diver* and her crew, under the joint sponsorship of the National Geographic Society, Smithsonian Institution, and Institute of Jamaica, marked the first attempt of such a well-equipped expedition to unveil the past of the old buccaneer city.

Port Royal had long attracted us as a unique site archeologically. Unlike cities on land, which change with the years, this one remained exactly as it had been more than two and a half centuries before—sealed by the sea in an instant of earthquake. Whatever we might find in the ruins would be truly indicative of the life of the time.

A resident's account published in London nine years before the disaster described the town as "the Storehouse or Treasury of the West-Indies... a continual Mart or Fair where all sorts of choice Merchandizes are daily imported..."

#### Life in a New World Sodom

Headquarters of buccaneers and pirates as well as crossroads of trade between Old World and New, 17th-century Port Royal must have presented a startling contrast to the sleepy fishing village of today.\* Not without reason was it known as the most wicked city in the world.

Port Royal reached the apex of its fame as Henry Morgan's base of operations when he

sacked and pillaged Spanish cities throughout the Caribbean. With its fine harbor and well-fortified shores, it was an ideal gathering place for the unholy Brethren of the Coast. With England and Spain at each other's throat, the British were inclined to encourage the presence of these marauders, whose chief targets were Spanish towns and Spanish shipping (see old map, page 170).

Life in Port Royal at that time was a carnival of riotous living. Gambling thrived, and dozens of taverns lined the streets, dispensing the hospitality of powerful rum and other strong drink, rich foods, and bawdy women.

Much of the buccaneers' ill-gotten wealth quickly found its way into the hands of the town's unscrupulous merchants. Safes and warehouses overflowed with loot—gold and silver bars, church plate, elaborately set jewels, rich silks and brocades—awaiting shipment to England and the Continent in exchange for money and other goods.

#### Drowned City Deeply Buried in Silt

A decade later, however, at the time of the earthquake, Henry Morgan had been in his grave for four years, and buccaneers were no longer welcome at Port Royal. But the minister of St. Paul's Church still described the inhabitants as "a most ungodly, debauched people."

During these years Port Royal had continued to grow, until the narrow sandspit could scarcely contain the hundreds of two- to four-story buildings. Brick structures crowded the streets, spreading even into the edges of the sea, where hasty fills had been made to accommodate the rapid expansion. Little thought was given—then—to the precariousness of tall brick houses resting on loose gravel.

Ed and I had paid a preliminary visit to Port Royal in 1956 with our first *Sea Diver*, a converted shrimp boat. To our surprise, where these buildings once stood we could

\* See "Jamaica—Hub of the Caribbean," by W. Robert Moore, NATIONAL GEOGRAPHIC, March, 1954.

#### *Sea Diver*, on Her Maiden Voyage, Sails Into Port Royal

Only vessel built from the keel up exclusively for underwater archeology, the 91-foot-long yacht and work boat carries radar, laser, echo sounders, and other instruments. Underwater ports permit observation of wrecks and marine life. High-pressure water jets under the bow aid the ship's screws when docking or maneuvering. By using her hydrojets, *Sea Diver* can turn within her own length.









© NATIONAL GEOGRAPHIC SOCIETY

### Relic of Someone's Last Meal, a Pewter Plate Rises From the Depths

*Sea Diver's* stern diving chamber, nearly flush with the waterline, made access to the sea easy for the ship's divers. The lower door swings down to form a ladder. Elgin Ciampi, wearing an Aqua-Lung, hands the platter to Marlon and Edwin Link. Mendel Peterson, Curator of Armed Forces History at the Smithsonian Institution, turns in a red roof tile. He uses a Descor mask with an air hose to the surface.

then find only a monotonous mud bottom under 20 to 40 feet of water, with never a sign of the old structures.

When we had tried to dig into the bottom near Church Beacon with an inadequately small dredge, we penetrated four to six feet before finding a trace of the sunken town. Even the heavy brick walls of Fort James were hard to locate beneath the silt, with only a slight difference in depth and a crown of dead coral to mark their location.

The water was nearly always murky because of the deposits of mud carried into the harbor year after year by mountain streams.\*

After a brief stay, during which we found

and raised one of the cannon from the fort, we had given up until we could return with proper equipment.

### Unique Ship for a Challenging Job

Ed immediately set about designing and building a new vessel that could conquer the difficulties of reaching the drowned and buried city. As inventor of the Link Trainer and many other aeronautical and electronic devices, he could draw on a fund of experience in designing special tools for unusual jobs.

\* See "Jamaica, the Isle of Many Rivers," by John Oliver La Gorce, *NATIONAL GEOGRAPHIC*, January, 1927.



His plan was to design a ship which would be the world's first built from the keel up for the express purpose of submarine archeology. Two years in the building, our new *Sea Diver* is a steel vessel 91 feet long, powered by twin diesel motors, with accommodations for twelve persons (page 159 and below).

Two generators supply almost unlimited electrical power. Electricity drives the large compressor that provides air for numerous divers and operates a 10-inch-diameter air lift, or dredge, to remove silt and gravel from the bottom (page 164). A heavy-duty jetting hose—a kind of super fire hose—helps clear away bottom deposits.

A special diving compartment aft can be entered both from the deck and directly from the sea (opposite). Here is concentrated all

the diving gear—Aqua-Lungs and Scott tanks and regulators, Desco face masks and reels of air hose, as well as a sturdy air compressor for filling the divers' bottles quickly, quantities of fins and face masks, weight belts, rubber suits and gloves, pinch bars, and other equipment.

On deck, heavy booms and electric winches stand ready to hoist cannon and other weighty objects from the sea floor. Through thick glass plates deep in the bow the ocean bed can be viewed in clear water. The wheelhouse includes radar, automatic pilot, gyrocompass, and a brace of echo-sounding devices for reading the depth.

The new *Sea Diver* is also jet-propelled—in part. Under her bow, on each side of the keel, Ed placed nozzles through which streams of water can be ejected at high velocity. By

### *Sea Diver* Dredges for Secrets of a City Under the Sea

Barge moored alongside supports the air lift, a jointed metal tube that sucks mud, gravel, and debris from the bottom (pages 164 and 165). Two divers below direct its vacuum-cleaning nozzle; crewmen on the barge rake the muck for artifacts. Under jib and mainsail, a native durout heads for Kingston after a night's fishing.







**Port Royal Today: Dotted Line  
Encloses the Underwater Area**

Only part of Port Royal subsided in the earth shocks of 1692. Time after time the town rose phoenixlike from the rubble and ashes of earthquake, fire, and hurricane. Kingston (left background) has taken the old port's place in govern-





© RANDALL STODOLSKY/GETTY IMAGES

ment and maritime affairs. In the buccaneers' day the sandy spit gave sailing vessels a haven close to sea, with no need to tow cargoes deep into the inner harbor. Port Royal's olive-green, silt-laden waters contrast with the sea's clear blue.

White-painted *Sea Diver* lies off the customs pier (left center), working on the site of a pre-earthquake house. Buccaneers were hanged for piracy on Gallows Point, the low mangrove-covered peninsula in left background.







jetting water from one side or the other. *Sea Diver* can turn in her own length. Seafaring men never fail to be startled when our ship stops several yards off a pier, then moves sideways into her berth by using stern screws and bow jets.

On the afterdeck the ship carries *Reef Diver*, an 18-foot launch that is wholly propelled by water jet, so that she can work over reefs and in other shallow places. Divers like the jet power because when they dive they do not risk being cut by a turning propeller.

#### British Museum Combed for Old Charts

In addition to constructing the new ship, Ed had spent much time in preparing a chart of old Port Royal. Without such a map, he realized, we could waste a great deal of time digging in profitless areas. This turned out to be quite a task, as we were unable to locate a pre-earthquake map of the town. The only chart available had been made by a government surveyor, Philip Morris, in 1827. It portrayed the bounds of the original city as well as the area that survived the earthquake, but Ed found that locations did not coincide with still existing landmarks.

In the British Museum he later discovered another chart. This one, although post-earthquake also, checked with present-day landmarks much more closely. With this map and survey data obtained

from the Jamaican government, Ed was able to establish the locations of streets and buildings of the old town—even beneath the water.

#### Surveying an Invisible Town

Our first task was to run a careful echosounder survey of the sunken city. With our launch *Reef Diver* and portable sounding equipment, this was energetically undertaken by Capt. P. V. H. Weems, retired naval officer and world-famous navigator, who had joined our expedition to aid in charting old Port Royal.

Captain Weems and Curt Scott, a young engineer and diver whose task it was to supervise the diving activities, returned with enthusiasm from the first day's mapping attempt.

"We've buoyed some of the walls of Fort

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#### Air Lift, Spouting Silt and Water, Probes Port Royal's Foundations

Bricks and brine pour from the pipe, but fragile finds are borne to the harge by hand. The author, wife of the expedition leader, takes a terracotta dish from her son Clayton. Earlier quests for history under the sea are described by Mrs. Link in her book *Sea Diver*, published last March by Rinehart & Company, Inc., New York and Toronto.

In murky water, a diver rescues a fragile bottle from the air lift's hungry maw. Two men guided the tube's mouth into position; then, as the suction hit into the silt of the sea bed, they groped for bottles and other breakable objects.



On the launch *Reef Diver*, Captain Weems takes position-finder angles; Edwin Link watches the echo sounder trace a profile of the bottom. Drop in the graph's line indicates the 15-foot-high walls of Fort James Church Beacon (right) marks the fort's site



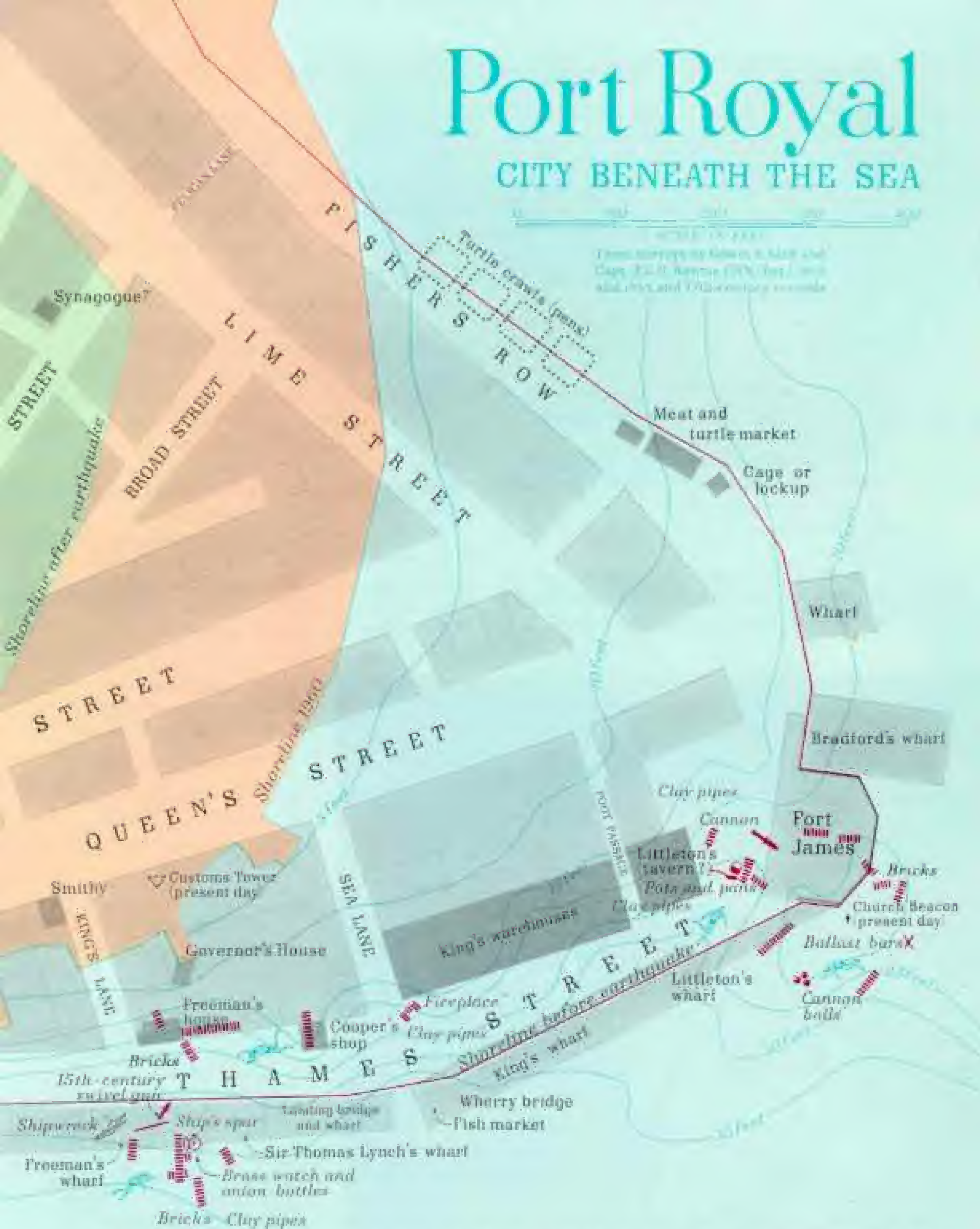
Fort Carlisle

© NCS



# Port Royal

## CITY BENEATH THE SEA



First modern chart of the 17th-century capital was plotted by Captain Weems (upper left) and Mr. Link from their own on-the-spot surveys and from 17th-century charts and records found in Jamaica and England. All streets and buildings shown existed before the 1692 earthquake.

Green area marks land left after the disaster. Blue tint indicates everything under water today. Red line shows the pre-earthquake shoreline. Tan colors the area reclaimed from the sea by nature and man in 267 years. As a result of silting in the harbor and sandbanks building up on the seaward side (off page at top), the peninsula has more land today than before the quake. Brick walls shifted seaward by the sliding, sinking earth are shown as red dashes. Divers gave the name "Fireplace" to a U-shaped brick wall uncovered off the end of Sea Lane. Wreck off the foot of King's Lane is a modern vessel.



James," they reported. "Tomorrow we'll try to locate Fort Carlisle. Then we can begin charting the depths between."

Captain Weems and Ed agreed that any abrupt variation in soundings would probably indicate the remains of old buildings. These Captain Weems proposed to locate by taking position-finder angles and plotting them directly on the chart (page 166).

"Then we'll lay out on the chart the exact dimensions of the lots and the owners of the property," Captain Weems said. "How fortunate that nice Mrs. Hall at the Record Office in Spanish Town was able to unearth the original property deeds."

"Why," I said as I listened to their plans, "when you've finished this survey it should be possible to pick from the chart exactly which building in the sunken city you want to dive on."

"Well, it isn't quite that simple," Ed explained, "for Port Royal didn't sink straight down. The gravel which formed the base of

that section of the town was shaken so violently by the earthquake that the whole area slid as well as sank into the water, carrying everything with it. But an accurate chart of the area will most certainly help."

#### First Target the King's Warehouses

It was several days before Ed felt that we were ready to begin actual salvage operations. The King's warehouse, or warehouses—too huge to have been a single structure and doubtless a complex of sheds—were selected for the first trial. Because of their size, and the fact that they probably had housed valuable merchandise under the protection of the Crown, this seemed a logical place to start. They had stood not far from Fort James, which Ed also wished to explore further.

We put down heavy mooring anchors in the area, and *Sea Diver* was bridled among them. By hauling and slackening on the winches we could move the ship to any spot within the square formed by the four anchors.

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#### Like Arthur's Sword, a Brass Skimmer Rises From a Sunken Kitchen

Under the protective red-and-white of the diver's flag, the cooking utensil emerges, just as the king's sword Excalibur rose out of the enchanted lake.

Buoyed flag warns vessels, especially those with churning screws, to give the diving area a wide berth.

Six-man team, lent by the United States Navy, played a valuable part in the underwater work on the Port Royal expedition. The Explosive Ordnance Disposal Team came from the Naval Minecraft Base at Charleston, South Carolina.

Lt. C. D. Grundy (left) led the team. With him, left to right, are A. J. Banasky, W. L. Collins (with tanks), Mr. and Mrs. Link, W. T. Farrell, C. E. Nowell, and D. E. Peck. Some of the objects they recovered lie on *Sea Diver's* deck.



From a large steel barge tied up alongside we slung the jointed 10-inch diameter tube of the air lift. This dredge was operated by compressed air carried through a hose to the bottom and released upward through the pipe, carrying gravel and silt up with it.

Once the dredge had begun digging into the ocean bed, it would be up to the divers who worked at the bottom of the shaft to salvage whatever articles were exposed before they could be carried up the air lift with the debris.

When our expedition began work in June of 1959, there were 12 of us aboard *Sea Diver*: Ed, Captain Weems, an engineer, a cook, a deck officer, photographer Elgin Ciampi, five volunteer divers—including our 17-year-old son Clayton, Curt Scott, and Charles "Chick" Twyman—and myself.

Our numbers varied during the summer. Mendel Peterson, Curator of Armed Forces History at the Smithsonian Institution, soon joined us. The expedition was lent a group of United States Navy divers for six weeks

through the interest of Adm. Arleigh Burke, Chief of Naval Operations. Lt. Comdr. Charles Aquadro, a U. S. Navy doctor, gave us a hand. Luis Marden of the National Geographic staff came to make the underwater and surface photographs for the magazine. Various diving friends joined us for shorter periods.

#### Days of Dredging Prove in Vain

Excitement ran high that first day when the dredge went into action, for somehow every one of us expected to see almost immediate results. There was a rumble deep in the throat of the air lift. Then, with a rattling rush of sound, a powerful jet of debris-filled water burst from its mouth. It struck the deck of the barge and ran off toward the edges, leaving muddy patterns of silt and gravel behind.

By late afternoon a spreading pile of detritus lay on the barge, dotted here and there with bits of china, pottery, and broken bot-





ties—all more recent than the earthquake.

When a second day's work resulted in nothing more than a barge piled thick with gravel, Ed gave orders to move the dredge a few yards farther to sea.

In the next few days several more test holes were drilled in the surrounding ocean floor without turning up a single artifact from the earthquake period. There was not a trace of a wall. Only mud, silt, and gravel came up the lift, with occasional pieces of china and glass. What could have happened to the King's warehouses?

#### 17th-century Relics at Last

"I'll bet we're smack in the middle of the buildings," I said that last day. "Look, the warehouses were 234 feet long. They probably stored cotton and sugar and tobacco in the big sheds. We might dig forever without striking the section where valuables were kept. Let's try digging in a more confined area, say in a shop or in someone's house."

So, after long discussion and a careful study of the chart, *Sea Diver* was moved to a new location, close to the east wall of Fort James.

The air lift had scarcely bitten into the bottom when it began to suck up quantities of bricks, broken bits of old wine bottles, and sections of white clay pipes. Soon appeared hunks of coal, bits of flint, a variety of bones, and chunks of white wall plaster along with roof tiles and broken dishes.

The most prized discoveries, however, were salvaged at the base of the dredge and brought to the surface by the divers. First came a long-handled brass ladle with a round, flat perforated bowl. This was followed by several broken pewter spoons, a badly corroded pewter plate, and many fine specimens of greenish-black, 17th-century

#### "Port Royall Sunk": Stark Epitaph on a British Chart of the 1720's

The atlas of Herman Moll, from which the chart was adapted, seems little more than an invitation to freebooters and pirates to plunder the area. The compiler carefully noted the routes of the treasure galleons and places that abounded "in Beeves and Swine."

Marked as the "best passage" to Spain was the narrow opening between the north coast of Cuba and the tip of Florida (upper left). There clumsy galleons got a lift from the Gulf Stream.







# BAHAMA

# ISLAND

Lucayos or Abaco I.  
 Green Turtle Key  
 Hole in Rock  
 Green Harbour I.  
 Eleuthera I.  
 Ship Channel  
 The first Discoverer of  
 S. Salvador or Coll I.  
 1st Land that was  
 all America 1492

Providence I. English  
 Little I.  
 Exuma  
 Little I.  
 Sound  
 Samana or Rum I.  
 Yumeta or Long I.  
 Exuma I. Stocking  
 Crooked I.  
 Achlin Key  
 Hogfishes  
 Atwoods Keys  
 Menago

Bahama  
 Shoald  
 Ragged I.  
 Mucaris  
 Mica por Vos  
 I. Verde  
 C. Quibamico  
 C. Cruys  
 C. Romano  
 Guaro  
 St. Iulian  
 Xayara  
 Bitta  
 Baracoa  
 C. Mayze  
 S. Iago  
 Port Palmas  
 Port Escondido  
 Bay of Quin  
 R. Sigues  
 R. Machanan  
 P. Portella  
 P. Morant  
 Navaza  
 Ash or Yacca I.  
 Comana

Anguilla  
 Old Straits of Bahama  
 C. Cruys  
 I. Verde  
 C. Quibamico  
 C. Romano  
 Guaro  
 St. Iulian  
 Xayara  
 Bitta  
 Baracoa  
 C. Mayze  
 S. Iago  
 Port Palmas  
 Port Escondido  
 Bay of Quin  
 R. Sigues  
 R. Machanan  
 P. Portella  
 P. Morant  
 Navaza  
 Ash or Yacca I.  
 Comana

Cabo de Cruys  
 Booby I.  
 Negrill Pt.  
 Blowfuld Bay  
 Black Pt.  
 C. P. Pedro  
 Binoras  
 Ranas  
 Port Royall Sunk  
 Portland Pitch  
 Ash or Yacca I.  
 Comana

Windward Passage  
 Guanabo I.  
 Baeta  
 Gulf of Logane  
 Comica  
 C. Rosa  
 C. Dona  
 C. Maria  
 and Bay  
 Tabran  
 Riv. Sippe  
 Petit Guad.  
 P. Congon  
 Ya quin  
 G. Anc.  
 C. de Ia

# GREATER ANTILLES



rum bottles, known as "onion" bottles because of their shape.

Curt said that the air lift was working close to a tumbled brick wall and there were signs of other walls close by. There was no doubt that we had at last struck upon evidences of the earthquake. I could scarcely wait to see what the bottom looked like, now that we had really struck pay dirt.

The next morning Ed suggested that I accompany him when he made his customary daily inspection, before the dredge went into operation. He had begun this practice because, once the air lift began work, the water in its vicinity became even more clouded with silt than usual. I followed him with alacrity.

#### Alone in an Opaque World of Gloom

No sooner had I ducked my head beneath the water than the bright morning light was replaced by a yellow-green blur. Ed had already disappeared below, and I was alone in the murky dimness. I pulled myself downward with my hands on the pale gleam of the air-lift pipe, allowing my feet to float upward so that when I reached the bottom my flippers would not kick up a cloud of silt.

I reached the heavy reinforcement of the dredge's mouth and still could not distinguish the sea floor, not more than a couple of feet beyond. There was no sign of Ed. As I thrust myself cautiously forward, I glimpsed a small section of brick wall almost buried in the muddy bottom. I reached for it and pulled myself down into the hole the air lift had dug.

It was no use. I could make out nothing more, and although I knew the shaft that had been my guide in descending was only a few feet away, it had vanished completely. I allowed myself to float a few feet higher; still I was surrounded with nothingness. I finally continued my ascent to the surface, wondering how the divers managed to work in this utter obscurity.

Once more back on deck, I questioned Curt.

"I guess you develop a sixth sense once you have been down there awhile," he said. "You hang on to the dredge with one arm as it digs into the bottom, while with the other you grope in the debris in front of it.

"You get so engrossed in what you may find there that you forget everything else. You lose all sense of time. You even forget to wonder if there are sharks near you. After

awhile you don't seem to require any visibility."

Although our anchorage at Port Royal was a sheltered one, diving in the opaque waters of the harbor was the most difficult ever experienced by *Sea Diver's* crew.

#### Divers Work Amid Unseen Dangers

Our diving hitherto had taken us to shipwrecks on outlying reefs where the water was clear and we were consequently aware of the hazards we faced. Here the diver worked in a world by himself, unseeing and unseen, even though his companion was only a few feet away.

There was constant danger of cave-ins, as the dredge sucked at the base of old brick walls. The air lift itself, with its heavy weight and powerful suction, was an ally to be respected. Many times the divers' gloves were seized in its greedy maw and deposited on the barge above. We almost expected someday to see the elongated form of the diver himself erupt from the upper end of the pipe.

Sea urchins, sting rays, moray eels, and scorpion fish lurked, mostly unseen, on the muddy bottom. Sharks and barracuda were often glimpsed near the surface, and although for the most part invisible to the diver in the murky depths, they were no less dangerous.

In spite of all these hazards, when the summer's activities came to an end, no more serious damage could be chalked up than an injured toe and a few squeezed eardrums resulting from their owners' changing depths too quickly.

#### Beef-and-turtle Stew Pot Found

When Ed returned to the deck that morning, he suggested that a team of divers go over the bottom with the underwater metal detector. This instrument had proved most useful in the past, for, when guided over the ocean floor, it registers the presence of any metal beneath. Once again it proved its worth.

The air lift was moved a few feet to the spot the detector indicated, and before long the divers uncovered and handed aboard a battered copper cooking pot, its sides partly collapsed from the weight of the debris that had rested on it.

As Ed scooped the sticky mud from its interior, a collection of bleached white bones was revealed.

"Why, a stew must have been cooking for dinner when the earthquake struck," he ex-





EXTRAORDINARY LEADERS AND FOLLOWERS BY NATIONAL GEOGRAPHIC PHOTOGRAPHER W. D. TAUNTON © N.G.S.

### 17 Minutes to Noon: X Rays Reveal the Instant of Doom

Gleaming in the sun, this elegant brass watch came rocketing out of the air lift miraculously undamaged. Paul Blondel, a Frenchman living in the Netherlands, made the timepiece in or before 1680.

When the watch rose out of the sea, a lily encrustation (upper left) clung to its glassless face. An X-ray photograph (upper right) of the matrix which had molded tightly to the watch's dial showed traces of the vanished hands (marked by arrows), stopped at 11:45. Either the first heavy earth shock or the plunge into the sea halted the works forever.

Brass gears, as bright and uncorroded as the day they were made, fell out when the watch was opened.

Minute silver studs, fitted into the perforated design at right, once held in place a leather sheath.





claimed. "You can see the marks of the meat cleaver on the bones."

Somehow the discovery of this motley assembly of bones brought the reality of the earthquake much closer to us all.

During the next few days evidence continued to pile up that we were digging in a kitchen, for we found many more cooking pots. A large pewter platter, weakened by its long immersion in salt water, broke into sections as it was being carried to the surface. There were charred bricks and the iron grill from a fireplace, a grindstone, more pewter plates and spoons, a porringer and platters, brass candlesticks, a wooden mortar, a glass linen smoother, and numbers of softly iridescent onion bottles (pages 156-7).

The very day after the first pot was found, Ed came up beaming from his daily inspection. The clearer water of early morning had revealed a collection of five more pots.

"They're all cemented together," he said, "just as they must have stood in the fireplace. There are two large brass ones, a couple of iron ones, and a small ceramic pot with a handle."

#### Enough Kitchen Equipment for a Tavern

We studied the chart curiously. According to Captain Weems's calculations, we were digging in an area between the fort and a property belonging to James Littleton, who had also owned a near-by wharf.

"Looks to me," said Mendel Peterson, "as if we're either in the cookhouse of Fort James or at Mr. Littleton's. Perhaps Mr. Littleton owned a tavern, for this kitchen was certainly equipped to serve large numbers of people."

The Smithsonian expert picked up one of the numerous chunks of plaster raised by the air lift. It had a curious twisted pattern on the back.

"You can see the walls of the building were wattled," he said. In this type of construction, twigs were twisted and tied together and then overlaid with plaster to form walls.

Flat red tiles, a hearthstone, and blackened bricks helped us complete the picture: a red-roofed, white plaster building with a fireplace and chimney, its interior crowded with the means of producing large quantities of food.

"It would be hard to find another kitchen in the world today with everything just as it was nearly three hundred years ago," Ed remarked. "On land it would have been de-

stroyed, or at least modernized, long before this. That's the advantage of underwater archeology."

#### Crack Navy Divers Scour Sea Floor

A few weeks after our arrival we were joined by a crack underwater team—six of the United States Navy's finest divers, headed by Lt. Charles Grundy and known as Explosive Ordnance Disposal Team 22. Expert in all forms of underwater search, these men based at Charleston, South Carolina, had been assigned by the Navy to assist us at the request of the Smithsonian Institution (page 169).

Their coming speeded up our program considerably. Besides helping our divers man the air lift, they organized a search team which soon completed the mapping of the bottom between the two forts. Wearing Aqua-Lung equipment, they swam over each square foot of sea floor. Wherever they came upon signs of walls, they placed yellow flag buoys to mark them for further inspection.

One morning they surveyed the area inside the walls of Fort James, hoping to locate a cannon like the one we had found on our previous trip. With *Reef Diver's* jetting hose they washed away at the bottom wherever the detector showed signs of metal. That noon they returned with a four-pound cannon ball, a lead ball from a swivel gun, and a broken bar shot—two small cannon balls linked by a metal bar and designed to turn over and over in the air, cutting down rigging or men.

#### Oldest Wine Not Always the Best

Seeking a new and promising area to explore, Ed selected a location just off the customs dock, where the Navy divers had detected tumbled walls beneath the mud.

According to the chart, *Sea Diver* was now anchored over the property of Humphrey Freeman. It lay next to King's Lane, just a few buildings east of the King's warehouses (page 167). Mr. Freeman had also owned a wharf, and this—if Ed's calculations were correct—should be in the deeper water astern.

Sir Kenneth Blackburne, Governor of Jamaica, chose that afternoon to pay us a visit. The air lift had been in operation scarcely an hour on the new site, and Ed and I were lamenting the fact that in such a short time there was little chance of anything being recovered while the Governor was aboard.

