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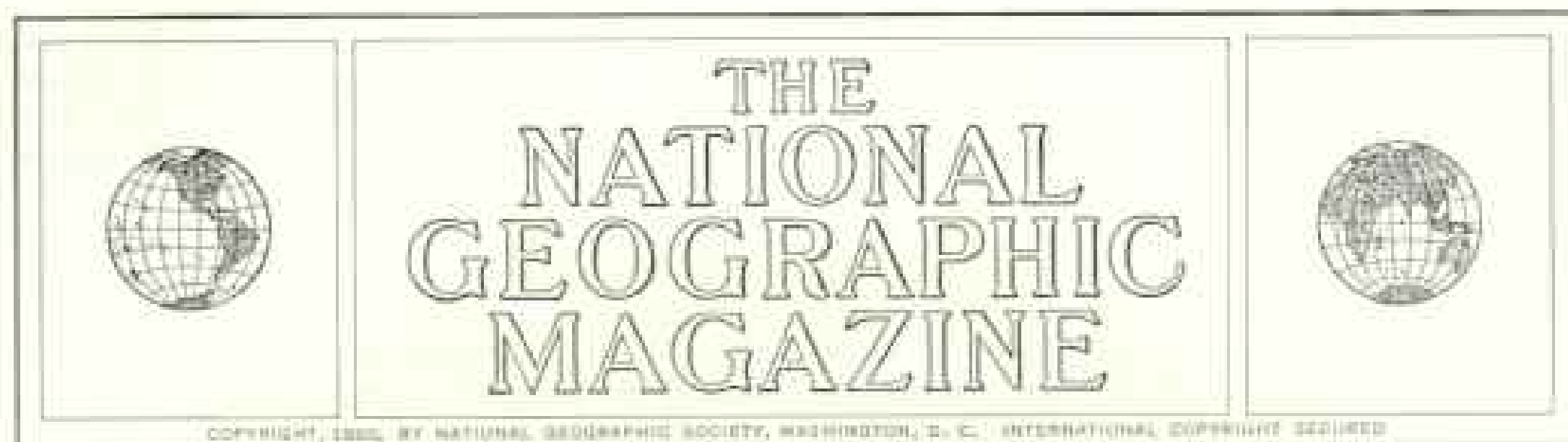
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Windjamming Around New England

BY TOM HORGAN

With Illustrations by National Geographic Photographer Robert F. Sisson

ALONG about April, when spring's first timid smile drives New England small-boat sailors into a frenzy of calking, painting, and repairing, I can expect at least one of my friends to say, in effect:

"Here you are, the owner of a fine little boat, one that could go anywhere. And yet every summer you take much the same cruise—South Shore, Cape Cod, the islands, North Shore, and Cape Ann. You cruise for three weeks and still you're never much more than 100 miles from home. Year after year you see the same places. Why?"

I always listen tolerantly to these well-meaning friends. True, my 40-foot auxiliary ketch *Nomad* could "go anywhere." Sometimes I don't even bother to point out that to "go anywhere" takes time and that three weeks is all the summer leave I can wangle from the Boston bureau of the Associated Press, where I earn the money to keep *Nomad* shipshape.

And so last summer our cruise was much the same as before, the latest in a series of many, interrupted only by World War II.

To me, New England waters offer everything the sailing vacationist could ask. *Nomad's* company has seen most of the world without finding a region of like area where so many pleasant and interesting places may be visited in so short a time.

Our course covered a route well worn by mariners since the days of the Norsemen (map, page 145). Everywhere were reminders of those who had sailed our way before, some godly and many otherwise. The coves and harbors we visited had been used by early explorers, patriots, pirates, and privateers;

slavers and whalers, East Indiamen, and other honest seafarers.

Nomad's company included four veterans of previous cruises. From Washington came two new hands: Robert F. Sisson, photographer, and Stuart E. Jones, both of NATIONAL GEOGRAPHIC's staff.

A reputation as cook gained on previous voyages, plus his magic touch with *Nomad's* often reluctant coal-burning stove, gave Robert G. Allen command of the galley (page 155). He was relieved frequently by Col. William H. Speidel, on leave from the Army.

Arthur Mortenson was responsible for *Nomad's* sailing gear, 24-horsepower auxiliary, and general well-being. I concentrated on navigation, mindful that *Nomad* could not easily be replaced if she strayed into shoal water, and often there was plenty of that close at hand. All stood tricks at the wheel.

A Haven for Boston's Bohemians

Last of the supplies went aboard at Boston's T Wharf the night before we sailed into a misty August dawn. T Wharf, built about 1722, gets its name from its original shape, not from the famous Tea Party.

Until the new State pier was built farther down the harbor, T Wharf was Boston's principal landing place for fish. Old-timers remember when windjammers crowded the slips on either side. That was before engines plucked canvas from the spars of fishing fleets.

Then busy sailmakers occupied the greater part of a long, rambling, three-storied building that runs the length of the wharf. As the sailmakers departed, artists, writers, and other folk converted the lofts into studio apartments,

finally 27 in number. I occupy one, and Bob Allen another. T Wharf is Bohemia's last damp, pungent beachhead in Boston. Visitors have called it "a bit of Greenwich Village—with salt water."

On the starboard hand leaving T was Long Wharf, supporting a big yellow shed at its end. On the shed's side is painted the intelligence that here Capt. Lorenzo D. Baker, a Cape Codder, in the schooner *Telegraph*, landed the first full cargo of bananas to reach the United States, back in 1871.

The *Telegraph's* bananas were received with suspicion. Captain Baker was forced to give away much of his cargo before Bostonians were convinced the fruit was not poisonous. Some time later, it was considered safe to give bananas to children. Such was the beginning of an important industry.*

Visibility was poor as we chugged down the harbor, whistling vainly for a wind. Passing the Navy Yard annex, we swept past the bows of the "mothball fleet." Gun mounts of aircraft carriers and other warships were ghostly under gray metallic "igloos."

In the haze we had a little difficulty picking up Nixes Mate, marking the entrance to the Narrows. Nixes Mate is a reminder of the tale of a seafarer said to have been hanged in 1636 for the murder of his skipper on what then was an island where sheep grazed. The mate said, as the noose was slipped over his head, that the island would wash away and thus prove his innocence. And so it has. Its location is marked only by a black-and-white pyramid as an aid to navigators.

Although the mate's name is lost to history, those of other notorious pirates and mutineers who were executed on the island are not.

Thomas Hankins, black sheep of a respected family, ended his piratical career there in 1689; John Quelch, in 1704; and William Fly, in the same era.

Through Cape Cod Canal

The haze burned off as we threaded the Narrows, passing between crumbling harbor forts, and laid our course for the Cape Cod Canal, 50 nautical miles away. The sea remained glassy, without a trace of wind. Allen whipped up breakfast, and we lolled comfortably in the cockpit, watching South Shore towns glide past (page 149). We vetoed calls, feeling the cruise would not be well under way until we reached the canal.

The original plan was to tie up for the night in a snug harbor of refuge dug into the bank near the canal's eastern entrance. But a green light glowed from the control station and the sun was still high; so we kept going. Sisson

dropped into the dinghy, towed astern, and went to work with his cameras as we passed under the two beautiful highway bridges, lacy against the sky, and the railroad lift bridge. All have 135 feet clearance, easily accommodating *Nomad's* 57-foot mainmast (page 160).

All along the canal's banks we saw anglers, perched precariously on rocks, casting for striped bass. Sometimes their lures almost landed on *Nomad's* deck. The only catches we saw were several big skates, which the fishermen discarded in disgust.

Gamy "stripers" seem to enjoy the swift, turbulent run of the tide through the canal, which at times attains four knots. This is further complicated by the fact that the mean rise and fall at the Cape Cod Bay, or eastern, end is 9.4 feet and only 4 feet at the Buzzards Bay, or western, entrance. It is well to consult the Coast and Geodetic Survey's *Tide Tables* before tackling the canal.

Before the canal was dug, small boats often were hauled across the narrow neck of land by oxen (map, page 145). Earlier, the Indians portaged their canoes by the same route.

Mysterious "Rites" at Mattapoisett

The tide turned against us as we cleared the canal and headed for Mattapoisett, on Buzzards Bay. As we felt our way in the blackness, steering for lights marking the old stone whaling pier, we noticed strange activity.

At the shore end of the pier several hundred people were whirling and gyrating, dipping and bowing, as if engaged in weird tribal rites. Floodlights illuminated the scene.

As we drew closer, we heard a metallic refrain from amplifiers: "Toe over toe, heel over heel! The faster you dance the better you feel!"

Mattapoisett was having a Saturday night square dance.

Once *Nomad* was secured, we walked through the festive throng and into the village to pay our annual call on Bill and Lu Monahan, a young couple who operate a summer hotel. Among this quiet inn's decorations are relics from the bark *Wanderer*, last square-rigged whaleship to sail from New Bedford. The voyage was brief, however, for *Wanderer* was wrecked on Cuttyhunk Island, about 15 miles from her home port.

Early next morning we struck out across Buzzards Bay for Woods Hole, the passage to Vineyard Sound between the mainland and Nonamesset of the Elizabeth Islands chain. Here we encountered our only fog in three

* See "Boston Through Midwest Eyes," by Frederick Simpich, NATIONAL GEOGRAPHIC MAGAZINE, July, 1936.



Daniel, Stout Veteran of Many a Whale Hunt, Now Graces a Nantucket Garden

Daniel I. Tenny still seems to be breasting a gale just as he did in the days when he adorned the prow of his namesake ship. When the vessel was converted to a barge, Bostonians bought her figurehead for their summer home. While being ferried to Nantucket, it was swept overboard in a storm. Lassoed, it was towed the last few miles to port. Meanwhile, the *Tenny* sank on her first voyage without her figurehead.

weeks. It rolled in thick and sticky, and the wind fell to a whisper. While groping about, we had time to consider what the *United States Coast Pilot* has to say about the Hole.

"Woods Hole," it cautioned, "is a narrow passage leading between numerous ledges and shoals . . . It is well marked . . . but the tidal currents are so strong [up to 4 knots] that the passage is dangerous without some local knowledge. The buoys in the narrowest part . . . are frequently towed under by the currents. A stranger should not attempt to pass through except near slack water."

Although we did not consider ourselves strangers, we were more comfortable when the fog lifted and we scooted through with much of the four knots hurrying us toward Edgartown, on Martha's Vineyard Island.

A Rendezvous of Windjammers

There, and it was the reason we were in a hurry, we found dozens of flag-bedecked craft of the New York Yacht Club on annual cruise.

Sailing partisans are inclined to look through the wrong end of their spyglasses at powerboaters, and call their craft "stinkpots," or worse. The N. Y. Y. C. fleet was reassuring. More than half of the 60-odd yachts in Edgartown Harbor wore canvas. Among them were John N. Matthews's 116-foot *Manxman*, the largest yawl in the world, and *Bolero*, the magnificent new 73-foot yawl owned by John Nicholas Brown, former Assistant Secretary of the Navy for Air.

We came up the harbor along a shore lined with the proud homes of famous whaling captains. Atop some were widows' walks, from which watch was kept for homebound vessels. The variety in doorways is no accident; the old captains wanted something distinctive.

English settlers in the early 1600's called it Great Harbor, but much earlier it was known to others, probably by other names. Island historians claim the Norseman Karlsefni Thorfinn came by in 1006; Giovanni da Verazzano, sailing in the service of France, in 1524, and later Samuel de Champlain and the Dutch navigators Hendrick Christiansen and Adriaen Block.

Many historians believe that it was this island to which Bartholomew Gosnold gave the name Martha's Vineyard in 1602.

Massachusetts did not establish authority over the Vineyard until 1691, after New York had abandoned claims.

It is pleasant to reflect that the Vineyard was an island of amity between the early settlers and the Indians, who later formed an important part of whaling crews.

Next morning we went out to the harbor en-

trance to watch the start of the N. Y. Y. C. race back to Mattapoisett. For a while we sailed in close company with *Fiddlers' Green*, a rakish little schooner which her owner, Dr. Edmund B. Kelly of Baltimore, took on an adventurous South Pacific cruise just before the war.

The racing craft got away, light airs ballooning their gay nylon spinnakers. We returned to resume exploration of Edgartown's shady streets, its many old dwellings neatly fenced and flanked with bright flowers. Flowers always seem more vividly tinted near salt water.

We drove over to Gay Head, on the western end of the island, where the cliffs wear varied pastel shades of red, yellow, and purple (page 163). There, too, were a few of the once numerous Gay Head Indians, selling beadwork and other trinkets.

We would have preferred to visit Menemsha, four miles from Gay Head, by water; but since long-legged *Nomad* draws nearly seven feet and the chart guaranteed only six, we drove to that picture-postcard fishing village.

Fishing boats snuggled against gangling wharves, at the head of which was the general store. Before the 1938 hurricane* carried away the original structure, the store had a sign: "We sell most anything but rum."

Small-craft warnings were flying as we sailed for Nantucket. Warnings of one kind or another were displayed almost constantly during the three weeks we were out. The Weather Bureau apparently had an eye on a hurricane then howling in the Tropics.

Brisk Wind Speeds *Nomad* to Nantucket

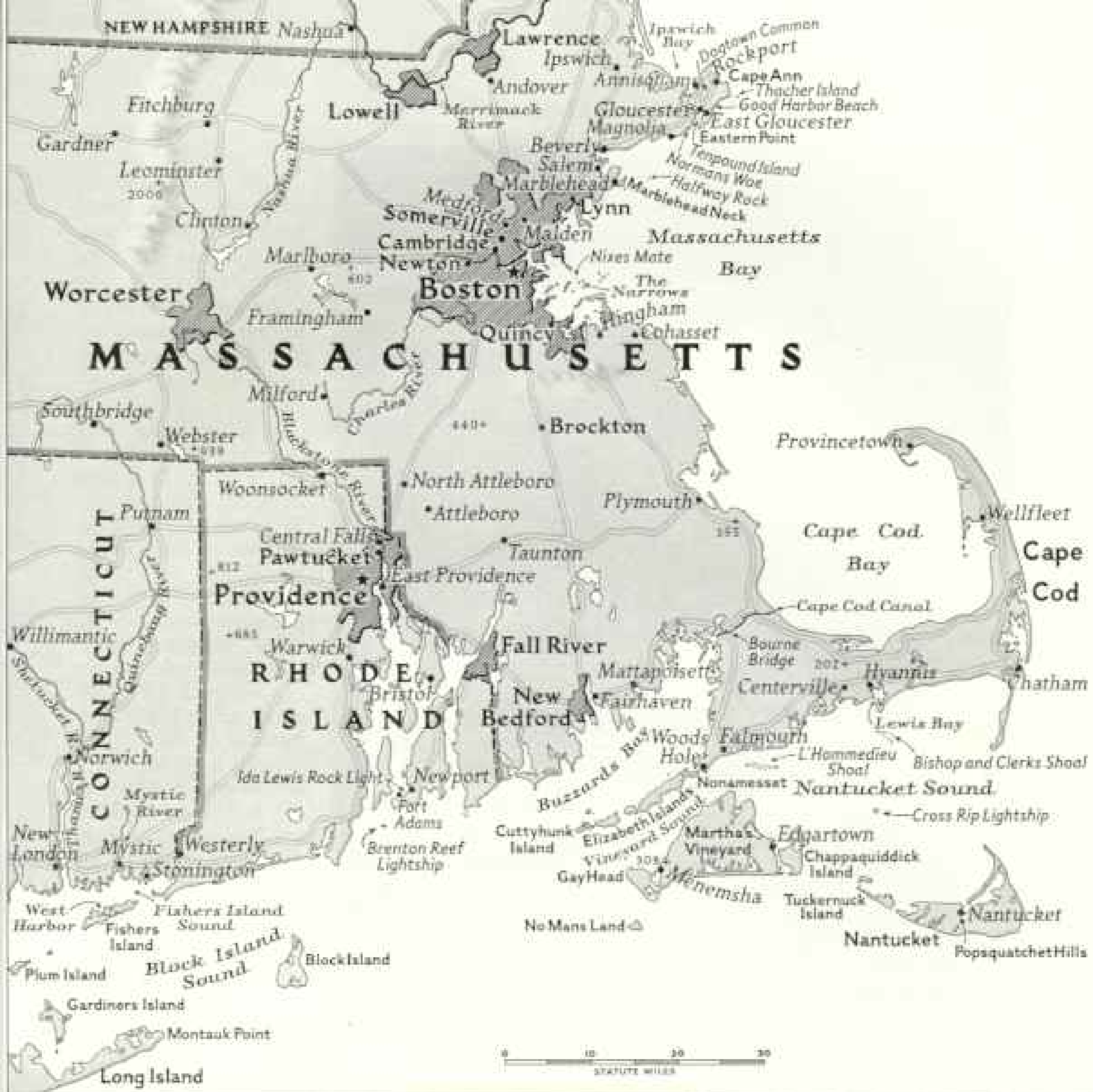
As it turned out, the 25-mile run to Nantucket was the only time it was found advisable to douse *Nomad's* mainsail. Under jib and mizzen, she skipped over a dancing sea, driven by a brisk northeasterly abeam, curtsied to the Cross Rip Lightship, and soon was boiling up the narrow mile-long channel to the harbor.

It was a route used by countless whalers, but when they came home heavily laden they were ferried over the shallows by "camels," mobile floating drydocks similar to those used in the Pacific war.

We tied up at the Island Service Wharf, using bollards that had held the dock lines of vanished blubber hunters. While fuel, water, and ice came aboard, Colonel Speidel disappeared, toured Easy Street's shops, and returned with lobsters fresh from the sea, and green corn from island farms.

When possible, we took advantage of local

* See "Geography of a Hurricane," by F. Barrows Colton, NATIONAL GEOGRAPHIC MAGAZINE, April, 1939.



Nomad's Vacation Course Touched Harbors and Coves Where America's Earliest Explorers Found Shelter

From Boston the author and companions sailed southward and through the Cape Cod Canal to Mattapoisett. Next stops were Martha's Vineyard and Nantucket. Past the Elizabeth Islands and Block Island, the route led to historic Stonington and Mystic, Connecticut. Returning through the canal, *Nomad* sailed to Provincetown, on the tip of the Cape, then across Massachusetts Bay to Cape Ann and back to Boston.

products, and were rewarded in quality and pocketbook. There is no more fruitful field for the sea-food branch of gastronomic research than New England. Lobster and corn we always boiled in sea water. No additional seasoning is needed.

Other menu items were scallops, quahogs, soft-shelled clams, swordfish, and tuna.

Nantucket's whaling museum, housed in an old sperm-candle factory, contains a fascinating collection. Among its documents is the log of Capt. Mayhew Folger, who discovered the last of the *Bounty* mutineers on Pitcairn

Island. Captain Folger devoted scant space to a subject that later inspired volumes.

America's Pioneer Woman Astronomer

We went around to Maria Mitchell's 18th-century home to squint through the brass telescope with which she discovered a comet in 1847 and won international renown.

Miss Mitchell, pioneer woman astronomer in America, made a computer of the Tables of Venus for the *Nautical Almanac* and instructed Nantucket mariners in celestial navigation. She also found time to rate ships'



Grandmother's Playthings Now Museum Pieces

Hunter House in Newport, Rhode Island, displays this dollhouse of the Gay Nineties. Faithfully reproduced in the old-fashioned kitchen are washstand, coal stove, oil lamps, and cooking utensils. Other cabinets contain dining rooms, drawing rooms, and bedrooms. Built in 1736, Hunter House served as the Revolutionary War headquarters of French Admiral Charles Louis d'Arzac, Chevalier de Ternay (page 165).

chronometers. She was a member of one of the many Quaker families who early settled on the island.

Nantucket boasts many venerable and stately mansions, built by whale oil and bone. Oldest dwelling is the Jethro Coffin House, built in 1686, a modest salt-box structure of small leaded casements and hand-wrought hinges. Oldest church is the Quaker Meeting House; oldest manufactory, a windmill built in 1746 to grind corn (page 152).*

We called on Charles F. Sayle, bearded seaman and maker of ship models, in his cluttered workshop (page 168). The sea summoned Sayle from his native Ohio at 14. He

has "swallowed the anchor," but ships are still his business—faithful replicas of vessels that once sailed the Seven Seas.

Besides building models, he restores old and damaged ones for museums and collectors.

With minute jeweler's tools, incongruous in the hands of a man more than six feet tall, Sayle was sheathing the hull of a windjammer model with tiny strips of copper. Each copper plate was made by Sayle, as was each of the 1,400 microscopic copper nails which he drove with a Lilliputian hammer.

Such a model, Sayle estimated, would require about 1,000 hours of meticulous labor. For this product of craftsmanship he expected to receive about \$1,500.

Daniel Has Retired from the Sea

We drove over to Gilbert Verney's rambling summer home on the western end of the island to inspect his figureheads. Histories of some of the ships they decorated are vague, but one at least

must have been tragic, for the figurehead was washed ashore.

On the lawn in front of the summer cottage of Hamilton Heard we saw another interesting figurehead, known as "Daniel." It is carved in the likeness of a bearded, frock-coated gentleman of the old school, possibly a skipper or shipowner. One wooden thumb is hooked under an oaken lapel. With left foot thrust forward, the figure appears to be striding into the teeth of a wind. A red bow tie makes a splash of color at the throat (page 143).

* See "Nantucket—Little Gray Lady," by William H. Nicholas, NATIONAL GEOGRAPHIC MAGAZINE, April, 1944.

For many years Daniel has been a member of the Adams-Heard family, who rescued it when the ship whose prow it adorned was converted into a barge. Members of its adopted family left Boston in a powerboat with Daniel as a cumbersome cargo. Just off Nantucket a storm swept it overboard. After some difficult maneuvering, the figurehead was lassoed and towed the last few miles to its new home.

When I asked the reason for the figurehead's name, I was told it was of one Daniel L. Tenny and once adorned a ship named for him.

Daniel now spends most of its time in the Heard garage. Every spring it is given a fresh coat of paint and placed outdoors.

We sailed across Nantucket Sound to Hyannis, the bustling metropolis of Cape Cod. Haze hid the Bishop and Clerks Lighthouse, marking the shoal of the same name, until we were close by.

A narrow channel winds through Lewis Bay to Hyannis. On an earlier visit we grounded in mid-channel. The fisherman who hauled us off assured us it was no disgrace. The sand bars, he explained, often shift faster than tenders can relocate the buoys.

At near-by Centerville we visited the Jack McGillicuddys of Boston, whose summer home is one of the finest examples of restoration on the Cape. Records indicate it was built in 1720, or earlier, by a member of the Lewis family, which settled on the Cape in 1639.

Among the house's features are Dutch ovens built into living-room and kitchen fireplaces. Clamshells were mixed in the cement, but our hosts were unable to explain their masonry value beyond their obvious availability.

Hyannis has a permanent population of about 6,000, but in summer it more than doubles. Part of Barnstable Town, it serves as a shopping center for a wide area. New York and Boston shops have summer branches there. It is a market place for Cape products from farm, sea, and workshop. Fragrant bay-berry candles are a specialty.*

One of the oldest windmills on the Cape stood just across Lewis Bay, in adjacent Yarmouth Town, until taken out to Dearborn, Michigan, by the late Henry Ford.

Chowder Fortifies Against Chill

Colonel Speidel, one of the few ship's cooks of his rank, brewed a big kettle of quahog chowder to fortify us against a chilly rain. The rapidity with which it disappeared attested to its quality. Enough quahogs—clams to non-New Englanders—for a sizable chowder can be gathered in a few minutes by wading at low tide and prospecting with the toes.

Hyannis to Woods Hole, a village in the town of Falmouth, was only a brief 23-mile run, but it called for precise navigation between the mainland and straggling L'Hommedieu Shoal. How the shoal got this spiritual name we were unable to learn, but we appreciated the clear weather as we picked up the buoys marking it.

Woods Hole, Center of Marine Research

Woods Hole is an important center of scientific research (pages 158 and 166). Here is located the Marine Biological Laboratory, which uses marine material in medical research, and to which scientists come from many parts of the world to work out experiments.

In large tanks at the United States Fish and Wildlife Service aquarium the private lives of shellfish and funny specimens are bared to the onlooker (page 153).

Close by is the Woods Hole Oceanographic Institution, which sends out laboratory ships to probe the secrets of the deep. A recent project was exploration of a submerged mountain range stretching from Iceland almost to the Antarctic. Co-sponsors were the National Geographic Society and Columbia University.†

Leaving Woods Hole after taking on supplies, we whisked through the Hole on a fair tide, safely past rocks on which a cabin cruiser had been wrecked a few days earlier. A spanking wind carried us briskly down Buzzards Bay, past New Bedford and Fairhaven, *Nomad's* birthplace, where she was launched by Major Casey. Major is the noted boat-builder's unusual given name.

Nomad made such good time that we were off Newport, Rhode Island, our intended destination, by noon; so we kept her headed westward for Stonington and Mystic, Connecticut, leaving Newport for the return trip.

It was a fortunate decision, even if it meant the longest leg of the cruise—about 70 miles. We arrived as those communities were celebrating Stonington Town's tercentenary with parades and other festivities.

As we came in between Fishers Island and the mainland, Fishers Island Sound was white with sail of scores of small racing craft finishing a regatta in a dying wind.

Fishers Island is New York territory, but on a chart it appears to have gone adrift from

* See "Cape Cod People and Places," by Wanda Burnett, NATIONAL GEOGRAPHIC MAGAZINE, June, 1946.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE: "New Discoveries on the Mid-Atlantic Ridge," November, 1949, and "Exploring the Mid-Atlantic Ridge," September, 1948, both by Maurice Ewing.

the parent State and grounded on the Connecticut shore.

We put in at the island's West Harbor, on a previous cruise to the New York World's Fair, and found rabbits and game birds so tame they were almost underfoot. The only shooting permitted on the island was target practice at the Army post, and wildlife seemed to know it.

Stonington Harbor is one of the best protected on the coast. Breakwaters staggered off opposite shores bar heavy seas, making it an unusually snug haven.

In the heyday of sail, near-by Mystic launched everything from clipper ships to gunboats.

Stonington now has one of the largest and best-equipped fishing fleets on the coast, largely manned by descendants of Portuguese who arrived on whaleships.

One of our first calls was at the studio of the portrait and marine painter, Griffith Baily Coale, one of the Navy's combat artists during World War II.

The Coale home, a big white structure nudging the main street, was built in 1765 by Capt. Amos Sheffield, a whaling skipper. Without outraging the original architecture, the artist has added a lofty studio to accommodate large canvases.

So strong is Coale's feeling for Navy tradition that, as we climbed a flight of stairs leading from studio to exit, he clapped a boatswain's whistle to his lips and expertly piped us "over the side."

"I do that for all my visitors," he said with a grin. "Glad to have you aboard!"

Coale is only one of many artists attracted to Stonington. James Abbott McNeill Whistler once resided here.

Williams Haynes, writer and president of the tercentenary celebration committee, drove us out to his home, built in 1750 by Paul Wheeler, veteran of the Indian wars.

Last of the Old Whalers

Mystic, three miles away, is part of the sprawling town of Stonington. There we found the Marine Historical Association busily reconstructing the venerable seaport and using as a centerpiece the whaleship *Charles W. Morgan*, more than a century old and the last of her kind (page 150).

The *Morgan* reputedly logged more miles and took more whales than any other ship of her time, bringing home cargoes worth more than \$2,000,000.

The whaleship no longer is seaworthy. Her hull, graceful even in decay, has been bedded in sand and stone beside a wharf. Into an oil

cask at the gangway visitors drop contributions to help save the old blubber hunter from irrevocable disrepair.

A more virile exhibit is the old square-rigger *Joseph Conrad*, which rises and falls with the tide beside the Mystic bulkhead, and appears sound and seaworthy. Having heard how the ship acquired her figurehead, I was particularly interested in examining the beautifully carved likeness of Conrad, the Polish-born author of *Lord Jim* and other sea stories (page 153).*

As the *Georg Stage*, this 156-foot frigate was launched in Copenhagen in 1882. For 52 years she sailed Baltic and North Sea waters as a Danish merchant marine training vessel. Alan J. Villiers, lecturer and author of many salty tales, bought the ship in 1934 and renamed her *Joseph Conrad*.†

Sailing his new property from Copenhagen to England to fit out for a two-year cruise, Villiers was accompanied by Bruce Rogers, American book designer. Rogers painted the new name over the transom, and offered to carve a figurehead and have it ready when the *Conrad* reached New York. Villiers accepted.

Hot Grog Served as Restorative

Mrs. Conrad, then living in England, supplied Rogers with portraits from which to work out his design. Rogers then modeled a clay head; from this he made a cast which he took to New York. There, in a hotel room, he labored at his wood carving from October to December, when the *Conrad* arrived at a Brooklyn shipyard.

For several days of zero cold, Rogers worked on a plank under the bowsprit, bolting the figurehead into place.

The dedication ceremony, held on an equally bitter day, was memorable. Despite the cold, about a hundred people listened to speeches by various dignitaries and Captain Villiers himself. Then all hands went below to thaw themselves out with hot grog.

The *Conrad* now wears a metal replica of Rogers's figurehead. The original is in the Seamen's Church Institute, New York City.

The windjammer served as a Maritime Service training ship during World War II. Then, by act of Congress, she was given to the Mystic museum and again is to a degree a school ship. Under the Marine Historical Association's program for youth education, she has become a floating classroom where

* See "Geography and Some Explorers," by Joseph Conrad, NATIONAL GEOGRAPHIC MAGAZINE, March, 1924.

† See "North About," by Alan J. Villiers, NATIONAL GEOGRAPHIC MAGAZINE, February, 1937.





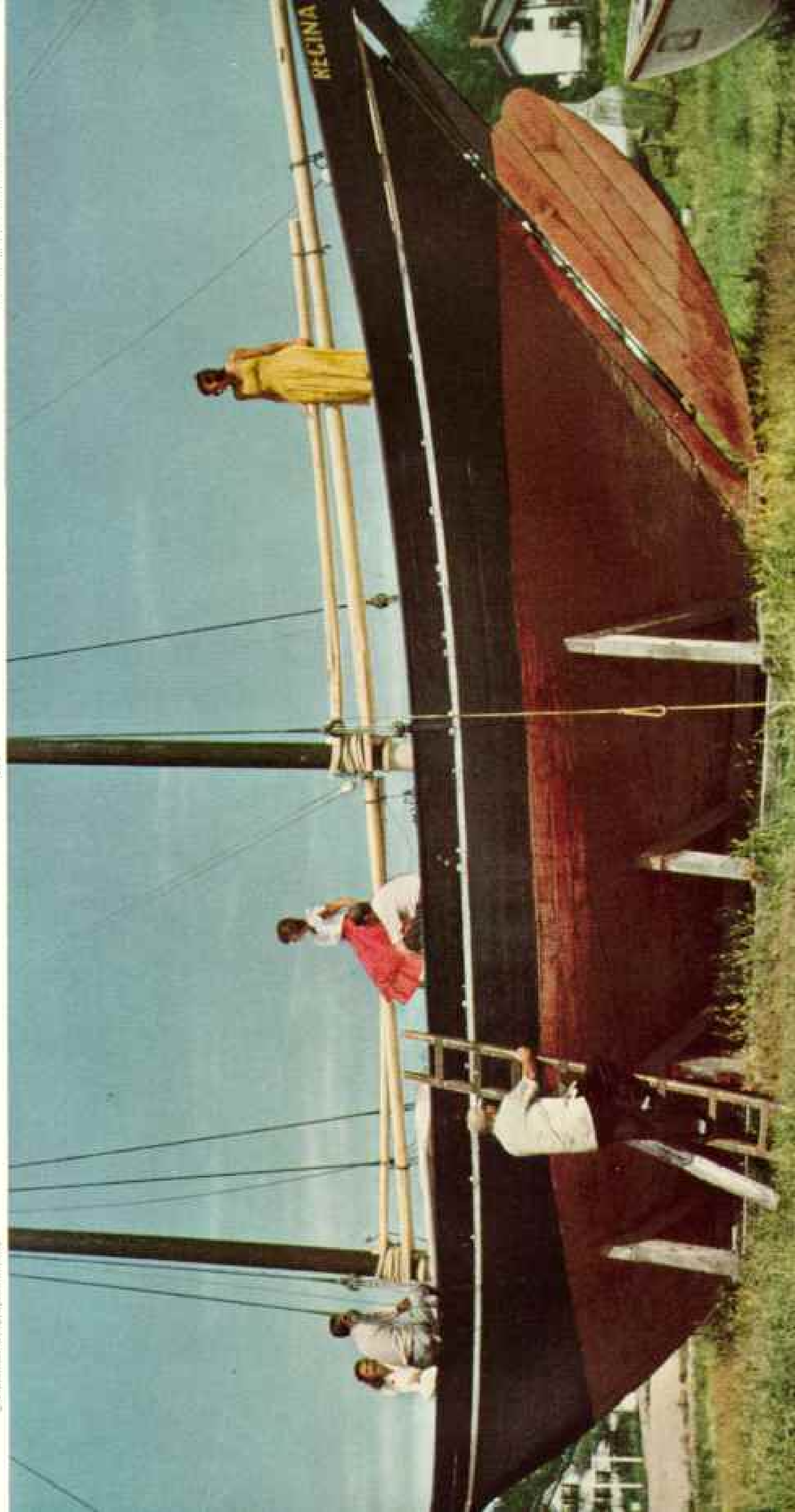
Square-rigger Masts and Yards Piercing the Skies Recall the Glory of Mystic, Connecticut, in the Days of Sail

Here on the banks of the Mystic River, the Marine Historical Association has re-created an old New England seaport and is preserving many nautical treasures such as the last of the whalers, *Charles W. Morgan* (opposite). Though apparently moored to a dock, the 109-year-old *Morgan* is "on the beach" to stay; the keel rests on a bed of sand and stone. Annually, thousands of visitors climb her gangway. Below decks they marvel at cramped quarters where sailors lived on voyages that lasted several years and netted sperm and bone cargoes worth \$2,000,000. Astern of the three-master lies Captain Irving Johnson's *Fancker*, calling at the Connecticut port on a summer cruise. The brigantine had just returned from her round-the-world voyage described in "*Fancker's* Wander-world" in the *NATIONAL GEOGRAPHIC MAGAZINE* for January, 1949. Another museum exhibit is the pinkie *Regina M.* (below), a shallow-draft schooner built at Lubec, Maine, about 80 years ago. Such swift "double-enders" were used for cargo carrying; some even bore arms in the War of 1812.

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Illustration by Robert F. Blanton





Nantucket's Old Windmill Inspires Artists to Tilt with Brush and Palette:

Weathered shingles cover a structure built of old ship timbers in 1746. Vanes turn only when the wind is due west. In whaling days, wives went to the mill, in Popsquatchet Hills, to scan the sea for home-coming ships.



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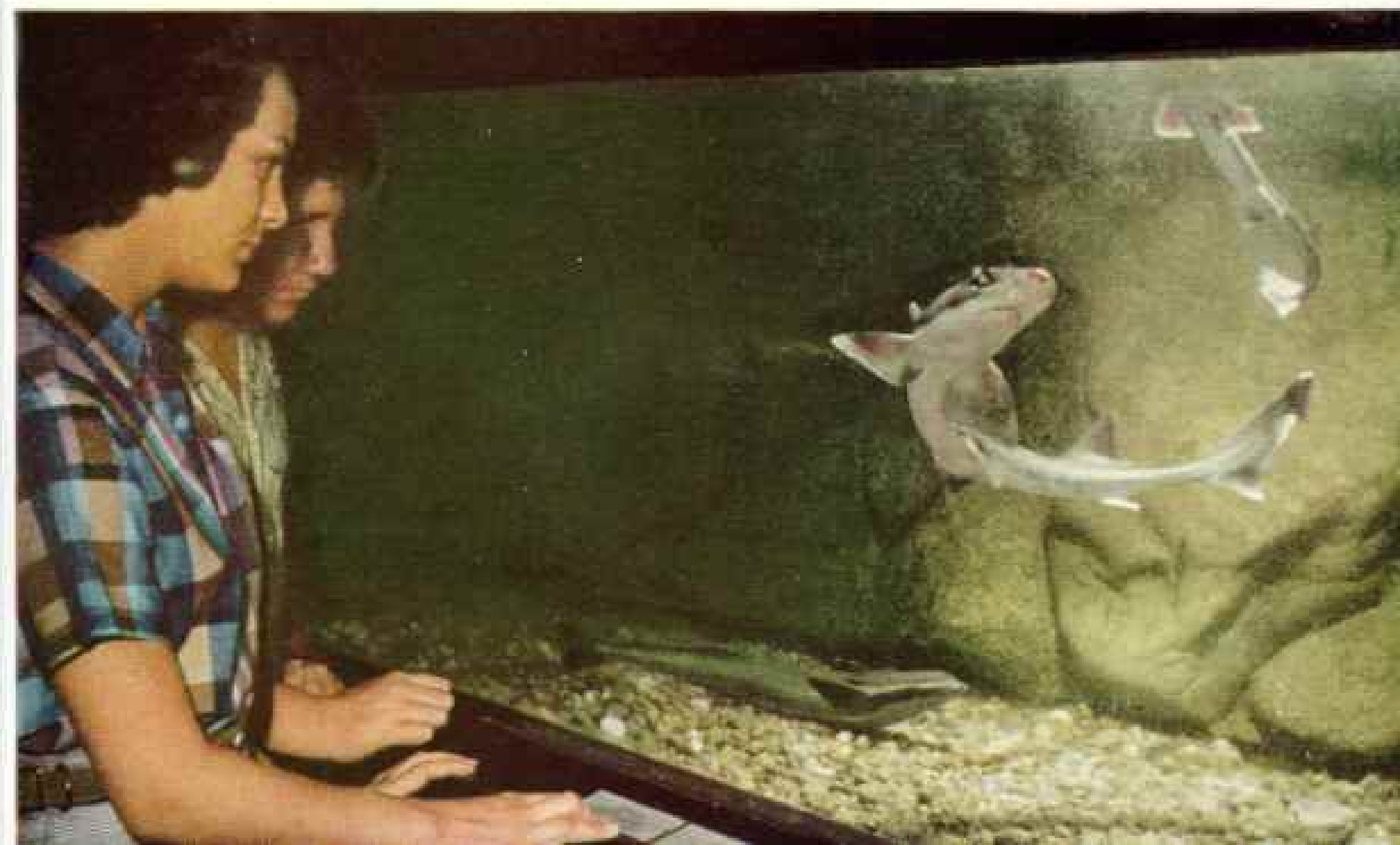
Kodachromes by Robert F. Hixon

✧ Aboard *Joseph Conrad* Youths Learn Tricks of the Salt-water Trade at Mystic

The full-rigged ship, 156 feet overall, now serves as a school for Sea Scouts and Girl Scout mariners. The *Conrad*, launched at Copenhagen in 1882, was sailed around the world by Capt. Alan J. Villiers. A likeness of the famous Polish-born novelist adorns the prow.

✧ At Woods Hole Fishes Give Up Privacy for Science's Sake

Dogfish cavort as if conscious of their audience. Shark sucker, a seagoing hitchhiker which clings to a shark by a disk on its head, rests aloofly on the pebbles. Hundreds of others from Atlantic depths are on view at the United States Fish and Wildlife Service aquarium.







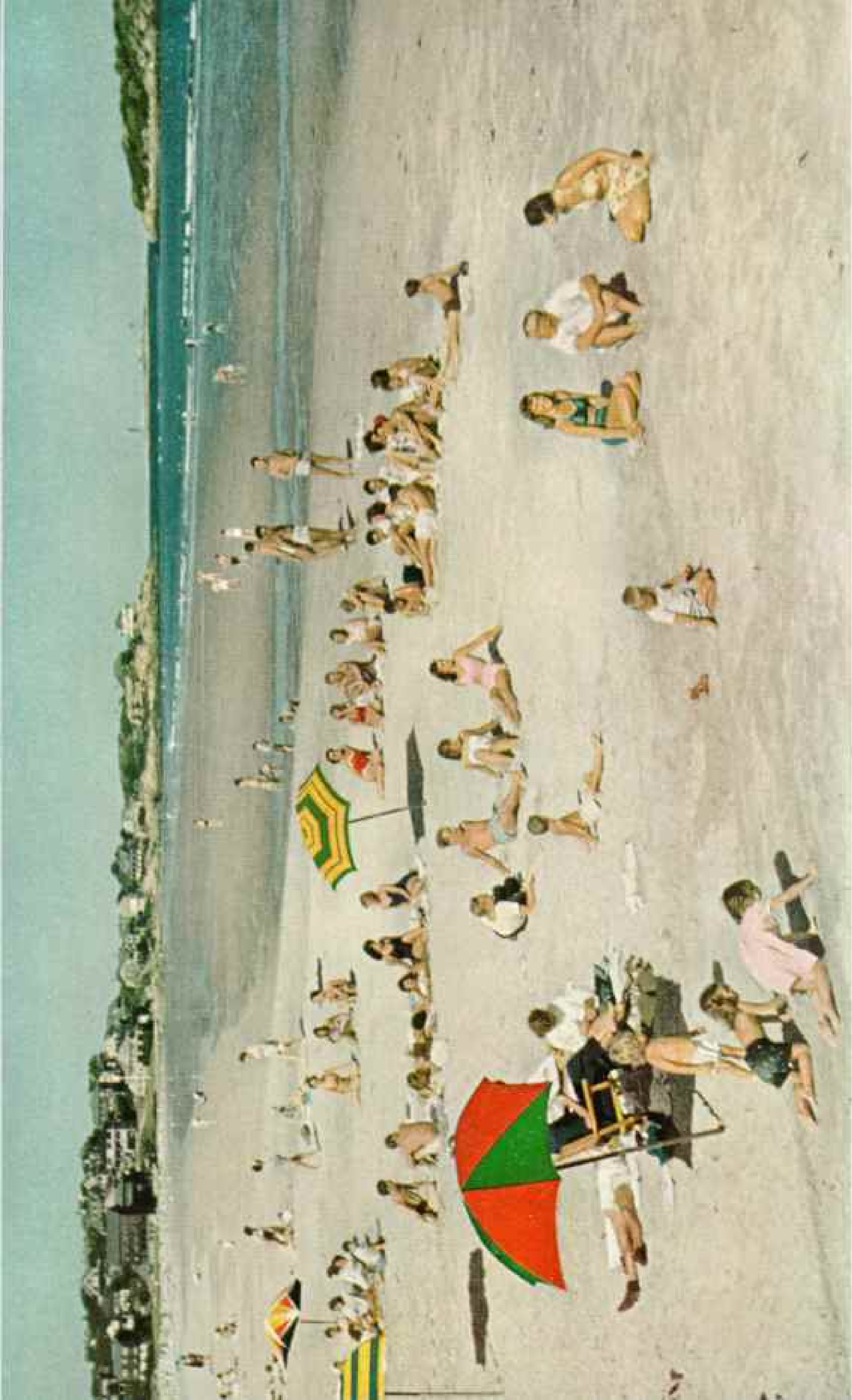
While Shipmates Gam on Nested Yachts, Dinghy Enthusiasts Flutter Butterfly Wings on Cuttyhunk's Snug Harbor

Thirty-one boats of the Cruising Club of America, which sponsors ocean racing and coastal cruising, gather here for a lobster dinner and to see the sights of this little island where the English explorer, Bartholomew Gosnold, attempted a settlement in 1602. Cuttyhunk lies at the westernmost end of the Elizabeth Islands, a pleasant chain of sandy beaches, woods, and meadow separating Buzzards Bay from Vineyard Sound. Anglers flock to Cuttyhunk for striped bass, broadbill swordfish, and bluefin tuna. A special type of Irish linen fishing line, developed by Cuttyhunk sportsmen almost a century ago and now used everywhere, bears the island's name. The word Cuttyhunk is a contraction of the Indian *poowotohunkunnok*, "thing that lies out in the water." At the end of a day's sail, lobster boiled in sea water tastes divine, says Mary Sullivan (left), feasting in *Nomad's* cabin. For a change from sea food, Robert G. Allen broils steaks over a charcoal fire in the tiny galley.

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Illustrations by Robert P. Klum





From Gloucester's Good Harbor Beach, Bathers Look Seaward to Twin Lighthouses on Thatcher Island

Cape Ann's Old Red Sail Loft, Jutting into Rockport Harbor, Ranks as "Motif Number One" for Artists

Scattered wooden houses look seaward, turning their backs on bleak, boulder-strewn meadows. Rockport still quarries granite, though on a reduced scale. Today's chief occupations are fishing and catering to vacationists.

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Illustration by Jack Breid



Weekly Regattas Decide Who's Best Among Cape Cod Sailors

On summer week ends, harbors along the Bay State's long, sickle-shaped sandspit are flecked with white as yachts compete in perennial contests for sailing honors. Between regatta yachtsmen spend hours tuning gear and polishing hulls to glasslike finish.

In passages like Woods Hole (upper), tricky currents and rocky reefs such as Red Ledge (scattered boulders astern of the left-hand schooner) require extra care, especially at night. Here a motorboat tows a string of Cape Cod Baby Knockabouts home to Woods Hole village (to the left of picture).

Provincetown yachtsmen (lower) annually play host to competitors from near-by Wellfleet in one of the Cape's oldest rivalries. One Lightning class sloop, benefited by a gust as she crosses the line, heels sharply, while her opponent, astern, sails on "her bottom."

"P'town's" 252-foot Pilgrim Monument commemorates the *Mayflower* landing at the tip of the Cape on November 11, 1620.

© National Geographic Society
Knockabouts by Melville Bell Grosvenor.
Lightnings by Robert F. Hensen

Block Island's Legends Tell of Sea Tragedy and Buried Gold

Visitors to the pear-shaped dot of land nine miles off the Rhode Island shore find little evidence of yesterday's drama—peopled by Indians, explorers, mutineers, pirates, and wreckers. Yet, frequently the island's sands are disturbed by optimists digging for treasures buried by Captain Kidd.

Another link with history, the graves of the *Palatine* immigrants, recalls the mutiny, shipwreck, and fire which inspired a poem by John Greenleaf Whittier.

Block Island today is a quiet haven whose menfolk draw their livelihood from the sea. Broadbill swordfish and bluefin tuna provide thrills for rod-and-reel anglers and good incomes for commercial fishermen. A Block Island youth comes of age on his first fishing trip.

Here, in the harbor channel, the ketch *Malabar VIII* passes the excursion steamer *Chancey M. Depew*, from Providence. At the helm is the late Morgan Butler, of New Bedford, Massachusetts.