But as he and Ed were examining some of





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#### Members of The Society's Research Committee Examine Prize Finds

The scientists who must approve all Geographic expeditions often check results in the field. At left, Dr. Remington Kellogg looks over the shoulder of Dr. Lyman Briggs, who holds a wine bottle. Mr. and Mrs. Link stand in the center. Melvin Payne, a Vice President of The Society, handles a candlestick. Dr. Alexander Wetmore inspects a brass ladle. Rear Adm. L. O. Colbert scrutinizes a pewter plate.

our previous finds, the divers handed up a fine onion bottle. It was similar to those previously found, but for the first time there was a cork in the heavily rimmed mouth. While the two men were inspecting this, a smaller corked bottle was recovered. This time the cork was tightly secured with a twist of brass wire.

"Perhaps there's still some wine in this one," the Governor said jokingly as he tilted it to his lips.

After he had departed, Ed and Charlie Aquadro, the U. S. Navy submarine medical officer who had taken his summer leave to join our expedition, examined the two bottles more carefully. Ed held the smaller one close to his ear and shook it.

"There's liquid in it," he said. "Do you suppose it could be rum or wine?"

At the doctor's suggestion, they inserted a hypodermic needle through the cork, withdrew some of the contents, and squirted the yellowish fluid into a cup (page 137).

Ed grimaced as he took a sip. "Horrible. Tastes like strongly salted vinegar," he sputtered. "I guess 1692 must have been a bad vintage year."

#### Bottles Bear Witness to Heavy Drinking

The number of bottles and pipes we found gave the impression that old Port Royal spent most of its time drinking and smoking.

From the start, our divers found hundreds of bottles. First to appear were Coca-Cola, rum, and beer bottles of the present day. Then, as the air lift penetrated the bottom, the divers came upon 19th-century bottles of many shapes—liquor bottles, torpedo-shaped soda bottles, and medicine bottles which were probably discards from the former naval hospital on the near-by shore. Next in depth came 18th-century rum bottles, their hand-blown shapes more round, the glass a darker hue, often flaking at a touch. Finally, at the base, of the broken walls, were the bottles of pre-earthquake origin, onion shaped,



their dark iridescence often marked with sea growth and coral encrustation.

After viewing our collection one afternoon, Bernard Lewis, Director of the Institute of Jamaica, said: "I'm sure there are more 17th-century bottles here than any place in the world. There must be thousands of them still under water."

Most of those we brought up commenced to flake and crumble as soon as they were exposed to the air. We were able to halt this temporarily by putting them in containers of fresh water.

At the same place we found the bottle containing liquid, the divers began to uncover dozens of metal objects encased in coral, many so heavy that they had to be hauled aboard with the hoist. There was only one way to deal with these: knock off the encrustation with a heavy mallet. Sometimes a piece of ship's rigging was exposed, but often there was nothing inside the coral except a black, powdery disintegration.

Three of the finds still intact were large iron weights of various sizes with a ring at the top of each. Later we were overjoyed to come upon the balance bars of both a large and a small scale, with which the weights had plainly been used. The divers also recovered a number of asheads and other tools; also sword grips and knife handles, their blades long since corroded away.

Close to the base of a wall they found the 20-foot-long wooden yard of a ship. Although it had been perfectly hewed and shaped, there was not a sign of a fitting upon it. This fact led Ed and Mr. Peterson to the conclusion that it never had been used but was part of the stock of a ship chandlery.

But how could this wooden yard have survived so many years under water, at the mercy of shipworms and other marine borers? Ed pointed out the reason: The yard had been found completely buried in the fine clay at the base of a wall.

#### Skimming Close Above a Brick Wall, Diver Spots a Crack Left by the Quake

Flat clay roof tiles, loose bricks, and bottle fragments rest on this section uncovered by *Sea Diver's* crew. When found, the walls were buried in gravel and silt. Only the straight, unyielding lines of the top courses revealed their hiding places to the divers' questing fingers.

"I've noticed that everything dating back to the time of the earthquake has been coated with this same muddy clay," he said. "There is always a layer of it just on top of the solid gravel which seems to form the base wherever we have been digging."

He decided the mud must have been carried into the harbor in great quantities by the rivers when the earthquake threw down part of the mountains.

#### Gun May Date From Columbus's Time

A large coral-encrusted hunk of iron which had been left to the last proved to be one of the most interesting as well as the most





puzzling of all our finds. It was a wrought-iron swivel gun, heavily banded at close intervals along the barrel—a type made in Spain in the 15th century (page 157).

Such a model, according to Ed, was in use at the time Columbus first came to America: even then this gun might have been half a century old.

"A gun of this kind hadn't been made for at least a hundred years before the destruction of Port Royal," Ed proclaimed wonderingly to Mr. Peterson as they attempted to fit one of the breechblocks found near it. "Where could it have come from?"

"There must have been gun collectors even

in those days," the museum curator said. "If Humphrey Freeman had a ship chandlery, perhaps he had the swivel gun on display in his shop."

Mr. Peterson thought the swivel might have been armament from one of the early Spanish settlements on Jamaica, either Spanish Town or an even earlier settlement on the north shore of the island.

Ed came forth with an even more interesting possibility. "It could have come from one of Columbus's ships when he had to strand them in St. Ann's Bay on the north shore," he said. "When the Admiral and his men were finally rescued, they must have had to leave

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### Surviving Quake and Wave, Fort Charles Mellows With the Years

Horatio Nelson commanded the fortification in 1779. In his day the sea sprayed its walls; now silt and sand have filled the approaches. Massive ring of an anchor from Nelson's era frames the entrance gate and ramp. A 24-pounder peers from an embrasure.

everything behind except their most essential belongings."

"Well, even though guns like this were made for many years afterward, this gun could date back to Columbus's time," Mr. Peterson stated.

We could so easily have missed the real find of the expedition. It was too small to be observed by the divers who were working the dredge below. And if it had escaped the notice of Al Banasky, one of the Navy divers who was taking his turn examining the debris as it spewed from the pipe, it never would have been found.

Fortunately, Al's sharp eyes caught the

bright flash of metal as the object was hurled from the pipe into the mass of debris on the barge. Snatching it up, he leaped to the deck of *Sea Diver*, a beatific smile on his face.

"How would you like a gold watch?" he inquired banteringly as he dropped it into my hand. I thought he was spoofing, for we had often joked about the prospects of finding gold and jewels.

But it was indeed a watch, and it looked as if it were gold. Its gleaming back bore a faint design. The face was covered with a heavy, black calcareous crust.

Excitedly, I called to Ed to come up from the engine room, where he was working. He





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Here lies the Body of LEWIS GALDY  
 who departed this World 5<sup>th</sup> of<sup>th</sup> in April  
 the 22. December 1794 at 40 Years of Age  
 at *MORPELIER* in *FRANCE* but left his  
 Country for his Religion to settle in  
 this *Island* where he was swallowed up in the  
 Great Earth-quake in the Year 1692. His  
 Providence of God was by another Shock  
 thrown into the Sea & miraculously raised  
 by swimming up to a Boat took him up & he  
 Lived many Years after in great Reputation  
 & loved by all that knew him and much  
 Lamented at his Death.

"Swallowed up in the Great Earth-quake." Lewis Galdy was "by another Shock thrown into the Sea and Miraculously saved by swimming," says his epitaph (upper right) in a Port Royal churchyard. "He Lived many Years after in great Reputation."

Other than the tombstone, no record of Galdy's experience exists.

Tortoise-shell combs and cases, prized exhibits of the Institute of Jamaica, were made in Port Royal before the earthquake. Carved and decorated with a scrimshaw-like design, the case bears the inscription, "Port Royall in Jamaica 1690."





turned the watch over and over in his hand, examining it reverently.

"Imagine finding a watch from the time of the earthquake!" he said. "But suppose it isn't. Suppose someone just dropped it overboard from a ship a long time afterward. How will we ever know?"

Ed spent hours that afternoon cleaning and examining the old timepiece. Prying open the case at the back, he found clearly engraved on the inner side the name of the maker, Paul Blondel. Surely with this clue we would be able to determine when it was made.

Ed continued his careful inspection. As he separated the back from the front, a handful of tiny, delicate brass gears and other parts rained into his palm. None bore a sign of corrosion, and except for a few dirt particles, the inside of the watch was as clean as the day it had been carried into the sea—perhaps, as we have visualized it, in the pocket of an earthquake victim.

When Ed had succeeded in removing the piece of coral which had formed in place of the glass upon its face, the hours in Roman numerals were distinctly visible. They were softly silver like the tiny studs that formed part of the pattern on the back. The numerals, he discovered, were repeated in reverse on the coral.

#### Coral Preserves Moment of Disaster

Naturally his thoughts leaped to the possibility that the watch would indicate the time of the earthquake, which all accounts say occurred shortly before noon. But there was no trace of the hands. Undoubtedly, like the pivots and pinions of the inner works, which had completely disappeared, the hands had been of steel and long since corroded away.

"There's just one possibility," Ed said thoughtfully. "If the hands disintegrated against the coral, perhaps an X ray will reveal their position."

A dentist in Kingston kindly offered to make the attempt. Late the next afternoon Ed held the negatives up to the sun, examining them minutely.

"Yes," he said, "there is a faint trace of the hands. They seem to point close to the eight and the twelve."

He placed the blackened coral against the face of the watch in the same position as when it was found.

"It stopped at 17 minutes of twelve," he said in amazement. "Just time enough for water to have reached the works after the earthquake struck."

Even then we could not be sure that the watch marked the time of the disaster until we could ascertain exactly when it had been made. A few weeks later Ed took the watch to the famous Science Museum in London, which has probably the world's finest collection of old watches and information about them. He cabled back:

WATCH AUTHENTICATED BY SCIENCE MUSEUM TO BE BY PAUL BLONDEL AMSTERDAM 1686 WHO WAS HUGUENOT REFUGEE FROM CHALONS STOP TIME SHOWN BY WATCH 17 MINUTES TO NOON IS REGARDED AS AUTHENTIC TIME OF EARTHQUAKE

Ed later explained that 1686 was the last known year in which Paul Blondel made watches. He also learned that the brass case of the watch had originally been leather covered. It was because this protective coating had been stripped away during its ascent in





the air lift that the metal had gleamed so brightly when it first appeared. The silver studs had served the dual purpose of attaching the leather to the case and forming the design on its back (pages 157 and 173).

#### Bell Tower Site Now on Land

While the diving was going on, Captain Weems was checking his chart of Port Royal ashore. He had run into difficulties in determining the exact positions of various landmarks of the old city, especially in the area reclaimed from the sea (map, pages 166-7). Most of these landmarks had long since disappeared with the rebuilding of the town and with the establishment, soon after the earthquake, of a naval yard for the British West Indies Fleet, which had occupied almost the entire inner shore.

I was walking through these grounds on my way to the Morgan's Harbour Beach Club one day, when I came upon the captain and an assortment of small boys with spades digging busily in an area southwest of the club.

"Whatever are you doing?" I asked.

Captain Weems pointed out some traces of brick walls which were beginning to appear beneath the sparse soil.

"We're looking for the foundations of the bell tower to St. Paul's Church," he said. "I think we've found them. See this corner section, how thick it is? It must have been built to support a heavy structure like the bell tower, and

it checks exactly with my calculations from the old map."

It is to the Reverend Emanuel Heath, Rector of St. Paul's, that we are indebted for one of the most vivid accounts of the earthquake. In a letter written shortly after, he recalled that he was about to take a glass of wormwood wine with John White, Acting Governor of Jamaica, when the earth rolled and heaved under their feet.

"Lord, Sir, what is this?" the Reverend Mr. Heath cried in alarm.

"It is an earthquake; be not afraid, it will soon be over," replied Mr. White.

Both men escaped, as if by a miracle, but, as Mr. Heath later wrote, "in the space of three minutes . . . *Port-Royal*, the fairest town of all the English plantations, the best emporium and mart of this part of the world, exceeding in its riches, plentiful of all good things, was shaken and shattered to pieces,

#### Its Thunder Stilled, a Fort James Cannon Emerges Into Sunlight

An electronic metal detector spotted the iron barrel on a 1956 reconnaissance trip to the site of Port Royal. Crowned rose insignie dates the gun as having been cast before the death of Queen Anne in 1714. Edwin Link inspects his find, which now rests in the Institute of Jamaica.

Hauled aboard the barge, another cannon lies in a bath of protective sea water, together with a 70-foot wooden spar (page 176).







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Aqua-Lunger heads for the surface with the pewter platter shown opposite.

### Given Up by the Sea, a Wealth of Relics Lies on a Port Royal Pier

Main discoveries of ten weeks' work face inspection by members of a committee that will decide their disposition among the Government of Jamaica, the Smithsonian Institution, and the National Geographic Society. Sir John Carberry (back to camera), former Chief Justice of Jamaica, heads the group.

sunk into and covered, for the greater part by the sea. . . ."

"The earth heaved and swelled like the rolling billows," says another account, "and in many places the earth crack'd, open'd and shut, with a motion quick and fast . . . in some of these people were swallowed up, in others they were caught by the middle, and pressed to death. . . . The whole was attended with . . . the noise of falling mountains at a distance, while the sky . . . was turned dull and reddish, like an glowing oven."

At the eastern end of the old naval property stands Sir Anthony Jenkinson's attractive Morgan's Harbour Beach Club, which he built after leasing the yard from the British Government. Sir Anthony was of great assistance to us, both in our activities and in providing a delightful hostelry where meals could be obtained for *Sea Diver's* crew, and guests could be accommodated. Once a week *Sea Diver* tied up there for water and supplies.

Every day now the divers were sending up an array of interesting articles. Our storage place ashore and the decks of *Sea Diver* were crowded with artifacts, a great many of them immersed in baths of fresh water or chemicals, in the first stages of preservation.

But the hurricane season was upon us. Reluctantly we had to call a halt to our diving and prepare to take *Sea Diver* back to a safer berth in Florida.

We felt that we had accomplished a great deal during 10 weeks of work on the sunken city. We had drafted the most accurate existing chart of pre-earthquake Port Royal, and we had succeeded in bringing up hundreds of valuable artifacts depicting its life and times.

Yet we knew we had only scratched the surface. "It would take years of steady effort," Ed summarized, "to make a thorough search. We were fortunate to come upon the particular locations we did—the fort, the cookhouse, and the ship chandlery. But they are only a beginning.

"Think of the houses, the taverns, the shops of all kinds, the King's storehouse, the warehouses, and the ships which sank at the docks. Why, it's probably the richest known archeological site of its period in the world today.

"Somebody will go back there someday and be rewarded with such an array of both artifacts and riches as to make our effort seem trivial."

And I know he hoped it could be *Sea Diver* that would make that next attempt.














*Visitors will find the woolliest sheep,  
the driest desert, the loveliest lakes,  
and the friendliest people in*

# CHILE

## THE LONG AND NARROW LAND

By KIP ROSS, National Geographic Staff

*Photographs by the author*

**R**AIN DRIFTED DOWN from sullen skies, just as it had every day for a week. With my spirits as damp as my shoes, I stood on a corner of the principal square of Valdivia, in the heart of Chile's lovely Lake District, pondering how to spend the day.

Abruptly a young man coasted up in front of me on his scooter.

"Get on!" he said in English.

I was startled, as I'm sure any stranger would have been. I thought to ask him where he was going and why the unusual invitation.

But, intrigued by his open smile, I yielded to an impulse and without a word straddled the rear seat of the scooter.

We had buzzed through traffic for a block before he introduced himself. Over his shoulder he told me his name was Roberto González and he was a student at Valdivia's Austral University. He had guessed, correctly, that I was a *norteamericano*, and that I would enjoy seeing the city. And so, out of sheer friendliness, he undertook to be my guide. He even took me to his home for lunch.

This encounter was by no means my first experience with Chileans, but it symbolized adventures that marked my every step throughout their country. I have been cordially received in many parts of the

**Sombrero shading his eyes and bright *manta* draping his shoulders, a Chilean *huaso* cuts a dashing figure at a cattle auction in Villarrica. Author Ross met this combination farmer and cowboy during a six-month survey of "the long land." Moving along the massive spine of the Andes, Mr. Ross traveled from the copper-and-nitrate desert of the Chilean north to the gate of Antarctica in Tierra del Fuego.**





Snow-cloaked Peaks of the Andes  
Cradle Santiago, Chile's Capital

Founded in 1541 as a handful of huts, Santiago today ranks as South America's fourth largest city; only Buenos Aires, São Paulo, and Rio de





ESTABLISHED BY GEORGE P. FORD, THREE LIVES, INC. © NATIONAL GEOGRAPHIC SOCIETY  
 Janeiro claims more inhabitants than its 1,600,000. Santa Lucia Hill offers this view of Catholic University and Avenida Bernardo O'Higgins.

world, but Chile is without question the friendliest land I know.

I went to Chile just a year ago. I traveled virtually the length of this string-bean land—from the Atacama Desert in the north to the gasty pampas of Patagonia—almost all the way down to Cape Horn itself.

I saw wasteland drier and more lifeless than the Sahara, yet Croesus-rich in minerals; fruitful farmlands where topsoil measures 300 feet thick; lake and mountain scenery as breath-taking as any in the Alps, with smoking volcanoes thrown in for good measure; and fiord and glacier country as rugged as that of Norway. Dominating it all rose the skyscraping Andes, the loftiest of mountain chains after the mighty Himalayas.

All this I saw in the narrowest country on the globe. In no other country, in such a limited expanse, can one find such extremes of topography, weather, and scenery.

#### Santiago: Too Busy for Serenades

Spread before you the 10-color Atlas Map of South America that accompanies this issue. With finger and thumb, measure the breadth of Chile on either side of the capital, Santiago. This span, roughly the 110-mile average width of the nation, is about the distance between Washington, D. C., and Philadelphia. The length of Chile, 2,650 miles, is more than the mileage from Washington to San Francisco.

In the central region, where live the bulk of Chile's 7,500,000 people, the sheltering Andes on the east and the cool Peru Current off the western coast help create a climate much like that of California.

If it is true that temperate climate makes temperate people, Chile proves the point. Chileans in temperament are much like North Americans—industrious, bustling, sober. They are aptly called the Yankees of South America. Nowhere else below the border have I ever felt so much at home as in Chile.

Especially did I find this true in Santiago, the capital, which defies the popular conception of a Latin American city.\* No romantic guitar-playing caballeros lounge about her streets. No languid-eyed señoritas wait behind barred windows for serenades.

Indians, so prominent a part of the population of many another South American country, are seldom seen in Santiago—or in most other parts of Chile, for that matter. And the

\* See "Capital and Chief Seaport of Chile [Santiago and Valparaiso]," by W. Robert Moore, NATIONAL GEOGRAPIC, October, 1944.



blue eyes, fair skin, and blond hair of many a *santiaguino* bear witness to heavy infusions of the same Anglo-Saxon and Teutonic blood that predominates in the United States.

In the early morning and at noon, throngs at the intersection of Agustinas and Ahumada Streets, in the business district, reminded me of the corner of State and Madison in Chicago. Particularly was I impressed by the number of young women in tailored suits or skirts and blouses who click along on spike heels to office or shop. Chile's women, unlike some of their Latin American sisters, have established their rights to work and to enter the professions, as well as to vote.

When I arrived in Santiago I discovered that the Castilian Spanish of the classroom—or even of Spain or Peru—sounds sharply different from that of Chile. A Chilean friend

unflatteringly described his country's speech as a kind of rapid-fire baby talk that mumbles initial consonants, drops all "s's" and "d's," and swallows final syllables.

"*Kew?*" people fired at me. This turned out to be a condensation of "*¿Qué hubo?*" a standard greeting. It means "What happened?" or, in English idiom, "How's everything?"

#### Chileans Lunch Large and Long

When a hostess passed me a plate of fish and asked, "*Kemapecao?*" I finally realized she was saying, "*¿Quiere usted más pescado?*" (Would you like some more fish?). I never really mastered this shorthand language.

Neither did I become fully accustomed to the eating pattern in Santiago. The *santiaguino* enjoys his breakfast and goes off to work just as would you or I. But at noon he does not go out for a quick lunch and head back to the job. Everything shuts down at midday—stores, offices, government—and everybody goes home for a leisurely lunch. Though the siesta has become a casualty of progress, business still does not resume until midafternoon.

This regimen, of course, means a late dinner, and hardly anyone in the capital takes his final meal until 9 o'clock or later.

The Chileans I visited ate enormous meals, all accompanied by red and white wines



#### Carabineros Change the Guard in Santiago

Armed with both carbine and pistol, this unit of Chile's national police force stands duty before the presidential palace in the capital's civic center. Sentinels permit free entry through the palace gates by day.

Balconied apartments and lofty office buildings flank the four-mile-long Avenida Bernardo O'Higgins, named for the leader of Chile's fight for independence.









# CHILE

from the country's famed vineyards. Perhaps this devotion to a full stomach is prompted by the long gap between lunch and dinner.

In any case, one friend put it succinctly: "The difference between you Americans and Chileans is that you eat between working hours, while we work between eating hours!"

From the fertile valley floor surrounding Santiago, Chileans look up to the majestic, frosted mountain chain on the east, 18,000 feet high at this point, and to the lower coastal range along the Pacific, 55 miles away. I reveled in this view from a roof-garden swimming pool, 17 stories up, on the Hotel Carrera. Again I enjoyed it from the hill of San Cristóbal that springs abruptly from the northeastern part of the city.

From this vantage point, too, I could see the green-and-gold farmlands and the numerous industrial plants on the outskirts whose smoking chimneys spell cement and tires and glassware and woolens and automobile bodies.

Chileans are proud of their industry. But I laughed one day when I saw an incredibly patched-up Model-A Ford with this droll slogan painted on its rear panel: "*¡Hecho en Chile por chilenos!*"—Made in Chile by Chileans!

## Avenue Honors a Fighting Irish-Chilean

Santiago's most famous thoroughfare is the Avenida Bernardo O'Higgins, a broad boulevard and *parque* some 325 feet wide, ornamented with statues, fountains, trees, and gardens (pages 186 and 189). Pronounced "O'He-beens," it honors the fighting Chilean-born Irishman who led Chile in her wars for independence from Spain in the second decade of the 19th century, and who became the country's first president.

History comes alive not only on this imposing avenue but also on a hill that juts 230 feet above the heart of the city—the peak of Santa Lucia. Haunt of lovers, students, and strollers, the park of Santa Lucia dominates Santiago physically, mentally, and romantically. The battlemented walls on its crest, raised during the last century, recall



String-bean Chile, seen in detail on The Society's Atlas Map supplementing this issue, measures 2,650 miles long and an average 110 miles wide. It squeezes between the Andes and the Pacific from Peru to Cape Horn. Larger than Nevada, Utah, and Idaho combined, the nation covers 286,000 square miles. Islands account for a sixth of its area.

Chilean naval base and the world's southernmost town.



that the hill was once the citadel of Pedro de Valdivia, the fortune-seeking conquistador who brought Spanish rule to Chile and founded Santiago in 1541.

Valdivia found greater obstacles than the waterless Atacama Desert when he marched down from Peru. So fiercely did the Araucanian Indians oppose his passage that he wrote to Emperor Charles V, "Never saw I men so stiff in battle." Valdivia never conquered the Araucanians: They captured him and, according to ironic legend, killed him by forcing a draft of molten gold down his throat.

Nobody, in fact, ever subdued the Araucanians. For more than three centuries they withstood the white man, although they were eventually obliged to retreat south of the Bio-Bio River. And there they live today, some 130,000 strong, still magnificently independent in spirit.

*La Araucana*, Chile's epic poem by Alonso de Ercilla y Zúñiga, immortalizes the heroic resistance of these aboriginal inhabitants. And on Santiago's hill of Santa Lucía, a bronze statue now pays tribute to one of the most courageous of all the Araucanian war chiefs, Caupolicán.

#### Ranchers Remake a Harsh Land

Friends in Santiago advised me to see Magallanes, the southernmost province of Chile, early in my stay to avoid the rigors of winter later on. Even in February, which corresponds to North America's August, the weather there was already baring its teeth.

The southern end of South America, sticking down into frigid waters like a crooked finger, beckons from the sea some of the wildest winds of the world. Icy blasts dwarf and twist the trees, and plants shudder and crouch against the earth. Across the lower third of the province the famed Strait of Magellan often thrashes like an angry sea serpent. This is the part of the world that British naturalist Charles Darwin condemned as unfit for anything or anyone except the poor Indians he found there.

"Darwin should see that area now!" Pedro Poklepović told me proudly. Señor Poklepović is chairman of the Tierra del Fuego Development Society, a huge Chilean corporation controlling three and a quarter million sprawling acres of sheep ranches, called *estancias*, in the Strait region.

"Down there," he said, "the words 'New World' have a literal meaning. We are remaking the face of the land, ridding it of scrub,



#### Sunflowers Spread a Blanket of Gold Across the Fertile Central Valley

Blessed with a balmy climate, sheltered from the winds by coastal hills, and watered by melting snows from the Andes, the Valle Central feeds most of Chile and houses two-thirds of its population.

Wheat, corn, rice, barley, and melons thrive in the dark, rich topsoil, which reaches depths of 300 feet. Orchards yield bounties of oranges, peaches, plums, and cherries. Sun-drenched vineyards produce white wines that rank among the world's finest.

Sunflower seeds yield oil for household use.





Shepherds' off-duty horses trot across a dry wash in Chilean Patagonia;

developing new grasses, expanding sheep pastures. Why don't you go and see for yourself?"

And so I went. I got my first sight of the Strait of Magellan (page 194) as the plane circled over the water to set us down near Punta Arenas, the provincial capital. We had come 1,400 miles from Santiago and were now 6,400 miles almost due south of Washington, D. C.

Halfway down the landing stairs, a vicious blast of wind nearly sent me headlong.

A friendly hand reached up and carefully

steadied me. "You must be the man from the National Geographic," said the voice with the hand. "I'm Carlos Aracena, editor of *La Prensa Austral*. I got word that you were coming."

He had spoken easy, colloquial "American"; so I replied in the same language, raising my voice so it wouldn't be blown away.

"Storm coming up?"

Aracena shrugged. "No, not at all. At this time of the year winds often hit 50 or 60 miles an hour. You'll get used to it."





ARGENTINA © NATIONAL GEOGRAPHIC SOCIETY

Argentina lies beyond the Sierra Baguales, a splinter range east of the Andes

As we drove into the city, he told me that he had studied journalism at Syracuse University, in New York State. No wonder he spoke my own language so well.

#### **Punta Arenas Hotel Uses No Keys**

The road from the airport to Punta Arenas dips and turns over the rolling country north of the city. Along the headlands, all the trees leaned toward the east, bent by winds.

Shortly I saw ahead of us the cobalt blue of the Strait, at this point about 18 miles

wide and running due north and south. Excitedly I realized that the low land beyond was the island of Tierra del Fuego, and that I was now riding along the edge of the continental mainland.

At the rambling Hotel Cosmos I signed a register that has recorded the names of a host of world travelers since the days before the Panama Canal—grand dukes, opera stars, statesmen, explorers, miners on their way to the Klondike.

When I asked for a key, the manager told



### Rider Threads Stunted, Wind-blown Trees on a Sheep Ranch in Patagonia

Nine vast *estancias*, or ranches, owned by the Sociedad Explotadora de Tierra del Fuego cover some 3½ million acres in Chile and Argentina. Since weeds and trees blanket much of its holdings, the society has launched an ambitious 12-year program to transform the wastelands to pasture. These scrub beeches (*Nothofagus antarctica*) on Estancia Rories will be bulldozed and burned. The ranch lies in the Última Esperanza region near Puerto Natales.

454 WILSON'S LIFE OF THE NORTH AND WILSON'S LIFE OF THE SOUTH © NATIONAL GEOGRAPHIC SOCIETY



Gilded sunset casts a yellow image on the Strait of Magellan. Discovered in 1520 by the Portuguese navigator Ferdinand Magellan, the tortuous 350-mile waterway offers a salt-water short cut between the Atlantic and Pacific. The strait lies so far south that the sun seems to set in the north. The author made the photograph as his plane glided in for a landing at Punta Arenas (page 197).

Scorched earth builds pastures for Cerro Guido, an estancia in Magallanes Province. Clearing the way for grass, the rancher sprays kerosene on *mata negra*, a woody weed that resembles sagebrush.







me I wouldn't need one. "We operate this hotel on the honor system," he said. "No need to worry about your equipment. Theft is unknown in this hotel."

Punta Arenas means Sand Point; the name refers to a slight jut of land, the delta of a small river flowing into the Strait. Since the settlement was founded in 1849, its strategic location on the Strait has brought international fame and a more cosmopolitan population than in any other Chilean city, with the possible exception of Valparaíso.

Seasick landlubbers, hopefully bound for the California gold rush, often jumped ashore and stayed. English, Scottish, Spanish, and French settlers came to raise sheep. And since the turn of the century, many Yugoslav families have settled here; they have a Bank of Yugoslavia and Chile.

#### Sheep Raisers Dress for Dinner

The general air of well-being in Punta Arenas reflects the fact that it is a free port. Elsewhere in Chile the government carries out an austerity program to combat inflation; imports are discouraged, to aid domestic businesses. Many luxuries, such as Irish linens and French toiletries, are generally unavailable in Chile, but I found them in Punta Arenas. Shopwindows here display everything from English laces to American refrigerators.

The cold, wet climate of Magallanes brings a profitable dividend to sheep ranchers: Wool grows exceptionally thick and heavy. Thus Punta Arenas has become one of the wool capitals of the world, and the Tierra del Fuego Development Society is the largest sheep-raising organization on earth.

At their headquarters I met Mario Habit, the organization's chief agronomist, who offered to take me for a "little trip to the country."

Next morning, when he picked me up at the Cosmos, I slung a camera over my shoulder and started to climb into his car.

"Aren't you going to take a suitcase?" Señor Habit asked. "We'll be gone for several days, and we usually dress for dinner."

Dress for dinner? In this wild Patagonian region? I concealed my surprise and hastily packed some clothes.

As we headed inland from the Strait, the country stretched before us as flat as the western plains of the United States. Occasional rocky ridges broke the monotony.

At the end of a gloomy day's drive across such country, the late afternoon sun broke through brilliantly as we reached an estancia known as Cerro Castillo. This sheep ranch covers nearly a third of a million acres in the upper part of Magallanes Province, between Puerto Natales and the Argentine border.

I thought we had come to a town. Filling station, machine shop, school, office, warehouses, barns, houses, even a first-aid station clustered around the estancia headquarters, testifying that such a large and isolated ranch must be self-sufficient.

George Saunders, manager of the estancia, proved to be British in features, accent, and dress. Instead of poncho and sombrero, he wore a flannel shirt and sports jacket topped with a gay tam o'shanter. He and his wife spoke Spanish with the English accent called "Spanglish" by the Chileans.

"Sometimes I think we're running competition with the Hotel Cosmos," Mrs. Saunders told me. "Our experiments and developments in sheep raising bring people from all over the world. One Sunday I counted people from nine different nations."

By jeep, Land-Rover, and truck, I visited the far corners of the estancia. I found Magallanes a land of terrifying loneliness, forbidding and somber, a secret land. Wind howls only when it meets an obstacle: in Magallanes it sweeps with silent fury across the pampa, or open land. No leaves rustle. No insects buzz in the stubby grass. Even the sheep seem oppressed by the solitude.

Overhead sweep the *caranchos*, or caracaras, sinister birds of prey gliding stealthily on their aerial surveys. These are carrion eaters, like the vulture, and also rapacious hunters. Sheepmen hate them. Should a sheep break a leg or otherwise lose mobility, the caranchos swoop down to pluck out its eyes, leaving the helpless animal to starve.

#### First Flocks Came From the Falklands

Sheep I saw everywhere. Usually they roam freely, except when mounted shepherds move them to new pastures (page 198).

"If you want to see a lot of sheep, I'll give you an eyeful," Saunders grinned one morning. From a Cerro Castillo hillside we watched a yellow dust cloud swirling down the valley from an adjoining estancia. Soon the valley floor changed to a rippling, woolly rug as the riders urged on their charges. Shepherds whistled, dogs barked, lambs quavered.





Punta Arenas, an attractive city of 40,000, began as a penal colony a century ago. A Chilean free port, the bustling metropolis overlooks the Strait of Magellan.

Tall white building dominating the skyline houses the local headquarters of Chile's nationalized oil industry. Carts compete with automobiles on the city's streets.

#### Southernmost Kilometer Stone Marks the End of the Line for Motorists

The last road on the South American mainland halts at Fuerte Bulnes, 36 miles—57.5 kilometers—south of Punta Arenas. The *fuerte*, or fort, was built to protect settlers from Indians when Chile opened the region to colonization in 1843. Now a national monument, it stands near Puerto del Hambre, or Port Famine, where Pedro Sarmiento de Gamboa, a Spanish navigator, founded an earlier colony. When bad weather blockaded the colony, about one hundred of the settlers starved to death.

RODCHAUVES © NATIONAL GEOGRAPHIC SOCIETY











PHOTOGRAPHS BY NATIONAL GEOGRAPHIC SOCIETY

### Tumbled Hills Shelter Puerto Consuelo, a Channelside Sheep Ranch

Southern Chile's island-dotted inlets bear a resemblance to the fjords of Norway. Early navigators, exploring the maze in vain for a passage to the Pacific, named this inlet Seno Ultima Esperanza, or Channel of Last Hope.

Cool, wet, and blanketed with grass, this is sheepman's country. Tides vary little, allowing the ranch to build its shearing shed and warehouse (left center) beside a jetty where ships load the wool. Slaughter shed edges the water at left. Stable at right shelters horses that help herd the flocks.



Shorn sheep trudge back to pasture. Thick fleece of the Corriedale ranks among the world's best. On either side a fire-ravaged forest lifts gaunt arms toward rain-laden skies.





Blazing jets flare off surplus gas on Tierra del Fuego—Land of Fire—whose name belies its chilling winds and damp cold. Discoverer Magellan named it for the Indian bonfires burning along the coast day and night.

Wells of high-quality oil, tapped in 1945, produce about 2,000 barrels a day. Warmth-seeking cattle huddle beside the flare.

#### Pickax Brigade Hacks Frosty Soil in the Boom Town of Sombrero

Chilean oil fields on Tierra del Fuego are bringing civilization to a wilderness. Builders of Sombrero, center of drilling operations, have raised homes and offices, church, gymnasium, and auditorium. During the long winter nights they work by the light of flaring jets, whose heat keeps the concrete from freezing. These men dig a trench for a pipe.

How many? "You're lucky," my guide declared. "We're bringing 24,000 down for dipping. You'll never see so many sheep in your life again at one time."

Almost a century ago the first sheep came to Magallanes from the Falkland Islands,\* Mario Habit told me. The lands are so well adapted for sheep that wool has become Chile's chief export after mineral products.

"But we're never satisfied," said Señor

\* See "People and Penguins of the Faraway Falklands," by Olin Sewall Pettingill, Jr., NATIONAL GEOGRAPHIC, March, 1955.





Habit. "We're always trying to increase production by applied agriculture. In some areas it used to require nearly 50 acres for one sheep. Today, on improved pastures, we can grow two sheep on one acre."

This part of Magallanes is called Ultima Esperanza; literally, the name means last hope. "But greatest hope might be a better name," one resident remarked. Many other Chileans seem to agree.

Crews of men and tractors work steadily to clear new land. I watched a monstrous chain, dragged by two diesel caterpillars, up-

rooting brush and scrub. Gangs of brawny men moved into its wake, armed with axes and power saws. In this bustling operation, some 45,000 acres of land were being cleared (page 195).

"We'll have this land a rich pasture by next year," Habit said proudly, crumbling a handful of the gray, peatlike soil. "We can grow almost anything here."

Hundreds of acres of alfalfa, wheat, oats, and potatoes verified his claim. But most important were the fields checkerboarded with various grasses. From these test plots come







### Puerto Williams: World's Southernmost Town

Three hundred residents living on two streets support Puerto Williams's claim to the "southernmost" title long held by Argentina's Ushuaia, which lies across Beagle Channel (foreground).

Named for an English sailor, Bristol-born John Williams who headed a Chilean expedition to these waters in 1843, the Navarino Island port and naval base serves vessels that patrol the area and bring in supplies to the isolated inhabitants. Surrounding mountains wear white crowns the year round, but the town itself sees little snow. The frigate *Covadonga* lies at anchor in the harbor.

Chilean sailor Felix Coronado and his family occupy the southernmost house in the southernmost town.





FORAIDRONES © NATIONAL GEOGRAPHIC SOCIETY

the new pastures that make sheep production skyrocket. Each patch was carefully labeled and checked against production charts.

Many of the grasses came from other countries to sink their roots in Chilean soil, just as thousands of immigrants have come from England and Ireland, from Germany and Italy, from Switzerland and Yugoslavia, to make their indelible mark on Chile's earlier Spanish and Indian cultures.

#### Oil Lights a Land of Fire

Wherever the land is being cleared, fires burn day and night, consuming the debris. I saw so many fires that I felt that the mainland, too, ought to be called *Tierra del Fuego*—Land of Fire--the name Magellan gave to the island across the Strait because of the many Indian fires he saw along its coast.

To see Magellan's famous land of fire and ice, I flew across the Strait to *Sombrero*, headquarters of Chile's new oil industry on the island.

Because it lies only 625 miles from Antarctica, I expected *Tierra del Fuego* to be

extremely cold. But instead of ice and snow, I found a soft, muddy land covered with tawny grass. South Atlantic currents warm the island, and even in winter the temperature rarely drops below 20° Fahrenheit.

One morning I had reason to think I was suddenly in the tropics. Walking in a mizzling rain, I passed a group of tall, gray water birds hunched in a pool. Then one untangled his neck. They were flamingos! They differed from the rosy tropical variety chiefly in color; only a faint pink showed under their gray wings.

Chile discovered oil on *Tierra del Fuego* 15 years ago, and the government has worked feverishly to expand production. *Sombrero* is still a boom town, with new buildings rising on every hand (page 201).

Here, too, fires burn constantly, to rid the oil field of excess gas. They give light for the workmen in the winter darkness and prevent fresh concrete from freezing. In the country, cattle cluster near the flares for warmth (page 200).

Oil to Chile means more than wealth. It



is also a source of national pride. Unlike many other countries, Chile has developed her own petroleum resources, avoiding expensive concessions and royalties.

From Tierra del Fuego I pushed still farther south to the little island of Navarino. Between the two islands runs Beagle Channel, named for the vessel on which Darwin made his famous voyage in the 1830's.

#### The Southernmost Town in the World

On Navarino I visited the Chilean naval base at Puerto Williams, whose 300 citizens enjoy the prestige of living in the southernmost town in the world (page 202).

One resident of the area I wanted very much to meet. In December, 1937, the NATIONAL GEOGRAPHIC had published a picture of Milisić, chief of the Yahgan Indians, and I hoped to find him still alive.

I mentioned my desire to Bruno Klaue, commander of the naval base.

"Milisić?" he exclaimed. "He still lives in his wigwam on the edge of town. Hop in the jeep and we'll go look for him." Not a block from where we started, Klaue spotted the Indian walking along the street.

As befits the last chief of the few remaining Yaghans, Milisić is a man of dignified reserve. His shock of hair has turned gray (opposite). The hand he gave me was callused and the fingers swollen with age.

He spoke Spanish with an accent, but with a rich, mellow voice. His name, pronounced Milisitch, sounded more Yugoslav than Indian, and I asked about it.

"I chose that name when I was a young man," he replied. "We Yaghans often took the names of men we admired, and a Yugoslav was my namesake."

To my surprise Milisić showed little interest when I showed him the photograph of himself that Amos Burg had taken 22 years before.

"Yes, I remember that young man," he said rather casually. "He had a little boat. *Muy simpático*."

A century ago some 3,000 Yaghans lived in huts along the coasts of Tierra del Fuego and the islands to the south. Hunting with spear, harpoon, and club, they subsisted on sea food, birds, and a few wild plants. They spent much of their lives in leaky bark canoes. Fires burned constantly in hearths of earth and stone in their boats.

Despite wind, rain, and cold, they went virtually naked except for capes of skins

which they threw over their shoulders. Yet they enjoyed fine health until white men came. After 1881 severe attacks of measles and other newly introduced diseases decimated the tribe; within 20 years it numbered scarcely more than a hundred souls. Today only a handful remain. I was glad to have met a survivor of this once-sturdy people.

As I visited other places along the Strait, I felt the company of many a famed navigator.

Magellan discovered the Strait that bears his name in the harsh spring months of 1520. After he had navigated the stormy waters, he came thankfully upon a haven of peaceful, open sea. Understandably he called it Pacific, unaware that it was the same "Great South sea" that Balboa had discovered beyond Panama seven years before.

#### History Sails Magellan's Strait

After Magellan, in 1578 came Sir Francis Drake on his voyage around the world, harassing Spanish ships and ports wherever he found them. And Pedro Sarmiento de Gamboa, Spain's "excellent and skillful navigator," rushed from Peru in a vain effort to intercept Drake. And still others came—King, Skyring, Fitzroy—names celebrated in the annals of British naval exploration.

While visiting the Estancia Río Verde near Punta Arenas, I came unexpectedly across a strange reminder of another explorer in another land. Driving along the narrow neck known as Fitzroy Channel, I saw huge iron hoops arching above the waves. Sleek black-necked swans swam among them.

"The hoops are all that remain of the river boat *Kabinda*," the estancia director, Bernard De Bruyne, told me. "Those old paddle wheels once churned the waters of the Congo River, bearing Stanley on the last stage of a 7,000-mile trek across Africa."

"My father bought the *Kabinda* in 1901 and had her sailed across the Atlantic. She was used by a whaling company until she wrecked a few years later where you saw the paddle wheels."

To get from the Strait region in the extreme south to the Lake District—and stay within Chile—requires either boat or plane. Between lies an impassable wilderness where the steep walls of coastal mountains dip down to the sea and break into pieces. No roads cross this 750-mile reach of islands and lakes, ice fields and fiords, and forested slopes.

(Continued on page 211)





One room, one teacher, and 14 pupils at Puerto Williams comprise the world's southernmost school. A sailor serves as instructor; his class includes the sisters Orellana (left) and Mabel Gonzales. A new school will open this year.

Chile instituted compulsory education in 1928. Today four-fifths of its citizens can read and write.

#### Yahgan Indian Chief Holds an Old Portrait of Himself

Sailing south to Cape Horn two decades ago, writer-photographer Anson Burg visited the Yahgan tribesmen. Their chief, José Milisič, posed for a picture that appeared in the December, 1937, NATIONAL GEOGRAPHIC.

When Mr. Ross called at Navarino Island last year, he found Milisič grayed but still robust. "Few of my people are still alive, and I am the last remaining chief," he told the author.

With his wife, Milisič dwells in a wigwam made of sealskins and broken lumber. He ekes out a living by farming and performing odd jobs around Puerto Williams.







*Azure Waters of Lake Buenos Aires  
Bathe the Feet of the Soaring Andes*

Lying partly in Chile and partly in Argentina, the lake covers 865 square miles in the heart of the Patagonian Andes. Up to 14 miles wide





WOLFFHART © NATIONAL GEOGRAPHIC SOCIETY

and 30 miles long, the 745-foot-high lake curls around cloud-shrouded peaks and drains into the Pacific through the Baker River. Few

travelers reach this remote spot, which lies 400 miles south of Chile's famous Lake District (next page). The author saw it from an airplane.



### Osorno Volcano Lifts a Crown Above Lake Todos los Santos

A landmark of Chile's spectacular Lake District, Osorno thrusts its cone to an elevation of 8,727 feet. Ice fills the crater; the last big eruption occurred a century ago.

Osorno's near-perfect symmetry invites comparison with Japan's famed Mount Fuji. Fed by springs and melting mountain snow, the lake at its feet ranks as one of Chile's loveliest.

The launch carries passengers between Petrohué, at the lake's western end, and Peulla, a scenic 20 miles east.



EXHIBITION (LEFT); AND ADDITIONAL BY NATIONAL GEOGRAPHIC SOCIETY

Rainbow trout (*Salmo gairdneri*) abound in Chile's lakes. "Fishing is fabulous," says the author. "I caught one almost by accident. Tossing out a line as I rowed, I pulled in a trout. Fish even struck at coins pitched into the water."

This angler hooked his rainbow at a contest on Lake Puyehue.

Roses brighten a terrace in Peulla, a lake resort in Llanquihue Province. Señora Ingrid Roth admires the blooms. One of Peulla's pioneer families, the Roths emigrated from Switzerland.











From my plane window I could see why the Strait region seems so isolated from the rest of Chile. But the barrier of ice and stone that cuts off Magallanes gives Chile some of the finest scenery in all South America. I was particularly exhilarated by a clear view of the seldom-seen Paine Mountains, a series of peaks and pinnacles like a mysterious city of skyscrapers. And I got a dramatic foretaste of lakes to follow by a crystalline glimpse of Lake Buenos Aires midway on the flight (page 206). But nothing could have prepared me for what lay ahead.

Imagine an area bigger than Switzerland with a balcony of magnificent mountains on the east and a thundering ocean on the west. Spangle this area with twelve large, shimmering lakes, and scatter it with rich green forests of oak, larch, and pine. Lace it with rivers and streams, and plant here and there fields of grain and vegetables amid pastures dotted with grazing cattle.

Stud the land with a dozen snow-capped volcanoes, averaging 9,000 feet high, any one of which would feed the national pride of any country. Then fill the waters with trout, some of them 30 inches long and all hungry.

Put all these things together, and you have Chile's great vacationland, the famous Lake District.\*

In all this scenic richness, the gem to me was Lake Todos los Santos, a regal mirror for Fuji-like Osorno Volcano and three other soaring peaks (page 209). Theodore Roosevelt, a visitor, called Todos los Santos "the most beautiful lake I have seen in all the world."

#### Chileans Shun the Mountains

Mount Tronador (thunderer) occasionally sends echoes flying across the lake from its massive avalanches and splitting ice blocks. Tronador stands squarely on the Argentine-Chilean frontier; so I climbed up to the pass for a better view and a quick jaunt across the border.

There I discovered why Chileans are not mountain people. Elsewhere in the world, mountain valleys have lured dwellers to their shelter. Even the lofty floors of the altiplano in Peru and Bolivia nurture villages. But

\* See "Chile's Land of Fire and Water," by W. Robert Moore, NATIONAL GEOGRAPHIC, July, 1941.

#### Rodeo Performers Await the Signal to Pin a Steer Against the Corral

The Chilean huaso performs as expertly as his cousin, the Argentine gaucho. These horsemen wear the traditional flat-topped sombrero and hand-woven wool manta. A kind of abbreviated poncho, the manta evolved from a garment worn originally by the Araucanian Indians.

Working as a team, the riders compete for prizes in Osorno.

Roweled spurs help the huaso control his mount. Fringed leather leggings protect his knees and shins. Toes of high-heel boots fit into carved wooden stirrups. A leather tab dangles from each rein.









Chile's mountains rise arrogantly, with few breaks, and the main ridge offers no inviting vales.

Throughout the Lake District below, it would be easy to believe that you are not in South America at all, but in the chalet country of Germany or Austria or Switzerland. German language, German architecture, and German faces and names—added to the alpine scenery—delude the visitor.

People of German blood began to come to Chile in 1846, at the invitation of the Chilean Government. They settled mainly around Valdivia, Osorno, and Puerto Varas. Like the Germans of Pennsylvania, they practiced agriculture with Teutonic thoroughness and thrived, and their mark is strong upon the land.

At the northern edge of the Lake District, around the city of Temuco, live most of the descendants of the Araucanians who for so long held the Spaniards at bay. Temuco's chief hotel, the Frontera, recalls the fact that a century ago Temuco marked the frontier against the warring Indians.

Even today the Araucanian possesses a fierce dignity and love for privacy. He hates to be photographed. When I walked Temuco's

market place with my camera, both men and women turned away.

Finally I retreated some distance and with a telephoto lens caught two Indian girls who had brought fowls and produce to sell (below).

#### Araucanians Defend Their Privacy

The next day I tried to photograph an elderly woman talking to a girl in an oxcart. The woman wore a blue wool band around her head and silver bangles of Araucanian design around her neck. Before I could even aim my camera, she whirled, marched firmly up to me, and jabbed a stubby finger into my chest.

"How dare you take a picture behind my back?" she demanded in Indian-accented

ANTHONY J. BELLI © N.Y.L.



#### Turbulent Toltén River Mirrors Mount Villarrica's Frosty Image

A slumbering volcano, the 9,318-foot peak rears above a lake resort dating from 1852. Mountain, lake, and town have the same name, Villarrica. The lake empties into the Toltén, which cuts an 80-mile channel to the sea.

Araucanian women visit the Indian market in Temuco to sell chickens, farm products, and handicrafts. Driven south but never subdued by the Spanish conquistadors, the Araucanians' 130,000 survivors live between the Bio-Bio and Toltén Rivers. They call themselves *Mapuches*, meaning "people of the earth."

Proud and dignified, members of the tribe usually refuse to pose for photographers. Mr. Ross made this shot with a telephoto lens.



### *Copihue* Blossoms Brighten a Boat in Valdivia's Floating Market

Chile's national flower, the copihue (*Lapageria rosea*), grows wild in gullies and forests. Red, pink, or white, the waxy blossoms bloom on vines from October to July. "Every Chilean likes to see them on his table," says the author.

Valdivia, called the Venice of Chile, stands at the junction of two rivers 11 miles upstream from the Pacific. Broad bayous facing the region encourage the use of water transport. Valdivia's river front lets farmers peddle their wares without unloading boats.

Founded in 1552, the city takes its name from Pedro de Valdivia, the conqueror and first governor of Chile. German immigrants in the mid-1800's left a Teutonic imprint.

Hungry lad gobbles a sea urchin on the Valdivia waterfront. Cracked like a nut, the spiny delicacy yields pulpy orange-colored flesh tasting strongly of iodine. Gourmets, who eat the urchins raw, also relish the spider-sized parasite crabs found inside the shell.

Chile's coastal waters harbor more than 200 kinds of fish. Excellent oysters come from the Gulf of Ancud. Crayfish reach lobster size in the Juan Fernández Islands, 415 miles west of Valparaíso. These crustaceans sustained Alexander Selkirk, a castaway sailor whose adventures led Daniel Defoe to write his immortal story of Robinson Crusoe.



Spanish. "I have a right to my own self." She continued with surprising eloquence, emphasizing such words as *dignidad*, *reserva*, and *derechos* (rights).

Even among themselves the Araucanians seem to lead antisocial lives. In an Indian village I visited near Temuco, their thatched *rucas* stood well apart from one another. Yet I could not help admiring these stout-hearted *Mapuches*—"people of the earth," as they call themselves.

One of the wettest regions of Chile, the Lake District thinks nothing of 100 inches of rain a year. Near here Darwin noted that "so much rain falls. . . to have a week of fine weather is something wonderful."





ILLUSTRATION © NATIONAL GEOGRAPHIC SOCIETY

And it seemed to me that my stay in the lake country must have been at least as soggy: It rained for 21 straight days.

In Villarrica I saw lines of oxcarts plodding from the mountains, each loaded with 15-foot logs. Lined up outside the sawmill, stolid oxen and drivers endured the pelting rain.

One husky driver jabbed at his spoke-wheeled cart to get rid of the clogging mud. Other drivers hurled gibes at him.

"What's the joke?" I asked.

"This one got rid of his solid wheels," said a driver. "He paid good money for fancy spokes. Now they sink deep and pick up the mud. Pablo wishes he hadn't been so smart."

At Osorno, the provincial capital, I met my first real *huasos*. I had assumed these cowboys to be mere hired hands, but a native of Osorno straightened me out.

"Huaso originally meant an independent horseman, neither a rich owner of an estate nor a peon. In the lakes, where we raise cattle, he may be a working cowboy, but more likely he is a small rancher or farmer."

#### Rodeos Test Men and Horses

Dressed for rodeos or festivals, the huaso wears a broad-brimmed, flat-crowned dark hat, a colorful manta over his shoulders, and hip-length fringed leather leggings. High-heeled boots, thrust into carved wooden stir-





### Fire-complexioned Workers at Huachipato Tend Furnaces and Swing Incandescent Steel Rods Into Glowing Crescents

Chile's only modern steel plant, the government-controlled Huachipato foundry near Concepción smelts iron ore from deserts. Most coal comes from a field whose galleries fan out beneath the ocean.

A time exposure (below) captures one step in the rod-rolling process. The workman with his back to the camera has just caught the end of a red-hot rod as it shot out of a pass, or channel, in the rolls. Holding the tip with tongs, he spins and thrusts it into another set of rolls that will reduce its diameter. Within one second, the time of this exposure, he grabs the rod, swings it in a golden blur, and starts it on its way again. Another glowing rod loops the second man as it emerges and re-enters.

Joseph Riazuto (left), a former Californian, superintends an open hearth.

SILVER ANODOCHONES © NATIONAL GEOGRAPHIC SOCIETY





rups, jingle musically with oversized spurs (pages 210 and 211). In bad weather he dons the all-enveloping poncho, a blanket with a slit for the head.

The rodeo in Chile offers no demonstration of ability to stay on an angry horse or to twist a steer to the ground. Rather it is a serious contest in which the huaso must chase a steer around a semicircular ring and, at full tilt, crowd the animal against a fixed length of padded rim. This exercise lacks the violence of the North American rodeo, but it is calculated to reveal every fault of performance in both man and mount.

#### Horsemen Show Skill in Osorno

At Osorno's annual competition to determine the champion huaso of the south, an *aficionado* explained the finer points.

"Chilean horses are bred to a special type. Note the short distance between fore- and hindlegs, and the full chests. These short-coupled horses can spin instantly on either right or left forefoot, even at full speed.

"I've read a lot of criticism of our large-roweled spurs," my friend continued, "but our *jinetes* [horsemen] don't use them to rake the flesh as some cowboys do. Watch how the men press the flat disks like hands against the horse's sides. The animal knows exactly what the rider wants."

I noted that of the hundred or more horses that entered the ring, not one showed signs of roweling.

The Chilean rider uses a V-shaped saddle which wedges him tightly front and back. He sits stiffly erect, with a tight rein. None of the huasos I spoke to knew the word "dressage," but their technique is similar, using shifting weight, knee pressure, and spurs to establish complete communication between man and horse.

Contestants from five provinces demonstrated their skill that day at Osorno. The horsemen worked in pairs to run each steer.

When the animal was released from its pen, both huasos started it running, urging it on with loud cries. Presently one took the lead. Quickly he gained on his quarry, closing in as he neared the target section of wall.

At this point the beautifully trained horse took over. He paralleled the steer, raising forelegs high and crowding more at each step. At precisely the right moment both animals skidded to a halt in a cloud of dust. The horse had neatly pinned the steer against a

soft basketwork padding. Such coordination between man and beast requires the most skillful timing.

I'm sure I was much more excited than the other spectators. Although this contest was the big annual event, the Chileans sat quietly, chatting with neighbors. When an expert rider made a good run, a few murmured "*Bueno*" or "*Bravo*," but only the judges showed keen interest. The Chilean rodeo is a contest among experts, not a combat for audience praise.

At least half of Chile is useless for agriculture and is uninhabited: too rugged, too dry, too heavily forested, too wet and cold. But in the heart of the Central Valley, from the Aconcagua south to the Bio-Bio, the land smiles bountifully on the farmer. There the brown of foothills and deserts yields to green. Rows of eucalyptus trees line fields of cereal grains, orchards, endless expanses of grapes, and pastures filled with Friesians.

Glowing fields of sunflowers gild Central Valley haciendas, producing oils for household use (page 191). Blackberries thrive to the point of being a pest. Encroaching on lanes and fields, reaching twice the height of a car, they leave the husbandman weary with chopping. Only recently a Chilean chemist has been experimenting with pulverized blackberry vines as cattle feed. Today's nuisance may become tomorrow's asset.

#### Chilean Wines Enjoyed in France

Chileans, I discovered, drink little milk and do not care for ice cream. But their dairy products—chiefly butter, cheese, and powdered milk—are gradually increasing in production and in popularity.

The national drink is wine—the excellent light vintages pressed in the vast vineyards of the Central Valley. Experts rate some of these wines with the world's best. Chileans cite with pride the fact that part of the 90 million gallons produced annually is exported to France.

The oxcart and the flail characterize much of the agriculture I saw. But slowly Chile's hacienda managers are turning to tractors, trucks, and threshing machines. Farm machinery ranks high on the list of Chilean imports. Strangely enough, farmers have only recently begun extensive use of the nitrate fertilizers that Chile has long exported in such large quantities.

Everywhere I found the people a delight



The friendliness I have mentioned marked my contacts in every part of the country.

My early confusion with the spoken tongue proved to be no obstacle. People were patient with me until my rustiness in Spanish disappeared, and some of them spoke my own language quite well. Chile's schools all require English studies.

Since 1928 Chile has had free, compulsory education for all children from 7 to 15. Her literacy rate—about 80 percent—is one of the highest in Latin America. The government also provides free professional training in such institutions as the University of Chile in Santiago, founded in 1842.

The school I wanted most to visit, however, was the University of Concepción, an unusual

institution supported in part by a lottery. On the campus, near the center of Chile's third city, riveters rattled up and down two blocks of steel skeletons of future classrooms and laboratories.

When I met Dr. David Stitchkin Branover, the brilliant and practical rector of the university, he explained why Concepción holds the spotlight in Latin American education today.

"With the help of UNESCO, we have created institutes of mathematics, physics, chemistry, and biology for basic scientific education. Each has its own budget, staff, equipment, and library.

"This revolutionary development transfers research and specialized teaching to institutes



PHOTOGRAPH BY NATIONAL GEOGRAPHIC SOCIETY

### Eaves Drained by Concrete Gutters, Valdivia Homes Imitate Umbrellas

"Rainiest city in Chile," the author labels Valdivia. Outsized roofs of faculty residences at Austral University cope with ever-weeping skies.

Relaxing between classes, students at the University of Concepción hold a campus council. Profits from a national lottery helped build the new medical school.









*Valparaíso Perches on a Crescent of Hills;  
Ships Ride at Anchor in Its Deep Harbor*

Long before New York or Boston existed, seamen of every maritime nation knew Valparaíso as the last sight of land before the long sail across the Pacific. In 1578 Sir Francis Drake plundered





PHOTOGRAPH BY ARTHUR ROBERTSON

a ship anchored in the bay. Street names like Chopin, Rousseau, Rigoletto, and Pythagoras reflect the port's ties to Europe. Earthquake and tidal wave in 1906 battered the tiered city, but,

like San Francisco, it rose anew. *Almirante Prat*, one of two light cruisers that Chile bought from the United States in 1951, lies at left. Formerly it was the U.S.S. *Nashville*.



independent of the professional schools. Educators even in Europe are watching the progress of our program."

Concepción also rates high in industry, for it is Chile's Pittsburgh. Six miles to the west, the steel mill of Huachipato produces steel for all of Chile's needs and exports to half a dozen other countries as well (page 216).

"We even export pig iron to the United States!" a mill executive told me with obvious relish.

#### Concepción Survives Disasters

Much of the coal for Huachipato comes from near-by Lota, on the coast. I have long heard of oil wells drilled in the ocean bottom, but this was the first time I ever found a coal mine beneath the sea.

Lota's tunnels extend for several miles beyond the shoreline. Slanting down steeply, the well-braced tunnels are shielded from waves overhead by a thick layer of shale.

The finest of Chile's glassware, produced at both Concepción and Santiago, need take no back seat. His Excellency Walter Müller, Chilean Ambassador to the United States, told me of an acquaintance who bought some beautiful glassware in Europe, paying a very high price for it.

On his return to Chile, he held his breath while the customs inspector examined his purchases. He expected the tariff to be steep.

"Why did you wait to get to Europe to buy all this?" the customs man wanted to know. "I can't charge you duty on it because it was made right here at home!"

Disaster has struck Concepción so many times that I wondered how it has continued. After the city's founding in 1550, Araucanian warriors destroyed it again and again; pirates often raided it; earthquakes periodically leveled its buildings.

Since the spectacular earthquake of 1939, one often hears the word *asísmico*, or earthquake-proof. Concepción citizens are taking no chances with their new construction. And the city's rapid growth of population to its present 180,000 shows a healthy confidence in the future.