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Reprinted by Merrill Bell Orono



Nomad, Sails Furlled, Chugs Through Cape Cod Canal

Mariners using this 8-mile cut between Cape Cod Bay and Buzzards Bay time their transit to take advantage of a tidal current which often runs at four knots.

On a favorable tide, vessels whiz through at a good clip, saving both time and fuel. Against the tide, boats crawl along at a snail's pace, giving passengers time to watch anglers casting for striped bass from the banks.

Here the author and companions, warmly clad against early-morning chill, pass under the Bourne Bridge, which carries motor traffic across the canal near the Buzzards Bay entrance. Trains halt when the vertical lift bridge (background) raises its central span to let vessels pass.

Before the canal was dug, oxen often hauled small boats across the narrow neck of land. Earlier, Indians portaged canoes here.

United States Army Engineers operate the waterway, used by thousands of vessels annually for a shorter, safer passage between Boston and Long Island Sound.

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Endpaper to Robert F. Ham



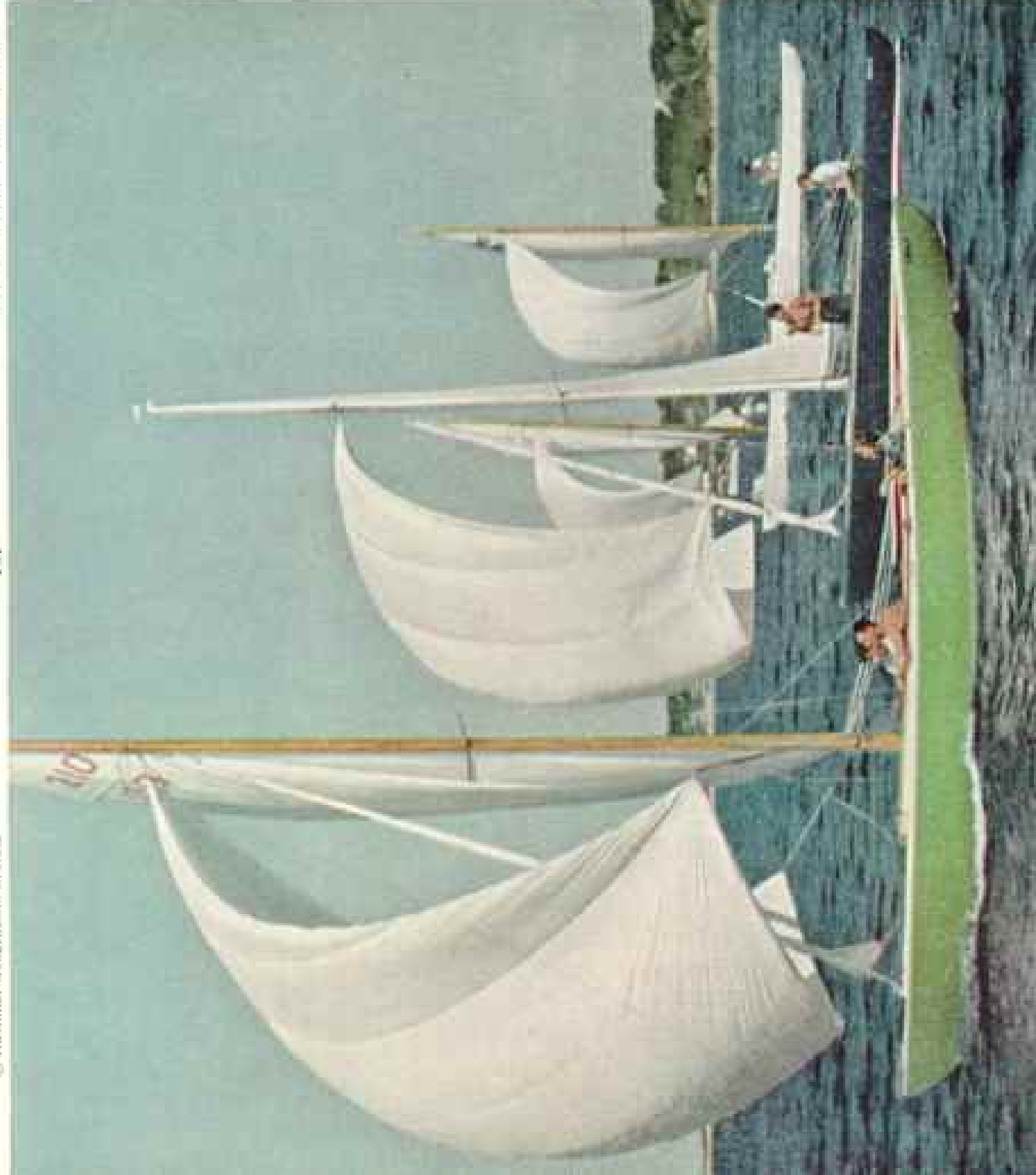
Boom! Goes the Starting Gun; under Taut Canvas Racers Hit the Line at Amisquam

A brisk wind, dead astern and filling mainsails and spinnakers, speeds these International 210-class sloops on their way around a triangular course in the Squam Bay regatta on Ipswich Bay. The annual event draws scores of small craft from yacht clubs along the North Shore of Massachusetts. At right, vacationers bask in the sun at the base of Edgartown Light, on Martha's Vineyard Island. Across the channel lies Chappaquiddick Island, sandy barrier between Edgartown and the open Atlantic.

© National Geographic Society

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Sketchmaster: Mr. Robert F. Hiram



Yachts Crowd Marblehead Harbor, Once Home of Merchant Fleets

From Crocker Park at harbor's edge, swimmers and sun bathers look across sail-dotted waters to Marblehead Neck. Race Week in August, 1947, set a world record of 522 starters.

Marblehead youngsters start sailing at seven in small, beamy centerboarders known as "Brutal Beasts." From these they graduate to larger craft. Even in winter, "frosthite" sailing teams from New England colleges race in the ice-free harbor.

Marblehead, a prosperous fishing center in Colonial days, once dreamed of being the eastern seaboard's chief port. But British blockades during the Revolution and War of 1812 brought destitution; later, Boston, Gloucester, and New York forged ahead.

Nominal last summer found many New England towns celebrating their tercentennials. Marblehead, however, was different. It was observing the 100th anniversary not of its founding but of its separation from neighboring Salem.

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Redaction: 10. Jack Reed



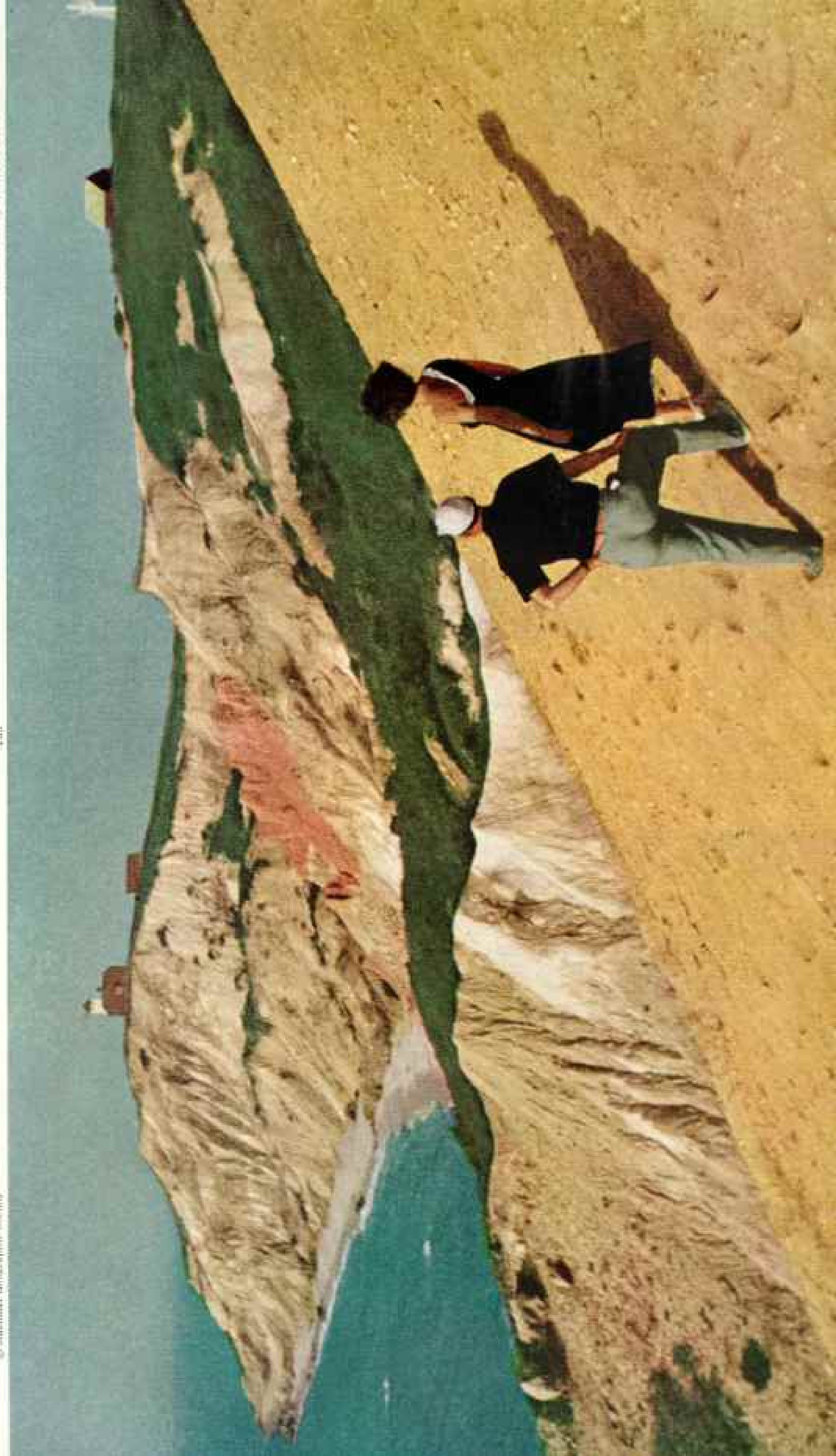
Gay Head Cliffs, a Dazzling Niagara of Clay, Gain in Beauty While Losing a Battle with Erosion

Foot by foot, the western headland of Martha's Vineyard crumbles into the sea under relentless battering by wind, rain, and tide. Each year the elements expose a new array of colors. Atop the cliffs stand a Coast Guard station and light.

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Modeling by Robert F. Staab





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Kodachrome by Melville Dell Grueszner

♣ "New England Has Everything!" Say Small-boat Mariners

Along the jamed coast yachtsmen find deep, safe harbors once used by early explorers, pirates, privateers, slavers, and whalers. Here, with his wife's assistance, Bill Butler of New Bedford steers the ketch *Malabar XIII* across Buzzards Bay.

♣ Home from the Sea Is Mystic's Wooden Glamour Girl

Feathered hat and demure bouquet adorn a figure-head from the early American merchantman *Abigail Chandler*. The carving spent years in antique shops and as a Long Island lawn ornament before it was presented to the Marine Historical Association.

Kodachrome by Robert F. Blum



youngsters, both boys and girls, study the rudiments of seamanship.

Hauled out on the Mystic River bank, not far from the *Conrad*, was the pinkie *Regina M.*, built at Lubec, Maine, about 80 years ago (page 151).

These popular double-enders were even used in the War of 1812. Shrewd Yankee skippers took advantage of the pinkie's shallow draft and lured British warships onto shoals. With the enemy ship helpless and unable to bring her guns to bear, the pinkie could lob at her with mortars.

When completed, Mystic seaport should be a maritime Williamsburg, Virginia. Along cobblestoned streets will be reconstructed shops of chandlers, coopers, blacksmiths, sailmakers, and the other tradesmen and artisans who kept the port's ships at sea.

In the museum's formal buildings are countless ship models, figureheads, portraits of ships and famous shipmasters, documents, logbooks, and tools of the whaling and sealing trades (page 164). It would require weeks to examine the contents of the Stillman and Mallory Buildings.

McKay's Pride Wrecked by Fire

In the Mallory Building, named for a famous Stonington shipping family, is the figurehead of the *Great Republic*, largest clipper ship ever launched. The builder, Donald McKay, thought she might also have been the fastest. But she was ravaged by fire before her maiden voyage and never restored to her original design.

Shouts and the sound of running feet sent us hurrying outside, where we could see, coming up the river and making the old port of Mystic live again, the lofty yards of a graceful brigantine.

No second glance was needed to recognize her as Capt. Irving Johnson's *Yankee*, even before he nuzzled her in to a berth astern of the earth-bound *Morgan* (page 151). *Yankee*, a former German North Sea pilot boat, came to Johnson through the fortunes of war. He had recently sailed her around the world and was planning another globe-girdling cruise.

It will be his fifth such voyage; he made three in another former North Sea pilot vessel he called by the same name. The writer has reported Johnson's departures from and arrivals at Gloucester almost since he was lured away from a Connecticut Valley farm by the uneasy meadows of the sea.*

Now, between more ambitious voyages, Johnson was leisurely cruising Long Island Sound, with, as usual, a crew mostly of landlubbers.

Irving is no Captain Bligh, but when he ordered *Yankee's* yards squared, even feminine members of the crew leaped to obey as if stung by a rope's end.

One of Stonington's most famous shipmasters was Capt. Nathaniel Brown Palmer, discoverer of the Antarctic Continent while on a sealing trip in the 44-ton sloop *Hero*. Of him, his shipbuilding father once said: "My home is Stonington, but Nat's is the world."

Newport More than a Pleasure Resort

We had an easy sail of about 40 miles to Newport, retracing our course of a few days past, until we picked up familiar Brenton Reef Lightship off the harbor entrance. The lightship is anchored in waters rich in yachting history, having served as one end of a starting line for countless races, including many of the America's Cup and Cruising Club of America ocean contests.

We tied up at the New York Yacht Club's abandoned Newport station, a biscuit toss from the center of the city. The glitter and polish of America's Cup days is gone and the old clubhouse is now used as a base for towboats.

To consider Newport solely as a playground of the wealthy is to make a great mistake. There are plenty of palatial and ornate villas, but the old port has a much more substantial foundation than imported pillars and friezes.†

Once it was a greater seaport than New York, and it is still an important naval station.

Still standing are some 400 houses more than a century and a half old. These include the headquarters of Charles Louis d'Arsac, Chevalier de Ternay, admiral of a French fleet in the American Revolution.

Our call at his headquarters was particularly fortunate, for workmen employed by the Preservation Society of Newport County were engaged in restoring the sturdy structure (page 146).

They were stripping off a dozen or so coats of paint which had concealed beautifully paneled walls, and ripping away plaster which hid pre-Revolutionary tile bordering the numerous fireplaces. They worked so skillfully that carved cherubs retained their original rosy complexions after layers of paint were removed.

The admiral, whose paternal grandparents immigrated to France from Ireland, is buried in the yard of Trinity Church, built in 1725 by

* See "NATIONAL GEOGRAPHIC MAGAZINE Cumulative Index, 1899-1949," for articles by Irving and Electa Johnson, particularly "The *Yankee's* Wander-world," January, 1949.

† See "Rhode Island, Modern City-State," by George W. Long, NATIONAL GEOGRAPHIC MAGAZINE, August, 1948.



On a National Geographic Map, School Children Trace the Pearl Sources of the World

At Woods Hole Aquarium U. S. Fish and Wildlife researchers have prepared this exhibit to show where pearl-bearing oysters are found. Valued chiefly for their mother-of-pearl, the large shells from Hawaii and the Philippines (top) occasionally yield pearls. Oysters from Panama (lower left) are almost extinct because of overfishing. Most pearls come from oysters found along the Arabian shore (right center of map) and from the coastal waters north and west of Australia.

Richard Munday and one of the finest early colonial churches in America. General Washington is said to have worshiped there.

The Preservation Society plans to recondition and make available for public inspection many old structures on their original sites.

Old Tower Defies Explanation

We found archeologists probing the foundation of the old stone tower in tree-shaded Touro Park, completing research through which it was hoped to establish its origin. One of the most popular theories was that the Norsemen built it, but claims that early Welsh, Irish, or Portuguese explorers were the architects also had supporters.

However, the archeologists reported they

found no pre-colonial relics, even though they could not reconcile the architecture with the colonial period.

So, perhaps it was "my stone built wind mill" mentioned in his will by Benedict Arnold, Rhode Island's first governor under the charter of Charles II, not the traitor.

At any rate, we came unexpectedly upon the governor's last resting place near by, while walking down the hill toward the water front. On previous visits to Newport we had often admired a big white dwelling and speculated on its history. This time it was serving as local headquarters for the Red Cross.

Red Cross workers told us the house was built by a Captain Littlefield when he married, and that later it served as the mansion of

Governor Charles Van Zant, in the days when Rhode Island had two capitals, one in Providence and the other in Newport.

Van Zant, depressed by a view of a tiny graveyard outside his windows, had the stones turned under. Preservation Society employees were even then restoring the little cemetery. One of the stones they had re-erected bore the name of Governor Arnold.

Next door to the former governor's mansion is the Prescott House, built by the smuggler John Bannister about 1750. Bannister's occupation then was known more tolerantly as "free trading."

In 1777 the big house became headquarters of Gen. Richard Prescott, the British occupation army's commander.

Named for Heroic Lightkeeper

Prescott's eventual capture, in his night-shirt, was a bitter embarrassment for the glittering officer, but a matter of considerable satisfaction to Quaker residents, who disliked having to doff their hats in his presence.

Entering and leaving Newport Harbor, we passed an attractive white lighthouse which serves both as navigation beacon and as quarters of the Ida Lewis Yacht Club.

The club took the name of a heroic woman who during many years as lightkeeper, from 1858 to 1911, saved 23 lives. Congress voted her a gold medal, and she received many other awards in recognition of her heroism. Her most treasured possession probably was a silver teapot presented by soldiers stationed at near-by Fort Adams, nine of whose lives she saved.

We left Newport on a blustery afternoon, with small-craft warnings whipping from the Ida Lewis flagpole; but the wind faded out before we reached Mattapoissett, and again we poked into that harbor in the dark.

Because we wanted a dawn start for Provincetown, all hands turned in early. The morning broke fair but chilly, making a hot breakfast doubly appreciated as we turned east through the canal under power. The Army Engineers frown upon sailing through the waterway.

After stopping briefly at a canal-side gasoline station for fuel, ice, and water, we headed out across Cape Cod Bay. Soon the Pilgrim Monument pierced the horizon ahead, furnishing the finest kind of landfall. That graceful stone structure towers 350 feet above sea level, commemorating the fact the Pilgrims landed at Provincetown before moving across the bay to settle in Plymouth (page 158).

Our annual pilgrimage always includes a visit to the Provincetown Playhouse and its

director, Miss Catharine Huntington, a pioneer in the little-theater movement. We found Conrad Aiken there and with him saw his new play, *Mr. Arcularis*.

The theater is on Provincetown's oldest wharf, used by the last of the port's whalers. It is a Playhouse tradition to open each season with a play by Eugene O'Neill, whose genius was brought to light in a Provincetown fish-house which had been transformed into the Wharf Theater.

While at "P'town," *Nomad* remained comfortably berthed at the long steamboat wharf, except during the afternoon visits of the Boston steamer, when she had to move briefly.

Provincetown has an important and lively colony of artists and writers. Exhibitions are open throughout much of the summer. Also worth visiting is the Historical Museum. In addition to a wide variety of antiquities, it contains an Arctic collection of Commander Donald B. MacMillan, assembled during his many voyages to the North.

The noted explorer is a resident of Provincetown when not voyaging in his schooner *Bowdoin*, which was the case during our visit. He was a member of the expedition on which Peary discovered the North Pole.*

Departure from Provincetown for Gloucester, 50 nautical miles across Massachusetts Bay, was made in another bright dawn. It was the only leg of the cruise during which we were beyond sight of land for an appreciable time. There wasn't much weight to the breeze and the sea was smooth; so we set a big, light jib and made such satisfactory time that we sighted the high land of Magnolia and Eastern Point Light early in the afternoon.

Reef of the Wreck of the *Hesperus*

Soon we entered Gloucester's beautiful and picturesque harbor (page 156), between the breakwater and the reef of Normans Woe, made famous by Longfellow's *Wreck of the Hesperus*.

On the port hand was the medieval castle of John Hays Hammond, Jr., the inventor; to starboard, magnificent Eastern Point and East Gloucester summer and year-round homes, and Tenpound Island, reputedly purchased from the Indians for that amount.

Cape Ann, in rugged contrast to sandy Cape Cod, is almost solid rock. And in the center of the 36-square-mile area is a desolate tract known as Dogtown Common, where huge

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, by Donald B. MacMillan: "Peary as a Leader," April, 1920, and "MacMillan Arctic Expedition Returns," November, 1925; also "A Naturalist with MacMillan in the Arctic," by Walter N. Koelz, March, 1926.



Under Skilled Hands a Miniature Windjammer Takes Shape

Charles F. Sayle, of Nantucket, works on a scale model of the New Bedford whaler *Lagoda*, built in 1826. Such a model requires about 1,000 hours of meticulous labor. All parts are handmade—even tiny nails and copper plates to sheathe the hull (page 146).

boulders are scattered on the surface, like marbles on a floor, marking what geologists call the terminal moraine. There the glacier quit its southern march and retreated. Among the boulders are cellar holes of the homes of early settlers.

According to some local historians, Thorwald Ericson, brother of Leif, visited Gloucester in 1004 and said he desired to remain. The story has it that his wish was granted—by an Indian arrow—and thus he became the first permanent white resident.

French explorers came later and called the harbor Le Beau Port; but it was not until 1623 that English colonists established a lasting settlement.

They also founded the fishery, which has remained the chief industry throughout Gloucester's history. In recent years, Gloucester has displaced Boston as the eastern seaboard's leading fishery center.*

Gloucester has paid dearly for its traffic with the sea. More than 1,000 vessels and more than 8,000 men have sailed for the fishing grounds and failed to return—a heavier tribute than levied by all the wars.

As *Nomad* came in to Capt. Ben Pine's wharf at the head of the harbor, she found herself the center of a water-front scene which was being placed on canvas by artist Emile A. Gruppe, and a group of students.

Near by, in his sail-loft studio, Lawrence O'Toole, who sometimes sails on *Nomad*, was painting salty murals for the naval officers' club in Boston.

Gruppe and O'Toole are year-round residents, but the artist population on Cape Ann jumps to about 5,000 in summer, when Gloucester's 25,000

population practically doubles.

Nomad had hardly docked when Captain Ben came aboard for a visit.

He was the last to keep a Gloucester schooner under canvas, and he likes to chat about the days when the Gloucester fleet numbered 500 "sail," and to resail the last International Fishermen's Races, in which he skippered the *Gertrude L. Thebaud* against the Canadian champion, Capt. Angus Walters's big salt-banker *Bluenose*.

Both of those schooners were lost after they left the fishing banks and went trading in the West Indies.

* See "Northeast of Boston," by Albert W. Atwood, NATIONAL GEOGRAPHIC MAGAZINE, September, 1945.

On all our previous visits we had seen the Hammond castle only from the water. Now we went over to examine it, and found the great stone pile serving both as a museum and as the noted inventor's laboratory. From it, some years ago, he astonished Gloucester by radio-directing a powerboat around the harbor. Many of his almost countless inventions aided the country in the war.

Castle's Materials from Europe

In constructing the castle, Hammond imported doors, windows, sculpture, and furniture from Europe. Roman, Gothic, and Renaissance art are intermingled. Surrounded by tall pines, the towering gray structure resembles a castle on the Rhine.