#### Coastal Cliffs Offer Few Beaches

When the people of Concepción or Santiago have had enough of factory smoke, they flee in two directions: to the increasingly popular ski slopes in the Andes or to the seaside resort of Viña del Mar.

Few countries offer so many snow-covered inclines for skiing; none offer better ones than Chile's best. From June through September, when snows are scanty in the Northern Hemisphere, international sportsmen join the throngs of Chileans who crowd the roads to Farellones and La Parva, both within 30 miles of the capital. Or they go 125 miles by train to Portillo, just below the pass where stands the bronze statue of the Christ of the Andes. The 22,834-foot peak of Aconcagua, highest mountain of the Western Hemisphere, looms only a short distance to the north.

For a country with such a lengthy coastline, Chile offers surprisingly few bathing beaches. Except in the Strait region, the country faces the Pacific with steep cliffs broken by few sloping shores or curving bays. For hundreds of miles in the north, the sea wall often rises to 3,000 feet.

Swimmers face another problem: the Peru Current. This deep ocean river parallels Chile's coast with waters too cool for comfortable bathing except in sheltered bays. Viña del Mar, a suburb of Valparaíso, is such an exception.

Most Chileans who can afford it play at Viña del Mar. If they are wealthy, they may own a home in Viña. There they find all the facilities of a Riviera—yacht marinas, race track, botanical garden, casino, and delightful beaches.

#### Cable Cars Climb Valparaíso's Hills

For myself, I liked near-by Valparaíso equally well. Its broad harbor and steep streets reminded me of San Francisco, particularly one day when I found the bay shrouded in fog. But with a difference: The usually calm water swarmed with thousands of hungry pelicans. More than half were bottoms up, gobbling greedily. An unusual eddy in the Peru Current had brought in untold numbers of anchovies instead of taking them farther north, where Peru's cormorants make guano of them.\*

For a better view of Chile's second city and one of South America's finest Pacific ports, I rode one of the *ascensores*, the rickety cable cars that serve this split-level city. From the hills above I surveyed the harbor that inspired James McNeill Whistler to paint the first of the series he called "Nocturnes."

\* See "Peru Profits From Sea Fowl," by Robert Cushman Murphy, NATIONAL GEOGRAPHIC, March, 1959.





PHOTOGRAPH BY NATIONAL GEOGRAPHIC SOCIETY

### Corkscrew Roads Link Doughtown Valparaíso With Hilltop Suburbs

Here rich and poor share a window on the sea. Tenements in rainbow colors cling like swallows' nests to stony cliffs; handsome villas open onto shady gardens.





ILLUSTRATION © NATIONAL GEOGRAPHIC SOCIETY

Grader stirs a nitrate broth in an 11-acre pond at Maria Elena. Solar evaporation concentrates the solution, permitting the recovery of nitrate of soda, iodine, and other salts from plant wastes. Enormous nitrate deposits lie in the Chilean desert.

Granulated nitrate flows like sugar into a lighter in Tocopilla harbor. A ship waits in deep water to load the snowy cargo. An ideal fertilizer, nitrate also forms the base of many explosives. Chile's plants produce about 1,300,000 tons a year.

I tried to imagine the ships that had made history there. Virtually every corsair in Pacific annals entered Valparaiso's waters, beginning with Drake and Cavendish and Hawkins. "Valpo" was the first major stop after rounding the Horn, and every sailor on the high seas was likely to put in there sooner or later. David Farragut, later the first admiral in the United States Navy, fought the British there as a 12-year-old midshipman.

It required no imagination for me to see modern warships riding at anchor, for this hill-girt harbor is an important Chilean naval base. I could easily make out the cargo ships and small craft, some of them unloading spiny lobster-size crayfish taken from the sea off Chile's Juan Fernández Islands.

The largest of these ocean specks, 415 miles

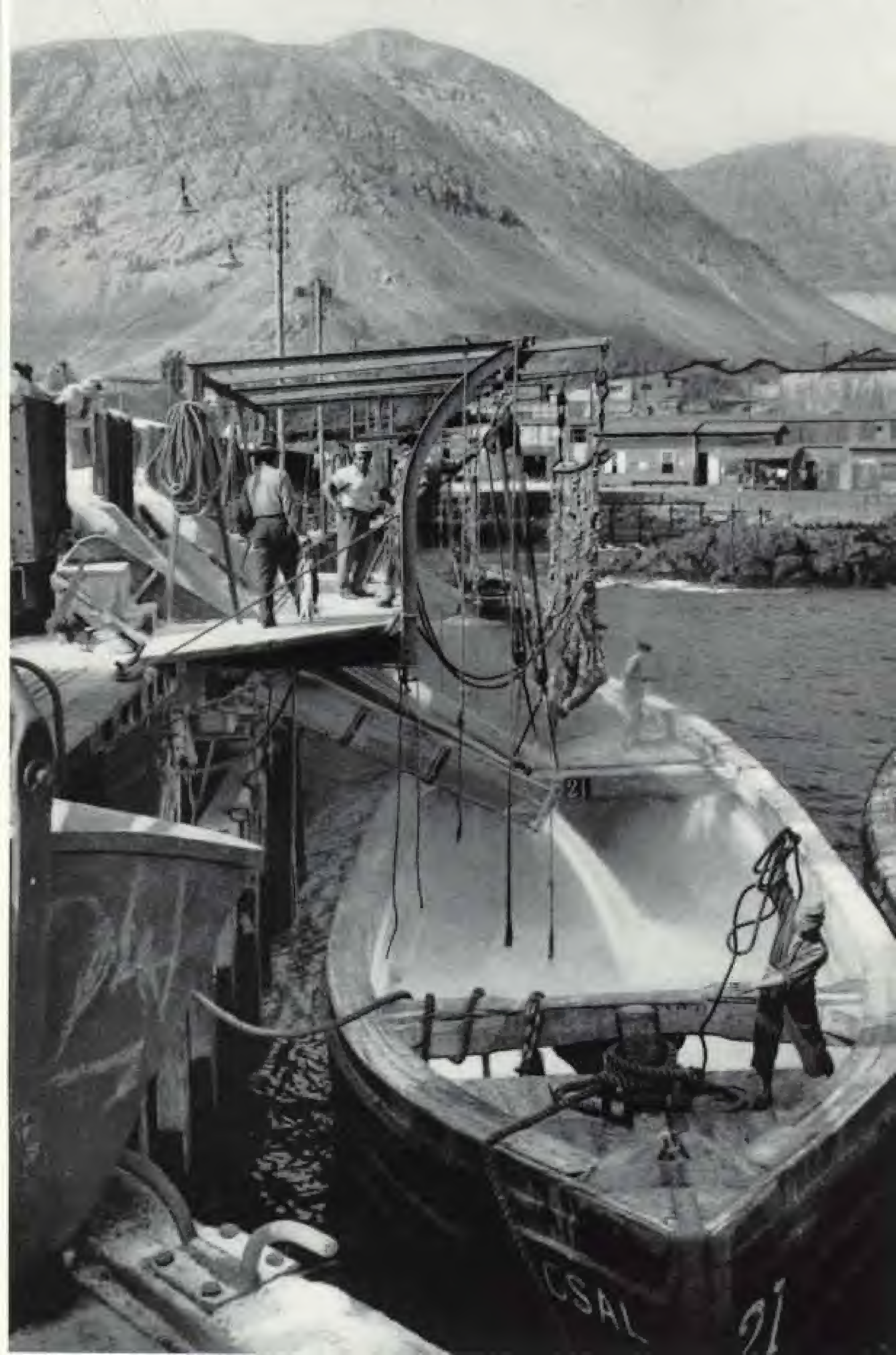
west of Valparaiso, is commonly known as "Robinson Crusoe Island." A marble tablet there honors the memory of Alexander Selkirk, the marooned Scottish sailor whose adventures on the island during the early 1700's formed the basis for Daniel Defoe's classic story.

Another Chilean possession, Easter Island, lies 2,300 lonely miles to the west. Its nearest inhabited neighbor, Pitcairn Island,\* is 1,500 miles farther on.

Because of Easter Island's strategic location as a crossroads in an empty ocean, I was not surprised to learn that Chile hopes to build a jet strip there. With greater accessibility, perhaps scientists will solve the remain-

\* See "I Found the Bones of the Bounty," by Luis Maiden, NATIONAL GEOGRAPHIC, December, 1957.













ing mysteries of Easter's civilization and the gigantic stone carvings\* that stud the volcanic outcroppings. Air routes across the South Pole may eventually tie Easter Island to the half-million square miles of Antarctica that Chile claims.

"Beauty and booty" could have been a rallying cry for raiders bound for Valparaiso. Today Chile's riches lie to the southeast, in the copper mountain called El Teniente, and far to the north in the enormous copper and nitrate deposits of the Atacama Desert.

The Pan American Highway (known in Chile as the Franklin D. Roosevelt Highway) took me 832 miles up the coast to Antofagasta, the copper port. From there I struck out to see Chuquibambilla, the richest open-pit copper mine in the world, nestling at 9,500 feet altitude in the Andean foothills.

When first I stood on the rim of the pit, I found it impossible to grasp its size: roughly two miles long and half a mile wide. A thousand feet below, at the bottom of a series of terraces, huge electric shovels gouged constantly deeper, while diesel-electric engines purred in and out with trainloads of ore.

Suddenly a tremendous geyser of earth spouted from the far end of the pit: 40 tons of explosives had torn loose 225,000 tons of ore. Seconds later the earth trembled underfoot as the shock reached our safe viewpoint. Then

*(Continued on page 233)*

\* See "Great Stone Faces of Easter Island" (11 illustrations from photographs), NATIONAL GEOGRAPHIC, February, 1944.

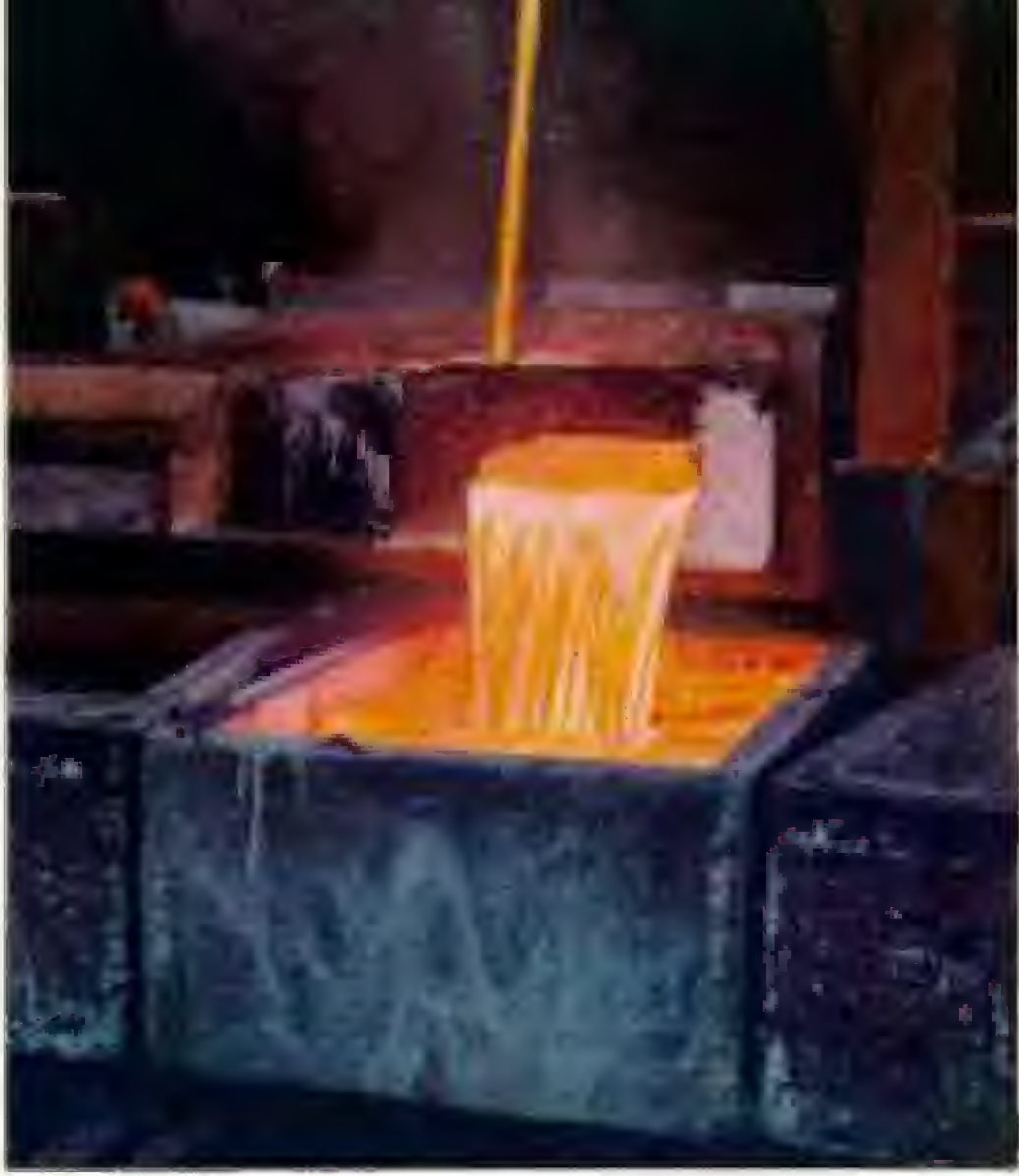
### At Dusk the Mining Town of Sewell Twinkles Like a Christmas Tree

Rising in tiers along a mountainside, Sewell's 107 apartment buildings house workmen employed at El Teniente copper mine. Built at an elevation of 8,000 feet, Sewell clings to a slope 50 miles southeast of Santiago.

The town takes its name from Barton Sewell, a founder of the Braden Copper Company, now a Kennecott subsidiary.

El Teniente (the lieutenant) ranks as the world's largest underground copper mine. According to legend, a fugitive Spanish army lieutenant discovered the ore body in 1760. Locked in the peak at right, the ore surrounds the cone of an extinct volcano. Some 212 miles of tunnels permit miners to tap the veins. To date the mountain has given up 10 billion pounds of copper.





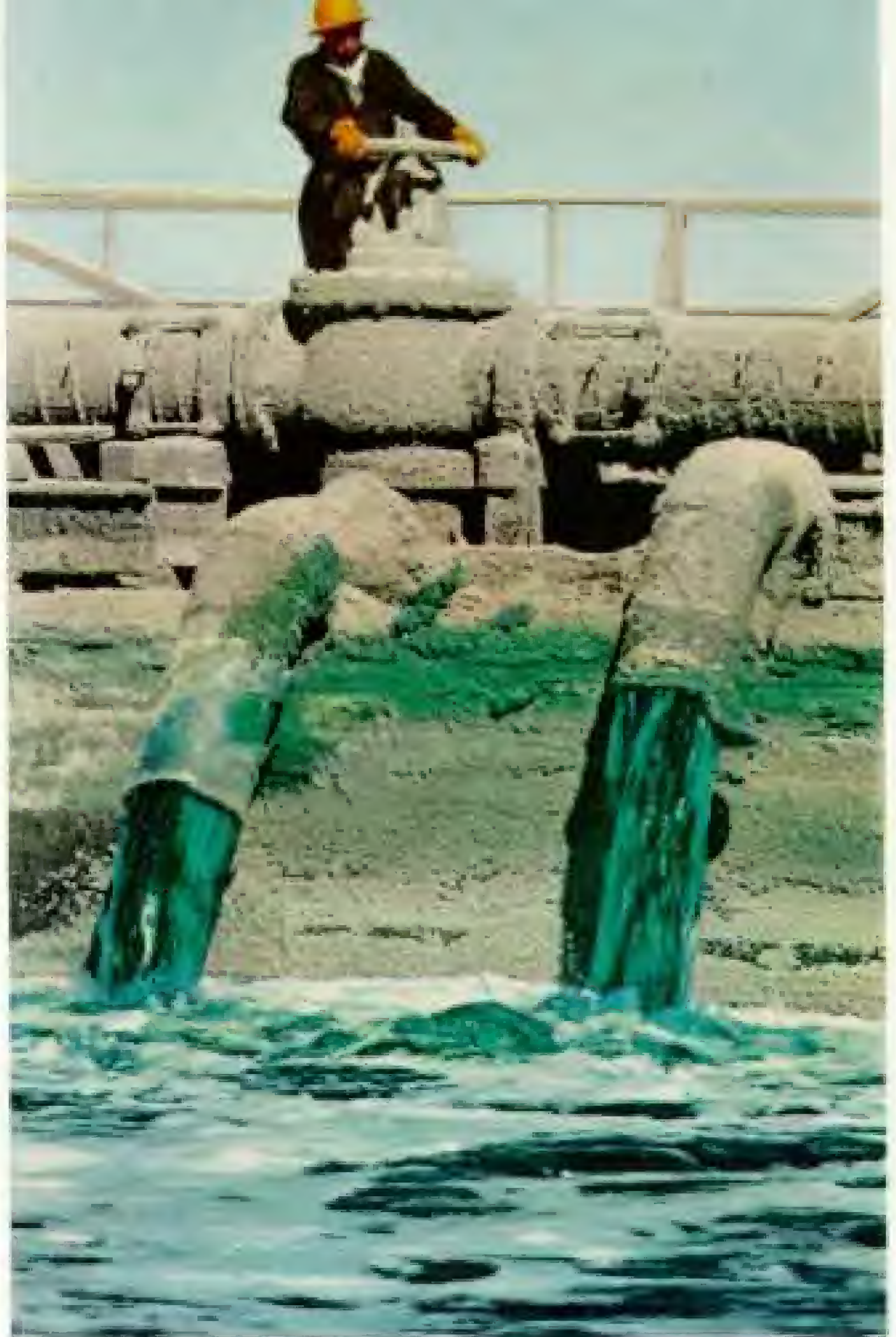
INDUSTRIAL SCENE IN AN IRON MINE (LEFT) OPERATED BY A FAMILIAR COMPANY, IN NEW YORK.





Molten copper gushes into a mold (far left) at Chuquicamata's smelter. Crusher, concentrator, and finally the smelter extract the metal from copper-sulfide ore. After pouring, the copper hardens into blister cakes.

Further processing awaits these blister cakes from Chuquicamata. Still too impure for commercial use, the 350-pound slabs will be refined electrolytically at the Raritan Copper Works, Perth Amboy, New Jersey. Raritan produces 99.98 percent pure metal.



KODACHROME © NATIONAL GEOGRAPHIC SOCIETY

Valve releases an inky bath of acid copper sulfate. Oxidized copper ore, mined at Chuquicamata, gives up its metal when leached in huge vats brimming with dilute sulfuric acid. Electrolysis then removes the metal from the solution.

"Whipped by gusty winds," the author recalls, "I strode onto a narrow catwalk between two vats to make the photograph. My hosts warned me that only my gold fillings would be recovered if I fell into the foaming acid."

### Chuquicamata's Pit Resembles a Battlefield as a Thunderous Blast Loosens Tons of Ore

World's richest copper mine, Chuquicamata's open pit looks like a gigantic amphitheater; its benches stand 52 feet high. Almost two miles long and a thousand feet deep, the man-made crater lies east of Tocopilla, where the Atacama Desert blends into the Andean cordillera.

The mine's history stretches back to pre-Inca times. Indians erected crude furnaces to smelt ore. Their copper ornaments have been found in tombs near by.

Explosives shatter the ore, and locomotives haul the rock to a crushing plant. Chuquicamata's output to date exceeds 13 billion pounds of copper. As a producer of the red metal, Chile ranks second only to the United States.





*Snow Water From the Andes Nourishes  
a Canyon Oasis in the Atacama Desert*

Chile's longest river, the Loa flows 260 miles from Miño Volcano to the Pacific; most streams dry up before they cross the desert. Rain rarely





© National Geographic Society

falls on this arid land. The chilly Peru Current and the high altitude hold daytime temperatures below 90 degrees. On winter nights a subfreezing

fog sometimes shrouds the ground. Ruins of Lasana, a pre-Inca pueblo, rise in tumbled mounds to the left of irrigated plots.







the shovels moved in to clear the way for more tracks.

Chuquicamata belongs to The Anaconda Company. Two-thirds of Chile's foreign exchange is provided by "Chuqui" and two other mines—the Anaconda mine at Potrerillos, northeast of Copiapó, and the Kennecott mine at Sewell. Only the United States outranks Chile in copper production.

#### Driest Desert Helps Feed the World

At many points in the Atacama Desert, 20 years may pass without a drop of rain. Over large areas the hard stony surface is utterly barren and devoid of plant life. Nowhere else on earth can the traveler find a more forbidding expanse of absolute desert.

As I walked out on the sterile expanse, my feet crunched into its crusty carapace. I stood under the sun, thinking of the Spaniard Almagro and his conquistadors who crossed this forbidding area in search of gold. How the swirling yellow dust devils must have filled their eyes and heightened their thirst.

The Atacama is "a sterility which has no use for man," wrote Gabriela Mistral, Chile's famed poet and Nobel Prize winner. How paradoxical it is that this place, where death reigns supreme, holds the world's only important deposit of life-giving nitrates, so useful as fertilizer for crops.

From Chuquicamata I drove down the slopes to María Elena, a capital of the nitrate world. There the desert loses its stark beauty. The coveted chemical lies in beds averaging 10 to 15 feet thick. Scoops and shovels dig to this depth; then trucks haul the brown earth to María Elena's plants, from which the chemical emerges as snowy powder. Plant-to-dock railroad cars transfer the refined material to Tocopilla, Chile's chief nitrate port (pages 224 and 225). Meanwhile, the desert remains a pitted battlefield, glorifying only the vast profits from its destruction.

The use of saltpeter, or nitrate, for explosives was known at least by the 13th century, when Roger Bacon described the composition of gunpowder. But no one knows when the Spaniards first discovered that the natural

nitrate of the desert could be used for fertilizer.

One story relates that two Chilean countrymen of the Province of Tarapacá became terrified when the desert around their campfire began to burn with a mysterious blue flame. They took samples of the material to their priest, who recognized it as nitrate, useful for gunpowder. As a man of peace, he had no use for the substance and threw it into his garden. His plants grew prodigiously, and an agricultural revolution was in the making.

Chile began exploiting nitrate commercially by 1850, for both explosives and fertilizer. For many decades substantial prosperity resulted. Then Chile's markets were staggered by the impact of synthetic nitrates developed during World War I; exports never regained their prewar importance. Today Chilean nitrate industrialists seek to stabilize their economy by turning to by-products. One of these by-products, iodine, now fills about 75 percent of the world supply.

Flying still farther north, past the port of Iquique where deep-sea fishermen take record catches of marlin, tuna, and swordfish, I looked down on Arica, Chile's northernmost city. There the high cliff of El Morro marks the battlefield of a bloody war.

When Chile first began to exploit the nitrate fields, her northern border was poorly defined. After all, why should anyone run a precise boundary through useless desert? But when Peru and Bolivia saw the sudden wealth to be had in the Atacama, they pressed claims to the area. In 1879 the War of the Pacific exploded, a fierce conflict between Chile and an alliance of Peru and Bolivia. Chile's armed forces soon triumphed. Though borders remained unsettled for years, Chileans gained possession of the rich desert, and Bolivia was left without a corridor to the sea.

#### Finding Friends at a Railroad Junction

Looking back on my passage through this long land, I feel that Chile's real wealth lies in the breadth of her people and their capacity for friendship. Out of my many experiences,

#### Forest of Candles Lights a Chapel at the Festival of Aiquina

Each September 5, as many as six thousand pilgrims visit this village in northern Chile to honor the Virgin Mary. Indians living as far away as 200 miles make the journey on foot; last year a Bolivian group walked for seven days to fulfill a vow.





Lace mantilla, high shell comb, and rose in hair deck a young dancer at the Alquiña festival. She sucks an orange while waiting for the music to start.

Costumed celebrants step to the rhythm of drum and flute in the Alquiña square. Dancing homage to the Virgin Mary, they emulate their ancestors, who so honored the pagan gods. Spanish padres who followed the conquistadors into Chile converted the northern Indians in the 1500's.



I recall most vividly an episode in traveling from Temuco to Concepción.

By mistake I got into the wrong car, and while I napped away the afternoon hours, the Pullman in which I should have been riding was dropped at a junction. Hours later, the conductor awakened me and told me I would have to leave the train.

"Fortunately, señor, we are just passing a small town where you can get a local back to Concepción," he apologized. "Someone will help you, I'm sure."

So I found myself standing in the darkness, somewhere in the middle of Chile. The rails rang with the sound of the departing train. In the other direction I could see the dim lights of a station.

Miraculously, five curious urchins appeared

out of the night. "Carry your bags, señor?" asked the biggest. The conductor was right. Someone *was* helping me.

Soon I sat in a tiny waiting room surrounded by several other passengers and a kindly ticket agent.

#### Stationmaster Drinks a Toast

Just how it all started I don't know, but before long we were chatting like old friends. The agent had opened his little wicket and was half out the window, satin sleeve protectors resting on his little shelf. His eyes happened to fall on my eight large pieces of baggage.

"These aluminum *maletas* of yours must have cost a fortune, señor," he ventured. "What in the world does one man need with





REPRODUCED BY © CAROLLE DEAN ROOPER, JR. © NATIONAL GEOGRAPHIC SOCIETY

so many. If I may ask?" I explained that I was a writer-photographer for an American magazine, preparing an illustrated article on his country.

That started it. Questions flooded. What did I think of Chile? How did I like the wines? And then, inevitably, what did I think of Chilean women? I said I thought they were beautiful, which was polite—but also true.

It was cold, and the double doors of the tiny, unheated station stood open to the night. This far below the Equator in May, the climate is like November in Washington. I shivered.

The agent noticed it, turned and called to someone. A moment later his wife appeared with small glasses of wine on a tray. After

offering them all around, the agent lifted his glass.

"Here's to the United States," he toasted. Somehow he managed to bow in my direction through his tiny window.

"Here's to Chile!" I replied.

Just then the local lumbered in. The youngsters swarmed at my baggage and took off down the platform, calling excitedly for me to hurry.

With a hasty goodbye to all, I started for the door.

"*Vaya con Dios—Go with God—señor,*" the agent waved. "A good trip to you. And whether you come from your famous magazine or not, come back to Chile. You will always be welcome!"

See what I mean?







# New Cities, Roads, Rails Sprout in South America

**A**BORIGINAL STILT VILLAGES along the fringes of Lake Maracaibo inspired Spanish explorers to name their discovery Venezuela—"Little Venice." A continent's length to the south, Magellan gazed at Indian fires on a wind-scoured shore and called it Tierra del Fuego—Land of Fire.

Today, in place of thatched dwellings, oil derricks rise over Maracaibo's waters, and the flames of Tierra del Fuego spout from waste gases of Chile's petroleum fields (page 200). Between them lies scarcely a country that has not found rich pools of "black gold."

From Caribbean to Cape Horn, the National Geographic Society's new Atlas Map **South America** reflects the continent's freshly tapped riches in growing road and rail networks, derrick symbols for oil fields, and new place names—new cities where none existed before. The measure of the continent's worth today lies not in the gold and gems the conquistadors once sought, but in lakes of oil, mountains of iron, miles of track; in coal, copper, and kilowatts.

## Brazil Builds an Inland Capital

The new map reaches 2,500,000 members as a 10-color supplement to their February **NATIONAL GEOGRAPHIC**. Designed as Plate 25 of the National Geographic Society's Atlas Folio, it provides up-to-date coverage of the whole continent, to be supplemented with large-scale regional Atlas Maps. One of them, **Southern South America**, already has been issued; two others, covering east and west, will follow.\*

Brazil, sprawling across nearly half a continent and bordering every South American country except Chile and Ecuador, inevitably dominates the new chart. And the most significant of the map's many new names appears here—Brasília, an ultramodern planned city which is scheduled to open for business this spring as Brazil's capital.

Imaginatively designed, Brasília in outline resembles a giant dragonfly. It was born of a law as audacious as its architecture: in 1956 the government simply decreed that it would build this city on a remote plateau 600 miles inland and move to it from Rio de Janeiro by April, 1960.

Eventually the new capital is intended to house half a million people and speed devel-

opment of the largely unsettled area around it. Already its impact is visible in a new highway threading northward some 1,400 miles to the port of Belém. This artery opens up nearly two million square miles of plateau and Amazon jungle lands. Similarly, a nearly completed railway pierces unexploited territory between Rio and Brasília.

Other new railroads creep across the map, each a sinuous symbol of fresh wealth unlocked from the earth. In northeastern Brazil, rails link the new town of Serra do Navio—where great blocks of rich manganese ore litter the ground—with the equally new port of Porto Santana. In Peru's Andean south, trains climb from the port of Ilo to the freshly exposed copper mountain of Toquepala, in an area that may yield a billion tons of ore.

## Jet Age Comes to South America

Red stars pinpoint many new airports on the map, for South America has vaulted impatiently into the air age. Today a stylish São Paulo woman thinks nothing of a morning flight to Rio for a dressmaker's fitting. The longest nonstop overland flight on any commercial schedule connects Rio with Caracas, 2,800 jungle and mountain miles northwest. Lima and Asunción are building landing strips for jet flights soon to start.

The continent's largest hydroelectric-power project is taking shape at Furnas Dam on the Rio Grande northwest of Rio de Janeiro; its output will serve fast-growing industries. Argentina's El Chocón Dam, under construction on the Limay River in Patagonia for irrigation and power, will create one of the biggest artificial lakes in the world.

Fourteen insets enlarge island areas off the coast of South America, and even these reflect progress. Great stone images brood on Easter Island over an airstrip newly cleared for the Chilean Air Force. And Brazil's Fernando de Noronha—long an isolated penal colony—now serves 20th-century technology as a United States Atlantic Missile Range station for tracking long-range rockets.