Hammond has installed a fine organ in the great hall, built like a church transept. Here noted musicians perform. The museum sections are open to the public in the summer.

The Church of Our Lady of Good Voyage is a Gloucester landmark, fashioned after a church in the Azores. Most of its congregation is Portuguese or of Portuguese descent. As evidence of the worshipers' close association with the sea, the statue of the Lady between the twin spires holds not the Christ Child but a model of a fishing vessel. On the church's carillon—the first modern carillon brought to this country—concerts are given during the summer.

Artists can be found on almost every wharf and rocky promontory around Gloucester. Motif number one is an old red sail loft at Rockport, said to be the most often painted building in the country (page 157).

A Coast Guard picket boat took us through the Annisquam Canal, which makes Cape Ann an island, to watch the start of the Annisquam Yacht Club's Squam Day Regatta (page 161).

More than 80 racing craft made Ipswich Bay white with their canvas. The bay also is a popular sport-fishing center; record tuna have been taken there.

Leaving Gloucester, we had only one remaining call to make, but an important one. This was Marblehead, conveniently on the route back to Boston.

So we steered for Halfway Rock, at which

mariners departing Salem and Marblehead in the old days tossed coins to purchase fortunate voyages. There must be a goodly amount of small change about the base of the Rock, but the water is too deep for profitable investigation.

Marblehead's deep and roomy harbor was as usual crowded with yachts (page 162). Time was when the town fathers, fearful that Marblehead might be supplanted by New York in maritime importance, vainly argued measures to avert such misfortune. But Marblehead retains another claim to fame, as one of the world's yachting capitals. In 1947 a record of 522 starters in a regatta was established.

The old town was in gala spirits, observing a rather unusual tercentenary—not the 300th anniversary of its founding but of its separation from neighboring Salem. Marblehead was settled some 20 years earlier than the festive date.

Birthplace of Our Navy

Marblehead disputes with near-by Beverly the title of birthplace of the American Navy. The first vessel commissioned by General Washington was the schooner *Hannah* of Marblehead, commanded by a Marblehead captain. She was, however, fitted out at Beverly. So there should be glory enough for both.

Jack Breed, who resides in Marblehead when he is not away making photographs for the NATIONAL GEOGRAPHIC and other magazines, drove us around the narrow, winding streets.

Our progress was hampered by a parade of ancient fire-fighting apparatus, assembled from a wide area of New England for the tercentenary celebration.

We visited the old, round, brick powder house, built in 1755, which supplied Washington's troops. Quite appropriately, the original of the painting, *The Spirit of '76*, hangs in the Townhall.

In midafternoon we sailed leisurely along the North Shore to Boston, lacing on *Nomad's* sail covers for the first time in three weeks and, according to the colonel's reckoning, for the first time in 700 miles.

INDEX FOR JANUARY-JUNE, 1950, VOLUME READY

Index for Volume XCVII (January-June, 1950) of the NATIONAL GEOGRAPHIC MAGAZINE will be mailed upon request to members who bind their copies as works of reference.



Seven Sprites Play at Seven Springs, Likely Source of River Thames:

Seven streams bubble from under the stone wall in Gloucestershire's Cotswold Hills to form what some call the true head of England's principal river. Others give the distinction to Thames Head near Cirencester (page 202). For more than 200 miles the Thames winds through a cross section of the English scene: meadows, manors, and hamlets, Oxford and Eton, Windsor Castle and London's water front.

A Stroll to London

BY ISOBEL WYLIE HUTCHISON

With Illustrations by National Geographic Photographer B. Anthony Stewart

ON A SUNLIT day of March I set out from my home near Edinburgh to walk to London, a distance by the shortest route of 380 miles. But what stroller takes the shortest route? My walk would be a goodly stretch of over 500 miles in 38 days.

On the 39th day I had a date in London with National Geographic photographer B. Anthony Stewart, who would retrace the journey with car and camera.

I planned, keeping to the hills, to cross the English border at Gretna Green, join the Pennine Chain near the Roman Wall, and follow England's spine to Derbyshire (map, pp. 184-5). Thenceforth, in the entertaining company of Boswell and Johnson, George Eliot and Shakespeare, I would find my way to Lichfield, Nuneaton, and Stratford on Avon.

There I planned to diverge through the blossomy Vale of Evesham to pick up the Thames at its source near Cheltenham or Cirencester. Both cities claim parentage of the stream (page 202). I hoped to follow it right into the beating heart of London. With my sister accompanying me for the first 18 miles, I set out in high hopes (page 173).

An Old Road Leads Across Lonely Moorland

The old road from Edinburgh to Lanark hugs the north side of the Pentland Hills through a stretch of bleak moorland. With Arthur's Seat and Castle Rock still faint blue clouds on the Edinburgh skyline,* a fingerpost of the Scottish Rights of Way Society indicates the old Cauld Stane Slap drove road which cuts across the hills from north to south.

The track led down to the infant Water of Leith. The steppingstones being covered, we removed shoes and stockings, planted flinching feet in the icy stream, and waded over.

At Harper Rig Reservoir, which is part of Edinburgh's water supply, we inquired the way of a shepherd, for the path had disappeared. In a high-pitched shout, like one used to converse with distant sheep dogs, he told us to make for a post between two heights ahead. It was eight and a half miles to West Linton.

"But it'll take you all of three hours," he shrilled after us, above the excited barking of his dog.

It was the season of heather burning, and the tang of smoke was in the air. Only sounds

to be heard, the wicker of sheep and the calling of curlews, seemed to emphasize the quiet of these black and ocher heights.

We met no human being till we came down the southern slopes to West Linton and the road to Habbie's Howe. There Allan Ramsay wrote his pastoral *The Gentle Shepherd*, little thinking that it would one day land him on a pedestal in Princes Street Gardens, Edinburgh (page 182), wearing round his brow a headdress much resembling a wet towel!

There was ice on the pools when I looked out next morning, but the frost proved merely a March frolic and the day soon became hot as summer. Alone I took the main thoroughfare to Moffat. Though heavy traffic thundered, I saw few private cars save in a funeral procession of 17 snaking down the valley from a white farmhouse.

I slept that night in a room I had engaged at the Crook Inn, halfway between West Linton and Moffat. Because I had imagined it a small place with little accommodation, I was surprised when the door into its luxurious lounge was opened by a page in a white jacket looking for my luggage!

I swung it off my shoulders with a sigh of relief, for I was beginning to find my pack too ponderous a companion. Next day at Moffat I bought a handbag and divided it.

First Offer of a Lift Declined

"Are you walking for walking's sake, or would you like a lift?"

It was my first offer, and it came, shortly after I had quitted Crook Inn and breakfast, from a lady driving a small saloon.

Since the day was young and my pack still light, I thanked her and said I was walking for walking's sake.

I seemed at that early season to be the only person in Scotland thus occupied. But for the Youth Hostels Association, Britain seems to be losing the use of its legs. This energetic body provides for members cheap board and lodging in a chain of hostels, often charming old mansions, from Land's End to John o' Groat's, the only rule being that they must arrive on their own steam, whether it be on foot, on cycle, or by canoe.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Bonnie Scotland, Postwar Style," by Isobel Wylie Hutchison, May, 1946; and "Edinburgh, Athens of the North," by J. R. Hildebrand, August, 1932.

It was 16 miles to Moffat, and the road climbs to 1,300 feet. Nevertheless, I was glad I had resisted the temptation to ride, so magnificent was the scenery. Near Tweedsmuir, haunt of the late John Buchan's boyhood and the name he took when raised to the peerage as Governor-General of Canada,* I crossed the Tweed, a lusty stripling issuing half-grown from its well in the hills above, to visit the late Dr. William Shillinglaw Crockett's church on its tree-fringed knoll.

This poet and historian of the Covenanters' country was also known in America and Canada. A tablet on the walls of the little church commemorates his jubilee as its minister.

Snow posts marking the highway led me up to the famous Devil's Beef Tub on the heights above Moffat. A roadside cairn reminded me of my unusual good luck in enjoying brilliant March weather; for here, in a great snowstorm in February, 1831, James McGeorge and John Goodfellow, guard and driver of the Edinburgh-Dumfries mail van, perished in a heroic struggle to bring the mailbags through.

In the old churchyard of Moffat, where these gallant postmen are buried, lies also John Loudon McAdam, whose name is immortalized by the type of road he popularized.

A charabanc from Blackpool had just scattered a load of Easter trippers, like bright butterflies, around the memorial to John Hunter, a Covenanter who was shot near the Beef Tub in 1685. The kindly accents of Lancashire were borne to me.

"Coom on, Mother, coom and see where the jocks used to keep the meat ration."

"She can't coom, 'Arry, she's wearin' 'er bedroom slippers! She'd fall down them places!"

But the old lady was helped out, slippers and all, and taken to the brink of the vast caldronlike Beef Tub, hemmed by steep green walls about 600 feet high. Here it is said the Scottish reivers (raiders) used to hide the herds of fat cattle they had filched from their neighbors across the border.

From the Tub the road spirals down like a revolving picture gallery to the pleasant spa of Moffat, noted for 250 years for its sulphur wells. A fountain in the market place, surmounted by the life-size statue of a ram, appropriately reminds visitors of a benefactor to whom this sheep-farming neighborhood also owes much of its prosperity.

By the old Carlisle road to Wamphray, an unfrequented and beautiful highway, I followed the Annan next day, rejoining the main road about six miles from Lockerbie.

It was an unpleasant six miles. There was no footpath (for who needed it?), and at frequent intervals lorries hurtled past, carrying prefabricated houses which by next morning would probably be filled with families whilst breakfast cooked in the kitchens!

Where Lies Scott's Favorite Heroine

What, I wondered, would Jeanie Deans have said to these? Before quitting Scotland, I had a special pilgrimage to pay to the little kirk of Irongray near Dumfries, where Sir Walter Scott's favorite heroine is buried.

Jeanie's real name was the very appropriate one of Helen Walker. In 1737 she walked barefoot to London over the rough and dangerous roads of that time, accomplishing her journey in 14 days, to intercede for her sister's life.

She sleeps beside the Cluden Water under a stone with a rather weighty epitaph, both the gifts of Sir Walter. Here, following a track beaten through the grasses by her many admirers, I found her on Easter Sunday (page 174).

The church was thronged for Easter, for Irongray—once a center of the studs of the famous Galloway nags—lies in the heart of the Covenanters' country, and the blood of the Covenanters still pulses in the veins of its parishioners.

"Upon an oak-tree near the kirk of Irongray, at the foot of which they were buried," Edward Gordon and Alexander MacCubine were hanged in the dark year 1685 for refusing to abjure their religious convictions.

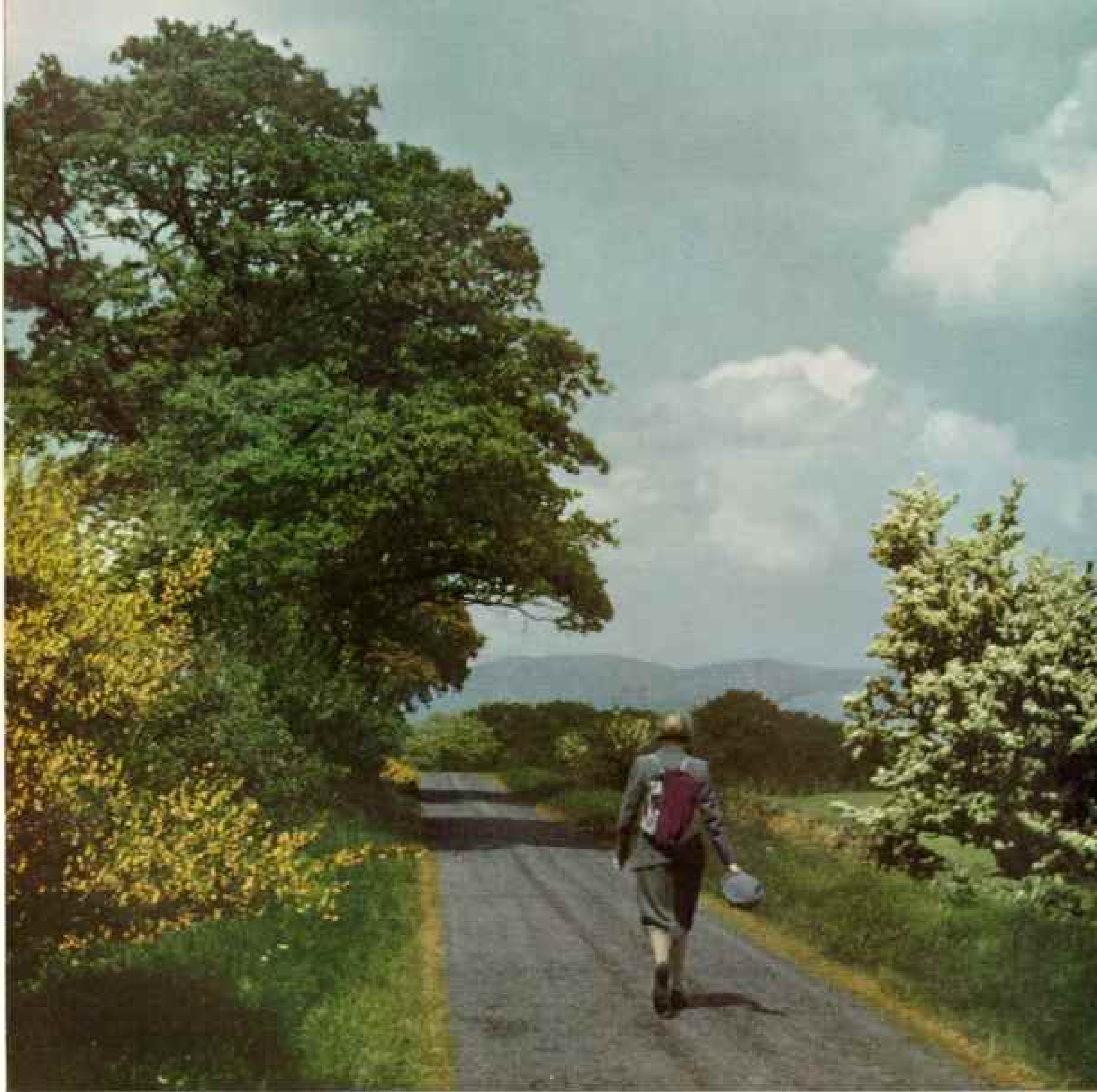
"Both died," said Scottish historian Robert Wodrow, "in much composure and cheerfulness," leaving their wives and babes "upon the Lord and to His promise."

I came quite suddenly upon a statue of Thomas Carlyle, the genius of Ecclefechan. There he sat, head on hand, gazing thoughtfully from an eminence down the winding road into the village. The two-storied house where he was born in 1795, son of a stonemason, now belongs to Scotland's National Trust.

At near-by Craigenputtock, where *Sartor Resartus* was written, Emerson visited the sage, and with Emerson's help, in 1836, the work appeared for the first time in book form in America.

The Carlyle house contains many interesting relics, including two of his wide-brimmed hats—a black felt and a battered straw. Seizing a moment when the attendant's back

* See "Tweedsmuir Park: The Diary of a Pilgrimage," by the Lady Tweedsmuir of Elsheld, NATIONAL GEOGRAPHIC MAGAZINE, April, 1938.



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Kodachrome by B. Anthony Stewart

All Alone, the Author Strolls Along a Scottish Lane Between Edinburgh and London

Isobel Wylie Hutchison has just duplicated the feat of the Sir Walter Scott heroine who walked from Scotland to London (page 174). On a less urgent mission than her predecessor, who made the trip in 14 days, Miss Hutchison took a leisurely 38. Though it was early spring, snow, hail, cold dogged her steps.

Deliberately avoiding main highways, the author sought out quiet country lanes and canal towpaths. In place of throbbing cities, she toured remote, forgotten hamlets scarcely changed since Tudor times.

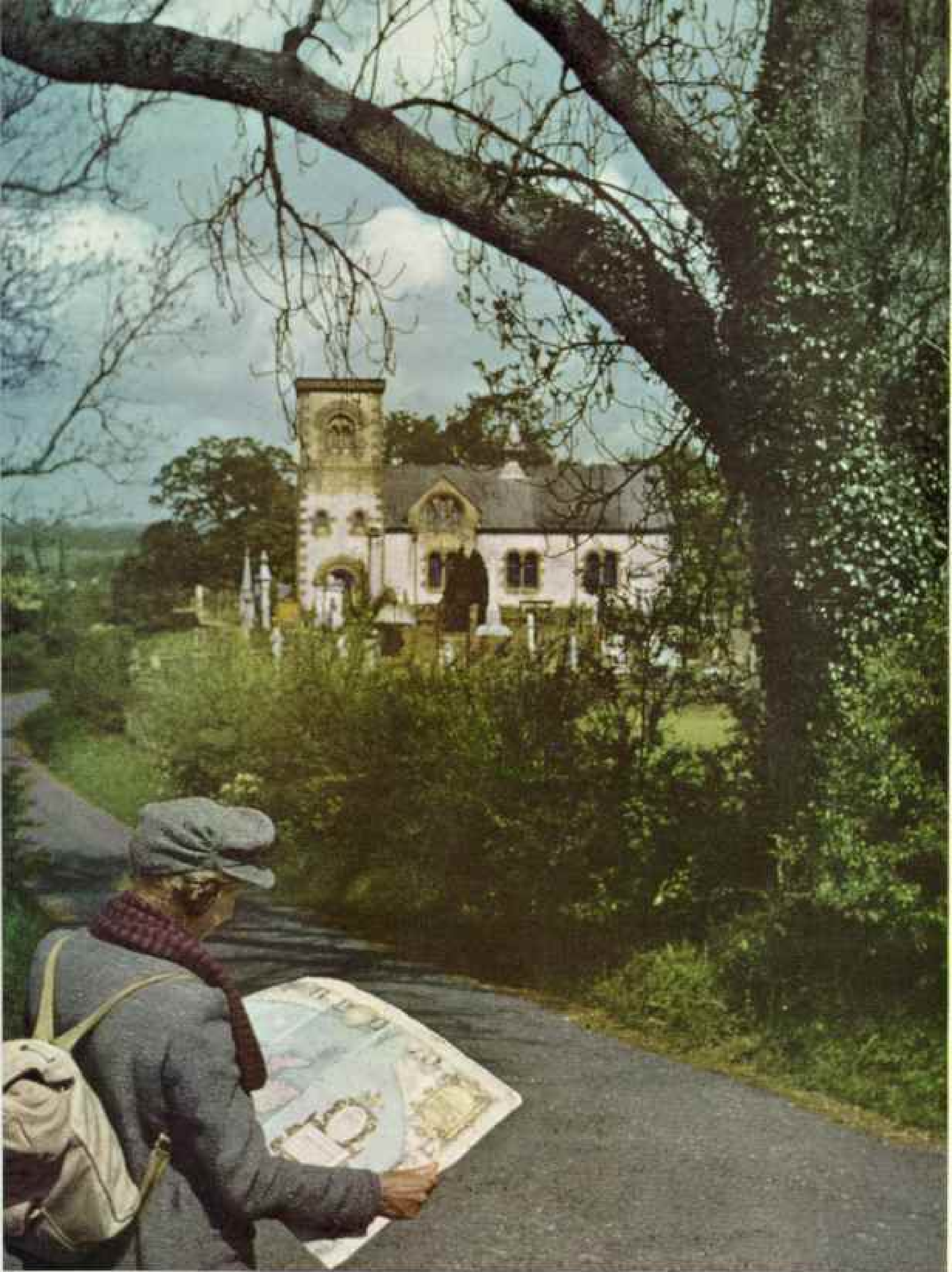
Her route carried the pedestrian past history's shrines, poets' corners, artists' haunts, and anglers' streams. She crossed bleak moors, scaled eroded mountains, and investigated the Roman Wall.

Determined to be reasonably honest on her walking assignment, the writer never showed the hitch-hiker's pointed thumb, and yet kindly motorists offered rides. "Jump in," said a policeman, stopping his car. What could Miss Hutchison do but obey the law? She accepted a van driver's courtesy only because a heavy rain was falling. "Never mind," he told her. "It's April Fools' Day. You can kid yourself that you walked it."

In London, Miss Hutchison met National Geographic staff photographer B. Anthony Stewart; and, together in his car, they retraced her route, taking this series of pictures. In May they crossed the border into Scotland and took the Wamphray road, here agleam with white hawthorn and golden broom.

Miss Hutchison got out of the car and, rucksack on back, showed the photographer how she ground down two pairs of heels walking more than 500 miles. Homesick for Scottish cooking, she wondered what she'd find to eat in Wamphray—bannocks, oatcakes, finnan haddie, or haggis?

"The best road the Scotsman ever sees," taunted Dr. Samuel Johnson, "is the one that leads to England." Miss Hutchison prefers the words of Charles Murray, Scottish poet: "Homewith [homewards] the road that's never dreary, back where (the) heart is all the time."



Miss Hutchison Makes a Pilgrimage to the Grave of a Famous Scotland-to-London Walker

In Irongray churchyard lies Helen Walker, who in 1737 walked barefoot to London in 14 days to plead for the life of her sister. Sir Walter Scott made her the heroine (Jeanie Deans) of *The Heart of Midlothian*. He wrote her epitaph. Miss Hutchison here consults the National Geographic Society's map of the British Isles.



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Kodachromes by H. Anthony Stewart

★ Yorkshire's Gloomy Moors and Boulders Inspired the Brontë Sisters

The tragic Charlotte, Emily, and Anne, poets and novelists, were daughters of the vicar of near-by Haworth. Like this girl, herself an ambitious novelist, they are said to have written while seated on this rock.

✧ Scott "Popped the Question" to His Intended at the Popping Stone

This young couple obligingly re-enacted the novelist's proposal in the River Irthing Valley. The Scotsman remarked that he did not often wear the kilt. Sir Walter sealed his own betrothal at the Kissing Bush near by.





"What! Walked from Scotland! Whatever Did Ye Do That for, Dear? Did Ye Miss t'Boos?" (Bus)
These Derbyshire women, who live behind Peak Dale's limestone fence walls, were incredulous. "Wish I had a year of your legs," said one.

Gretna Green's Marriages over the Anvil Are No More

Runaway English couples, some pursued byirate fathers, took advantage of Scotland's former "wed in haste" laws. Most anyone could serve as "priest."