\* Fifteen Atlas Maps have now been issued, designed to fit the convenient Atlas Folio. Individual maps, 50¢ each; the Folio, \$4.85. A packet of the seven 1958 maps or the seven 1959 maps (folded once), 55¢; both packets, \$5.50; both packets (14 maps) with Atlas Folio, \$9.95. All are available from National Geographic Society, Dept. 34, Washington 6, D. C.







*How does one sum up a man of Abraham Lincoln's stature? His biographer, the distinguished poet, chose these words before a Joint Session of Congress and the assembled diplomatic corps on February 12, 1959*

## *Lincoln, Man of Steel and Velvet*

By CARL SANDBURG

**N**OT OFTEN IN THE STORY of mankind does a man arrive on earth who is both steel and velvet, who is as hard as rock and soft as drifting fog; who holds in his heart and mind the paradox of terrible storm and peace unspeakable and perfect.

Here and there across centuries come reports of men alleged to have these contrasts. And the incomparable Abraham Lincoln, born 150 years ago this day, is an approach if not a perfect realization of this character.

In the time of the April lilacs in the year 1865, on his death, the casket with his body was carried north and west a thousand miles; and the American people wept as never before; bells sobbed; cities wore crape; people stood in tears and with hats off as the railroad burial car paused in the leading cities of seven States, ending its journey at Springfield, Illinois, the home town.

**D**URING THE FOUR YEARS he was President, he at times, especially in the first three months, took to himself the powers of a dictator; he commanded the most powerful armies till then assembled in modern warfare; he enforced conscription of soldiers for the first time in American history; under imperative necessity he abolished the right of habeas corpus; he directed politically and spiritually the wild, massive, turbulent forces let loose in civil war. He argued and pleaded for compensated emancipation of the slaves.

The slaves were property; they were on the tax books along with horses and cattle, the valuation of each slave written next to his name on the tax assessor's books. Failing to get action on compensated emancipation, as a Chief Executive having war powers he issued the paper by which he declared the slaves to be free under "military necessity." In the end nearly four billion dollars' worth of property was taken away from those who

were legal owners of it—property confiscated, wiped out as by fire and turned to ashes, at his instigation and executive direction. Chattel property recognized and lawful for 250 years was expropriated, seized without payment.

In the month the war began, he told his secretary, John Hay, "My policy is to have no policy." Three years later in a letter to a Kentucky friend made public, he confessed plainly, "I have been controlled by events."

**H**IS WORDS AT GETTYSBURG were sacred, yet strange with a color of the familiar: "We can not consecrate—we can not hallow—this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract."

He could have said "The brave Union men." Did he have a purpose in omitting the word "Union"? Was he keeping himself and his utterance clear of the passion that would not be good to look back on when the time came for peace and reconciliation? Did he mean to leave an implication that there were brave Union men and brave Confederate men, living and dead, who had struggled there? We do not know, of a certainty.

Was he thinking of the Kentucky father whose two sons died in battle, one in Union blue, the other in Confederate gray, the father inscribing on the stone over their double grave, "God knows which was right"? We do not know.

His changing policies from time to time always aimed at saving the Union. In the end his armies won and his Nation became a world power.

In August of 1864 he wrote a memorandum that, in view of the national situation, he expected to lose the next November election; that month of August was so dark. Sudden



military victory brought the tide his way; the vote was 2,200,000 for him and 1,800,000 against him. Among his bitter opponents were such figures as Samuel F. B. Morse, inventor of the telegraph, and Cyrus H. McCormick, inventor of the farm reaper. In all its essential propositions the Southern Confederacy had the moral support of powerful, respectable elements throughout the North, probably more than a million voters believing in the justice of the Southern cause.

While the war winds howled, he insisted that the Mississippi was one river meant to belong to one country, that railroad connection from coast to coast must be pushed through and the Union Pacific Railroad made a reality.

While the luck of war wavered and broke and came again, as generals failed and campaigns were lost, he held enough forces of the North together to raise new armies and supply them, until generals were found who made war as victorious war has always been made, with terror, frightfulness, destruction, and on both sides, North and South, valor and sacrifice past words of man to tell.

In the mixed shame and blame of the immense wrongs of two crashing civilizations, often with nothing to say, he said nothing, slept not at all, and on occasions he was seen to weep in a way that made weeping appropriate, decent, majestic.

AS HE RODE ALONE on horseback near Soldiers' Home on the edge of Washington one night, his hat was shot off; a son he loved died as he watched at the bed; his wife was accused of betraying information to the enemy, until denials from him were necessary.

An Indiana man at the White House heard him say, "Voorhees, don't it seem strange to you that I, who could never so much as cut off the head of a chicken, should be elected, or selected, into the midst of all this blood?"

He tried to guide Gen. Nathaniel Prentiss Banks, three times Governor of Massachusetts, in the governing of some 17 of the 48 parishes of Louisiana controlled by the Union armies, an area holding a fourth of the slaves of Louisiana. He would like to see the State recognize the Emancipation Proclamation: "And while she is at it, I think it would not be objectionable for her to adopt some practical system by which the two races could gradually live themselves out of their old relation to each other, and both come out better prepared for the new. Education for

young blacks should be included in the plan."

To Gov. Michael Hahn, elected in 1864 by a majority of the 11,000 white male voters who had taken the oath of allegiance to the Union, Lincoln wrote: "Now you are about to have a Convention which, among other things, will probably define the elective franchise. I barely suggest . . . whether some of the colored people may not be let in—as, for instance, the very intelligent, and especially those who have fought gallantly in our ranks."

AMONG THE MILLION WORDS in the Lincoln utterance record, he interprets himself with a more keen precision than someone else offering to explain him. His simple opening of the House Divided speech in 1858 serves for today: "If we could first know *where* we are, and *whither* we are tending, we could then better judge *what* to do, and *how* to do it."

To his Kentucky friend, Joshua F. Speed, he wrote in 1855: "Our progress in degeneracy appears to me to be pretty rapid. As a nation, we began by declaring that '*all men are created equal*.' We now practically read it '*all men are created equal, except negroes*.' When the Know-Nothings get control, it will read '*all men are created equal, except negroes, and foreigners, and catholics*.' When it comes to this I should prefer emigrating to some country where they make no pretense of loving liberty."

Infinitely tender was his word from a White House balcony to a crowd on the White House lawn, "I have not willingly planted a thorn in any man's bosom," or to a military governor, "I shall do nothing through malice; what I deal with is too vast for malice."

He wrote for Congress to read on December 1, 1862: "In times like the present, men should utter nothing for which they would not willingly be responsible through time and in eternity." Like an ancient psalmist he warned Congress: "Fellow-citizens, we cannot escape history. We . . . will be remembered in spite of ourselves. No personal significance, or insignificance, can spare one or another of us. The fiery trial through which we pass, will light us down, in honor or dishonor, to the latest generation."

Wanting Congress to break and forget past traditions, his words came keen and flashing: "The dogmas of the quiet past, are inadequate to the stormy present. . . . We must think anew, and act anew. We must disenthrall our-



selves." They are the sort of words that actuated the mind and will of the men who created and navigated that marvel of the sea, the *Nautilus*, on her voyage from Pearl Harbor and under the North Pole icecap.

The people of many other countries take Lincoln now for their own. He belongs to them. He stands for decency, honest dealing, plain talk, and funny stories. "Look where he came from—don't he know all us strugglers and wasn't he a kind of tough struggler all his life right up to the finish?" Something like that you can hear in any near-by neighborhood and across the seas.

Millions there are who take him as a personal treasure. He had something they would like to see spread everywhere over the world.

Democracy? We can't say exactly what it is, but he had it. In his blood and bones he carried it. In the breath of his speeches and writings it is there.

Popular government? Republican institutions? Government where the people have the say-so, one way or another telling their elected leaders what they want? He had the idea. It is there in the lights and shadows of his personality, a mystery that can be lived but never fully spoken in words.

Our good friend, the poet and playwright

Mark Van Doren, tells us, "To me, Lincoln seems, in some ways, the most interesting man who ever lived. He was gentle, but this gentleness was combined with a terrific toughness, an iron strength."

**H**OW DID LINCOLN SAY he would like to be remembered? Something of it is in this present occasion, the atmosphere of this room. His beloved friend, Representative Owen Lovejoy, of Illinois, had died in May of 1864, and friends wrote to Lincoln and he replied that the pressure of duties kept him from joining them in efforts for a marble monument to Lovejoy, the last sentence of Lincoln's letter saying:

"Let him have the marble monument, along with the well-assured and more enduring one in the hearts of those who love liberty, unselfishly, for all men."

Today we may say, perhaps, that the well-assured and most enduring memorial to Lincoln is invisibly there, today, tomorrow, and for a long time yet to come. It is there in the hearts of lovers of liberty, men and women—this country has always had them in crisis—men and women who understand that wherever there is freedom there have been those who fought, toiled, and sacrificed for it.

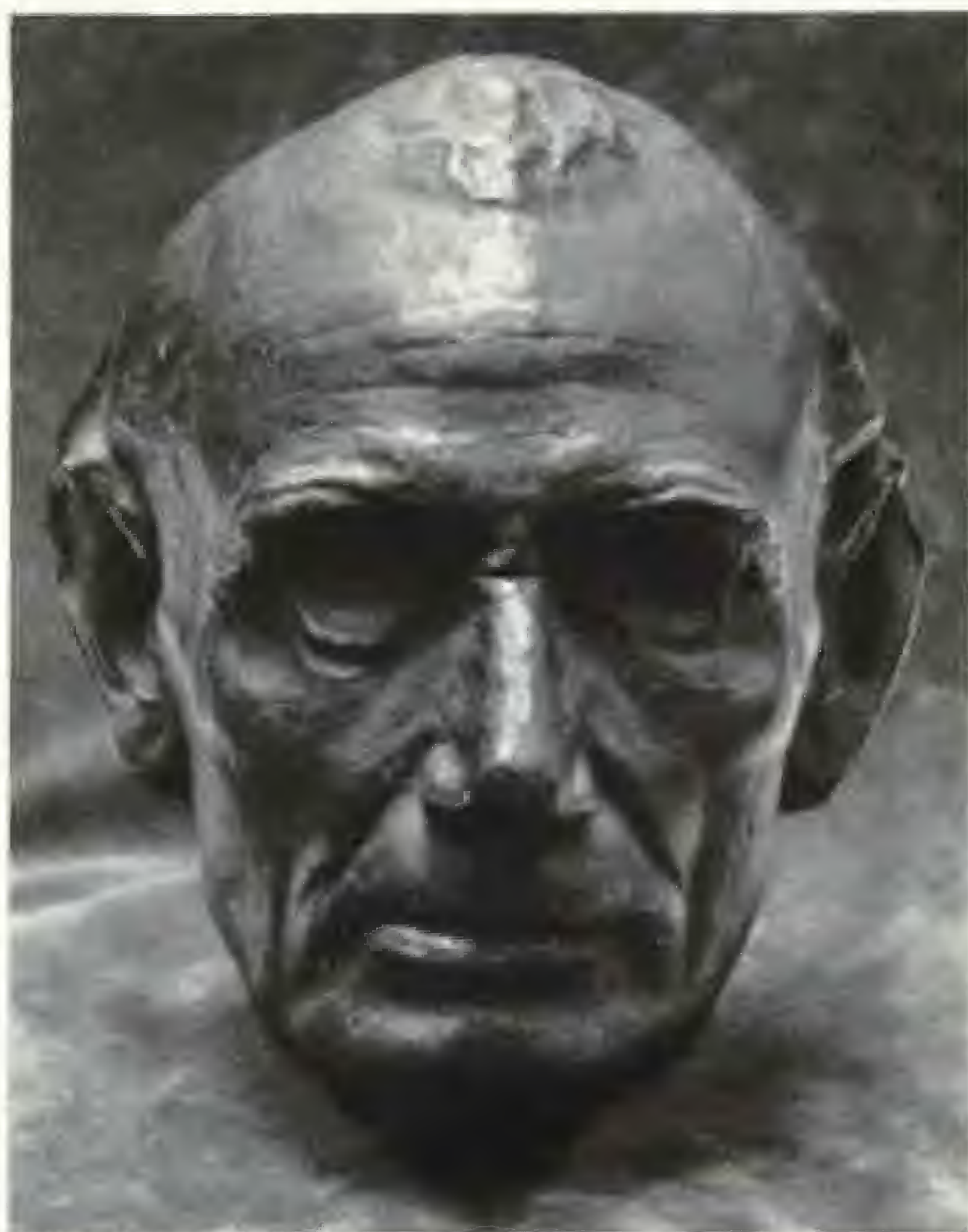
**Lincoln's Life Mask:  
Molded by Volk and  
Photographed by Steichen**

Meeting Lincoln in 1858, the Ohio editor David R. Locke wrote: "I never saw a more thoughtful face. I never saw a more dignified face. I never saw so sad a face."

Two years later sculptor Leonard Wells Volk captured the look of thoughtful dignity and haunting sadness for the generations who would never see it in life.

Lincoln sat for the mask in Volk's Chicago studio between the court sessions that brought him to the city. The artist modeled wet plaster on the lawyer's face and waited an hour for it to harden. Pulling the mold off "hurt a little... and made his eyes water," Volk recalled.


Of his features frozen in Volk's work, Lincoln exclaimed, "There was the animal himself."











# Our Land Through Lincoln's Eyes

By CAROLYN BENNETT PATTERSON  
*National Geographic Staff*

*Kodachromes by National Geographic  
Photographer W. D. VAUGHN*

**“W**E CANNOT ESCAPE HISTORY. We . . . will be remembered in spite of ourselves.” Abraham Lincoln's prophecy rings true as we look back over the past year, celebrated around the world as the 150th anniversary of his birth.

In school and statehouse, courthouse and Congress, in song, drama, speech, and printed word, men paid tribute. Throughout the 24 States where Lincoln lived and moved, thousands walked in his footsteps, reliving episodes of his life. On every hand bronze marker and granite monument proclaimed the sites that Lincoln knew: Here he slept, there he walked, yonder he spoke.

Traveling through those States, photographer Vaughn and I sought features of the land that Lincoln himself might still recognize. In recording what remains from the past, we hoped to encounter those forces and discover those truths that gave power to a giant who held destiny in a gnarled hand.

“In this temple as in the hearts of the people for whom he saved the Union the memory of Abraham Lincoln is enshrined forever.” The Lincoln Memorial in the Nation's Capital draws nearly two million visitors a year.



*I was born Feb. 12, 1809, . . .  
My earliest recollection  
is of the Knob Creek place*

Lincoln remembered his Kentucky years—  
six at the farm on the right—  
in two letters to Samuel Haycraft, 1860.

The facts of Lincoln's birth lie like seeds buried in the rich soil of legend. Decades after the event, neighbors and relatives "remembered," and thus the saga grew. Yet the truth still lies where all can see: in the Kentucky landscape, in a rough cabin, in a dusty court record announcing the sale on December 12, 1808, of a 300-acre tract near the present Hodgenville to Thomas Lincoln. From such we reconstruct.

Only cedars in winter green broke the drab of the gently rolling Kentucky Barrens on the winter day that Thomas Lincoln, his wife Nancy, and their infant daughter Sarah moved to Sinking Spring farm. Heavy with child, the mother set to making a home in the one-room, dirt-floor log cabin. From its ax-hewn door she saw the bare, spreading limbs of the Boundary Oak, then a 150-year-old landmark.

A few weeks later Nancy gave birth to



Abraham, named after a grandfather who was killed by Indians. Looking on the wrinkled scrap of humanity, a 9-year-old cousin exclaimed—or so it was later recalled—"He'll never come to much."

Today the shaved lawns and paved walkways of Abraham Lincoln Birthplace National Historic Site surround the traditional natal cabin, itself preserved in an imposing memorial of marble and pink granite. But the venerable Boundary Oak and a sunken moss-rimmed spring remain the same as on that sunrise when Thomas Lincoln stepped outside the cabin to take the first look at his infant son in the light (*left*).

The drawing, by W. A. Rogers, appeared in the *New York Herald* on the 100th anniversary of Lincoln's birth.





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In the spring of 1811 Thomas moved his family 10 miles to another log-cabin home on Knob Creek (*above*). "Our farm was composed of three fields...surrounded by high hills and deep gorges," said Abraham.

Growing up, the boy ran errands, hunted rabbits, picked berries, and played with his friend Austin Gollaber. Once Abe tumbled into flood-swollen Knob Creek and would have drowned had not Austin pulled him to safety.

Work on the farm came early. One Saturday Abraham dropped pumpkin seeds while other boys planted corn in the seven-acre "big field."

"The next Sunday morning there came a big rain in the hills," Lincoln remembered. "It did not rain a drop in the valley, but the water coming down through the gorges washed

ground, corn, pumpkin seeds and all clear off the field."

When they could be spared from chores, Abe and his sister trudged two miles to a one-room school kept by itinerant teachers.

In this view of the Knob Creek homesite, oak and hickory still climb the steep slopes. In the vale, soft green tints the fields and transforms a weeping willow into a verdant cloud. Waters of Knob Creek, rustling over stones, make everlasting song. The reproduction of the Lincoln cabin, made from the logs of Austin Gollaber's home, keeps a look of frontier peace. But in Lincoln's memory the home forever represented "stinted living."

In December, 1816, the Lincolns sold most of their possessions and set out along the Cumberland Trail for Indiana.







*My childhood's home I see again,  
And sadden with the view;  
And still, as memory crowds my brain,  
There's pleasure in it too*

Lincoln wrote the poem after returning in 1844 to Indiana, where he had lived in a log cabin (left) and had buried his mother (lower).

During the first weeks in Indiana the family lived in a rude three-sided lean-to, eating game, drinking melted snow, and huddling together for warmth.

Tom built a log cabin; not two years later its one room saw the body of wife and mother laid to rest in a hand-made coffin. "Sorrow comes to all," wrote Abraham, "and to the young it comes with bitterest agony, because it takes them unawares." Trees flamed with autumn color when the family buried Nancy. Sixty-one years later her tombstone was "Erected by a friend of her Martyred Son."

Abe worked the land and "went to A.B.C. schools by littles." The aggregate of all his schooling "did not amount to one year." But he walked miles to borrow books. Lincoln Pioneer Village, Rockport, reproduces the family cabin, which gives meaning to his summary of the Indiana years: "The short and simple annals of the poor."



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*I can remember... the  
journey with my  
father and mother  
to Southern Indiana*

Lincoln spoke to Leonard Swett in 1863 of the move from Kentucky.

Braving chill winds, Tom, Nancy, Sarah, and 7-year-old Abe crossed the Ohio River into Indiana's wilderness. "The panther's scream, filled night with fear and bears preyed on the swine," Abraham recalled. Hacking a 17-mile path through the tangle, the father selected a homesite near present-day Gentryville and Rockport; it stood almost a mile from the nearest spring.

This artist's conception of the 1816 trek appeared in a German book the year following Lincoln's death.











FROM THE HEROIC LIFE OF ABRAHAM LINCOLN — PUBLISHED BY DOWLEY, YORK & CO. 1865

*When he was nineteen . . . he  
made his first trip upon a  
flat-boat to New-Orleans*

Lincoln spoke of New Orleans, with its French Market (opposite), in an autobiography written in 1860 in the third person.

After working as a ferryboat helper on the Ohio River, 18-year-old Abe went into business for himself in the summer of 1827. He built a flatboat and started hauling passengers and luggage out to steamers anchored off the riverbank at Rockport, Indiana.

James Gentry, a prosperous landowner, noted the youngster's enterprise and asked him to take a cargo of produce down the Ohio and Mississippi Rivers to New Orleans.

"He was a hired man merely; and he and a son of the owner, without other assistance, made the trip," wrote Lincoln in his third-person autobiography.

The young men set off in the spring of 1828. The current powered their boat; a stern oar guided it (*above*). They may have stopped at Memphis or bustling Vicksburg. Trading along the Louisiana sugar coast, they were attacked one night "by seven negroes with intent to kill and rob them. They were hurt some in the melee, but succeeded in driving the negroes from the boat," Lincoln wrote.

And so they drifted down to New Orleans, a French-founded city of 40,000 people, already old when the Nation was born. Ma-

neuvering their flatboat to an anchorage amid proud square-riggers, keelboats, log rafts, and other small craft, the backwoodsmen stepped out into another world.

Strolling the narrow, cobbled streets, Abe elbowed past sailors from the ports of Europe, brushed by Spanish-French dandies who considered the term "American" provocation for a duel, and stood aside as women in silk and lace swept by. He may have peered through doorways into garden courtyards where French wines sparkled; heard the laughter and oaths that spilled from saloons and casinos; glimpsed the Old World luxury of gleaming silver, fragile china, and graceful furniture.

And he must have seen Negroes in chains, in labor gangs, and on the slave block. Years later the legend grew up that a New Orleans slave auction so sickened Lincoln that he cried: "Boys, let's get away from this. If ever I get a chance to hit that thing, I'll hit it hard."

Modern New Orleans, treasuring its French traditions, preserves some of the landmarks that struck wonder in the rustic, rawboned Abraham. Balconies with iron lace standing during Lincoln's visit remain as islands among houses built later. St. Louis Cathedral, seen from the river, looks like an antique toy dropped between warehouses and skyscrapers.

Here at the French Market, where the Indiana youths sold their produce, time seems to stand still. In the dark hours of early morning, these countrymen with their vegetables await the buyers that dawn will bring.



**ILLINOIS**

**NEW SALEM:** In this frontier town, 1831-7, Lincoln served as storekeeper, postmaster, and surveyor; studied grammar, mathematics, and law.

**VANDALIA:** Filled his first elective office, a seat in the State Assembly.

**SPRINGFIELD:** His home town after 1837; practiced law and rode the circuit; married Mary Todd, who bore him four sons.

**OTTAWA, Freeport, Jonesboro, Charleston, Galesburg, Quincy, and Alton** witnessed Lincoln-Douglas debates. Lincoln covered 50 other towns in campaign for U. S. Senate. Lost election but gained national renown for his eloquence.

**CHICAGO:** Attended River and Harbor Convention, 1847; pleaded law suits, 1850-1860, spoke many times.



**KANSAS TERRITORY**  
ORGANIZED FROM  
STATE, 1820

*Strove to unite Republicans in these Kansas towns, 1859*





CANADA

MAINE

**NEW ENGLAND**  
Twenty towns, including four capitals, heard Lincoln speak on two tours, 1848 and 1860.

**NEW YORK**  
N.Y. CITY: His Cooper Union speech in February, 1860 launched Eastern campaign for presidential nomination.  
NIAGARA: Discovered, first hand, Niagara's "power to excite reflection," 1848.

VT

Concord  
N.H. Exeter

MASS. Boston

Hartford  
CONN. R.I. Providence

**MICHIGAN**  
Addressed crowd of 10,000 at Kalamazoo in campaign for Fremont, 1856  
\*Kalamazoo

Lake Huron

Lake Ontario

Lake Erie

Detroit

Niagara Falls

Buffalo

**NEW YORK**

Albany

West Point

New York

ANA

**OHIO**

Columbus

**PENNSYLVANIA**

Pittsburgh

Gettysburg address November 19, 1863.

Gettysburg

Antietam

Harpers Ferry

Harrisburg

**NEW JERSEY**

Philadelphia

**MARYLAND**

Reviewed troops at Frederick, visited Antietam battlefield, 1862.

**WASHINGTON, D. C.**

Served as Representative, 1847-49; President, 1861-65; assassinated, 1865.

**WEST VIRGINIA**  
state 1863

Met McClellan at Harpers Ferry, 1862.

Washington

MD. Baltimore

DEL.

Fredericksburg

James

Richmond

Petersburg

**VIRGINIA**

Fort Monroe

Norfolk

**VIRGINIA**

Personally directed capture of Norfolk, May, 1862. Reviewed troops near Fredericksburg, April, 1863. Walked Richmond streets almost unattended day after city fell, April, 1865.

**TUCKY**

**KENTUCKY**

HODGENVILLE: Lincoln born near by, February 12, 1809.

KNOB CREEK FARM: Family moved here in 1811.

LOUISVILLE: Lincoln visited his old friend Joshua Speed in 1841.

LEXINGTON: On the way to Congress in 1847, the Lincolns stayed 3 weeks with Mary's family.

\*Atlanta

\*Columbia

**SOUTH CAROLINA**

**NORTH CAROLINA**

\*Raleigh

**GEORGIA**

**OHIO**

CINCINNATI: Spoke for his candidates in the State elections, 1859.

COLUMBUS: Addressed the State Legislature on his inaugural trip to Washington, 1861.

TRAVELS OF

A. Lincoln

SHADED AREA MARKS STATES IN WHICH LINCOLN TRAVELED

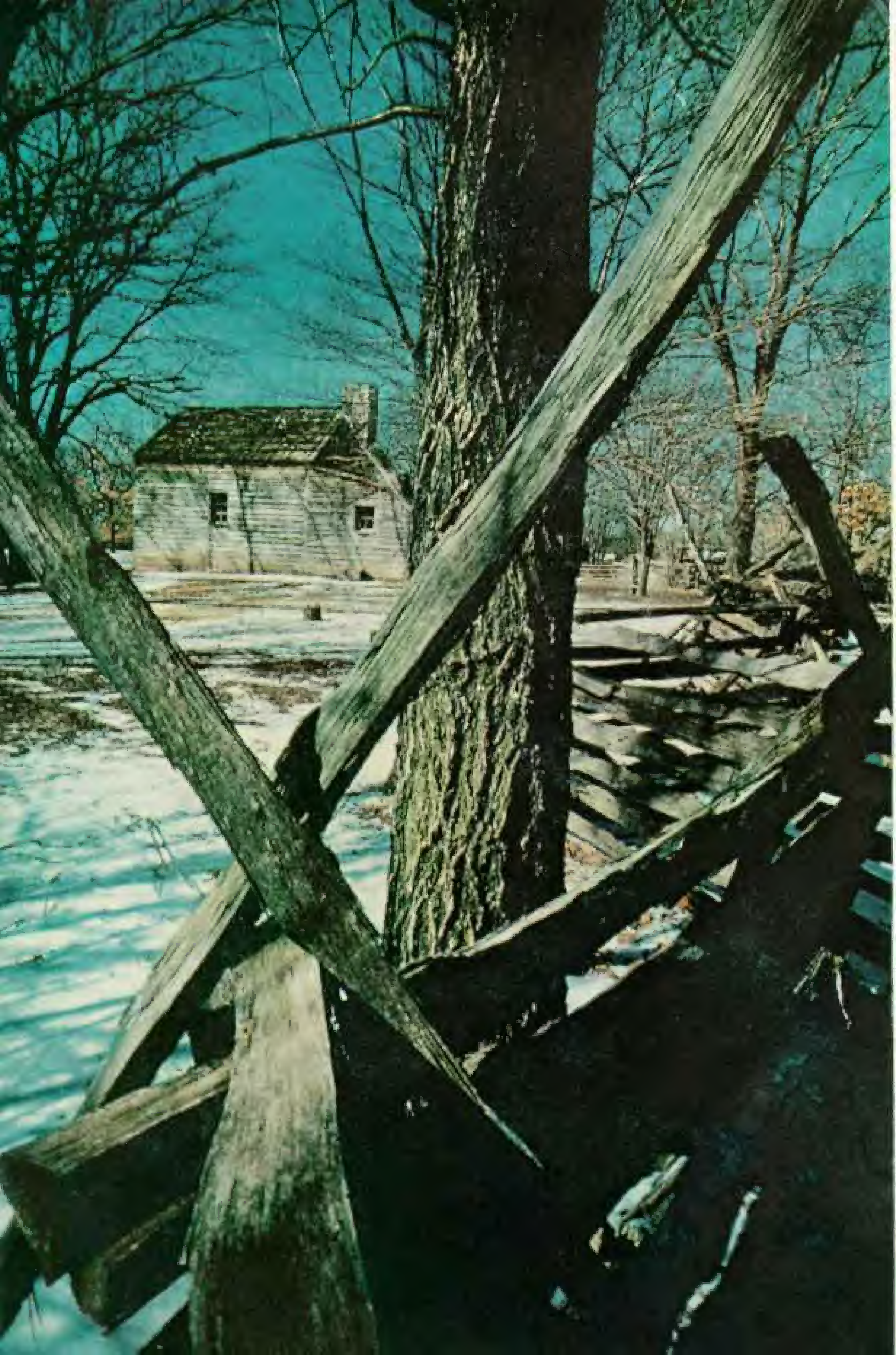
FLORIDA

Scale: 0 50 100 150 MILES

Design: William N. Palmstrom  
Map: V. J. Kelly and J. H. Eastman  
Sketches: L. F. Allen

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## *At New-Salem . . . he rapidly made acquaintances and friends*

New Salem (opposite), about which Lincoln wrote in his third-person autobiography, stands reconstructed.

Three years passed between Lincoln's 1828 trip to New Orleans and his arrival as "a piece of floating driftwood" at New Salem, Illinois, a log-cabin village crowning a bluff above the Sangamon River. They were years of back-breaking toil—clearing the forest, splitting rails, plowing, planting—and some travel.

In the spring of 1830 Abraham helped his father, his kindly stepmother, and several relatives to move 200 miles from Gentryville, Indiana, to a new farm near Decatur, Illinois (map, page 250). En route, the party paused at historic Vincennes, Indiana.

When the family moved again the following spring, Abe struck out on his own, floating another cargo of produce to New Orleans, this time for Denton Offutt.

"Offutt . . . conceived a liking for A.," Lincoln wrote of himself, "believing he could turn him to account." Offered a job, Abe went to work in Offutt's store and mill at New Salem. The pioneer community, never larger than 25 homes and stores, offered surprising opportunities to young Lincoln. He debated with the town intellectuals, "studied English grammar, imperfectly, of course," and sharpened his mind on mathematics.

When Offutt's store almost "winked out," Abe enlisted as a volunteer in the Black Hawk War. Chosen captain of his company at Richland (*right*), the raw recruit marched off to the Rock River and into the swamps around Wisconsin's Lake Koshkonong. "Served near three months, met the ordinary hardships of such an expedition, but was in no battle," the soldier reported. However, he saw the aftermath of a fight; white men lying dead on a field, heads bloody from an Indian scalping party. "It was frightful, but it was grotesque; and the red sunlight seemed to paint everything all over."