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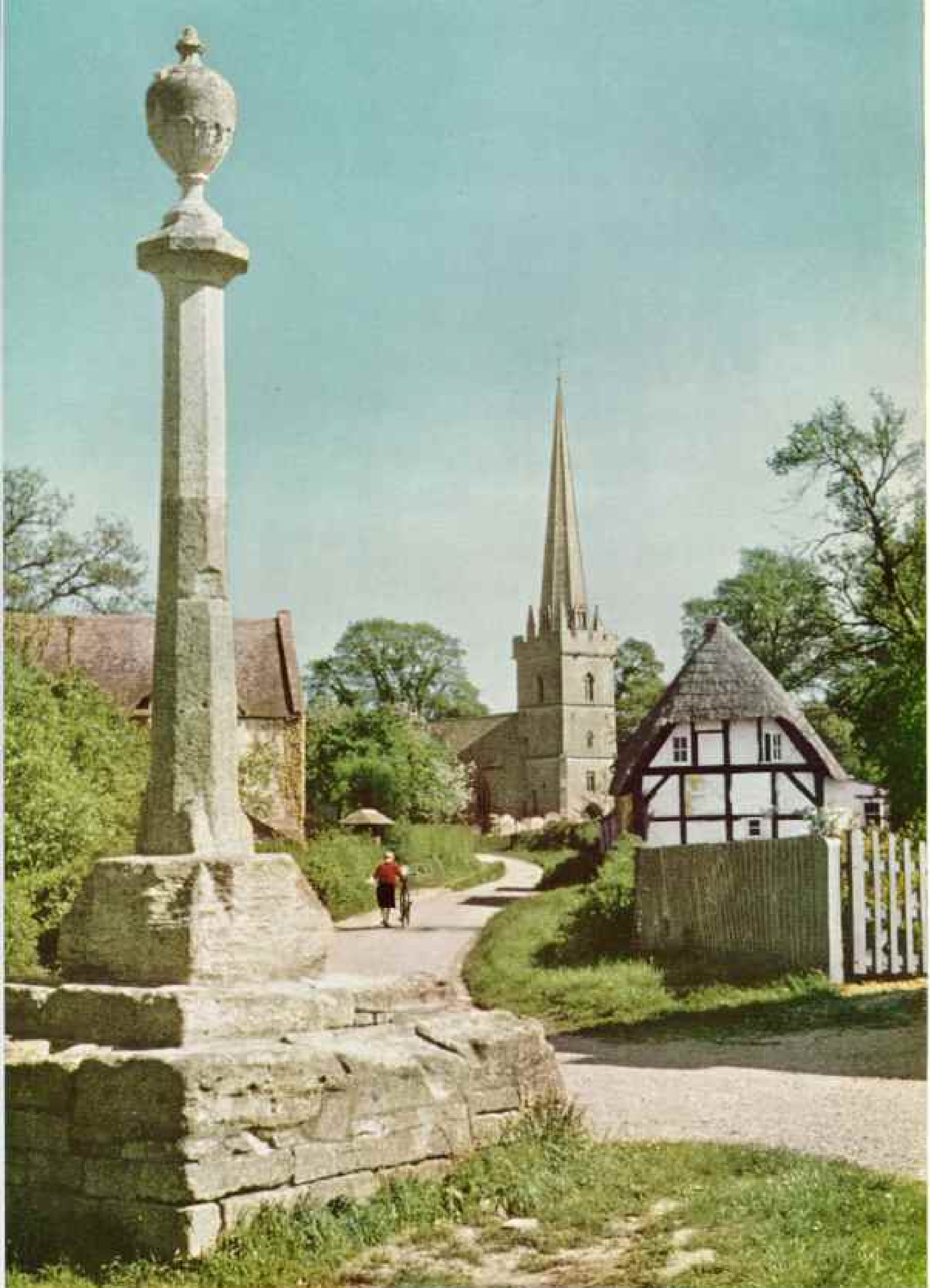


Sewing Kit, Ten Cozy, and Cat Are Comforts of a Kitchen

This hospitable lady, who appears again on the opposite page, mends an apron in her snug Peak Dale farmhouse. The patchwork rug is her creation.

Illustrations by H. Anthony Howard





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Illustration by Dr. Anthony Stewart

Norman Church, Thatched Home, and Winding Lane Tell Why Artists Love Childs Wickham

Long ago the old market cross was broken or lost. The stone urn which now tops the shaft is, in the words of a resident, a "monstrosity." One of the loveliest of Cotswold villages is Childs Wickham, near Evesham.



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Kilacharnies by H. Anthony Stewart

✦ A Farmer-Veteran in His Old Uniform Devotes Sunday to His Family

Baby occupies an old-fashioned rocking cradle. Home-cured hams hang on the wall. The kettle swings on a "sway," a movable brass rod. Near this farmhouse in upper Teesdale a spring blizzard almost overtook the author on her hike southward.

✧ A Miniature Thatched Cottage Covers a Teapot in Stratford on Avon

Shakespeare, who lived in Stratford, did not mention tea in any of his works, for he never saw the "national beverage." Tea was introduced to London in 1657, four decades after the poet's death. The price was \$30 to \$50 a pound.





Glass Houses of Vegetable Marrow Plants Cover a Field in Evesham Like Tents of an Army



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Kodachrome by B. Anthony Stewart

Walking Through the Vale of Evesham, the Author Meets Five Racing Greyhounds

Greyhound racing, a sport which the British affectionately dub "the dogs," is a favorite relaxation of working men. Until recently the Government limited midweek dog events lest they interfere with national recovery.

was turned, I put on the black one and wished a wish.

It seemed the right thing to do, for not far away is the Gretna Green blacksmith shop where visitors write their names and make wishes, and in Irthing Valley just across the Border is the Popping Stone where it is said Sir Walter Scott sat when he "popped the question" to Charlotte Charpentier and got his wish (page 175).

At Ecclefechan there is a good hotel whose manager, an expert angler, will take a visitor out to the Annan and help him to catch a salmon trout, or maybe a salmon, for his supper. But if asked for a vendace, the manager will send him to Lochmaben. Like Robert Bruce, who may have been born at Lochmaben Castle, this little fish has brought fame to the region.

Romance Lingers Around Gretna Green

How far, how far to Gretna?
Tis years and years away,
And chaise-and-four will nevermore
Fling dust across the day.
But as I ride the Carlisle road
Where life and love have been,
I hear again the beating hoofs
Go through to Gretna Green.

Dusk was falling in the "long, low dining-room" admired by Charles Dickens when he visited Gretna Hall in 1852, as I sat after supper and read these lines in a little book which relates the romantic history of this famous mansion. Built in 1710, it became the goal of pilgrims of the upper classes anxious to marry in haste and repent at leisure.

Under a now obsolete Scots marriage law, "where a single man and woman declare themselves husband and wife in presence of two witnesses, they are in fact legally married." There were many "priests" around the Border villages who married couples under this old law, though they were not necessarily blacksmiths. The blacksmith item is a modern innovation unknown to stagecoach days (page 177).

One famous "priest," David Lang, had a very different career, for he was captured by a press gang and forced to serve in the British Navy. But his vessel was seized by John Paul Jones!

When the Father of the American Navy raided his native Solway Firth, Lang was compelled to accompany him. But Lang knew Solwayside as well as Jones, the gardener's son from Arbigland. One dark night he escaped.

Changing his role of sailor to that of "priest," Lang conducted marriages at Gretna Hall till his death in 1827.

One of the marriage registers of that date, recovered at a London sale room in 1912 for £420, contains 1,134 entries between 1825 and 1855.

The firelight flickered on the walls around me, lighting up cartoons of famous lovers of the past: John Peel of the rousing hunting song, who in 1797, forgetting hounds and horn, carried his sweetheart, bonnie Mary White, to Gretna; Prince Charles Ferdinand Bourbon, who married Penelope Smythe of County Waterford, "reputed to be the most beautiful woman of her time." She was also (though one hopes Prince Charles did not know about this!) heiress to £30,000.

Here, too, came 22-year-old Archibald, Lord Drumlanrig, heir to the Marquess of Queensberry, to espouse 17-year-old Caroline Clayton, lovely daughter of General Sir William Robert Clayton. "The gods," it is said, "smiled on this romantic union," and the pair lived happily ever after at Kinmount close by, "loved and respected by all."

Equally happy was the union of Lady Maud Villiers, beautiful daughter of the Earl of Jersey, to Capt. C. P. Ibbetson of the 11th Hussars, though she was pursued to Gretna by her irate father.

A few years later, on August 26, 1847, "when the harvest moon hung low in the sky," the Duke of Sforza Cesarini, "a direct descendant of Caesar and related to all the sovereign houses of Europe," was married here to Caroline Shirley of Chartley Castle, Staffordshire, apparently without pursuit, for the pair "remained at the scene of their romance for several days." I wondered if they had visited the Roman Wall, as I was about to do, and if Caroline had found the Duke's Roman affections as lasting as that astonishing piece of masonry!

There was still no sign of my hostesses when at last I crept rather hurriedly through the dark hall and up the stairs to my bedroom and shut myself in. As I closed the door, I recollected an unpleasant ghost story about someone who had done just that, and immediately had heard a thin voice among the bed curtains say, "Now we're shut in for the night!"

Anything like that might have happened in my bedroom, which was a romantic apartment lighted only from the roof and hung about with curtains. I got into bed hurriedly and fell asleep, only to be awakened by a persistent knocking and by what seemed a cry from the romantic past of "House! House!"

It was merely an early bird hopping on my skylight and the wind whispering to the old yew tree in the garden. The tree has watched



Great Britain

Close to Scotland's Heart Lies Princes' Street

Named in honor of two royal sons of George III, Princes Street reaches west from the North British Station Hotel's clock tower to the spires of St. Mary's Episcopal Cathedral. Clubs, hotels, shops, restaurants, banks, and offices line one side of this "short mile"; the other overlooks gardens and monuments honoring Scotland's illustrious sons.

so many lovers come and go that it has at last decided to blossom itself.

Roman Wall Ruins Still Draw Travelers

The Romans, who occupied Britain for some four centuries, have left as their most remarkable monument in these islands the great Wall, 73 miles long and once probably 15 feet high above ground. It was built during the reign of the Emperor Hadrian across the great dyke of igneous rock, the Whin Sill of northern England, from Tyne to Solway. Its ruins draw travelers and scholars from all parts of the world.*

I visited it from Brampton, a pleasant market town in Cumberland, where I passed my first night in England. In the '45 rising its mayor unwillingly presented the keys of his town "on bended knee" to Prince Charlie.

The Prince's passage was indirectly responsible for the destruction of a section of the Wall, which was pulled down by the opposing general to pave a road for his cannon.

Many old houses near the Wall, including much of the beautiful 12th-century Lanercost Priory, are built of the square Roman stones whose masons have left their names chiseled on a crag near Birdoswald.

* See "The British Way," by Sir Evelyn Wrench, *NATIONAL GEOGRAPHIC MAGAZINE*, April, 1949. Reprint for separate sale in gray paper covers includes a 132-page booklet with 48 full-color pages of historical paintings, 19 black-and-white photographs, and articles by Gilbert Grosvenor, Sir Evelyn Wrench, and Franklin L. Fisher. This reprint may be had from headquarters of the National Geographic Society, 75¢ in United States and possessions; elsewhere, 85¢.



Quaffing Ale or Carrying Mail, the Local Postman Makes His Daily Rounds

At Newbiggin's Street Head Inn the cycling courier pauses for morning "clevenes" with three cronies. The author found him there on her first visit to this Yorkshire "pub." And "when I returned six weeks later to the same delightful hostelry," she writes, "there was the same postman in the same seat, apparently quaffing the same tankard of ale!" (Page 188.)

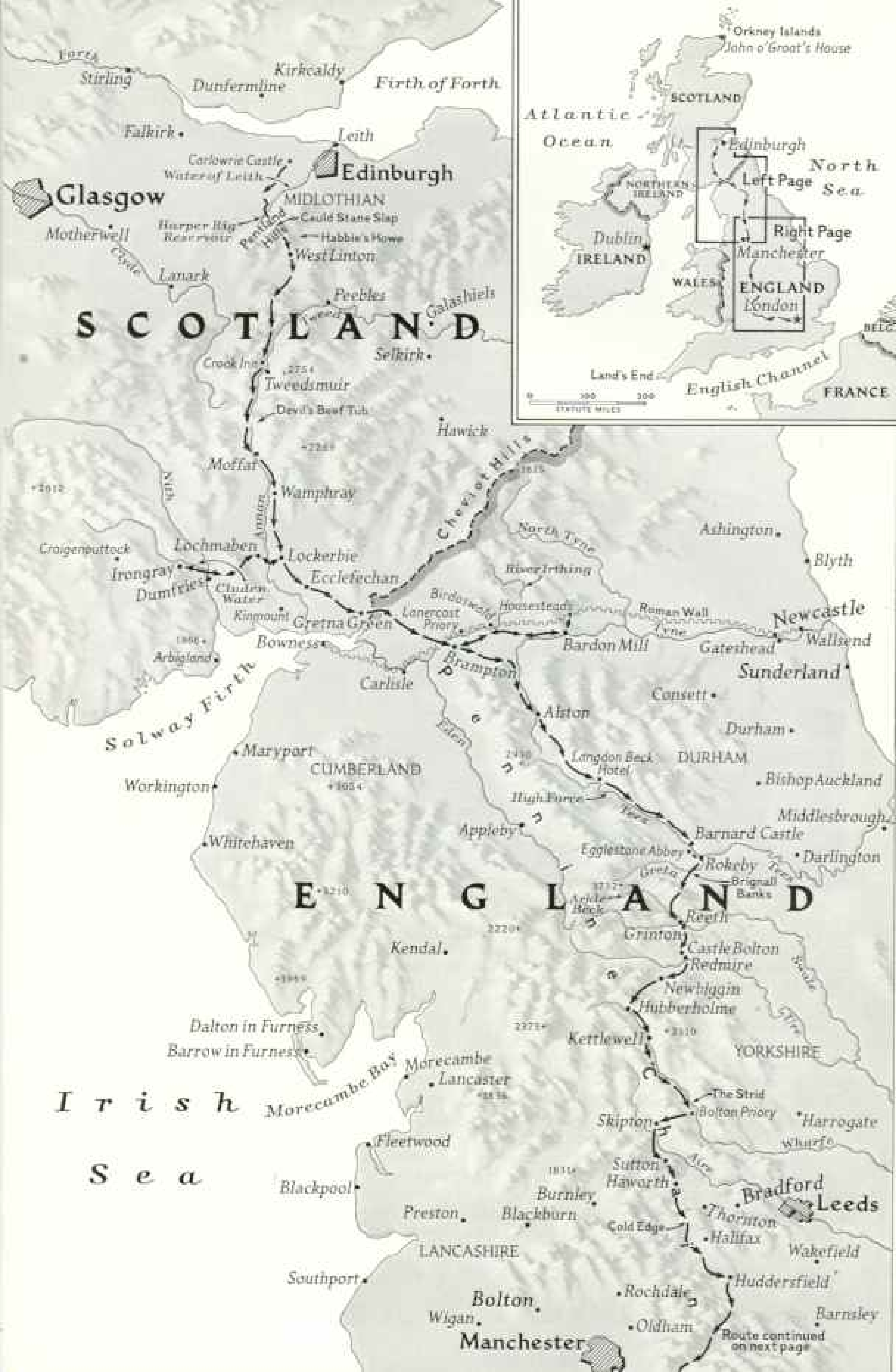
Climbing through the hills from Bardon Mill, I joined the Wall at Housesteads; the most famous of the excavated forts (Borco-vicus), now the property of the National Trust.* At Housesteads all the layout is seen, from the commander's colonnaded hall to the shops and temples of the camp followers—even the "murderer's room" where a skeleton was found with the knife blade still fast in the victim's ribs.

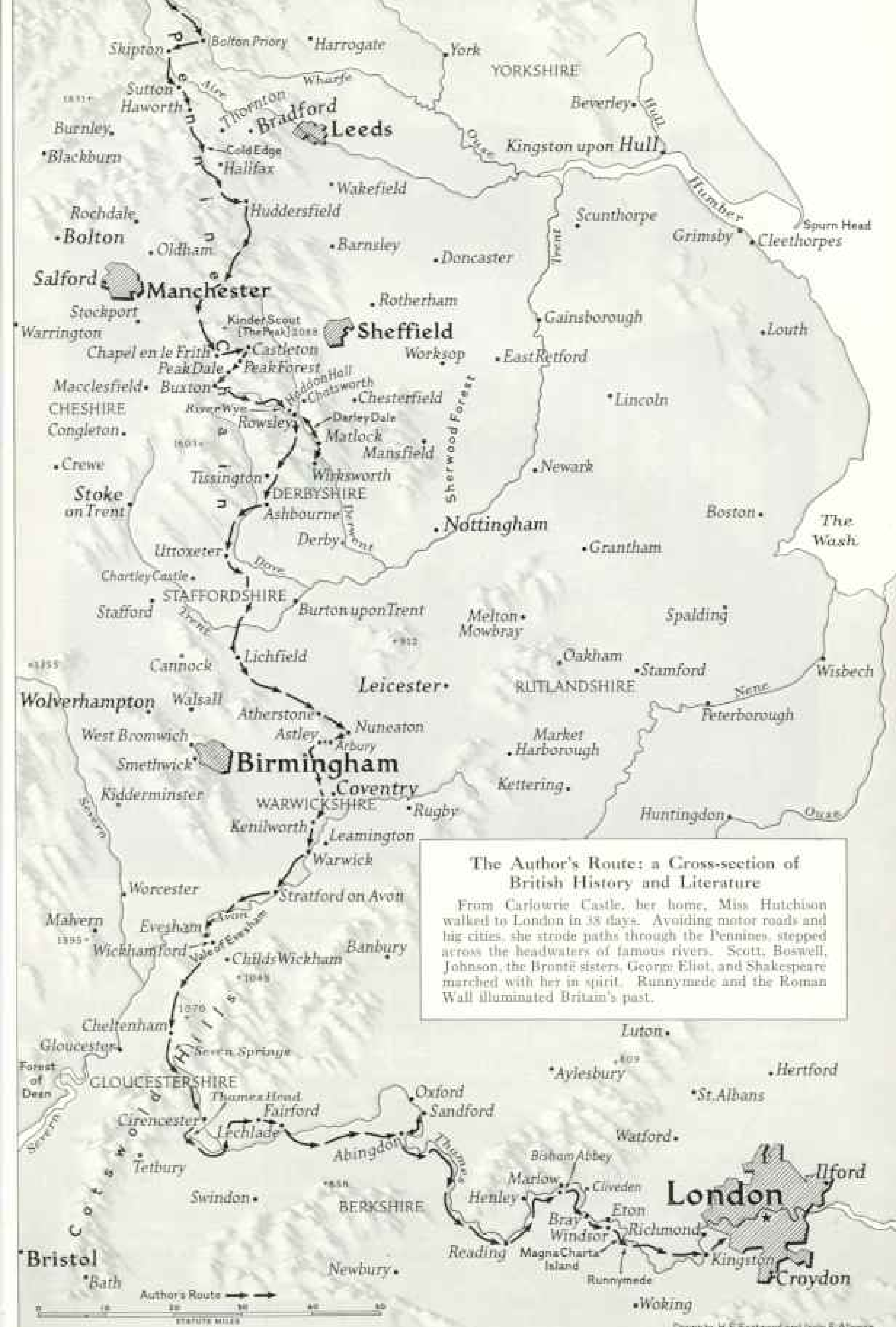
Close by is the armorer's forge, with his bunker of fuel and supply of arrowheads for a morrow which has lasted close on two thousand years!

The views over the Border mountains from the Wall are spectacular, but gale warnings were out on the day of my visit, and an icy hurricane almost blew me over the precipitous crags. I was forced to clamber down, pitying the exiles from sunnier skies who had stood watch on such bitter ramparts.

Next morning the wind had dropped, but heavy rain was falling. For the first time I had to accept the kind offer of a lift. The young driver of a confectioner's van took me

* See "Preservation of England's Scenic and Historic Treasures," by Eric Underwood, NATIONAL GEOGRAPHIC MAGAZINE, April, 1945.







Three-wheeling Family of Four Rolls Through Rural England

Lucky baby lounges in the private sidocar equipped with springs, windshield, and a top to pull up in case of rain. Father, mother, and brother share a bicycle built for two. If a fifth member should arrive, they will doubtless fix a basket on the handle bars to hold the infant. British cyclists may pedal 100 miles or more over week ends. This quartet rides through Wirksworth, onetime lead-mining center of Derbyshire.

to picturesque Alston, on the slopes of the Pennines, which at 960 feet is reputed the highest market town in England.

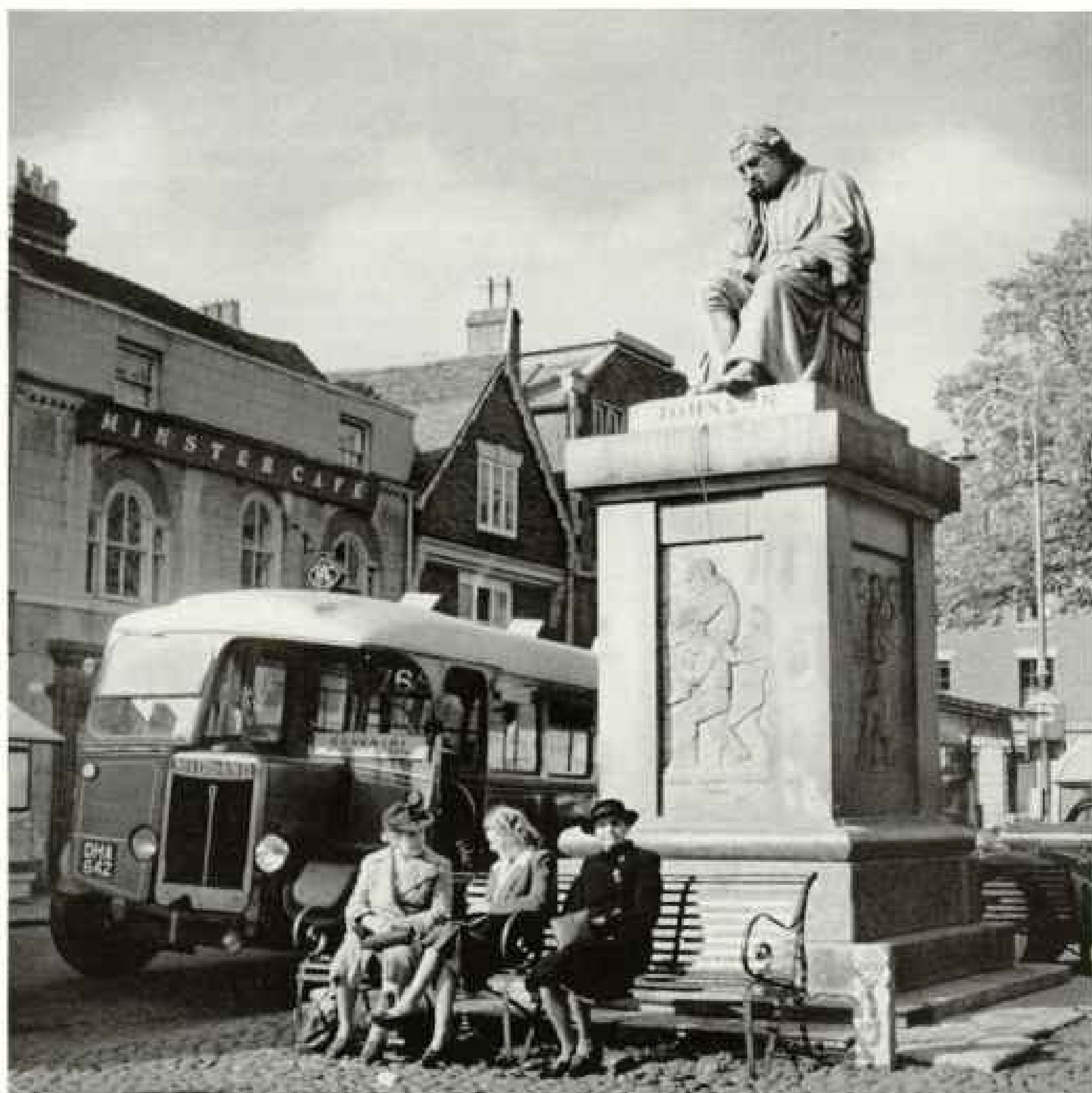
"Never mind," my driver consoled me. "It's April Fools' Day. You can kid yourself you walked it!"