Returning to New Salem, Lincoln ran for the State Legislature. His appeal to the voters said, "I was born and have ever remained in the most humble walks of life. . . . If the good people . . . keep me in the back ground, I have been too familiar with disappointments to be very much chagrined." He lost.

Buying into partnership with William F. Berry, Abraham became a merchant. Failure of the business left him in debt for a decade. A postmaster through these months, he now had to earn extra money as a mill hand, farm laborer, rail splitter, and surveyor. In April, 1834, Lincoln ran for the Legislature a second time and won. The Representative-elect began to study law "in good earnest." In November he swung aboard a stagecoach for Vandalia, then the State capital.

Lincoln's New Salem petered out soon after he left, but the village—reconstructed—rose anew in the 1930's as a place of pilgrimage. Here in winter's isolation New Salem seems haunted by ghosts of the past. Icy branches of trees murmur above the Berry-Lincoln store, and the weathered fence calls to mind the bony Rail Splitter.







*Here I have lived a quarter  
of a century*

Leaving his Springfield, Illinois, home (opposite) for the White House, Lincoln spoke this farewell to his friends.

When Lincoln moved to Springfield, Illinois, he was 28 years old, a self-taught lawyer, lacking cash to buy bed linen. He left as an attorney, the possessor of his own home—and President-elect of the United States. Speaking farewell, he poured out his gratitude. "To this place, and the kindness of these people, I owe every thing."

Springfield returned his affection and treasured landmarks Abraham could have seen while pulling his son through the streets (*left*). A mansion where Lincoln attended parties still keeps the long mirrors that reflected a long man. The Lincoln pew at the First Presbyterian Church is enshrined by the congregation. The only home Lincoln ever owned stands today as a State museum. Expertly restored, the rooms display many Lincoln possessions, arranged in the order shown in this contemporary sketch.

FROM THE FURNISHING. — PUBLISHED BY GARDNER & GREENE, 1891.











*A. Lincoln . . . will practice . . .  
in the courts of this  
judicial circuit*

Lincoln announced his law practice in  
the *Sanguin's Journal*, April 15, 1837,  
and later pleaded cases at Mt. Pulaski.

Each spring and fall the lawyer set off  
from Springfield on horseback, often  
with book in hand (*right*), following  
judges from one courthouse to another  
in the Eighth Judicial Circuit of Illinois,  
a domain 110 miles long and 120 miles  
across. On the wide prairie, farmhouses  
lay hours apart; rain and sleet slowed  
the pace. But memory of hardship faded  
at the county seats where Abe honed  
his wit against that of his colleagues.

Mt. Pulaski Court House (*above*),  
where Lincoln practiced, now stands mu-  
seum quiet, a stage with no actors.





*He was elected to the lower house of Congress, and served one term only*

Representative Lincoln in 1847 took his seat in the United States Capitol (below, as seen from Pennsylvania Avenue).

The arrival of Representative Lincoln at the United States Capitol culminated 15 years of political activity. During the 1840 presidential campaign he had crisscrossed Illinois for the Whigs, even invading the Democratic bastion of Egypt, the State's southern region.

As Lincoln's future in public life looked brighter, so did that of his private life. He married Mary Todd in November, 1842. By 1846, when the voters chose him for the House of Representatives, the family had grown by two sons.

Shortly before setting out for Washington, D. C., Lincoln went to Chicago for the first time, to attend the River and Harbor Convention. Standing beside Lake Michigan, he watched grain boats begin their parade around the Great Lakes.

Congress-bound by way of Lexington, Kentucky, Mary's home town, the Lincoln family took a stage for St. Louis. River steamers carried them down the Mississippi and up the Ohio. Passing Louisville, Lincoln may have mused over a sojourn near by six years earlier

as a guest of his friend Joshua Speed at Farmington, a mansion designed by Thomas Jefferson. Memory of that time yet lingers; last spring, during ceremonies opening the house to the public, members of the Speed family reenacted Lincoln's arrival at Farmington.

In Washington the new Congressman took his seat in a Capitol that had yet to add the cast-iron dome and House and Senate wings seen today. On the floor of the House, debating then where noted Americans appear now as statues, Lincoln raised his voice against the Mexican War while voting supplies for its soldiers.

Once the House roared with laughter over his account of Black Hawk War "charges upon the wild onions" and "bloody struggles with the musketoes." In June he joined a "multitude of strange faces" at the Whig Convention in Philadelphia.

Back in Washington one evening, the lawmaker strolled the Capitol grounds while listening to music, perhaps from the Marine Corps Band, though history does not state. More than a century later, below a dazzling white dome afloat in the night sky, other Marines fill the summer air with melodies Lincoln loved—as from time to time wind snaps the flag whose stars he kept in the field.

When his term in Congress expired, Lincoln did not seek re-election. Believing that "turn about is fair play," he stood aside to allow another member of his party to run.







*When Moses led Israel  
through the Red-Sea . . .  
Niagara was roaring here*

Visiting Niagara Falls in 1848, Lincoln recorded his impressions in private notes.

Lincoln's look at "that world's wonder," Niagara Falls, came after the adjournment of Congress and a speechmaking swing through Massachusetts. Niagara's "violent and continuous plunge . . . foam, and roar . . . mist . . . perpetual rain-bows" impressed the visitor.





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But, he concluded, "It's power to excite reflection, and emotion, is its great charm." He mused over Niagara's "indefinite past" and pondered the fact "that the plunge, or fall, was once at Lake Ontario, and has worn its way back to its present position."

In the decades since Lincoln gazed on the scene, water has nibbled off another 28 feet from the crestlines of Bridal Veil Falls (*foreground*) and American Falls (*beyond*). Here, in spring, fallen boulders anchor ice that the spray has marbled with muddy veins.





*I... have invented a new... manner of buoying vessels*

A trip around the Great Lakes (right) appears to have given Lincoln an idea that he described in a petition for a patent.

After seeing Niagara, Lincoln boarded the steamer *Globe* at Buffalo for a 1,000-mile cruise around the Great Lakes to Chicago.

During his voyage Lincoln saw the steamer *Canada* piled up on an island in the Detroit River. Watching as seamen wedged bales of straw and empty barrels under gunwales to increase the ship's buoyancy, he conceived a



way for a ship to float itself off such shoals. He visualized a boat permanently equipped with "expansible buoyant chambers" placed at the sides." He saw how "sliding spars" inserted in the chambers and fastened to their bottoms could be used to make them expand and contract like a bellows; how the





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spars themselves could be manipulated by ropes, pulleys, and a shaft.

As Lincoln explained: "By turning the main shaft . . . the buoyant chambers will be forced downwards into the water and at the same time expanded and filled with air for buoying up the vessel by the displacement of water." Returning to his home in Springfield, Lincoln whittled a model of a steamboat (*upper left*) and tested his invention in a public water trough.

In Washington at the close of the second session of the 30th Congress, inventor Lincoln filed an application for patent, together with the model. He won his patent in May, 1849, but nothing came of it.

Today the Smithsonian Institution displays the model (*left*), complete with hull-riding chambers and deck-topping spars; and ore boats, here reversing *Globe's* course, sail past the new Mackinac Bridge between Lakes Michigan and Huron.





*"A house divided against itself  
cannot stand." . . . This government  
cannot endure, permanently  
half slave and half free*

Lincoln addressed these words to the  
Republican State Convention  
in Springfield, June 16, 1858.

This galleried hall of the onetime Illinois State Capitol at Springfield saw Lincoln nominated to the U. S. Senate by the Republicans in June, 1858. Accepting, the candidate spoke

his deepest convictions: "I do not expect the Union to be *dissolved*—I do not expect the house to *fall*—but I *do* expect it will cease to be divided. It will become *all one* thing, or *all the other*." The speech stirred a Nation torn over the prospect of slavery's spreading to its new territories.

The nine years between Lincoln's term in the House of Representatives and his nomination to the Senate had richly prepared him for the coming race. "I was losing interest in politics," he wrote, "when the repeal of the Missouri Compromise aroused me again." He took the stump, his speeches at once attracting a more marked attention than they





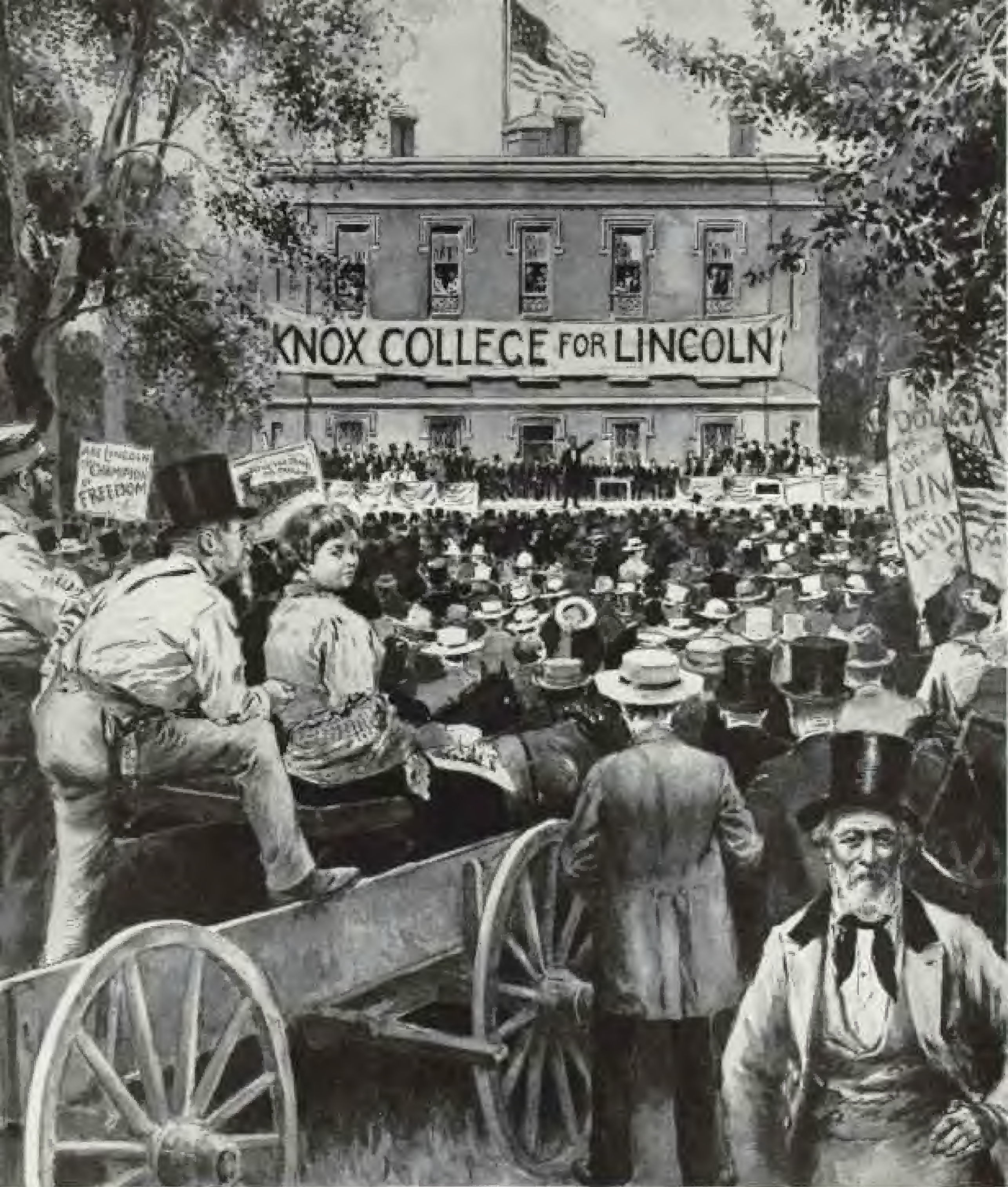
ESTABLISHED 1856 AND REBUILT 1912. © H.S.S.

had ever done before, he observed. In the election of 1856 he made more than fifty speeches. Campaigning, he traveled through Illinois and into Michigan. Then came the House Divided speech.

Two and a half years later Lincoln sat by the office window (*right*) that frames the old State Capitol and composed his inaugural address. Today the former statehouse serves as the Sangamon County Court House, and Circuit Court meets in the room (*above*) where he spoke.







*I . . . contemplate slavery  
as a moral, social and  
political evil*

Knox College, at Galesburg, Illinois,  
heard the Lincoln-Douglas  
Debate of October 7, 1858.

"Of all the damned Whig rascals about  
Springfield, Abe Lincoln is the ablest and

the most honest." Thus Stephen A. Douglas,  
Democratic veteran of two terms in the United  
States Senate, sized up his opponent in his  
1858 bid for re-election.

The campaign kicked off at Chicago in July,  
and the speeches drew battle lines: Douglas  
fighting for the principle that western terri-  
tories had the right to vote slavery "up or  
down"; Lincoln, for the philosophy that slav-  
ery be put "in course of ultimate extinction"





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by confining it through Federal law to areas where it existed. Later Lincoln challenged Douglas to a series of public debates; they agreed to appear at seven Illinois towns.

Douglas, known as the Little Giant, traveled in style with a private railway coach and a cannon. The gun, lashed to a flat car, boomed out his arrivals. At least once Lincoln rode the same train in a public coach.

Ottawa, Freeport, Jonesboro, and Charleston welcomed the candidates with carnivals; torchlight parades snaked through the streets, brass bands blared, and glee clubs caroled.

On October 7, at Galesburg's Knox College, Lincoln looked on a sea of 20,000 faces, the largest turnout of the debates. For three hours the crowd listened while a cold wind tugged at coats and tore down banners, a circumstance ignored by artist Victor Perard, whose painting (*opposite*) appeared in *McClure's Magazine* in 1896.

Last spring old elms whispered with gentler wind as Knox students (*above*) streamed across the campus where Lincoln's voice once echoed. Flanking the door of Old Main, the debaters, frozen in bronze, survey the scene. Their words spoken here still appeal to the mind:

Equality among the different states is a cardinal principle upon which all our institutions rest. *Douglas*

He is blowing out the moral lights around us when he contends that whoever wants slaves has a right to hold them. *Lincoln*

After Galesburg the debaters duelled at Quincy and finally at Alton, where an observer saw Lincoln stand "like some solitary pine on a lonely summit."

When Douglas won the election, Abraham compared himself to the boy who stubbed his toe: "It hurt too bad to laugh and he was too big to cry."

The Senator returned to Washington; Lincoln, to the stump, speaking during 1859 in Illinois, Iowa, Ohio, Indiana, Wisconsin, and Kansas. In February, 1860, he faced an audience of "intellect and mental culture" at New York's Cooper Union. His address, with the ringing conclusion, "Let us have faith that right makes might," put its author into the presidential spotlight in the East.

Two days later, after appearing in Rhode Island, Lincoln walked the quiet streets of Exeter, New Hampshire, with his son Robert, a student at Phillips Exeter Academy. Then, "unable to escape this toil," he moved on to other speeches in New Hampshire and Connecticut.

"Far worn down," Lincoln returned in mid-March to Illinois, remaining until nominated and elected President of the United States.









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*I...look to the American people and to that  
God who has never forsaken them*

On his inaugural journey, Lincoln spoke here  
in the Ohio State capitol, February 13, 1861.

The American House was dividing. Seven slave States had just seceded, and seven others stood on the brink. Civil War guns were primed to boom in two months. Filled with anxiety, the President-elect set out from Springfield, February 11, 1861, for his inaugural in Washington. The 12-day journey carried him into Illinois, Indiana, Ohio, Pennsylvania, New York, New Jersey, and Maryland. Rolling through the country, he saw well-wishers lining the tracks. In flag-decked cities he paraded past tumultuous thousands, shook countless hands, and addressed five State legislatures.

In Ohio's new capitol at Columbus the honored guest faced the General Assembly, gathered then as last winter (*above*) in the House of Representatives. "There has fallen upon me a task such as did not rest even upon the Father of his Country," Lincoln said, but declined to discuss the crisis until he had "gained a view of the whole field." Moments later he stood on the State House steps (*left*) to thank a crowd for its greeting. "It is not much to me, for I shall very soon pass away from you; but...affection for the Union [is] of immense value to you and your posterity forever."





*We are not enemies, but friends.  
We must not be enemies*

At his first inaugural, Lincoln spoke these lines  
in front of the United States Capitol (right).

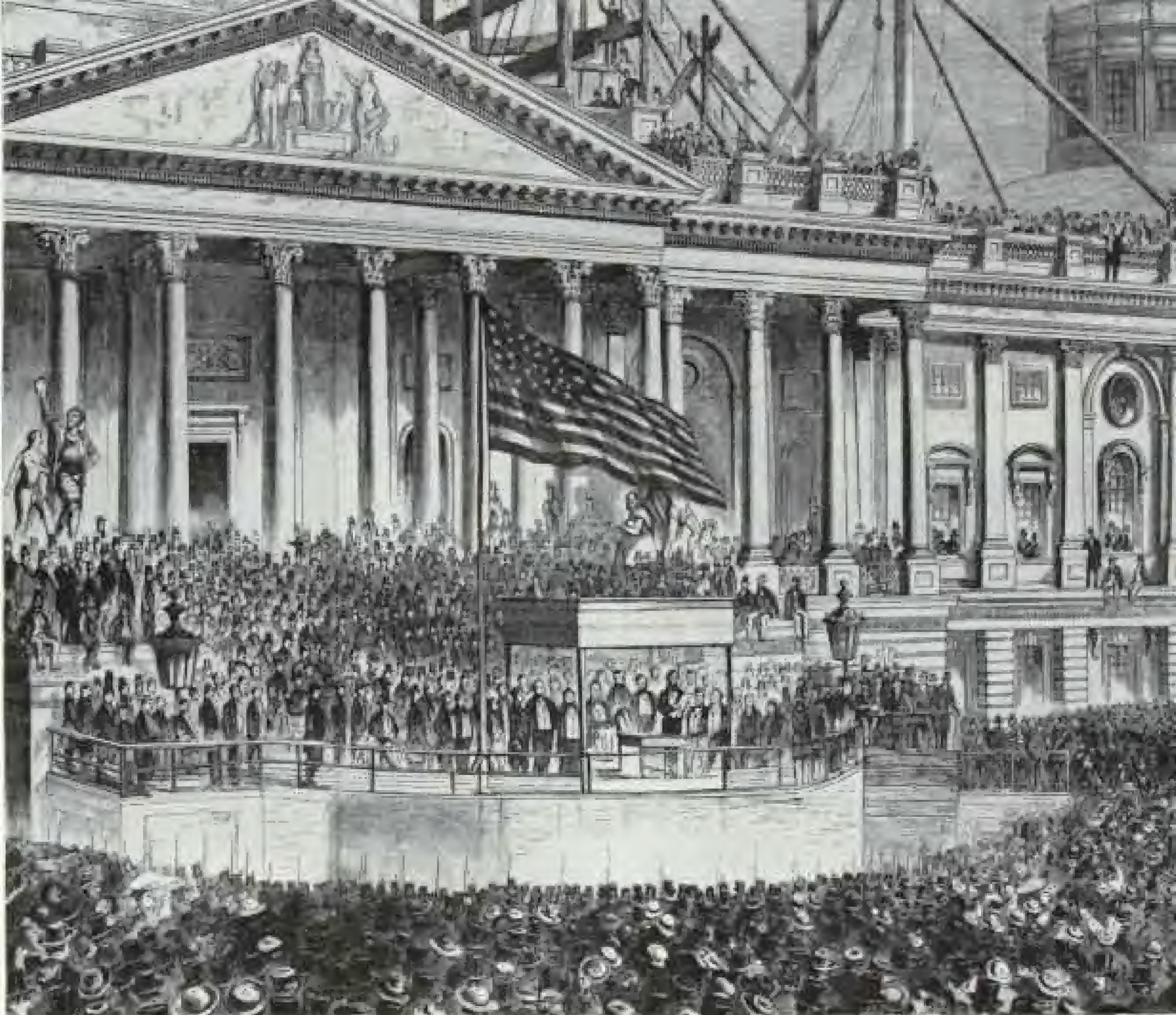
Lincoln's "march of triumph," as one reporter called the inaugural journey, ended in a secretive dash from Harrisburg, Pennsylvania, to Washington—an expedient prompted by rumors of a plot to assassinate him in Baltimore. On February 23, 1861—nine days before inauguration—Lincoln checked into Willard's, a hotel still welcoming guests on Pennsylvania Avenue.

No city can ever be called complete, but the Washington that Lincoln saw seemed hardly to have gotten started. "It was then . . . unattractive, straggling, sodden," wrote a contemporary. Yet some of the landmarks remain as national treasures, enriched by the passage of a century: Lincoln called on President Buchanan at the White House; he worshiped at St. John's Church on Lafayette Square. On a drive, he viewed the Smithsonian Institution's red sandstone castle and glimpsed the marble stub of the incomplete Washington Monument. Visiting Congress, he found the Capitol under construction, its dome surrounded by scaffolds and cranes.

On March 4 Lincoln returned to Capitol Hill, riding with President Buchanan up Pennsylvania Avenue, Street of Presidents. Standing before a







THE ILLUSTRATED WEEKLY — MARCH 14, 1861

crowd of 10,000 (*above*) assembled to see him inaugurated, he uttered fateful words: "In *your* hands, my dissatisfied fellow countrymen, and not in *mine*, is the momentous issue of civil war. . . . You have no oath registered in Heaven to destroy the government, while *I* shall have the most solemn one to 'preserve, protect and defend' it."

Moments later Lincoln took the oath of office, administered by Chief Justice Tancy (*right*): artist Thomas Nast sketched the scene. That night the Lincolns were at home in the White House (*opposite*). This engraving, from Francis Bicknell Carpenter's painting, shows the President and First Lady with their sons Willie (*left*) who died February 20, 1862, Robert Todd, and Tad.









*I will hold McClellan's horse if he  
will only bring us success*

Lincoln's patience with McClellan, exemplified by these words spoken at a White House conference, ran out after the battle at Antietam Creek (opposite).

War's outbreak saw anxiety etch Lincoln's face. The North had to fight to decide "whether in a free government the minority have the right to break it up." But could the Union win the campaign? Lincoln asked, as he endured the "slows" of his leading general, George B. McClellan.

Although McClellan organized the army skillfully, he overestimated Confederate strength and demanded more men and equipment. He treated the President with condescension, but Lincoln bore the insolence philosophically, hoping for victories. Overly cautious, McClellan brought failures.

To spur the general into action, Lincoln took to the field during the Peninsula Campaign. Assuming active command of land and naval forces at Fort Monroe, the President directed the capture of Norfolk, Virginia.

Despite his efforts, Lincoln stood helpless to prevent McClellan's greatest bungle when the Union Army met Confederates under Robert E. Lee at Antietam Creek near Sharpsburg, Maryland, on September 17, 1862. Although the North claimed victory after Burnside captured the stone bridge spanning the creek (opposite), McClellan might have won the war on the spot had he risked his reserves or pursued Lee after the battle. Instead, he stopped to reorganize, and let Lee escape.

Distressed by the inactivity, Lincoln rode west to see the troops at Harpers Ferry, now in West Virginia; Frederick, Maryland; and Antietam, where Matthew Brady photographed him (below) facing "Little Mac" near a farmhouse that stands today. Later, as the President walked at dawn through the army's tent city, he asked a friend, "Do you know what this is?" "The Army of the Potomac," came the reply. "A mistake," Lincoln objected; "it is only McClellan's body-guard."

Nevertheless, Antietam gave Lincoln the military success he needed to announce the Emancipation Proclamation freeing the slaves. In November he removed McClellan.











*We can not dedicate—we can not  
consecrate—we can not hallow—  
this ground*

Lincoln made the Gettysburg Address (above)  
after revising the text in the room opposite.

In the months following Antietam, Lincoln grappled with despair. Planning to attack Fredericksburg, Virginia, Burnside moved too slowly in spite of Lincoln's rendezvous near his camp to urge speed. When Hooker met defeat at Chancellorsville, Virginia, the President cried, "My God! My God! What *will* the country say?"

Union victory at Gettysburg, Pennsylvania, doomed the Confederacy, but few realized it. When Meade let Lee escape once again from defeat, the anguished Lincoln wrote, "The war will be prolonged indefinitely." However, successes in the west sparked new hope as he traveled to Gettysburg on November 18, 1863, to dedicate the battlefield cemetery.

There, a guest of David Wills, whose home still faces the town square, Lincoln revised the "few appropriate remarks" he had been asked to make. The bedroom where he wrote

remains, furnished much as Lincoln saw it.

On the battlefield next morning, Lincoln listened to the two-hour oration by Edward Everett. The President spoke for only two minutes. "Four score and seven years ago our fathers brought forth on this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal.

"Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. . . . It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. . . . that we here highly resolve that these dead shall not have died in vain—that this nation, under God, shall have a new birth of freedom—and that government of the people, by the people, for the people, shall not perish from the earth."

The speech "fell on the audience like a wet blanket," Lincoln said later. He could not know that the world would acclaim it.



*Excuse me now. I am going  
to the theater*

Lincoln spoke these words to a White House visitor, Representative Isaac N. Arnold, on April 14, 1865. Ford's Theatre, where he was shot, and Petersen House, where he died, are national memorials today.

On Good Friday, 1865, the President sat in his office talking to a friend.

"Everything is bright this morning," he said. "The war is over. . . . We are going to have good times now, and a united country."

Forty-one days had passed since the second Inaugural Address and its moving benediction: "With malice toward none; with charity for all; with firmness in the right, as God gives us to see the right, let us strive on to finish the work we are in; to bind up the nation's wounds; to care for him who shall have borne the battle, and for his widow, and his orphan—to do all which may achieve and cherish a just, and a lasting peace. . . ."

Behind the President were the sight of dead and wounded on the Petersburg battlefield; the walk, almost unguarded, through the streets of fire-ravaged Richmond; the news

of Lee's surrender at Appomattox. And several days had elapsed since he experienced a disturbing dream. In his vision Lincoln heard the sobbing of mourners, saw a body laid out in the White House, listened to a soldier say, "The President . . . was killed by an assassin!"

Although shadows of the past still haunted that 14th day of April, Lincoln looked forward to his future as a private citizen. "We will go back to Illinois," he said to Mary. ". . . I will open a law office . . . and at least do enough to help give us a livelihood."

That evening the President and his wife went to Ford's Theatre to see the English comedy *Our American Cousin*. A few minutes after 10, John Wilkes Booth, a crazed actor, slipped into the unguarded Presidential box and fired a derringer point-blank at the President's head (*below*). Leaping to the stage, Booth escaped.

Mortally wounded, Lincoln slumped unconscious in his rocker. Gently, friends carried the "giant sufferer" down to the door of Ford's Theatre (*opposite*), slowly bore him across 10th Street, and labored up the steps of the Petersen House (*foreground*). There he fought with death. About 7 the next morning Abraham Lincoln was dead.







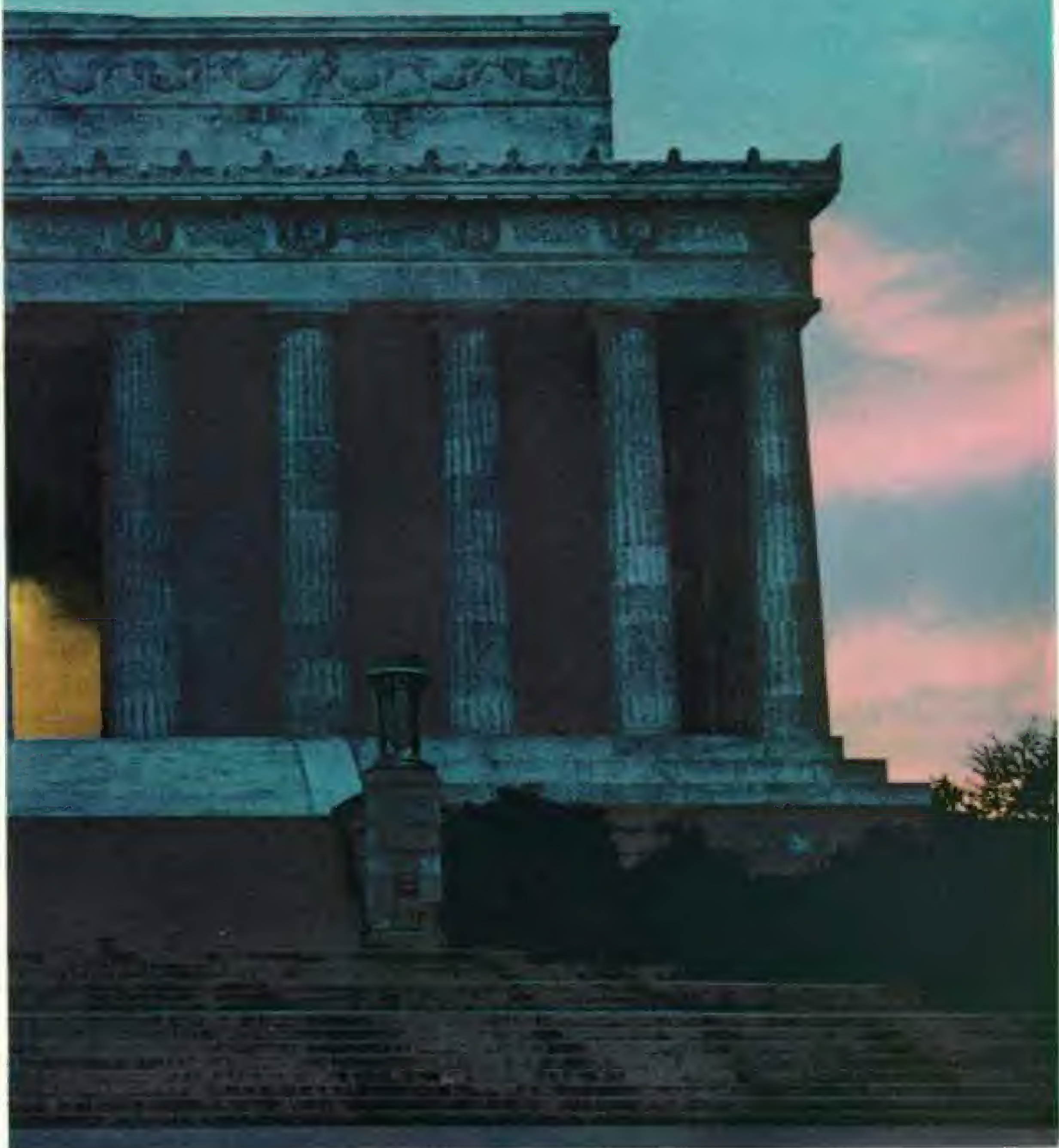




NOW HE BELONGS TO THE AGES

*Attributed to Secretary of War Edwin M. Stanton*





*Let him have the marble monument, along with the well-assured  
and more enduring one in the hearts of those who love  
liberty, unselfishly, for all men.*

Lincoln's epitaph for his friend  
Owen Lovejoy, who died May, 1864.