Wafted Along by a Blizzard

The Pennines have been likened to a fern frond with ribs lying roughly at right angles to the main stem. The rivers of the Yorkshire dales flow between the ribs. From Alston I planned to follow Teesdale for some 30 miles to Barnard Castle.

Blown by an icy blizzard which turned into snow behind me, I crossed the watershed beyond Alston and entered Durham at a height of nearly 2,000 feet. This high pass between Cumberland and Durham seemed one of the loneliest and loveliest roads in England. The hail showers swept the high tops like veils, chased by bursts of sun. It was April in her most teasing mood.

Not a soul did I meet till I reached the valley, where a farmer attending to cattle told me that the road had been ten feet deep in snow the previous spring, and cattle fodder was dropped in upper Teesdale by plane.



Above His Native Market Place, a Once-eloquent Genius Meditates in Stony Silence

Near the house in Lichfield, Staffordshire, where in 1709 Dr. Samuel Johnson was born, stands this memorial sculpture (page 200). The panel in relief, showing the young author on the shoulders of his mates, attests his popularity even as a student; the inscription reads: "Thus he was borne from school."

"It's a fine place in soomer," he said. "But t' winter's hard."

As I nursed my benumbed fingers over a mug of hot tea at Langdon Beck Hotel, I decided that I was lucky in the weather after all. Six weeks later Mr. Stewart and I found valleys filled with mountain globe-flowers, pansies, marigolds, cuckoo-flowers, and the rarer mealy primrose (*Primula farinosa*, page 191), and spent a happy afternoon midst the Dale folk, of whom the saying goes, "They'll soomer you and they'll winter you, and then they'll take you in."

I slept that night at High Force Hotel, near which the Tees spills itself over basaltic

craggs into a "pit profound." The roar of the cataract resounds from afar as one descends to it through a wood in the hotel grounds, home of the red squirrel.

"I once tamed one o' t' little beasts," said the custodian, "but I never handled him. When I sat quite still, he would joomp up to t' table and sit on my shoulder and eat ice cream. He liked it better'n nuts. Someone dropped some on t' path, and squirrel he finished it; so after that I used to buy him ice cream regular!"

Snow lay next morning in the yard of the hotel, once a ducal shooting box patronized by King Edward VII; but the sun shone out

as I passed on down Teesdale to Barnard Castle. Here the river, curving under the old bridge, girdles the ruins of Bernard Baliol's 12th-century fortress, around which Sir Walter Scott wrote the poem *Rokeby*.

Dickens too is associated with Barnard Castle, which owns one of the best provincial museums in England. He visited it in 1838, and wrote part of *Nicholas Nickleby* in the old King's Head Hotel.

There are few toll bridges left now in England, but one crosses the Tees near Rokeby. For a halfpenny I reached the farther bank and the ruins of the 12th-century Egglestone Abbey.

On the monks' little packbridge close to the modern highway I met the Rokeby game-keeper, a man of many enemies, such as poachers, magpies, and weasels, and a few friends. One of the latter, a red squirrel, watched me next morning from a branch with his large brilliant eyes as I went down Brignall Banks reciting to myself Scott's ballad:

O, Brignall banks are fresh and fair,
And Greta woods are green;
I'd rather rove with Edmund there,
Than reign our English queen.

A Prison of Mary Queen of Scots

I thought of the lines again two days later when I came to Castle Bolton in the Ure Valley, where the hapless Mary Queen of Scots spent the first seven months of her 19 years' imprisonment in England.

The way to Bolton led me over high lonely moors. From the magnificent distance of these high tops I descended into one of the loveliest of the Yorkshire dales, Arkengarthdale, with its stone-walled fields, little gray village, and old bridge. The Arkle Beck tumbles into the Swale near Reeth, a picturesque town of Yorkshire's North Riding, set around a wide green.

I slept that night at Grinton Bridge Hotel, overlooking the Swale, and next day crossed bleak moors to Redmire, in the wake of Queen Mary and her retinue of 40. My path, like hers, apparently bristled with secret dangers, for the moors above Redmire are a War Office range.

When the red flag was flying, a notice warned that it was dangerous to proceed. But I had already proceeded about a mile before I saw a tattered red flag flapping dismally from a post.

"Go back! Go back!" shouted a grouse, springing up from the burnt heather.

I regarded the emblem, however, as a war relic and proceeded. I came to a larger, even redder, flag, and beyond it another warning.

The path ran downhill now, and above the trees I could see the strong towers of Mary's prison. I pushed on past a quarry where yet another notice warned me not to proceed when the signal on the slag heap was set at "Danger," as "shot firing" was in progress.

When I recounted my adventures that afternoon at Street Head Inn, Newbiggin, on my way across the pass into Wharfedale, the postman withdrew his head from a foaming tankard to shake it at me and remark solemnly, "You've coom a very dangerous way if you've coom over Redmire when t' red flags were oop. In fact, you're lucky to be 'ere at all!"

He took another enormous swig. Indeed, I believe he is doing so at this moment, for when I returned six weeks later to the same delightful hostelry, there was the same postman in the same seat, apparently quaffing the same tankard of ale! (Page 183.)

Wharfedale, says Baedeker, is "the finest of the Yorkshire dales and one of the most beautiful valleys in England."

Between the lovely old church of Hubberholme and the ruins of Bolton Priory there lies a succession of picturesque stone-tiled villages, the delight of anglers and artists. I passed the night at Kettlewell and came down the riverside next day by a woodland path, past the famous Strid.

Here the river narrows to a few feet, surging between rocks, and here (says legend and Wordsworth) young Romilly, "the noble Boy of Egremound," was drowned whilst attempting the jump.

The greyhound in the leash hung back,
And checked him in his leap.

His sorrowing mother decreed that in his memory there should rise

In Bolton, on the field of Wharf,
A stately priory.

Its fine ruins still stand in the meadow close to a loothbridge and steppingstones, the delight of picnic parties.

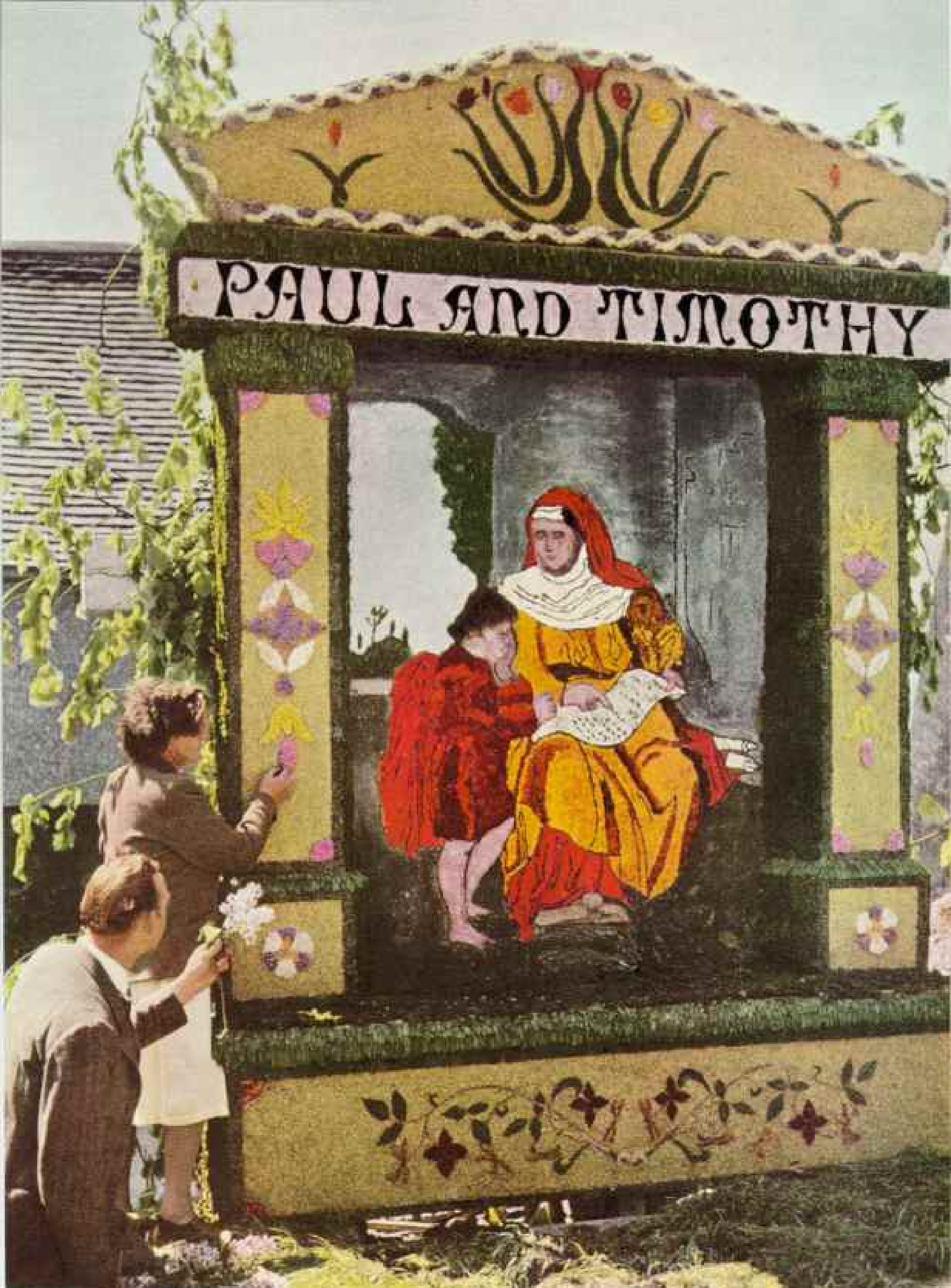
In a hotel close by I had salmon trout for dinner, and afterward in the lounge listened rather apprehensively to two fishermen discussing with great earnestness the very queer contents of a trout's stomach.

Brontë Country Grim as *Wuthering Heights*

Next morning it was raining, but the weather seemed to suit the day, for I was bound for the Brontë country. Beyond Aire-dale, home of the well-known breed of dogs, the moors change color and blacken above their hard foundation of Millstone Grit.



Gone Are Warwick's City Walls, but East Gate Survives. It Wears a Chapel as Its Cap. The Porridge Pot's sign reminds the author, who lives near Edinburgh, that "Scots in England usually have to write home for their porridge oatmeal. England doesn't seem to grow the right kind."



Wirksworth, Where Water Is Scarce, Enshrines Precious Wells with Flower Pictures

Derbyshire attributes its summertime well dressings to pagan times, but the clergy nonetheless give their blessing. Biblical legends are told in blossoms mounted on clay. When petals wither, they are scattered.



Shakespearean Actors Rehearse on the Site of the House Where the Poet Died in 1616
Flowers mentioned in his works fill the interknotted beds of the Elizabethan "Knott" Garden.



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Endotermes by B. Arthur Stewart

Roadside Wildflowers Brightened the Journey of the Botanizing Author

Left: *Primula farinosa*. Right center: yellow tormentil, "St. Columba's flower." Below it: chervil. Extreme right: Wordsworth's favorite—"There's a flower that shall be mine, 'tis the little Celandine." All are enlarged.



A Cycling Family Picnics Beneath Fragrant Hawthorns in the Cotswolds. Cheltenham's Spires Loom in the Distance

Many English families spend their week ends on wheels. Cycling clubs pedal out in companies of 20 and 30 or more.

Wives and Pets Live Wherever the Bargemen Go. Brass and Paint Strive to Make Each Floating Home the Shiniest

These English canal craft prepare to haul coal from Atherstone to London, a four-day trip. Some barges are still horse-drawn.

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Kodachrome by B. Anthony Howard





Grassy Parks Which Saw the Deer and Heard the Hunting Horn Now Know the Plough and the Workhorse
To produce as much food as possible, many English meadows such as this tree-belted pasture near Marlow are now under cultivation.

Merry Members of the Women's Rural Institute Revive a Folk Dance on the Lawn of Storied Bisham Abbey, Berkshire

To this mansion Henry VIII relegated Anne of Cleves after their divorce. Legend says it is haunted by the blind-washing ghost of Lady Hobby.

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1911

Reproduction by H. Anthony Hayward





Beneath the Window's Stations of the Cross, the Vicar of Bray Reads His Prayer Book

The Reverend Sydney Lowman had a famous predecessor who, in the days of Henry VIII, Edward VI, Mary, and Elizabeth, thrice changed his Church allegiance, inspiring the verse, "And this is law that I'll maintain until my dying day, sir, that whatsoever king shall reign, still I'll be Vicar of Bray, sir."

I got a lift to Skipton, where Longfellow's uncle is buried, but as I labored up the steep hill out of Sutton village, some miles farther on, furious onslaughts of rain harassed me. As I was blown down an almost perpendicular slope on the other side, the freakish sun lit up as if by electricity, and the "dark satanic mill" in the hollow lured me to sit down by the millstream and eat the pork pie I had bought in Skipton for lunch.

On again—pork pie notwithstanding!—blown now by winds from every quarter, to another height which showed me Haworth straddling the opposite slope, topped by its square-towered church.

After another grim climb I reached the church and sat down to rest under Charlotte Brontë's window, gift in 1883 of publisher George W. Childs of Philadelphia. In the church is the Brontë vault, where one by one every member (except Anne) of this gifted but fated family was untimely laid.

The grim parsonage where Charlotte, Emily, and Anne spent their short lives (they were born at Thornton in Yorkshire) is now a museum, the property of the Brontë Society. With other valuable Brontë relics it houses the collection made by the late Henry Houston Bonnell of Philadelphia. It has been placed here for exhibition in "recognition of the high appreciation of this gifted family by the English-speaking people on both sides of the Atlantic."

I slept that night in the Brontë Guest House, where my sole companion was a young girl. She was writing a novel centered around Emily Brontë's *Wuthering Heights* (the Withins). Springing barefoot over the rough moor like some reincarnation of Catherine Heathcliff, the writer led me in late twilight past the Brontë Waterfall and the Brontë Chair (a stone shaped like a seat—page 175) to the derelict building of the Withins, which still stands abandoned on the height of the moor.

Peering into its dark and broken chambers, we seemed to hear the ghostly fingers of Catherine tapping on the window.

My way next morning led over another razorlike ridge appropriately marked on my map as "Cold Edge." It was the old coach road to Halifax. Here and there I came on stretches of pavement amid the heath, and at last, quite suddenly, on a little public house overlooking the valley.

The jolly landlord was brewing tea in his kitchen. He made me sit by a welcome fire whilst he filled an enormous mug of the potent beverage for me, talking the while in the loud voice of one accustomed to outcry the wind.

"It's the wind that's our enemy here, not the snow or the rain," he shouted.

In World War I he had fought with the Gordons, but his heart was in his native Sherwood Forest. "You miss the trees up here," he said wistfully. "If I was younger, I'd emigrate."

Presently his wife returned from her shopping expedition in the valley. She started back in surprise to find a visitor in her lonely kitchen, for few came that way over the abandoned road, save the ghosts of dead and gone postilions.

I walked on for many miles, uphill and down dale, after passing Cold Edge. The little inns in this neighborhood are mere road-houses and do not cater to overnight visitors. At last I was obliged to take the bus to Huddersfield to find a bed.

Next day, again traveling over the tops of high hills, I crossed a corner of Cheshire and looked down upon the reservoirs which feed Manchester lying in the bottom of the valley. Beyond them lay the high plateau of the Kinder Scout in Derbyshire, from which the Pennines decline gradually into the green plain of central England and roll to a stop in the Vale of Trent.

Where Izaak Walton Fished

Derbyshire's loveliness is one of high bare hills, hazy distances, and steep gorges. Through its porous limestone rocks water soaks away, bubbling up in deep subterranean caverns and lead mines which were worked by the Romans. Its three rivers, the Derwent, the Derbyshire Wye, and the Dove—beloved of Izaak Walton—are famous trout streams.

I spent a week walking through Derbyshire, for I had now traveled nearly halfway to London and felt that I could draw breath. The Derbyshire folk showed gratifying surprise when they heard that I had walked from Edinburgh, but one woman looked at me in consternation and cried, "Whatever did ye do that for, dear? Did you miss t' boos?" (Page 176.)

It is around Derbyshire that folk begin to call one "dear," and they go on doing it all through the kindly counties of Stafford, Warwick, and Gloucester.

Usually I was asked what kind of shoes I wore and if I had kept to the same ones. I had, but the Pennines had ground down my heels, and at Chapel en le Frith I had the shoemaker put on new ones whilst I waited.

Old customs survive in Derbyshire, nestled in the deep heart of England. In the dining room of the comfortable King's Arms at



One Long Line of a Rope-making Family Has Worked Here for 300 Years

When not driving a taxi in Castleton, Hugh Marrison operates a primitive ropewalk in the vast mouth of Peak Cavern. Below a crumbling 12th-century fortress, generations of Marrisons have plied their trade in Derbyshire. Thanks to the Dukes of Devonshire, the family has never had to pay rent. The moist cave atmosphere favors the craft (opposite page).

Chapel are two remarkable leathern figures which prentices formerly carried in procession on holidays, when plays were acted outdoors. At Ashbourne (opposite page) a kind of football is played in the streets on Shrove Tuesday.

The most famous of all Derbyshire customs, however, and one peculiar to this county of dry limestone, is the beautiful ceremony of well dressing. It is still observed in summer in certain places, such as lovely Tissington and Buxton spa.

The custom has been attributed to the Romans, who are thought to have introduced the pagan rites of Fontus, god of wells and fountains; but today the ceremony consists of a procession headed by clergy and choir. This goes from well to well—or even from tap to tap—in the village, offering praise and thanksgiving to God for the inestimable boon of water.

At each well there has been erected overnight a picture made entirely of flower petals, leaves, bark, or other organic growths—nothing else may serve. This picture is usually some Biblical scene connected with water. It is mounted on a clay-smeared board and is the work of local craftsmen, who often show remarkable artistic talent (page 190).

"Very early in the morning while it is yet almost dark" (writes Canon Stephen L. Caiger of Wirksworth in his history of well dressings), "the completed picture will be tenderly carried to the place of its erection, bolted together and fixed in position. It is a thing of beauty and a joy—though not forever. For, although sprayed with water, the freshness and the glory soon fade, and within a few days this work of consummate artistry so laboriously and skillfully put together is taken down and scattered to the winds."

Buxton's medicinal waters are used in the cure of rheumatism and were known to the Romans. The thermal waters issue at a constant temperature of 82° F., and are strong in radioactivity.

I found Mary Queen of Scots—and her descendant Queen Victoria—ahead of me when I walked over the hills to Castleton and descended the famous Blue John Mine, the only place in the world where this lovely bluish-purple spar, topazine fluor, is found in sufficient quantity to repay the cost of working. It was probably discovered by the Romans whilst they were searching for lead.

Where One Family Has Made Rope for 300 Years

In the vast mouth of Peak Cavern, which tunnels the rock to which Peeveril Castle ruins cling above the village like an eagle's eyrie, a solitary ropemaker, Mr. Hugh Marrison, may still sometimes be seen working at his ropewalk like his fathers before him.

The Marrisons have had this novel workshop rent-free from the Dukes of Devonshire for 300 years. The moist atmosphere of the cavern is suitable for their craft.

When Queen Victoria visited Peak Cavern, she had to lie on her back in a flatboat, which the guide pushed across a subterranean waterway. I ruminated on this unusual picture of the Good Queen as I crossed the hills of this ancient royal forest to the little village of Peak Forest, which was once England's Gretna Green.

Its present vicar, whose former charge was at Dawson in Yukon Territory, let me handle the interesting wooden seal, dating from 1661, of the Peculiar Court of Peak Forest.

The vicars of Peak were its principal officials and judges, having power to grant marriage licences and to marry any persons applying "from anywhere at any time," for this church in the royal forest had its own jurisdiction. An average of 60 "foreign marriages," as they were called locally, took place every year. The seal is still used on marriage licences granted by the vicar of Peak Forest.

From here I went on to the famous Peacock Inn at Rowsley, a fine manor house built in 1652, which is now a charming hotel. Here I spent three nights, for it lies within a few miles of Chatsworth on the Derwent, the palatial residence of the Duke of Devonshire, and of still lovelier Haddon Hall on the Derbyshire Wye.

The immortal love story of Dorothy Vernon and John Manners, who eloped in the

days of Elizabeth whilst Dorothy's sister was holding her marriage ball, draws visitors from all corners of the globe to Haddon Hall.

The ideal baronial mansion was recently restored by Dorothy's descendants, the Dukes of Rutland, who occupied it till 1939. The door by which Dorothy slipped at midnight into the garden, and the little packbridge over the Wye where her lover, disguised as a forester, waited with the horses, is still seen.

Neither they, however, nor the yew trees in the terraced gardens of Haddon can be compared in age with the great yew of Darley Dale churchyard near Matlock. It took me 45 seconds to walk at average speed round its enormous girth. For possibly some 900 years its branches have sheltered the sons of the countryside. Now they spread their benison over tablets commemorating battles of World War II.

On April 19 the cuckoo's note floated over the gauzy damson blossom as I approached the pleasant Staffordshire town of Uttoxeter. I had come 14 miles that morning from Ashbourne, Derbyshire, which figures as "Oakbourne" in George Eliot's *Adam Bede*.

Repairing early to its fine church on Sunday morning, I was rewarded by the unique sight of eight ringers ringing their changes in the chancel in full view of the assembling congregation. The sight was one seldom seen in England, where ringers are usually concealed in the tower.*

In the Footsteps of Boswell and Dr. Johnson

At Ashbourne I picked up Dr. Johnson and Mr. Boswell in the time-mellowed and comfortable hostelry of the Green Man and Black's Head Royal Hotel.

"A very good inn," said Boswell in 1777, ordering his post chaise there. His hostess (Mrs. Killingley), "a mighty civil gentlewoman," curtsied very low to the Scots gentleman and begged for his continued patronage, for Boswell had just been staying with Dr. Johnson as the guest of Mr. John Taylor at the Mansion, a house of importance.

The solid shadow of the lexicographer, whose birthplace was Lichfield, stretches also over Uttoxeter, where his father kept a book-stall. Here in 1777 (as a memorial in the market place records) Dr. Johnson stood for a considerable period bareheaded in the rain, doing penance for refusing one day in his boyhood to keep the stall for his father.

Mary Howitt, who wrote *The Spider and*

* See "By Cotswold Lanes to Wold's End," by Melville Bell Grosvenor, NATIONAL GEOGRAPHIC MAGAZINE, May, 1948.



Penitent Mother Prays over a Son She Beat to Death for Spilling Ink

So goes the legend associated with the 16th-century Hoby family of Bisham Abbey in Berkshire. A scholar herself, Lady Elizabeth Hoby lost patience with her small boy, who badly blotted his copybook (page 204). Here in Bisham Church she kneels upon her own tomb; she died in 1609. Little feet of the child's effigy lie between his mother and the lectern. Others of the family, including her diplomat husband, Sir Thomas Hoby, appear behind her.

the Fly, was a native of Uttoxeter. "The way into her parlor" is now through a doctor's consulting room.

Through green byways I walked on to Lichfield, the spires of whose graceful Cathedral of red sandstone are reflected in the calm waters of the Minster Pool.* Dr. Johnson's huge statue fronts his birthplace in the market. He is depicted in thoughtful mood, cheek on hand, somewhat as if nursing a toothache (page 187). Behind him is a more recent effigy of his biographer, an alert perky-looking fellow in period costume.