By ANNE EISNER PUTNAM

The start of a dance finds a Pygmy elder intently coaxing provocative rhythms from a skin-covered drum while other performers exchange jokes. To show their hearts are gay, the younger men wear girdles of leaves over bark-cloth breechcloths. Ituri Forest Pygmies often dance far into the night.

# My Life With

*In the Belgian Congo's Ituri Forest,*

ILLUSTRATION





# Africa's Little People

a New York artist copes with witchcraft and tragedy among the Pygmies



THE FRENCH BUILDERS of my new station wagon would have been amazed. Here was a five-passenger car rolling along crammed with 30 men, women, and children, all wearing wide grins and very little else.

Some of my guests reached over my shoulder, punched the horn button, and shouted in delight at the sound. They cranked the windows up and down, grimaced into the rear-vision mirror, and giggled at the results.

I halted the car, climbed out, and stood laughing helplessly as the others disembarked. The scene reminded me of the Keystone Cops pouring interminably out of their Model-T patrol wagon in an old Mack Sennett movie.

My passengers were Pygmies, the tiny reddish-chocolate people who live deep in the Ituri rain forest of the Belgian Congo. They were denizens of the villages adjoining Camp Putnam beside the Epulu River, a minor tributary of Africa's second longest stream, the Congo (map, page 284).

## Scientist Takes a Bride to the Congo

I was home again. Here I had lived for eight wonderful years with my late husband, Patrick Tracy Lowell Putnam, a Harvard-trained anthropologist. After Patrick's death in December, 1953, I had spent three years in my native New York City. And now I was back among my best friends.

Patrick Putnam first came to the Congo in 1928. He fell in love with the Epulu region, saw the Pygmies as a challenging subject for his research, and resolved to spend the rest of his life there. By taking a course prescribed by the Belgian Government, he became an *agent sanitaire*, or public health officer. Patrick was also an expert woodsman; during World War II the Belgians asked him to investigate the Congo's important wild rubber resources.

In addition to these attainments, Patrick had an imposing appearance, a gift for leadership, and a genuine concern for the Little



People's welfare. All combined to give him godlike stature among the Pygmies. A wild shock of hair and a luxuriant beard of flaming red made him seem even taller than his six feet, one inch. Whenever I saw my husband surrounded by miniature Congoese, whose height varies between four and five feet, I always thought of Gulliver among the Lilliputians.

#### Triumphal Arch Welcomes Author

Not long after Patrick and I first met on Martha's Vineyard during one of his trips home, I knew the Congo could mean as much to me as it meant to him. I was a painter, and the thought of having an unspoiled landscape and primitive Pygmies as subjects excited me.

Some of my friends thought I was taking leave of my senses to go off to Africa as the bride of this lean giant. Sometimes, privately, I thought they might be right.

Up to then my chief contacts with nature had been on Vineyard vacations and a sketching expedition in the Great Smoky Mountains. As for beasts with fangs, claws, hoofs, horns,

and bad tempers, I preferred them behind bars in the Bronx zoo.

Yet in the eight years we spent together on the banks of the Epulu, I did not once regret my decision.

I shall never forget my first glimpse of Camp Putnam, which Patrick had built as a laboratory, animal-collecting station, and hotel on land leased from the Belgian Government. To welcome us, the natives had erected before the entrance an arched canopy of scarlet hibiscus tied to palm stalks. At once I knew how truly fond they were of Patrick and how much they wanted to please his bride.

#### Tropical Rains Scour a Road

Such memories, and the anticipation of a reunion, filled my mind as I ended a six-week freighter voyage, picked up the Peugeot 403 at Stanleyville, and began the 285-mile drive to Camp Putnam. I could hardly wait to see what the boys who worked at the camp had done in my three-year absence. I was dying to see my adopted Pygmy children. The oldest, named William J, for my father,

#### Playful Children Give the Author's Station Wagon Their Approval

Subjecting the French-built Peugeot to tests its designers never dreamed of, Pygmies squeezed in by the dozens. Mrs. Putnam found that other business had to wait until boisterous scores had taken rides. Here a Japanese visitor photographs youngsters leaping from the door. Near by, a normal-sized Bantu girl carries her baby sister.

YOSHIOKA TAKAHASHI







LORILL THORPE, JR.

"Adopted sons" of the author renew acquaintance with Mrs. Putnam, the American woman who cared for them in infancy. The mothers of William J. (left) and Katchalewa died in childbirth. William J. has the features of a Pygmy child; Katchalewa resembles his Bantu father and is taller than Pygmies his age.

would be almost six by now (above). Would he remember me?

All went well for the first 190 miles. Then suddenly it was dark. I was practically on the Equator, where twilight is fleeting. With the gloom came a violent tropical storm. Quickly it scoured the road into a relief map of gullies and hills. The car bounced and bucked like a rodeo horse.

#### Route Blocked by Fallen Tree

The roar of the storm shut out all other sounds and halted logical thinking. Only instinct made me slam on the brakes in time to stop six inches from a huge tree that had toppled across the road.

Well, I was back in the Congo all right.

Possibly this was all that I would see of it again—if I could see anything on this drenching, pitch-black night. My only companions would be antelope, okapis, elephants, and leopards, until some wandering native might happen along and I could bribe him to cut the tree or return to his village for help.

I thought of the many times I had scolded Patrick for running just this kind of risk in the forest. Then the rain stopped just as abruptly as it had begun. That meant the animals would soon start prowling. More than ever I disliked the thought of spending a lonely night there.

Getting out to reconnoiter, I found that I might just possibly drive the car over the top branches of the fallen tree. It could get hung



### Forest Midgets Relax at Day's End in Their Jungle Courtyard

Woman resting with chin on hand is Sau, accused of witchcraft, whom Mrs. Putnam saved from death (page 297). Sleeping dog descends from ancient Basenjis, depicted on tombs of the Egyptian Pharaohs.

Thatches of leaves, though flimsy in appearance, shed the rain forest's frequent downpours. One unfinished hut reveals its lattice framework. Wicker baskets atop another are used to carry food.

Descendants of an ancient race whose origins baffle anthropologists, the 4½-foot, brick-brown hunters survive with a few crude weapons, courage, and a reluctance to worry about tomorrow.

up there, and all the ants in the tree might join me in the car, but even that seemed preferable. Backing up the Peugeot for a good start, I shifted into low gear and lunged forward. After a breath-taking moment among crackling branches, I found myself on the other side of the tree.

Hours later, after 95 more miles of slick road and virtually zero visibility, I was honking my horn at Camp Putnam. Sleepy-eyed Pygmies and their masters, the normal-sized Bantu, stumbled out of huts and surrounded the car. They were so taken with it for a few minutes that I began to feel a little in the way. Then they remembered me.

### Pygmies Offer Forest as Gift

When Patrick died, the Pygmies, Bantu, and other natives from miles around had assembled at Camp Putnam for a solemn little ceremony.

"Now that *Bwana* is dead," their spokesman had told me, "the forest is left in your hands. We give it to you."

Now, as of old, they called me "*Madami*"—madame—and said: "The forest still belongs to you. It does not matter how many other white men come."

That first night I was too tired to unpack. Bantu neighbors came to my house and lent me bed sheets embroidered with red elephants. I dropped off to sleep reflecting anew upon the curious bond that exists between these taller Africans and the Pygmies.

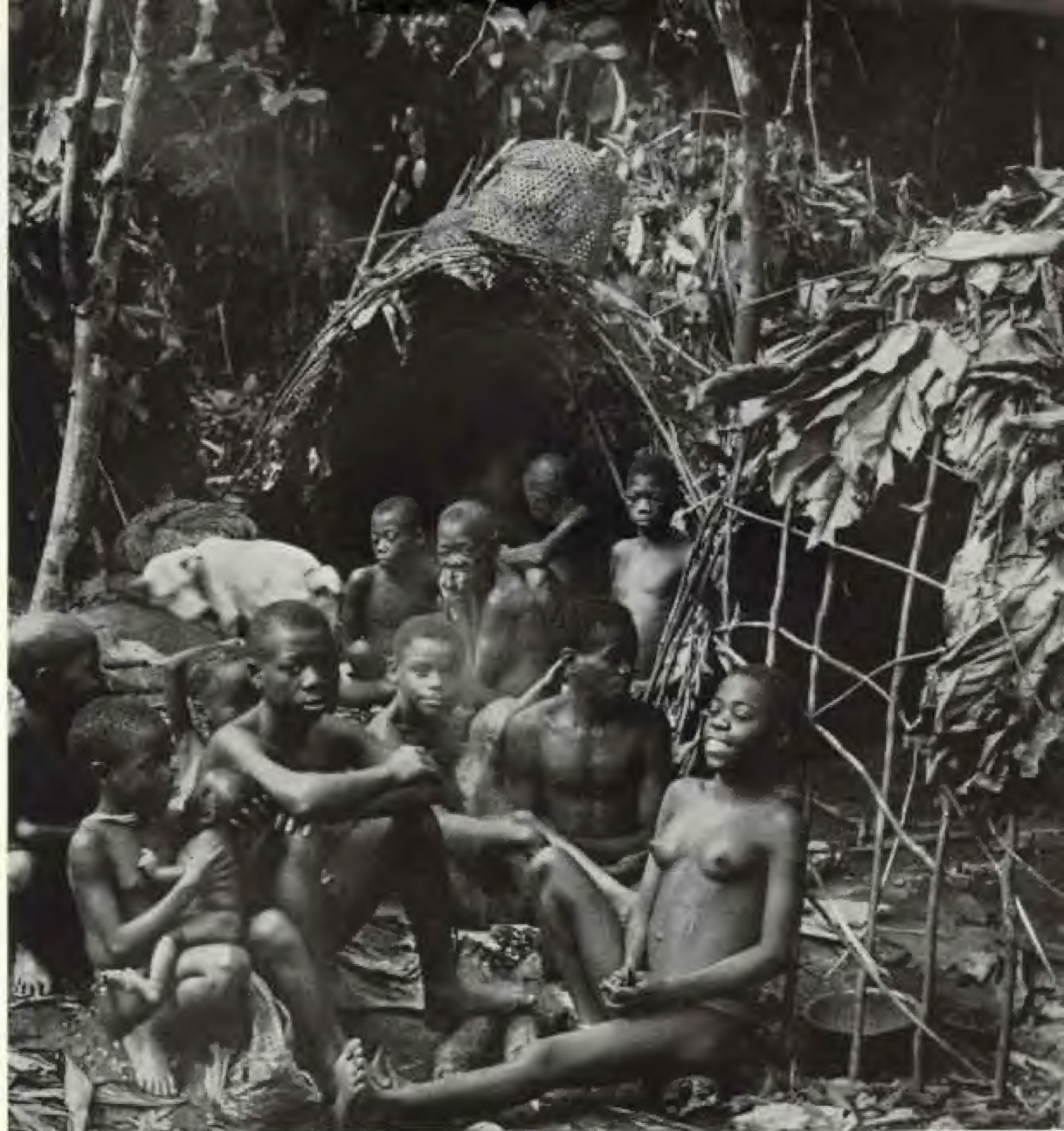
The strangest part of this feudal relationship lies in the absence of oppression or cruelty sometimes found in such social systems. Violence did play a part, however, in the early 18th century, beginning long before Europeans arrived in central Africa. In those days in-



terribil wars were encouraged by the Arabs, who invaded the interior in search of ivory, used captured natives to carry tusks to the coast, and sold them as slaves to traffickers in human flesh. Many Pygmies were involved in these wars.

The taller Bantu, busy fighting, saw the Pygmies' usefulness as hunters and foragers and tried to keep them in a serflike status. The Pygmies, who have never mastered the art of forging metal, obtain tools and utensils from their lieges. In return, the Bantu exercise certain protective rights over the Pygmies. Good will exists on both sides.





FRED A. WYCHENHORN

Under this loose, informal arrangement, the Bantu get fresh meat—which they pay for—and the Pygmies get an African forest version of social security. Toward the Pygmies the Bantu definitely feel a sense of ownership and even “bequeath” the useful Little People from generation to generation.

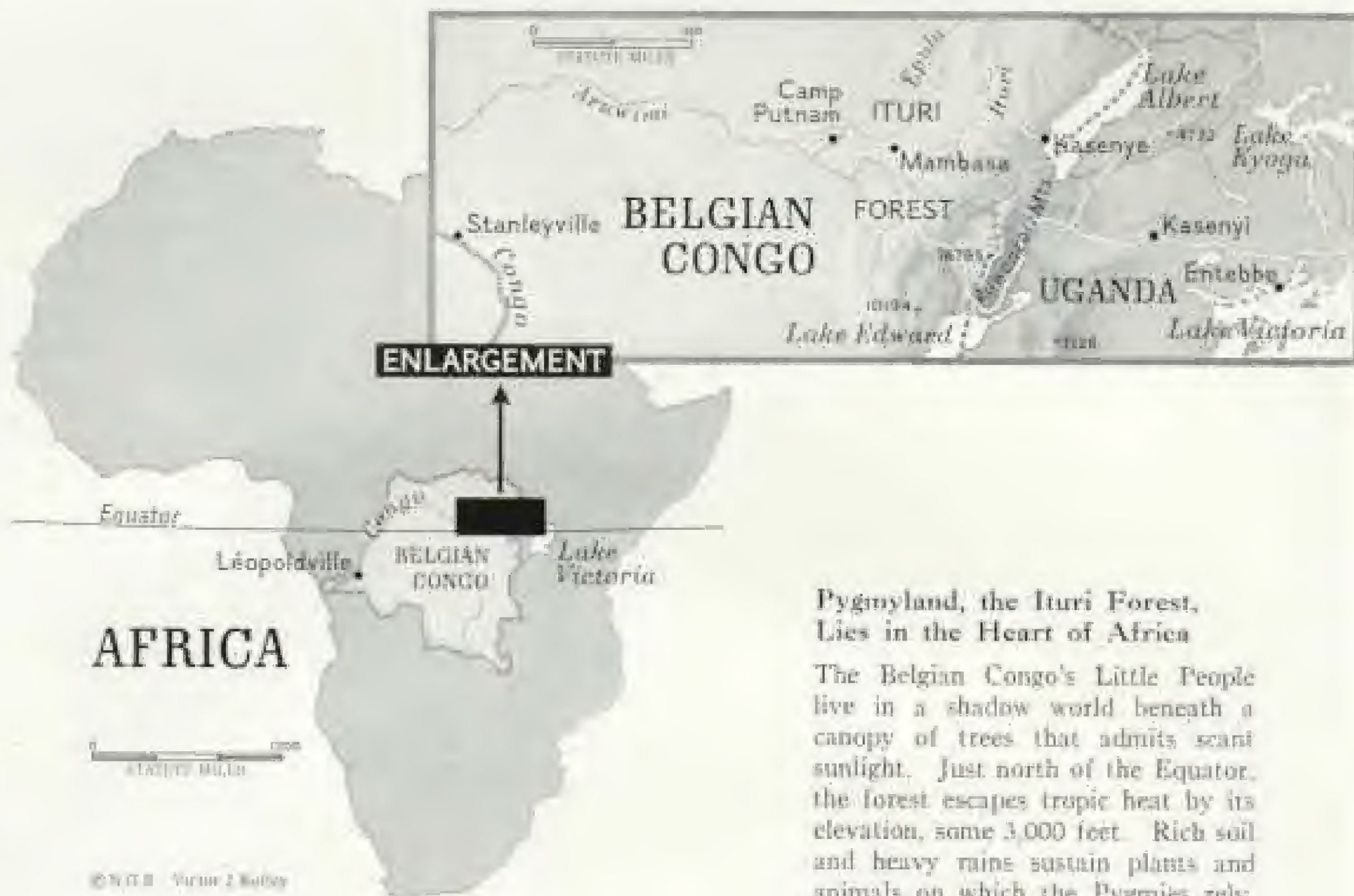
Mystery shrouds the origin of the Pygmies, but they seem to have dwelt in the forest for many centuries. They are mentioned and pictured in early Greek and Egyptian works, and some anthropologists believe they were the first humans in central Africa. The Greeks, in fact, coined the word *pygmaion*,

indicating the distance from elbow to knuckles—the Greek notion of a Pygmy’s height.

Racially, Pygmies remain a puzzle for the anthropologists. Most authorities agree that these Little People do not belong to the Negro race. The Bantu heartily concur; they consider Pygmies subhuman. The Pygmies themselves retaliate by privately calling their towering neighbors *Banyama*—meaning “animal people.”

The Belgian Government recently began a campaign to end the Bantu-Pygmy peonage by encouraging the Pygmies to become self-supporting cultivators. The Little People,





### Pygmyland, the Ituri Forest, Lies in the Heart of Africa

The Belgian Congo's Little People live in a shadow world beneath a canopy of trees that admits scant sunlight. Just north of the Equator, the forest escapes tropic heat by its elevation, some 3,000 feet. Rich soil and heavy rains sustain plants and animals on which the Pygmies rely.

however, view agriculture as less fun than hunting. A good Pygmy hunter ranks as a hero. And besides, cultivation requires confinement and labor in the hot sun—the sort of life that repels a forest-loving nomad.

There was no chance of my oversleeping that first morning back at Camp Putnam. Each family clamored for a ride in the new car (page 280). After the joy riding, I collected my children. William J. may have remembered me, but the thrill of a shiny new car left little room for sentiment.

That night I was quite happy to go to bed at 8 o'clock. But not to rest. No sooner was I asleep than I awakened with a scream. I was undergoing a full-scale invasion by ants, and they were biting fiercely.

There are more kinds of ants in this part of the world than one can imagine: tree ants, ground ants, driver ants, big ants, little ants, ants whose sting raises huge welts. Against some, instant flight is the only defense; they have been known to strip the flesh completely from penned calves and pigs.

These were driver ants, black rivers of them streaming in through every opening. I could actually hear them moving and clicking their mandibles.

My screams brought Yaull, a Bantu night

watchman, running to the rescue. He took logs from the fire that burns all night in any forest encampment and knocked off glowing coals along the floor, especially where the ants were entering.

I fled to another room to save a litter of newborn puppies from the invaders. Yaull spread a circle of coals around us, and I sat there with the pups the rest of the night.

"Thank heaven," I thought as I dozed off, "at least there are no leopards around."

I was wrong. The next morning I found that a leopard, most dangerous marauder of the region, had got a baby okapi at an animal station across the road from Camp Putnam.

"Don't worry," the Pygmies told me. "It is only interested in animals, not human beings." "It" later turned out to be a family of three—father, mother, and baby leopard.

### Language Brought by Arab Slavers

Scholars suspect that our Pygmies once had their own language; if so, the tongue has long since been forgotten in the Ituri Forest. Among themselves, these Pygmies speak either Kibira or Kilesi, the dialects of their Negro neighbors. Since the Pygmies use their own singsong intonation, even the Negroes find the Little People hard to understand. Few white



people master the infinitely difficult inflections of these tongues.

For marketing, the Pygmies use Kingwana, the trade language of the east Congo. Kingwana is a corruption of Swahili and was brought into the Congo by Arab slavers. It has a grammar and can express relatively complicated ideas. I learned Kingwana well enough to translate into English hundreds of legends that the Pygmies chanted around campfires and often recited to me. Most of the legends, so symbol laden as to be incomprehensible to non-Pygmies, tell of the conflicts with animals, nature, and spirits.

#### Wall-to-wall Mud Carpets Rooms

When I left Camp Putnam three years before, I gave the household equipment to our Bantu workers. To my amazement, they now brought back almost everything: gasoline lanterns, alarm clocks, tools, pots and pans. One man went into the forest and cut a tree, from which he made me a table all of one piece of wood; another made me one of wicker-work.

For weeks after my return the chiefs of Bantu villages visited me, bringing traditional gifts of chickens, peanuts, and eggs. As soon as I could, I renewed a custom—holding a weekly market on Sunday. The natives came with plantains, rice, mushrooms, tomatoes, eggplant, palm wine, eggs, chickens, baskets, mats, drums. They also brought knives and spears forged out of old automobile parts, but not tempered. Under the trees, women spread their brightly dyed cloths. The scene was like an animated Matisse painting.

Although the Bantu had kept the camp in good condition, there was much to be done to make it comfortable again. The boys built a big two-car garage. Outer walls of the main house had to be remudded. Living room and bedrooms of my home have cement floors: the other rooms were freshly carpeted with wall-to-wall mud—when dried, a firm floor.

As soon as word leaked out that I was back, travelers began stopping by, as in the old days: First came a group of American tourists led by a Hollywood columnist. Then came a California entomologist, collecting

#### American Women Tower Like Giants Above an Ituri Hunter

This man stands 4 feet 4 inches, but a bass voice belies his size. He carries his centuries-old hunting arsenal: bow and arrows and a net for trapping animals. Pygmies spend most of their days in zestful pursuit of game.

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elephant ticks. An all-girl safari from Léopoldville gave me air mattresses, lamps, and canned food. A party of Danes left a fine sleeping bag. Soon it seemed as if I had never been away.\*

#### Garden Sprouts a Forbidden Crop

But when I found time to go exploring, I noticed many changes. Civilization had come to the Ituri Forest. Now there were six trade stores and a bakery opposite the entrance to Camp Putnam. Near by stood a new motel complete with gasoline pump.

The natives had formed the habit of going to this new trading center to drink beer. Even worse, many of them had taken to smoking marijuana, an old Congo custom that has been outlawed by the Belgians. I immediately banned the drug from my property and forbade anyone who used it to come on the place. Then, to my embarrassment and the natives' vast amusement, I found a healthy crop of the marijuana weed springing up in my own new garden.

After a few weeks I decided it was time for me to go into the forest camps and paint scenes of Pygmy life. Mbaka, a Pygmy of about 18, volunteered to guide me and to carry my sleeping bag, in which I wrapped toilet articles and paints.

It felt good to get into the forest with its strange blue-green atmosphere, highlighted with yellow here and there when the sun splashed through onto the high *wangongo* leaves. (The Pygmies use these broad leaves as thatch.) Birds chattered noisily overhead, but I rarely glimpsed one. Monkeys played their endless game of tag in the treetops; we heard many, but saw only two.

Mbaka walked so fast it was hard for me to keep up with him, in spite of my consider-

\* Among earlier visitors to Camp Putnam were Tay and Lowell Thomas, Jr., who told of their experiences in "Flight to Adventure," NATIONAL GEOGRAPHIC, July, 1957, pages 59-64 and 73.

#### Stealthy Hunter, Screened by Grass, Takes Aim at a Tiny Duiker

Every male Pygmy becomes an expert hunter because his skill determines his menu. He moves through the forest so silently that some of the Bantu believe he can make himself invisible. Before firing an arrow, the hunter creeps close enough to leap easily upon his quarry, strangle it, or cut its throat. In fact, he often does





W. H. H. H. H. H.

### Poison Makers Crush Plants Into a Lethal Paste for Coating Arrow Tips

For large game, the elfin archers use iron arrowheads obtained from Bantu blacksmiths. For monkeys, they use serrated wooden tips dipped in a heart-stopping juice. Henry M. Stanley, exploring the Congo in 1888 when forest folk still warred on strangers, reported that a superficial arrow wound killed one man within a minute.

Flames dry poison on the arrows (opposite), making them safer to handle. Careless with most possessions, Pygmies treat the poisoned shafts with appropriate respect.



ably longer legs. At times I almost ran, for I did not want to lose the path and possibly encounter a leopard. Mbaka walked silently, but under my city-pavement tread the dry leaves crackled like potato chips.

After wading a couple of streams, we came to a clearing where the Pygmies grew plantains, starchy green bananas that are a diet staple. These plantations were something new; in the old days the Pygmies never would have thought of such a thing.

Until recent years, Mbaka pointed out, hordes of baboons had swooped out of the forest to raid the plantain crop of local cultivators. Now there were fewer of these animals and more plantains survived.

We met some Pygmies on their way back to their camp and decided to accompany them. The women carried their babies strapped to their sides with antelope skins. On their backs they bore baskets of manioc, the weight supported by tumplines passing around their foreheads. In spite of their loads and the fact that a Pygmy takes three steps to my one, the women forged ahead of Mbaka and me and arrived about an hour before us.

Soon a familiar sound told us we were approaching a Pygmy camp. It was the tap-

tap-tap of ivory hammers beating fig-tree bark into cloth. We found only a few Pygmies at work; others took their ease on little stools made of four sticks tied with a vine. Some older women were making baskets. Other men and women were out hunting with their nets.

#### Evil Eye Rules Jungle Life

A hunting net, made of *mbusa* vine, is higher than a tennis net, of similar mesh, and from 100 to 300 feet long. Pygmy women go along on the hunts and stir up the animals, driving them toward the linked nets hung in the undergrowth. When an animal runs into the semicircle of nets, the men kill it with spears or, if it is not too fierce, grab its legs and cut its throat.

The camp was just what I had expected it to be, surrounded by primeval forest hung with vines and moss. At once the Pygmies offered me food—manioc and roasted *aculi* nuts, whose delicate almondlike flavor I love.

Then my little friends built me a large rectangular hut of branches, leafing the roof but postponing the covering of the sides until later. They did, however, fully enclose my outhouse and shower.

My house completed a circle of seven huts, some facing the forest and some not, according to the occupants' current notions about the evil eye and which neighbors might possess it. Owners changed the entrances of their huts constantly.

The evil eye—*bolozzi*, Pygmies call it—is a deadly serious matter. Difficult for us to comprehend, a person can "have" a *bolozzi* or can even "be" one. You can, for example, be a good person, but if a *bolozzi* comes into your body, there is nothing you can do about its transforming you into a wicked one. It will build a house in your stomach and tell you to do things you ordinarily never would do. You can argue with it, but still you do what it tells you.

Some persons have a *bolozzi* without knowing it; others know they have it and are deliberately evil. These latter are supposed to have such strong "medicine" that they can effectively will another person to die.







Although I well knew how this malevolent spirit could often affect Pygmy lives and actions, I did not then realize how uncomfortably involved in a *holozí* case I was later to become.

#### Tethered Beetle Becomes Toy Airplane

The Pygmy children in this forest camp were busy with their games. Some played a form of darts; they stood in a circle and shot arrows at a fruit on the ground (page 299). Others imitated their hunting elders, chasing a scrawny chicken into a worn-out net. The girls, like their sisters everywhere, played house. In a miniature hut that they had built themselves, they cooked real plantains over a real fire.

Both boys and girls spun tops made from forest nuts or soared aloft on liana swings. Some dashed about with a noisy beetle tied to a string; as they ran they excitedly yelled

the French word for airplane: *avion! avion!*

The older boys played with the men; one swung a fruit while the others tried to hurl their lances—actually, sharpened sticks—into it.

There are few “don’ts” to bother a Pygmy child. Tots who can barely toddle are allowed to climb trees, and they play with the sharpest knives. While still quite young they hunt rats with bows and arrows. They also fish with hand lines and store-bought hooks, and swim like trout in the streams.

#### Cooperative Nets Yield Meat Dividend

In midafternoon the hunters returned, complaining that they had bagged only three antelope. They carefully examined the connected nets to see whose portions were bloody. Each net is shared by several Pygmies, all of the same family. The family into whose net an animal falls takes first choice. Relatives



### Intent Spearmen Stalk Their Pretended Prey in an Elephant Dance

One man, with arm extended like a trunk, portrays the swaying beast; two others act the part of hunters.

Slayers of elephants enjoy hero status, for they have passed the ultimate test in courage. Not every 85-pound Pygmy has the nerve.

The hunter creeps virtually under the grazing beast, then thrusts his spear repeatedly into its belly. If the dim-sighted elephant turns, the attacker must freeze, because the slightest movement will betray him, meaning almost certain death.

The elephant dance may precede a hunt to work good magic or follow a kill to celebrate valor. For the sake of a laugh, the performers may toss comic antics into the dance's most dramatic moments.

Chanting and shouting, women in background circle the drums.

The hunter below slips in for the attack (next page).





in families not so fortunate also get a share. The remainder is sold to the Bantu.

Pygmy mothers sometimes weave the nets and give them to their sons when they marry. A mother starts a net when her son is young: until it is his alone, he shares the family net. A Pygmy may transfer his share of a net: whoever receives it gets part of the game it traps.

#### Wayward Spear Wounds a Hunter

At sundown Salamini, one of the hunters, began chanting. Five of the other young men answered him in chorus. The song was a prayer to the forest spirits for better hunting. The rest of the Pygmies were silent. In the dim light under the high green vault, I felt as if I were at vespers in a great cathedral.

We all ate a meager dinner together and

sat around the fire chatting for a while. The Pygmy women squatted in front of their huts, shredding vines to make ropes for the hunters' nets. Everyone went to bed early.

By the time I awakened, the Pygmies had been up for hours. The older women had gone off to the river, and the hunters were out with their nets. The camp was quiet, except for the children's games, for there was no beating of bark. Rain threatened, and the Pygmies believe bark-cloth making in such weather brings bad luck.

Of the old men only one was left in camp. His name was Sale. He gave me some delicious meat he had cooked in a leaf over the coals, and also avocado and roasted manioc.

About three in the afternoon the hunters returned, grim and wordless. After a long silence Salamini said Mbaka had been wounded.