George Fox, imprisoned for conscience' sake in Derby jail in 1650-51, stood barefoot in Lichfield market and cursed its inhabitants. A century later in the Three Crowns Inn near the same spot, Dr. Johnson praised them as "the most sober, decent people in England, the genteeldest in proportion to their wealth, and spoke the purest English."

A little way out of Lichfield I came on a deserted canal and followed its grass-grown

* See "Cathedrals of England," by Norman Wilkinson, with 16 pp. of dry-point etchings by the author. NATIONAL GEOGRAPHIC MAGAZINE, December, 1939.

towpath for some distance, meeting only ducks and a brown spaniel. At Atherstone gaily painted barges were loading coal for London. They would reach it, said a stout woman in a cabin full of twinkling brass, in about four days (page 193).

I had blistered both feet rather badly in a wet walk from Uttoxeter. The sight of this woman slipping gently toward the metropolis at some four or five miles an hour, her feet dangling comfortably from the coaming whilst she imbibed a cup of tea, was alluring; but though she waved me a greeting, she did not invite me to join her. I followed the towpath till I came to Nuneaton, where I exchanged Dr. Johnson's company for George Eliot's.

Nuneaton lies within the industrial ambit of Coventry and Birmingham. All hotels were full.

A Visit to the Mill on the Floss

"When in doubt, ask a policeman," is a sound maxim in Britain. I asked. My bobby directed me to the police station; but, on second thought, "Wait a bit," he cried. "I'll come with you myself."

A few minutes later I was introduced to a kind landlady in a back street who called me "dear." She knew all about George Eliot and was able to direct me next morning to the Mill on the Floss. It still retains this name, though the wheels are now silent.

American scholars have written many studies of Mary Ann Evans (George Eliot) and her work. I found the present tenant of her birthplace at South Farm, Arbury, which I reached by a field path from the mill, very enthusiastic about the American soldiers who had come her way during war years.

A large military camp still stood in the wood beside George Eliot's obelisk, on which lay a wreath of withered laurels from the birthday celebrations in November.

A mile beyond Arbury I saw the bluebells. There they were, shimmering like water in the dappled sunlight below the trees. "Oh!" I cried and knelt to smell them. When I got up, the keeper was looking at me rather glumly, his gun across his shoulder, for the road I had come was a private one for military persons only.

It led me to the old castle of Astley, associated with the nine days' queen, Lady Jane Grey, who preferred reading Plato to following the hunt, and whose head was cut off by order of Bloody Mary in 1554. During the war the castle suffered from military occupation and was now to let for the modest sum of £6 weekly. The gardener's wife showed me over the beautifully paneled rooms, where

the soldiers had played darts in the wainscot.

I by-passed Coventry after a long walk which brought me within the boundary of Lady Godiva's much-bombed city, and then carried me out of it again by a speedway where countless cars were being exercised like race horses. They all bore export labels, for in the present dollar shortage Britons have to wait for their new cars.

I dined that night in Kenilworth, in the King's Arms where Sir Walter Scott planned the first chapters of his famous romance. To make sure of my night's lodging in this congested district, I decided to stay in Kenilworth for three nights in a private home and walk to Cheltenham by installments, returning each night by bus. In this way I strolled backward from Stratford on Avon to Kenilworth.

Because evening buses were often full, I took a morning one to Shakespeare's town, meaning to return through the old city of Warwick in the afternoon. I had reckoned, however, without my host, William Shakespeare himself, who, quill in hand, from his quiet niche facing the altar of Holy Trinity Church, dominates Stratford (pages 189, 191).

I was probably the only person in its beflagged streets that brilliant morning who had quite forgotten that St. George's Day was also Shakespeare's birthday.

On walking tours one is apt to lose count of time. Luckily my guardian angel had been more thoughtful and had landed me in Stratford on the very morning of the great day of its year!

The birthday celebrations began at three. It was unthinkable to start on my return to Kenilworth before the international procession set out, headed by the mayor, to visit the poet's birthplace in Henley Street. The house is now national property in the care of the Trustees & Guardians of Shakespeare's Birthplace.

This trust owns many other priceless relics of the poet, including the only surviving letter delivered into Shakespeare's hand. It was written by his friend Richard Quynne, from the Bell in Carter Lane, London, on October 25, 1598, and requests a loan of £30. In view of Polonius' advice to Laertes, one wonders if the poet complied!

All the World Honors Shakespeare

The sun blazed, the white clouds billowed, the trumpeters trumpeted, and out flew a hundred flags of all lands, from Argentina to Soviet Russia, from America to China, in glorious unanimity. Shakespeare had succeeded where the League of Nations had faltered!

In the mayor's procession I saw two Indian ladies in blue and gold saris, a small Chinese in white trousers carrying a very large wreath, the American and Soviet representatives, and many other overseas visitors.

When I found my way to the quiet church on the Avon to bid Shakespeare farewell, two American soldiers stood there silently looking on the poet's grave within the altar rails. Its sole decoration was a sprig of gray rosemary tied with a ribbon—"There's rosemary, that's for remembrance." Through the stained glass the sunlight fell gently on it in three great purple splashes.

The Vale of Evesham is a market garden. In spring, when the orchards are dripping with plum and apple blossom, it is one of the beauty spots of Europe (page 180).

Beyond Evesham the Cotswolds rise out of the haze, and a couple of miles to the southeast Penelope Washington, daughter of Col. Henry Washington, has been asleep since 1697 under the "stars" and "bands" of the famous family's coat of arms in the beautiful old church of Wickhamford. Penelope, who never married, had the good sense to spend her days in this charming Cotswold village.

I entered Cheltenham wedged rather tightly between two Forest of Dean gentlemen who had driven a "prefab" to its destination and were returning for another. After I accepted the lift they offered, they deposited me on the outskirts of the elegant spa which became fashionable after George III drank its waters in 1788. I walked to the town center through magnificent public gardens and found a rookery in the chestnut trees which line the famous Promenade.

The town is an educational center for both sexes. Its great Cheltenham Ladies' College, founded in 1854, one of the largest girls' boarding schools in Britain, had 700 boarders and some 60 day pupils at the time of my visit.

When I returned to Cheltenham later, I visited the college by courtesy of its principal, Miss Margaret Evelyn Popham, a lady who has traveled much in the United States. She commended the NATIONAL GEOGRAPHIC MAGAZINE as of unrivaled geographical value for her pupils. We found them, a gay and colorful assembly in their soft-green school frocks, in the lovely quadrangle amid the flowers, enjoying their "elevenses" (morning tea).

On my walk from Cheltenham to Cirencester I passed the Seven Springs, which Cheltenham folk hold to be the source of the Thames. The springs rise in a pond by a road which borders Seven Springs prepara-

tory school for girls, recently founded by two mistresses from Cheltenham Ladies' College. A week later, seven of its pupils delighted in representing the geni of the springs for the NATIONAL GEOGRAPHIC (page 170).

The Cirencester folk claim that the source of the Thames is nearer their town.

It was a delightful walk to the old town through the Cotswolds, past the golden-walled farms with their stone tiles draped in brown velvet moss, wistaria festooning the ocher walls. A hedger was at work amid the bluebells, layering the hedge in the expert fashion of the West Country by cutting half through the stems. His craft is now a rare one, and his services are much in demand.

Real Birthplace of the Thames?

Scarcely had I passed him when a car stopped beside me and a commanding voice said, "Jump in!" A policeman sat in the back seat. What could I do but obey?

Seven miles later I was set down under the aged church tower of Cirencester, a town which the Romans called Corinium and Shakespeare Cicester, but which the natives pronounce as it is spelt.

Next morning I set out to discover Thames Head. A few miles out on the Tetbury road, a countrywoman told me to follow up the field till I had passed two copses and then look for a tree marked "TH." Apparently there used to be a tablet on this tree, but someone—perhaps from Cheltenham!—has removed it.

"It's not so pretty as it used to be up there," she added. "They've been cutting down the trees."

Surprisingly, in this age of vandalism they had spared "TH," an ash tree under which I found a small depression filled with stones.

Poor Father Thames! He was as dry as a bone. I preferred Seven Springs, for at least there was water in them. But a man burning brush near by told me the channel was full in winter and that in summer the water ran underground, coming up a few fields off, where there was a pump and windmill.

"If you ask me," he added, "that's the right source o' t' Thames. It mun be where there's water all the time." *

A week later I penetrated with Mr. Stewart and two youth hostellers to the field with the windmill and found a sizable brook there. It

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Time and Tide on the Thames," by Frederick Simpich, February, 1939; and "Through the Heart of England in a Canadian Canoe," by R. J. Evans, May, 1922.



Beside Father Thames Stands the Mother of Parliaments

England's greatest contribution to civilization—parliamentary institutions—came from London's Palace of Westminster, a court of law in existence before the Norman Conquest. Occupying the site of ancient predecessors, the present Houses of Parliament date from 1857. To the left of Victoria Tower, Westminster Abbey shows above the trees. The clock tower's heaviest bell, affectionately called "Big Ben," took its name from Sir Benjamin Hall, Chief Commissioner of Works when the 13-ton bell was hung.

bubbled out of a pond covered with white water ranunculus. Here at least was the ideal source of the storied river which would presently toy with ocean liners. Solemnly we all shook hands across it!

"Straight on for London" says a sign near the glass reflector of Fairford whose church is also noted for its magnificent stained glass.

Though the road to London from Fairford is by no means straight, I felt that matters were warming up when I saw this heartening sign.

The first lock on the Thames is near

the Trout Inn by Lechlade. I remained at Lechlade for two days, walking from there to Abingdon and returning to Lechlade to sleep at its comfortable Crown Hotel. There are still 88 river miles between Abingdon Lock and Richmond, and I had only three days in which to cover them. Could it be done without recourse to buses?

It could. Mr. Lundy and Captain Gibbs showed me how. Mr. Lundy had retired some years ago from teaching school and was having supper in the Crown & Thistle when I returned from Abingdon. He too had just

discovered Thames Head and was on his way back to London by the towpath, which he volunteered to show me. That was how, next morning, we met Captain Gibbs at Sandford Lock, three miles from Oxford.

Captain Gibbs was taking his company's pleasure steamer, the *Cliveden*, to Windsor, a two days' trip, to refit for the summer cruises which began in mid-May.

My overworked guardian angel had spotted him leaving Oxford that morning and had arranged that our arrival at Sandford Lock should coincide with his. There stood *Cliveden* in the lock, sinking slowly as the water ebbed, her deck a forest of empty and inviting seats.

"Will you take two passengers?" we cried, hardly daring to hope.

"Step in," said Captain Gibbs as the vessel settled.

"Strolling" by Boat Last Lap to London

We stepped. After all, one can still stroll to London on a pleasure craft at a leisurely four or five knots. Luxuriously we watched whilst history wafted past.

"Waft," said Mr. Lundy, "is the only word for such motion as ours!"

Mansions and villages, orchards and tapering poplars were reflected in the mirrorlike stream. Sometimes a leisurely heron flapped past, or a swan sailed out from the reeds. There are 11 locks between Sandford and Reading, where we tied up for the night. I found palatial quarters in a balconied room overlooking the river.

Our progress to Windsor next day was equally triumphal. We were the first boat of the year, and Captain Gibbs was the most popular of captains with lock keepers and their wives. Down the long straight regatta course of Henley we sailed to Bisham Abbey, which Henry VIII gave to Anne of Cleves in compensation for divorcing her. Lucky Anne! (Page 195.)

In the Templars' church beside Bisham Lady Hoby kneels in widow's weeds on her wonderful tomb, her infant son at her feet and other members of her family at her back (page 200).

Poor Lady Hoby! Fate has blotted her copybook indelibly, for tradition has it that she chastised her young son so severely for blotting his that she caused the child's death. Whether this be true or not—and the infant on the tomb seems much too young to have died pen in hand—her ghost still walks at Bisham, preceded by a basin in which, like Lady Macbeth, she washes her hands.

Whether the basin is filled with blood,

water, or ink, history does not relate. This strange story was curiously confirmed in 1840 by the discovery of some badly blotted copybooks behind the wainscot of her room!

We tied up for lunch at Marlow, whose quiet backwaters framed for Shelley's "lone boat a lone retreat" when he was writing *The Revolt of Islam*.

Beyond Marlow lovely Cliveden is screened in trees. In 1942 the estate was generously presented by Viscount Astor to the National Trust, a fitting custodian for the mansion where "Rule Britannia" was first sung.

Below Cliveden we came to Bray, also associated with song, for here lived Simon Aleyne (1588), who turned his coat thrice to keep his living. But who could blame him for resolving that "whatsoever king should reign" he would remain in this sequestered and lovely retreat? (Page 196.)

We rounded a bend and came rather suddenly in sight of the gray pile of Windsor Castle, spectacularly floodlit by a freakish sunshaft. The spire of Eton Chapel rose over the "playing field where the Battle of Waterloo was won."

The *Cliveden* went no farther than Windsor, and I said good-bye to our kind host, wishing him "Happy holidays."

"I don't think I've ever had a holiday," was the simple reply of this hard-working Thames navigator.

I slept that night under the shadow of Windsor Castle. Next morning was May Day. I had still some 20 miles to go past Magna Charta Island and through the field of Runnymede, both National Trust property and the most famous places on the Thames.

Here, in 1215, having submitted perforce to his barons encamped in their might on the greensward, King John was forced to sign on the dotted line, and the standard of freedom flew for the first time over England.

King John bitterly regretted his act. According to Holinshed, he "cursed his mother that bare him and the hour in which he was born. . . . He whetted his teeth and did bite now on one staff, now on another as he walked and oft brake the same in pieces when he had done."

My walk virtually ended upon Runnymede with King John. His vexed shadow seemed to follow me when, taking bus from Kingston Bridge, I alighted by the Houses of Parliament just on time (page 203). It was 3:30 by Big Ben on the afternoon of May Day. I had kept my date.*

* For additional articles on England and Scotland, see "NATIONAL GEOGRAPHIC MAGAZINE Cumulative Index, 1899-1949."

Switzerland Guards the Roof of Europe

By WILLIAM H. NICHOLAS

With Illustrations by National Geographic Photographer Willard R. Culver

ONE sunny Sunday afternoon in April, a thousand Swiss gathered in a semi-circular ring on the castle hill above the town of Sarnen. They wore their somber Sunday suits and black hats.

From the window of an old clubhouse behind them I looked out over their heads to the raised platform we all were facing. There, alongside a medieval church, sat the elders of the community. A few were in traditional flowing robes denoting cantonal office.

Obwalden, one of the two half-Cantons of Unterwalden, was holding its annual *Landsgemeinde* (Country Council), reminiscent of the forums of ancient Greece or Rome, or the town meetings of New England. Here were revealed the roots of Swiss democracy.

Any male of the Canton over 20 years of age might have his say on public issues, and could vote for his cantonal officers and the men sent to Bern, the Swiss capital, to represent him in the Federal Government. Beyond the roped-off ring stood women and children, voteless spectators at the annual event.

"Showing of Hands" Decides Issues

An issue was debated in Swiss-German. The presiding officer put the question. Most of the men raised their hands to vote "aye." The measure was passed.

In the year the Magna Carta was signed in England,* the three original Swiss Cantons, of which Obwalden was a part, were voting by this "showing of hands." When feudal lords ruled most of Europe; later, when Napoleon was building his Empire; and still later, when Hitler was forcing totalitarian rule on all Germany, the basis of Swiss government continued to be the "showing of hands."

Today in most of the 22 Cantons free elections with secret ballot, right of petition, initiative, and referendum take the place of the cantonal council. But in Glarus, Unterwalden, and Appenzell the councils are held each spring on traditional spots where they have taken place for many centuries.†

This Swiss tendency to welcome modern ways but still cling to tried traditions results in many contradictions.

One day in Geneva (Genève) I was sitting at a table of a sidewalk cafe when the noon-time whistles blew. From stores and offices people poured forth. They converged upon an open space where a hundred or more

bicycles were parked. In a few moments they had joined a growing stream of pedal-pushing traffic.

On bridges across the Rhône, flowing from Lake of Geneva (Lac Léman) through the heart of the city, traffic soon became so congested that motorists were slowed down to a crawl. Geneva, *en masse*, was going home to dinner and would not return until 2 p. m.

Dinner in the Evening? Absurd!

A few days later I asked an industrialist about the survival of this custom among an alert, hard-working people.

"Many manufacturers would like to see the practice abandoned," he told me. "People could come to work later and go home earlier if they would adopt a brief lunch period. They might be more efficient."

"However," he added, "there isn't the slightest chance of a change. The Swiss prefer to take two hours for dinner at midday, and that's that."

There are many other contradictions.

Switzerland is far from the sea. There are jocular remarks about the Swiss navy and nonexistent Swiss admirals.

Yet this inland, mountainous country is famous for its manufacture of huge Diesel marine motors. The Dutch ocean liner *Oranje* is powered by three Diesel engines of 12,500 horsepower each, built in the industrial city of Winterthur.

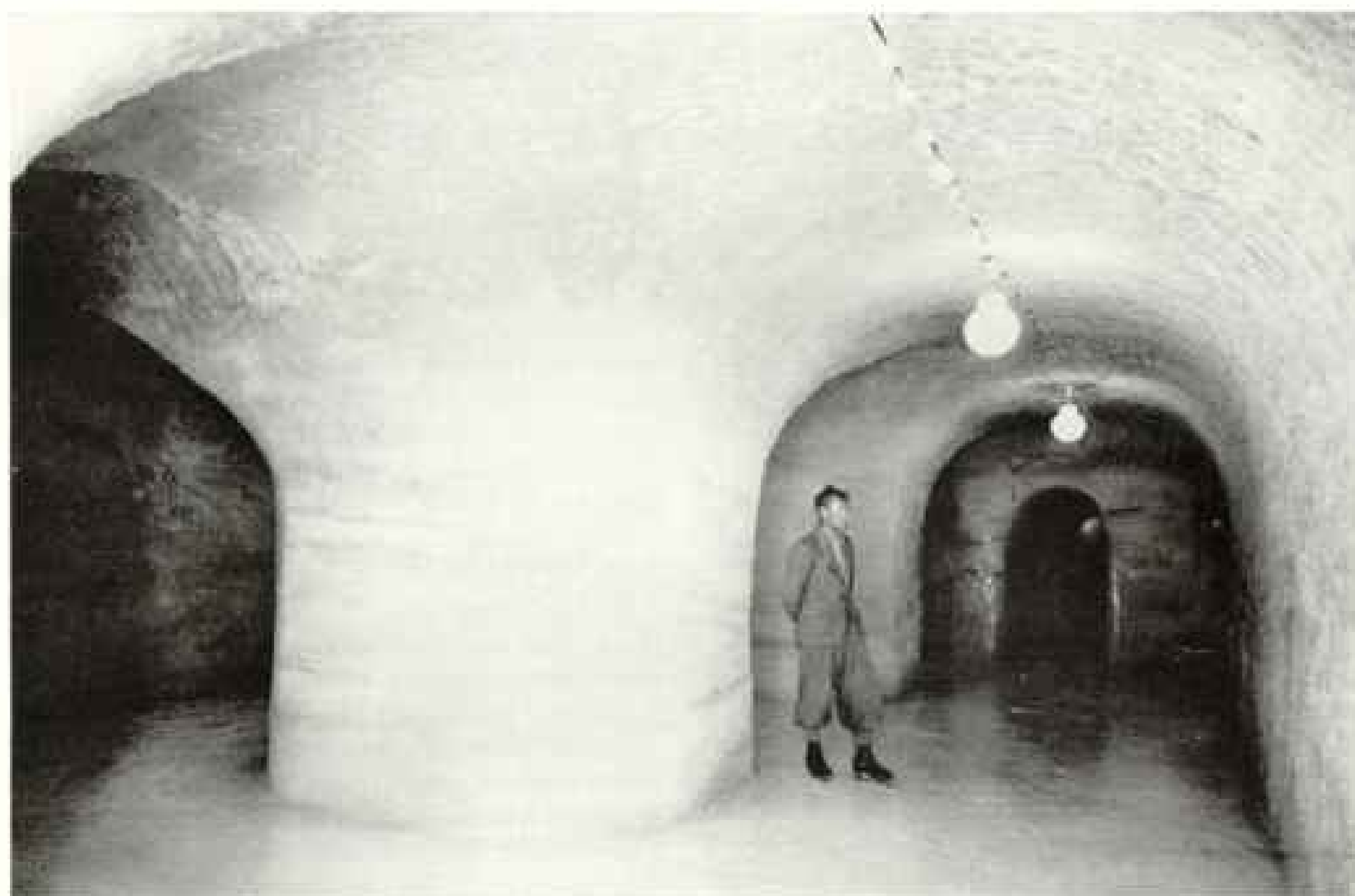
The watch industry employs 50,000 persons. But in 1949 Swiss machinery exports were of greater value than exports of watches. Swiss heavy machinery goes all over the world.

Swiss-built Diesel engines provide the power for a big Shanghai power plant. Many Swiss Diesel locomotives and railway cars operate in South America.

Switzerland imports virtually all of its raw materials and huge quantities of food. Every year it buys more than it sells abroad. It receives not a cent in Marshall Plan aid. Yet Swiss currency is the strongest in Europe. By nurturing its important tourist trade and by making wise investments abroad, Switzerland keeps its books balanced.

* See "The British Way," by Sir Evelyn Wrench, NATIONAL GEOGRAPHIC MAGAZINE, April, 1949.

† See "Swiss Cherish Their Ancient Liberties," 21 illustrations, NATIONAL GEOGRAPHIC MAGAZINE, April, 1941.



Carved in a Glacier, 65 Feet Down, This Skating Rink Never Melts

But it stands so high at Jungfraujoch that exercise causes hearts to pound furiously, because of rarefied air. Guides of the Jungfrau Railway shaped the galleries and thick pillars. Visitors reach them by a long staircase, mat-covered to assure firm footing.

Free from the devastation of war for more than a century, Switzerland's population has grown rapidly despite frequent waves of emigration. To support 4,300,000 people, the nation's economy has undergone a radical change. From a strictly agricultural country it has turned into a highly industrialized one in little more than 100 years. Nearly half its workers now find employment in factories, fewer than 25 percent on farms.

Five Countries Hem In Switzerland

Switzerland, bordered by Germany, Liechtenstein, Austria, Italy, and France, is about half the size of South Carolina (map, page 210). Yet its climate varies from Arctic cold in the Alps to the Mediterranean temperatures around Lake Maggiore. Perpetual snows clothe the Alpine summits; palms, magnolias, oleanders, agaves, and lemon trees grow along the shores of the Lake of Lugano.

Altitude ranges from about 650 feet above sea level on the shores of Lake Maggiore (page 222) to 15,216 feet in the Monte Rosa group of the Alps.

The waters draining from the Swiss Alps flow into the Atlantic Ocean by way of the Rhine; into the Black Sea by way of the Inn,

a tributary of the Danube; and into the Mediterranean by way of the Rhône, through France, and by way of the Ticino, through Italy.

The tree-clad Jura Mountains, much lower than the Alps, edge Switzerland's northwestern boundaries.

Between the Alps and the Juras extend the broad Swiss midlands, roughly from Lake Geneva northeast to the Lake of Constance (Boden See).

The nation's important cities—Geneva, Lausanne, Lucerne (Luzern), Bern, Basel, Zürich, and St. Gallen—dot this fertile stretch, separated by thriving farmland.