Unsuspecting "elephant" lifts his "trunk" as a hunter closes in. Holding a spear





A spear that missed an animal had pierced the hunter under his armpit.

Presently the victim walked into camp, tears streaming down his face—unusual in a male Pygmy—and blood trickling from his wound. The women also returned, weeping and wailing.

#### Orator Resists a Hospital Trip

The Pygmies washed the wound with hot water, and I sterilized it with alcohol and bandaged it. "Tomorrow," I said, "he must be taken to the hospital."

This remark produced a storm of protest, for these Pygmies have lately opposed white men's medicine. In a long oration old Sale pointed out that the Pygmies wanted only to hunt, so that they could buy other food. They wanted this to be a good camp, not one re-

duced by its members going to the hospital.

Finally, by citing the many accident victims Patrick had saved, I convinced them that Mbaka should go, and he promised to set out in the morning.

Next morning, shortly after Mbaka had left for the hospital, there was much talk about breaking camp because the hunting was so poor. Good hunting, of course, is all-important to the Pygmies, not only for their own meat supply but also for cash income provided by the sale of meat to the Bantu and white people.

Then Basalimbe, a medicine woman, arrived unexpectedly and was greeted with great enthusiasm. From another camp had come word about her hunting medicine. The charm had been so effective that the Pygmies there speared an elephant the day after receiving it.

under the arm to depict impalement, he topples and falls dead. The victor exults

HELENE FISHER





Seeing me, Basalimbe ran over and described her wonderful medicine, which, she took pains to point out, cost 50 Belgian Congo francs. Obviously I was expected to shell out.

As I gave her the money, I said, "If your medicine is so strong, I should be able to get an elephant myself, shouldn't I?" All considered, Basalimbe thought that was asking a little too much.

She cut some leaves from a plant behind a hut and cooked them to cinders in a pan. Then she called Salamini to her. With a razor blade she nicked him along his ribs and one side of his back. Then she rubbed the leaf powder into the wounds until the blood stopped flowing.

#### Music Conjures Pygmy Powers

I went off sketching while she operated on the other hunters. When I got back, the Pygmies had begun a great dance and song fest, for they had decided to go elephant hunting the next day.

That night the Pygmies' dancing and singing was marvelous. One, who had purchased extra medicine from Basalimbe and stored it in an antelope horn, had himself scarified again and more elephant medicine rubbed into the wound.

Near where I sat a hunter began chopping down an *esuru* tree. Elephants love to eat its fruit, he said. He sliced out a piece from the heart of the trunk, stripped off the bark, and beat on it as a kind of drum while he sang. This *esuru* heart, he told me, made powerful magic indeed.

Another hunter whittled the root of a *bangupa* vine and boiled the shavings with a vile-smelling animal extract. This brew he poured into his dog's nostrils while three Pygmies held the poor beast. When the dog was released, it seemed to have a slight fit, which did not surprise me, but it soon recovered and thereafter would supposedly be a better hunting dog.

#### Death Postpones the Elephant Hunt

All the men sharpened their spears on a stone sprinkled with sand. Then they capered around the fire before clearing a space for the women to dance.

The women threw fernlike *ndindimyo* leaves—elephant medicine—on the fire. They would continue to do this all the next day while the hunters were out, and would also use these leaves to rub or sprinkle water on

the huts of the absent hunters. All the women wore skirts of these leaves, and some stuck them in their hair.

Two days later, when I was back at Camp Putnam, my hunter friends appeared. The elephant chase had been postponed, for a Pygmy in a near-by village had died. After telling me this, they asked to borrow some of my spears, as they had sold their best ones to tourists. Of course, if they got an elephant with one of my spears, I would get the ivory. They also wanted 20 francs to pay Basalimbe for some berries that were supposed to be extra-strong elephant medicine.

So I parted with the money and a few spears, knowing that they probably meant business. The men were already away from home, and they would not be allowed to go near their wives until they brought home the elephant bacon; otherwise the medicine would lose its magic.

#### Baleful Grief for a Congo Funeral

The Pygmy who had died was Aberi. I had known him for years, and also his wife Tomasa. They had six children. It was obligatory that I offer unbleached muslin, soap, and a bottle of dime-store perfume, and that I attend the funeral. The ceremony, directed by the Negroes, took place at their graveyard.

When I arrived, the mourners were in full cry. A bier had been built; Pygmies and Negroes were digging the grave. Though this funeral was by no means my first in the Congo, it gave me a feeling of apprehension. Here the evil eye was suspected as the cause of death, and in such cases the atmosphere acquires a baleful quality that few can ignore.

Shortly after noon the grave was ready. Women and children were ordered to keep away. Then the men brought the corpse out of a hut and placed it on the bier. It had been washed three times with my soap and wrapped in the muslin.

Aberi's wife and sister wailed hysterically and threw themselves on the ground. With great ceremony my perfume was brought out and sprinkled over the body. Aberi's son Sansiwake threw some earth into the grave, at whose four corners sticks had been placed. Then Sansiwake himself sat down to watch and wail.

The Pygmy who had wrapped the body in muslin directed the other men to pour water into a hole that had been scooped where the head was to rest. The water was poured





LAWRENCE WOODMAN, 24

### Spears, Nets, and Game Basket Equip a Jungle Hunting Party

Pygmies connect several nets, each up to 100 yards long and four feet high, to form a barrier that may stretch half a mile. Then the women, some carrying babies, drive game into the trap with whoops and whistles. Men knife small creatures but spear dangerous animals, such as the forest hog, which has razor-sharp tusks.

three times, then along the grave and down the path to Aberi's hut.

After the funeral a kind of court was held around Sansiwake. One of the visiting mourners said to the child: "Your father is dead. Who is going to be your father? What are you going to do?"

Sansiwake made no answer; nor was one expected. Once stated, the case would be

decided by the older members of the village.

As night came on, the women were sent away, and it was hinted that I was overstaying my welcome. It was time, I realized, to call out the *esumba*, the great spirit of the forest.

Legend says the *esumba*, which seems to take the form of an animal, or sometimes a rainbow, once belonged to the women. But





#### Fashion Decrees Black Stripes Applied in Whimsical Patterns

Women mix vegetable juices and charcoal into a sticky, indelible paste with which they fingerprint one another. Children sometimes get the same treatment. The boy, named Patrick after the author's late husband, cries in fear of the camera's flash.

the men captured it, and now they allow no women to see it. The *esumba* is called out after an important person has died, and sometimes when the hunting has been extremely bad.

I withdrew to my car, from which I could still see the encampment and hear the excited singing. Then came the eerie sound of the *esumba* horns—like the lowing of a cow eager to be milked, but with the sumber, metallic vibrancy of a tuba. Even after years of hearing it, I am still fascinated by its terrible evil roar.

#### Killers Dress in Leopard Skins

The singing grew wilder. A dancer gyrated in the final ritual designed to drive out evil spirits. At the climax he seized a glowing coal from the fire and, turning it in his hands, whirled and stamped through the fire itself. As I left, all was quiet in the blackness of the forest.

About this time there were rumors that the sinister leopard-men had killed six men about 100 miles from Camp Putnam. Government administrators were called from near-by settlements to investigate the stories of violence.

The leopard-men are a sort of forest Ku Klux Klan; members go from village to village, taking the law into their own hands and avenging suspected wrongs with death. These terrorists dress in leopard skins and use metal claws for their dirty work; it is hard to tell afterward whether the maimed victim was destroyed by the claws of a real leopard or by a leopard-man.

Members of the secret society must kill when ordered to, or be killed. In the old days the society was fairly active hereabouts, but there had not been a leopard-man case in our vicinity for 20 years.

The incident seemed to loose a spate of supernatural disturbances. On one of my market days Sindanu, my Pygmy gardener,



### Modish Hairdos Require Long Hours

Fancy designs result from cropping with an old razor blade or broken glass. Ear at left holds two cigarettes.



EDWARD G. BAZZ (OPPOSITE) AND HEARNE THORPE

limped up to me with a swollen leg. He used a stick as a crutch.

"I know who made me sick," he said, pointing dramatically at a young Bantu.

I started. The accused was the same fellow who had gone into the forest several years ago with our blacksmith. The blacksmith had never been seen again, and there was talk of cannibalism. Here, I thought with dismay, is a *holozi* case.

Instead of denying Sindanu's charge, the Bantu merely said when I questioned him: "Sindanu is my Pygmy. Since you have come back, he has not done a stroke of work."

A spirited discussion started among the other Pygmies and Bantu, but I stopped it.

"The whole affair needs more people," I said. "Wait till I get Sabani and other witnesses and judges."

Sabani was the respected chief of the Bantu village across the Epulu River. When I told him of the accusation, he shrugged and said: "So it's he who put the *holozi* on Sindanu and made his leg swell."

There was also much talk among the Pygmies about the death of Aberi. Actually he had died of dysentery, but all of them believed the *holozi* had killed him because he had not kept his part of a bargain.

Giving the *holozi* is the local people's means of revenge or of punishment for an injustice. When one of my Pygmies fell sick, for example, I was told it was because for a long time he had owed money to a relative, who had put a spell upon him. As soon as he repaid his debt, his health improved.

Now the Pygmies were saying that Tomasa, Aberi's wife, had a *holozi*. Indeed, the *holozi*

had marked Aberi long before; hadn't it one night eaten up all the meat left on an animal Aberi had just killed?

Even one of Tomasa's own children said to me: "My mother is a *holozi*."

I decided I must go back to see how the widow was faring.

### Excitement Brings a Witchcraft Charge

Near the village I heard such a commotion that I started running. As soon as I arrived, a young man told me that the Pygmies were beating an old woman named Sau, whom everyone accused of being a *holozi*.

"You've got to do something about Sau," he said, "or all your Pygmies will be dead. She is throwing her *holozi* around the forest and spoiling our hunting. We want good things in our nets, not leopards."

Then my friend Mbaka told me he had seen Sau tampering with his net in the forest and that she had followed him back to camp. He was afraid of her; after all, it was he who had been wounded while hunting.

Other Pygmies complained that their hunting had been bad ever since Sau came to their village. Tomasa reported that Sau had threatened her. The feeling against Sau was intense, and in the excitement the charges against Tomasa, which had brought me to the





village in the first place, were now forgotten.

It was a thorny problem for me. Sau was the mother of two of my Pygmies and the grandmother of several others. I knew she was as innocent as I. Still, how could I insist that a person whom all the people feared live among them? I was by no means sure of my ability to control what was beginning to look like a lynch mob.

Sau was old for a Pygmy; that is, about 45. A troublemaker, she had started and continued a bitter feud with another family, and it had just broken out again. Several years before, she had been accused of being a witch, and I had stopped the Pygmies from beating her to death then.

Now they were persecuting her again. Furthermore, Aberi's brother Take claimed to have seen Sau dancing around a tree a few nights past—damaging evidence, for the *bolozis* is supposed to inhabit trees.

Suddenly old Sau rushed out of her hut. A noose was around her neck, signifying that

she would kill herself for being a *bolozis*. She was slashing at her stomach with a small knife. Her daughter tried to stop her, but Sau broke away and fled down the path.

I caught her, led her back to the hut, and removed the noose. Sau rolled on the floor, groaning.

"I am going to die today," she cried. "They are going to say to my son, 'Your mother is a *bolozis*.'"

I tried my best to comfort her, but I didn't know quite what to say to a woman accused of witchcraft. Eventually her hysteria spent itself, and I called her daughter to stay with her.

Outside the hut again, I found that I was the only person who did not believe Sau to be a witch. And while the Pygmies might not risk governmental retribution by committing an obvious murder, they had many subtle ways of doing away with her.

I went home full of fears. It was a beautiful moonlit night, but for me it was full of





### Little Folk Form a Tunnel of Legs for Comrades to Crawl Through

Pygmies readily adopt any alien game that strikes their fancy, adding refinements to suit their sense of humor.

Children in background try out a drum that they borrowed from the Bantu, with or without permission.

Ituri Pygmies, who make no drums of their own, have such an excellent grasp of rhythm that their tempos influence the music of their Negro neighbors. Accomplished vocalists, they sing in harmony and in rounds.

Boy archers bombard a fruit target, sending it dancing across the forest floor. They play with bows and arrows as soon as they can walk, and some are fair marksmen by the age of three.

Parents unworriedly let their offspring climb trees, swing on lianas and play with spears, knives, or discarded razor blades. The author shuddered at such hazards, but discovered that few children got hurt.

Youngsters sometimes play a game vaguely resembling soccer, using a ball made of latex from a rubber tree.







LEONARD S. BROWN

### Tap! Tap! Tap! An Ivory Hammer Pounds Cloth From Bark

About 10 varieties of the wild fig tree provide material for bark cloth, one of the Pygmies' few handicrafts. Homemade dyes add color and design. A surprising softness marks the finished product. This man breaks down the coarse fibers.

witches on broomsticks. Every leaf seemed to be haunted. I felt I knew what it must have been like in old Salem.

All the next day, after I had returned to the village, I could sense something strange in the atmosphere. There was much beating of drums and rehashing of all that had happened. The general opinion was that a diviner was needed, and one was summoned.

No sooner had the diviner arrived than he took some medicine and went into a trance. He made a beeline for Sau's hut and beat on it, and then on her back. Soon all the Pygmies were beating her.

I put a stop to that and sat outside her hut, guarding it. Sau had put a noose around her neck again. She remained sadly inside her hut, moaning.

Sau's wife approached and called to Sau. "Speak up, Sau," she yelled, "and tell us who dances with you at night. We know there are others. It is not you alone."

Sau moaned and rolled on the floor. Then she staggered out of the hut and across the road. I followed her.

"I am going to die today," she said.

"Not if I can help it," I reassured her. "Where do you want to go?"

"To the woods. To my son."

Suddenly she collapsed. I ordered some Pygmies to carry her into her hut, where she soon fell asleep.

The diviner then began an incredible kind of dance in the scorching sunlight. Soon he stopped and began to imitate a person in a trance. Grunting loudly, he waved a stick



around, pointing this way and that, until he singled out an old hollow tree. Still grunting, he climbed into the hollow. Another Pygmy followed him.

There seemed to be no doubt in anyone's mind that the bolozzi had something to do with the tree. Presently the two Pygmies emerged from it with a dead rat they had found, and there was great excitement. Presumably the bolozzi was inside the rat, but they could not be sure until they opened it; and, since they feared the bolozzi's escape, they would not cut it open.

But Pygmy crises have a way of vanishing as quickly as they begin, and this was no exception. That night coincidence took a hand. A fierce storm toppled the bolozzi tree. The next day Sau left the village with one of her sons. With her out of the way, the Pygmies soon forgot the whole episode, and it seemed that the witch-hunting madness might be over for a while.

The Little People now had other excitement to look forward to: a wedding that had been postponed by the Sau affair. Although the bride, Sikapawa, was so young that I had opposed the marriage, she already had the reputation of being a flirt. Her brother, a notorious Casanova among the Pygmies, was especially eager to get her wed.

#### Pygmy Bride Changes Her Mind

Now that she could be married, however, the plans kept changing hourly. Finally, on a Monday afternoon, it was decided that the bridal party should leave Camp Putnam and sleep that night at a village about 10 miles away where the wedding was to be held. Naturally I was to drive them in my car.

I could hear the Pygmies singing outside the bride's hut. The burden of the song was that Sikapawa was now a big girl; she was leaving her family's home and protection; she must be a good wife.

Then a Pygmy rushed to my house to say that I should come at once and get Sikapawa, for no sooner had she been given a festive smearing of palm oil than she had covered herself with ashes.

"Doesn't that mean she won't go through with it?" I asked.

"Yes. But you've got to make her. The women have been celebrating, and they say she must."

When I said I'd do no such thing, the Pygmy left and returned with the bride's

brother, who was in a rage at Sikapawa's obstinacy. He had arranged the marriage on a head-for-head exchange; for he wanted the groom's sister for a wife. If Sikapawa backed out, his own wedding would be off. I told him he would have to solve the problem himself.

He thought it over for a moment, then brightened. "I'll go beat her up," he said.

Whatever he did, by the time I drove up to the bride's hut, everyone was gay. Sikapawa had been oiled again and her face painted blue. She seemed more cheerful than before, but nowhere near as happy as the rest of the party.

The Pygmies lined my car with banana leaves to protect the upholstery against the palm oil, and then piled inside, filling every inch of space. Those who could not squeeze in followed on foot.

#### Ten-franc Notes Replace Axes in Ceremony

When we reached the village, the Pygmies came running out of their huts at the sound of their leader's ivory horn announcing our arrival. The Bantu masters also appeared and proposed that, for some reason or other, the wedding be postponed for one more day. I, however, flatly refused to stay over or to make the trip again.

Then I gave the bride and groom 10-franc notes to hold in their mouths during the ceremony, and that settled the matter. In the old days tradition decreed that wedding principals hold iron axes in their mouths, as symbols of wealth and strength. Today the favored symbol is money.

Young folk took Sikapawa into a hut to freshen her up. Soon she emerged newly oiled and with one side of her face painted black. She wore an orange cloth I had given her, fastened in back with two safety pins. She also wore a string of banana leaves and a colorful beaded belt. On her shaven head, which had been daubed with red, perched an old felt hat.

One of her girl friends preceded the bride, carrying a stick from which waved a wine-colored scarf, and one of her sisters also walked before her. Two women spread a carpet of banana leaves in front of this procession. The girl with the stick advanced to another hut and ceremoniously called forth the groom.

He was a lithe, muscular lad, quite light in color. One side of his face was painted black,





WHEELER

Bundle of plantains on a tumpole bows a sturdy four-foot wife. Bantu supplied the fruit, which is cooked before eating. Plantain contains more starch and less sugar than the related banana.

and he wore three strings of red plastic beads.

The groom met the bride's procession and led it to two banana-leaf cushions that had been placed on the ground. There they all stood still for quite a time. Meanwhile, the village matriarch sat fanning the cushions, and the other villagers filed past, giving the couple a slap and putting presents in a plate.

Some of these gifts were symbolic. The bride's Bantu mistress, for example, laid down a gourd cut to look like a lamp, indicating that the village would eventually give the couple a real one. Pieces of broken and twisted grass represented beads that would sometime replace them. Then, too, there were real gifts: pots, beads, cigarettes, franc notes, and two old-fashioned iron bracelets once used for wedding money.

As each guest deposited his present, he had the right to hit one of the bridal party and smear ashes on the crone who was fanning the cushions. If she were to stop, even when

rubbed with hot ashes or coals, the wedding would thereupon be off.

Now came the dancing, led by a male Pygmy beating on an antelope skin. Following was a number by female precision dancers waving leaves. Last came a conga line—the Pygmies called it a monkey dance—of eight people, each clinging to the bark-cloth garment of the person ahead.

Finally, the married Bantu women lectured the bride on how to be a good wife. Sikapawa hung her head and looked wretched. She actually burst into tears when told that if she were a bad wife, her husband would beat her. Then the Bantu women invited the bride to the stream, where they would wash her.

The groom had been silent all this while. "Who will wash you?" I asked.

"He will wash himself," the Bantu women said.

Their departure for these ablutions concluded the ceremony, but there was still some skylarking among the youths and the bridesmaids. I deposited my gifts—a pot, some cigarettes, fish, manioc, and ten bottles of banana wine—and left.

When my Pygmies got home the next day, they were exhausted. They had sung and danced all night and had mixed banana wine with bottled beer.

No work was done around my place for several days.

As Christmastime approached, I decided I had had my fill of witchcraft, superstition, and pagan rituals. I wanted to share the holiday joy with my white neighbors, and so I invited them to Camp Putnam for a party. My boys understood and helped me decorate.

We hung the living room with green vines from which we strung red fruits from the forest. Candles were margarine cans wrapped with green leaves and filled with palm oil.

For dinner we had guinea hens the Pygmies had killed for me with bows and arrows. It was good to sing the old familiar Christmas carols instead of trying to join in the Pygmy chants.

When I saw my guests out, moonlight flooded the Epulu as it flowed calmly through the Ituri Forest. The trees beyond the river were so high that the outline of their tops was like the crest of a mountain. More than ever I felt in love with my African home.





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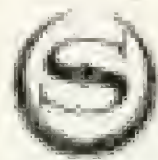


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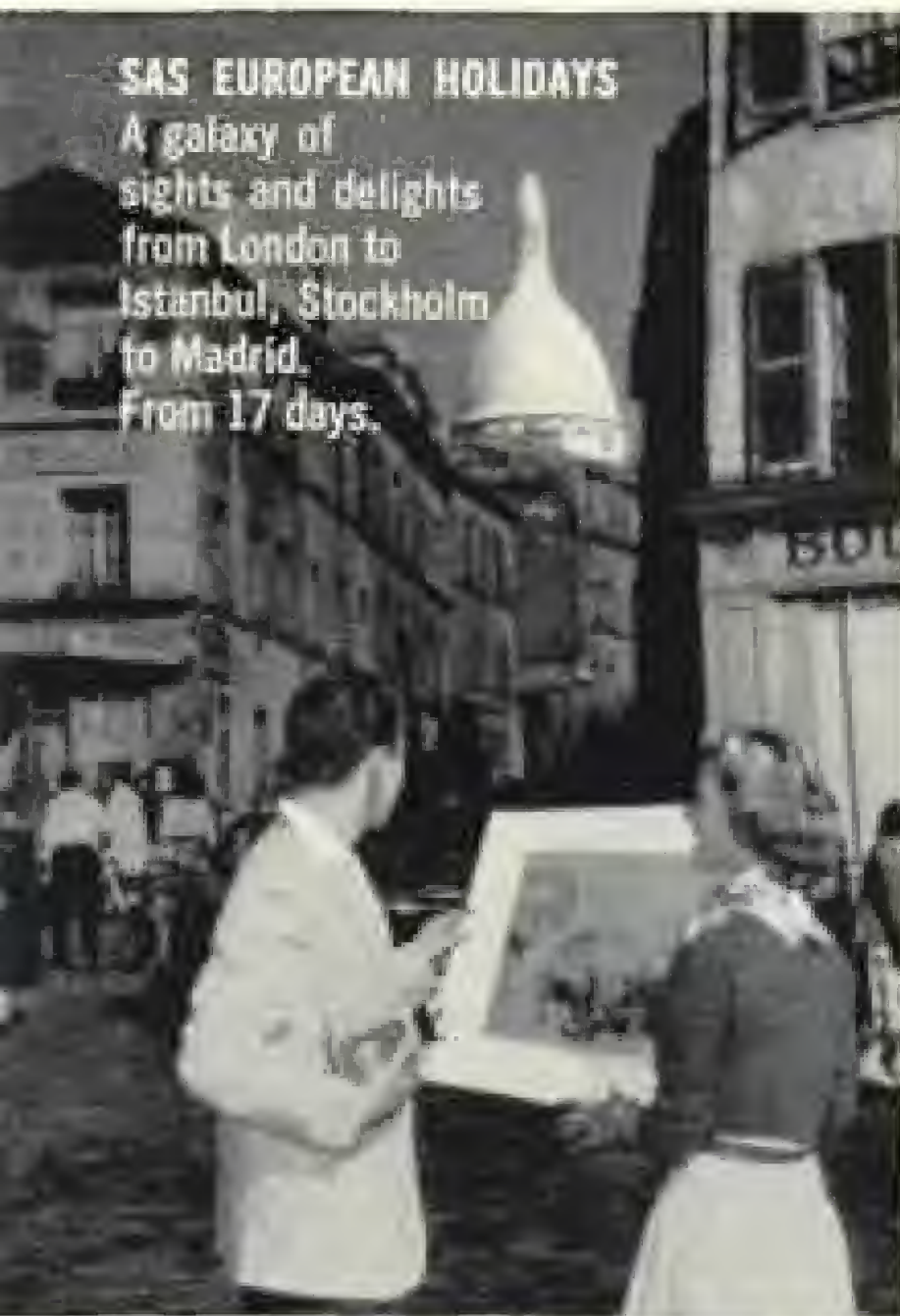
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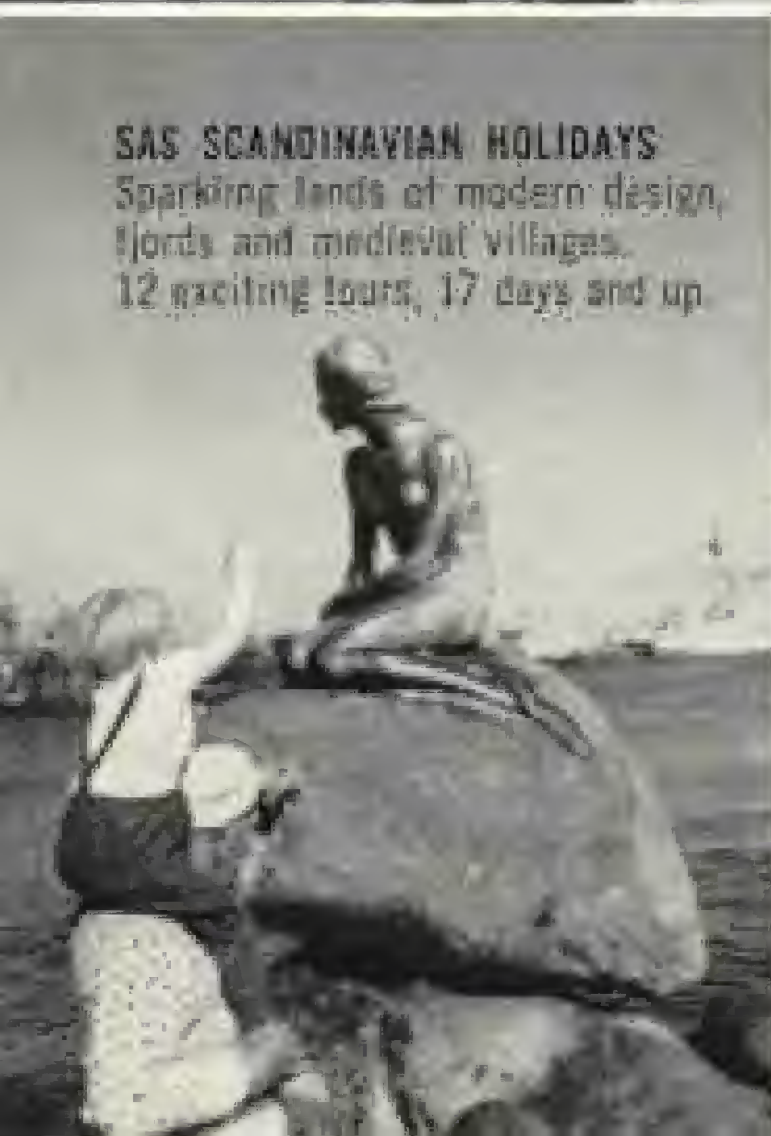
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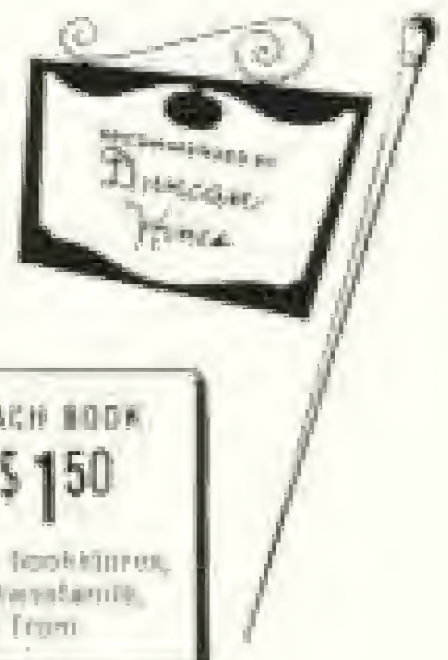
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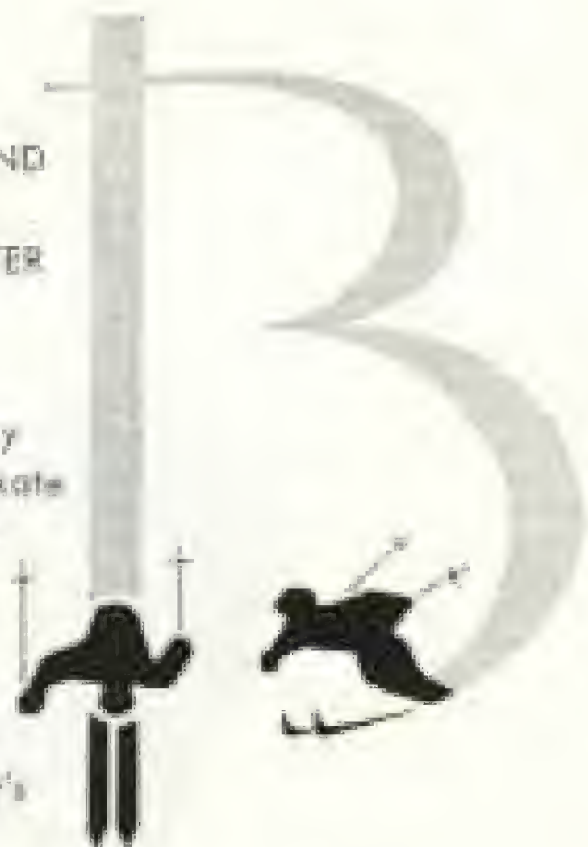
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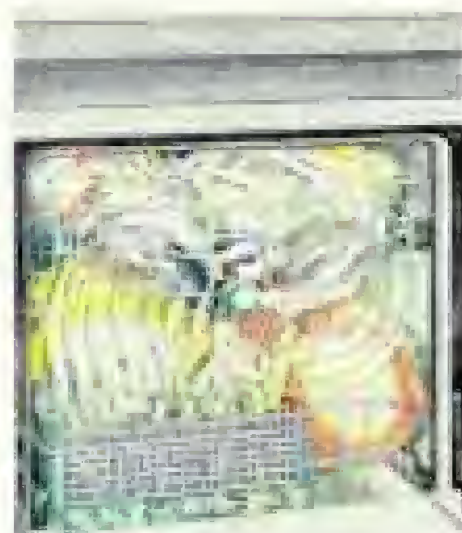


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