The Alps account for about two-thirds the country's area; the Juras, about one-eighth. Economic heart of the nation is the midlands; but travelers for centuries have paid it comparatively little heed, riveting their attention on the overpowering beauty and grandeur of the massive Alpine chain and the charm of the southern lakes.

Of every 100 people in Switzerland, 72 speak Swiss-German, 21 French, six Italian, and one Rhaeto-Romansch. But many thousands speak both French and German, or French and Italian, or Italian and German.



Hikers Above the Clouds Don Sunglasses in the Glare of Great Aletsch Glacier

Here, not far from Jungfraujoch (page 211), they see part of the 15-mile-long frozen sea moving slowly down the valley to help feed the River Rhône, which winds across southern France to the Mediterranean. Aletsch Glacier, the largest in the Alps, fills the valley between the Finsteraarhorn, Jungfrau, and Aletschhorn mountain groups.



Photograph: Wehrli & Vögelé

Heatless Stove and Tuneless Piano Grace Crystal Palace

Cut from the ice, they stand in a corner of the "cocktail lounge," a feature of the spacious cavern hewn from the glacier below Jungfrauoch (page 206). Unlike snowmen posing on garden lawns in winter, they will not pass away with the coming of spring, for here the temperature never goes above freezing.

A large and growing proportion speaks English as well.

Bern, the nation's capital, also is the key to the famous Bernese Alps, including the celebrated Jungfrau, 13,668 feet above sea level (page 230).

More than 750 years ago Berchtold V, Duke of Zähringen, founded the city as a powerful stronghold against his enemies.

Bern's Symbol Is a Bear

Bern is derived from the German word for bear. According to legend, a bear was killed on the spot when the city was founded; hence the figure of a bear appears on the town flag and in scores of decorative motifs. Famous

and popular are Bern's historic bear pits, as I discovered on a Saturday morning stroll.

As I approached, it seemed to me that all the children of this city of 130,000 had come there. I could hear peal upon peal of childish laughter.

These bears of Bern trace their history back through the centuries. About the only thing a Bernese has to say about Napoleon's invasion of Switzerland is that he took the bear population of Bern to Paris with him.

Bern jealously retains its medieval character. Graceful arcades flank the streets of the business district, a joy to shoppers on rainy days (page 240).

Cool water streams from centuries-old monumental fountains in the center of busy streets. One is crowned with the figure of a bagpiper, another a ropemaker, a third an archer, a fourth blindfolded Justice. Of course a carved bear surmounts another. Most famous of Bern's fountain statues is that of an ogre devouring a small child.

With several hundred other onlookers I stood at noon one day before the ancient clock tower, to see all the figures in this complicated apparatus spring into action with the striking of the hour.

Florentine-style Federal buildings house the Swiss Parliament, patterned after the Congress of the United States, and the Federal departments. Near by stand the cantonal buildings, for Bern is also the capital of its Canton, similar to a State in the United States.

Store windows are filled with all manner of merchandise, much of it imported. Popular brands of American cigarettes are available in nearly all tobacco shops at 45 cents a pack, along with many English varieties and

more of Swiss manufacture.

One of the most popular makes of automobiles is the little German *Volkswagen*, originally built by the Nazis and now in mass production in Germany. Popularity of small cars is not surprising, with gasoline at 56 cents a gallon!

In Bern keeping streets and sidewalks spotless is a matter of civic pride. Late sleepers have difficulty catching their last few winks when housewives begin their rug beating.

Bern goes to work early. Government offices open at 7:45 a. m. in winter and 7:15 a. m. in summer. Closing time is 5:45 p. m. In spring and autumn school opens at 7 a. m.

Recently the school authorities decided to change the starting time to a later hour, but were forced to reconsider when the mothers protested.

To get their housework done, then attend to marketing and prepare that big noonday meal, it was necessary, they said, that their children be on their way to school before 7!

On the outskirts of Bern one morning I visited a cheese-processing company, where the finest of Emmentaler and Gruyère cheese is molded into triangles and packed in circular boxes for export (page 243).*

New Tricks of the Cheese-making Trade

The Swiss cheese maker, to keep abreast of the times, had added variety to his product. At this plant, the bulk of whose output goes to the United States, I saw cheese with ham mixed into it—70 percent cheese and 30 percent ham—to provide the inside for a combination sandwich all in one package.

The Ovomaltine plant is a few miles from Bern. With its name changed to Ovaltine,



Haas Bildenstein

"We'll Settle for a Couple of Carrots"

Bern is proud of its generations of city-owned bears, the Swiss capital's mascots for centuries. Legend tells that the day the old town was founded, a bear was killed on the spot. Every fine afternoon hundreds of children and grownups ring the tops of the pits, tossing food down to the beggars.

this chocolate-malt drink also is made in the United States. The drink originated in Switzerland. The Bern plant exports to some 40 countries.

One of my early sorties from Bern was to Interlaken, in the Bernese Alps, to make the spectacular ascent to Jungfrauoch by mountain railway.

The ascent by rail from Interlaken to the hamlet of Kleine Scheidegg, up the Lauterbrunnen valley, gave a foretaste of what was to come. As we climbed, twisting into and out of tunnels, a chain of snow-clad

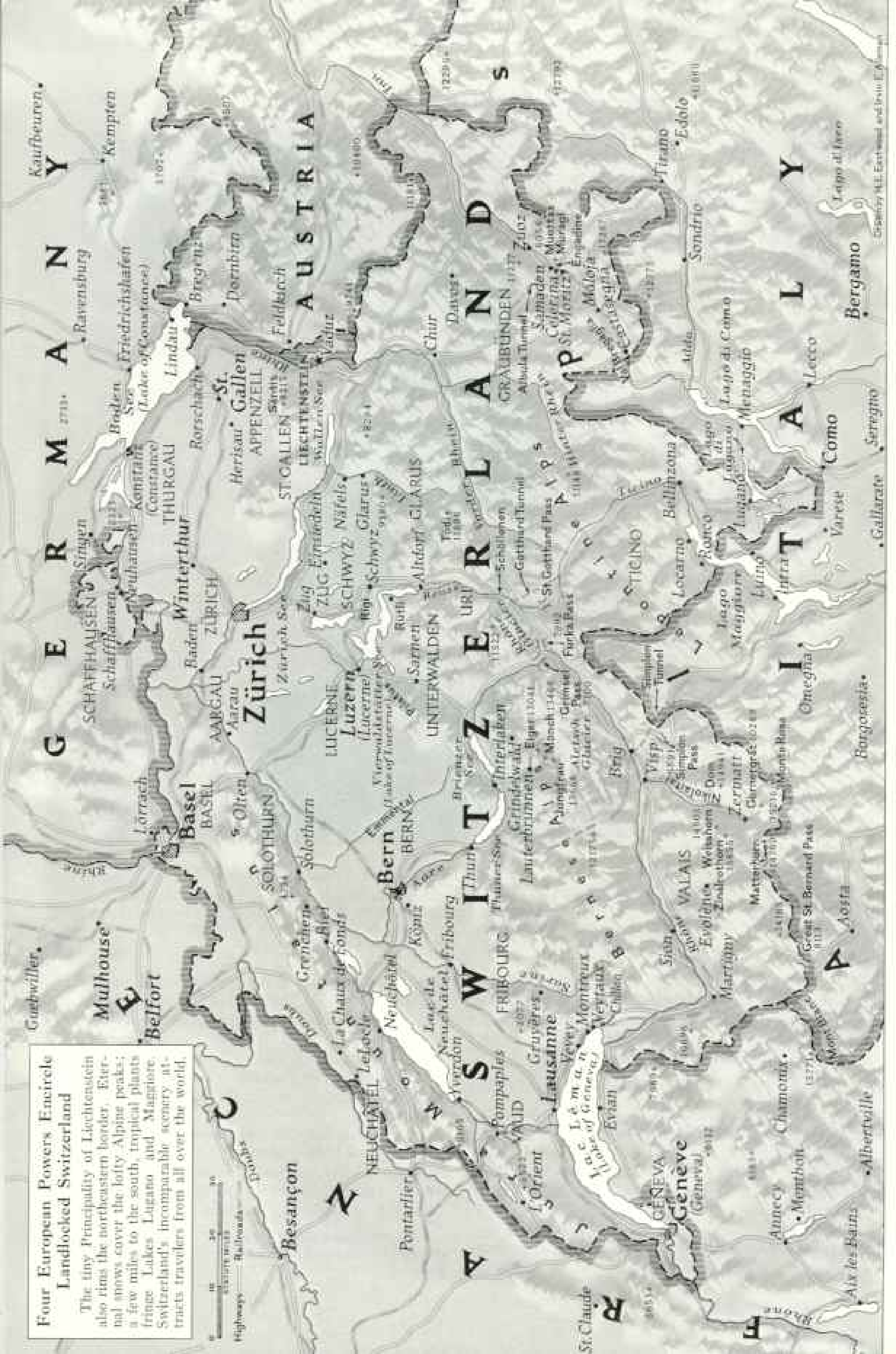
* See "August First in Gruyères," by Melville Bell Grosvenor, NATIONAL GEOGRAPHIC MAGAZINE, AUGUST, 1936.

Four European Powers Encircle Landlocked Switzerland

The tiny Principality of Liechtenstein also rims the northeastern border. External snows cover the lofty Alpine peaks; a few miles to the south, tropical plants fringe Lakes Lugano and Maggiore. Switzerland's incomparable scenery attracts travelers from all over the world.



Highways — Railroads



**Europe's Highest Hotel,
Shrouded in Snow,
Peers from the Icy Face
of the Sphinx**

To reach the Hotel Berghaus, its restaurant, and the scientific institute carved in the mountain-side, visitors ascend, molelike, by the famous Jungfrau Railway. In rack-and-pinion cars, they climb first through timberland and pastures, affording marvelous views of the Jungfrau and the Grindelwald valley, then enter tunnels hewn in the interior of the Eiger and the Mönch.

Favorite base for Alpine assaults and skiing, Jungfrauoch perches here at 11,540 feet on a slope of the Sphinx, a saddle between the Mönch (background) and the Jungfrau. First climbed in 1811, the Jungfrau (13,668 feet) is easily scaled in summer when the snow is in good shape. Many other climbs afford magnificent views of the Bernese Alps and Mont Blanc.

The solitary, castlelike meteorological and astronomical observatory (upper right) is reached by a 164-foot elevator from the railway station inside the mountain.



peaks gradually appeared in the background.

At Kleine Scheidegg we changed to the Jungfrau Railway and began a steeper, cog-wheel climb. This line, highest in Europe, was begun in 1896 and completed in 1912 to Jungfraujoch, at a point 2,328 feet from the summit.

Twice the train paused so we could visit enclosed galleries for superb views of the valleys below and the peaks above. Then, at the end of a tremendous tunnel, we pulled into the underground station of Jungfraujoch (p. 211).

Europe's Highest Observation Terrace

Walking at this high altitude was difficult because of the rarefied air, but the view at the end of a stroll to the snow-covered plateau of Jungfraujoch repaid the effort. Then we retraced our steps to an elevator which ascended 364 feet to the summit of the Sphinx, where we emerged upon the highest observation terrace in Europe.

Around us, perfectly at home amid the snow and ice, flocks of alpine choughs wheeled and soared in the cold mountain breeze. These birds, related to the crow family, inhabit many mountains of northern Europe.

Climbers can ascend from here to the summit of the Jungfrau in from three to four hours. The ascent of one sister peak, the Mönch, is harder; but most difficult of all is the near-by Eiger. Though the mountain was climbed as long ago as 1858, the sheer, almost unscalable approach up the north wall, the Eigerwand (Ogre's Wall), was not conquered until 1938 (page 230).

The Jungfrau Railway is spectacular, but so is a goodly portion of the entire Swiss Federal Railways.

Their electrification, begun in 1907, is 98 percent complete today. When World War II cut off coal supplies to Switzerland, its people were thankful that they had embarked upon this \$250,000,000 project.

In thrifty Switzerland most passengers travel third class (about 94 percent in 1949); only one percent buy first-class accommodations. The Swiss love to tell about a high Government official who once was encountered by a friend in a third-class coach.

"Why, sir, how is it that you are riding third class?" the astonished friend inquired.

"Come, now," replied the official, "surely you know there is no fourth class."

In Lucerne, Switzerland's most frequented tourist resort (page 232), I promenaded with hundreds of other visitors along the quays, looking out over the sparkling waters of the Lake of Lucerne (Vierwaldstätter See) to the Alps beyond.

Behind me in a solid row stood the big hotels, famous for their views of the lake and the mountains—the Rigi to the east, Pilatus to the south, and the long ranges in the Cantons of Uri, Schwyz, and Unterwalden to the south and east.

I rambled through the streets until I came upon the Lion Monument. This commemorates the Swiss Guards who died defending Louis XVI and Marie Antoinette from the attacks of Revolutionary mobs on the Tuileries in Paris in 1792.

Hewn in the face of the living rock by a Constance (Konstanz) sculptor, the figure represents a lion of colossal size, mortally wounded but endeavoring to protect to the last a shield bearing the fleur-de-lis of the Bourbons. The figure is mirrored in a pool at the monument's base.

Steamboat trips on the Lake of Lucerne are legion. The boats penetrate deep into the heart of the William Tell country, where spot after spot is associated with the legendary hero of Swiss independence.

But I was most interested in the meadow of Rütli. Swiss independence was born there in 1291, and a dramatic event took place there during World War II. This spot on the lake shore now belongs to the State and is a place of pilgrimage, particularly on Sundays.

In July, 1940, after Hitler's armies had overrun Belgium and the Netherlands, and had conquered France, the Swiss learned through their excellent Army intelligence service that their turn was about to come.

Switzerland had mobilized all its manpower to maintain its neutrality. It was prepared to resist any invader at all costs.

But the shattering impact of the blitzkrieg on stronger nations had had a pronounced effect on Swiss morale. In some quarters, both civilian and military, defeatism set in.

General Guisan Restores Morale

Then Gen. Henri Guisan, commander in chief of the Swiss forces, on the eve of the threatened attack, on July 25, 1940, summoned every high-ranking officer of the Swiss Army to the Rütli.

"I have decided to assemble you in this historical spot, the cradle of our independence, to talk with you as soldier to soldier," the General told them.

He outlined the military situation, warned his officers against listening to the ill-informed or ill-intentioned, and concluded firmly:

"On August 29, 1939, the Federal Council ordered mobilization of frontier troops, then total mobilization. It entrusted the Army with safeguarding our secular independence.



Men of Appenzell Cherish Folk Costume but Know the Feel of Army Uniforms, Too

Earrings add an extra touch on festive occasions. But, like all Swiss, these herdsmen take their turn at military service. So efficient was Switzerland's Army that Hitler was unwilling to pay the bloody cost of an invasion.



Alpine Peaks Cradle St. Moritz, World-famous Winter Sports Center, By Its Lake in the Heart of the Upper Engadine Valley

Cable-car ascent to this terrace at Muottas Muragl, one and a half miles high, rewards travelers with a vista of grassy slopes that winter turns to fast ski runs. Celerina lies in the valley foreground. Skiers, skaters, tobogganers, curlers, and ice-hockey players from many lands crowd the hotels of this playground.

Early in June Flower-garlanded Villagers and Their Cows Parade to the Mountains for the Summer

Behind their Brown Swiss leader, her huge cowbell clanking at every step, trek Appenzell herdsmen. Some will live in hill cottages until September. Thus they conserve valley hay for winter forage. The big Simmental at left wears paper posies.

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Photographed by Willard H. Culver



**At Snail's Pace, Mighty
Rhône Glacier Creeps
down Its Valley**

Here, a mile and a half below historic Furka Pass, the vast river of ice flows past the Hotel Belvedere, perched on its very edge. Not far away a man-made ice grotto has been hewn into the glacier's side. Each spring a new entrance must be cut, for the old one moves downward with the ice about 30 feet every year.

The slow-flowing river of ice, eight miles long, has shrunk during the centuries. Within recorded history it has retreated about two miles up the valley. This glacier, one of the wonders of Switzerland, comes to an abrupt end in an ice fall which becomes the source of the Rhône River. One of the principal water arteries of Europe, the Rhône winds its way across France to empty into the Mediterranean Sea.

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Kodachrome by Willard H. Curver



Do, Mi, Sol, Do! Resonant Notes Blown by an Appenzell Herdsman on a Huge Alpine Horn Boom and Echo in the Swiss Mountains
Tones of this 15-foot giant are superb as background for the music of a group of yodelers. An alpine horn is hollowed by hand from a small mountain pine. A tree growing horizontally out of a crevice and turning skyward is selected because of the natural curve at the base of the trunk.

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Redrawn by William H. Culler



Lacy Veils of Spray
Cascade from a 1,000-foot
Cliff at Lauterbrunnen

Byron likened Staubbach Fall to the "pale courser's tail," referring to the horse ridden by Death in Revelation, 6:8.

Lauterbrunnen means "pure springs." In the vicinity of this village two-score "wreaths of dangling water smoke" erupt from the enclosing valley walls.

The community lies on the route from the popular resort of Interlaken to the famed Jungfrau (Virgin Peak) and its almost equally well-known sister peaks, Mönch and Eiger.

The snow-capped Jungfrau towers 13,668 feet above sea level. A spectacular railway, highest in Europe, was completed in 1912 to a point 2,328 feet from the summit. One tunnel on this line pierces the limestone and gneiss rock of both Mönch and Eiger for a distance of four and three-quarter miles.

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Kodachrome by Willard B. Carter



Swiss, Lacking Coal, Stack Their Wood with Care Against Long, Cold Winters; Decorate a New House with a Festooned Tree

Practical cone-shaped piles admit sun and air to dry the sticks. Their tidy appearance also appeals to Swiss neighbors. As outer pieces cure, they are put into wood bins, until the entire stack has been moved indoors. The carpenter at left hoists the gay little pine to show he has reached the highest point of the building. Now it's up to the owner to give a dinner for the workmen in celebration.

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Photomontage by William B. Culver





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Kodachrome by Willard R. Culver

✦ Butterfly Headgear Tests the Skill of Appenzell Needleworkers

Edelweiss, prized mountain flower, is worked into the collar design. The tiny Canton long was famed for its delicate embroidery, but such handwork is vanishing. No longer is it profitable to spend months in producing one handkerchief, scarf, or luncheon cloth.

✧ Sugarloaf Bonnet for a Zermatt Maid; Glass Balls Crown an Evolène Bride

If the girls enjoy mountain climbing as much as most Swiss, they can visit each other by taking a 13-hour hike over a famous trail between their two villages. The path leads over a snow-covered pass more than 11,000 feet high, and along narrow ridges.





On a Hill Close to Lake of Geneva Gay Narcissus Promises an End to Cold Weather

But the girls still wear the winter bonnets of Vaud Canton—it's too early for their better-known straw hats. The flowers grow in profusion above the vineyard line near Vevey. Their blooming is celebrated with festivals.



Summer Villas in Tiny Ronco Flank the Shore of Europe's Deepest Lake, Maggiore, Shared by Switzerland and Italy

About one-fifth of this narrow, 40-mile stretch of water, which reaches a depth of 1,450 feet, is Swiss. Mediterranean temperatures prevail much of the year. In the romantic atmosphere of the southern lake district, Italian-speaking Swiss are concentrated. They make up six percent of the nation's population.

Smiling Girls Cart Empty Wicker Baskets out to Hay Fields; Sturdy Couple Plods Home with Theirs, Heavily Laden

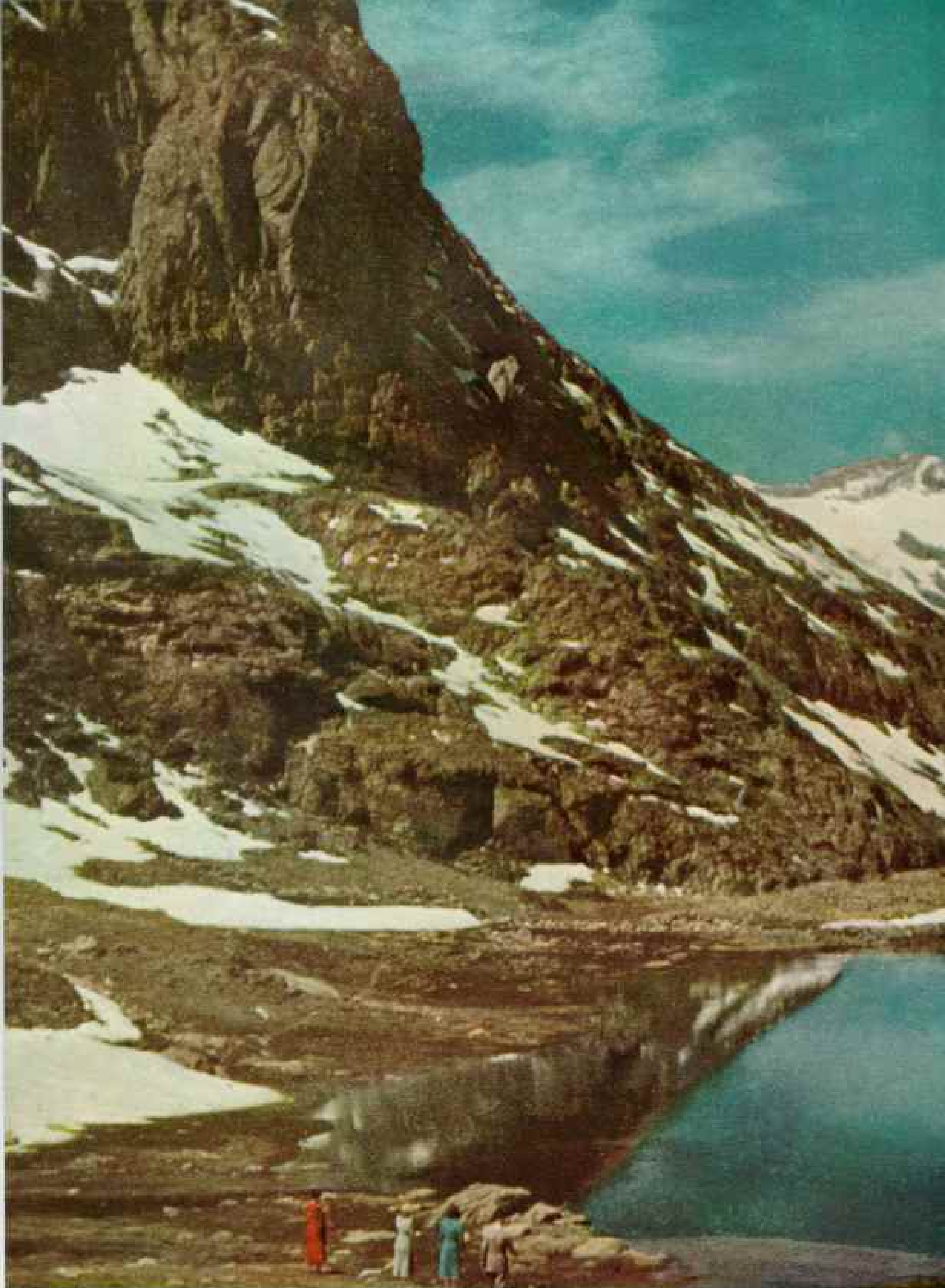
Men and women alike rake the steep hillsides. Bulging baskets are a common sight on country roads in the southern lake district of Switzerland, where small farming is carried on in primitive fashion. The girls help on the family farm near Locarno; husband and wife tend a small plot near Lugano. All are Italian speaking.

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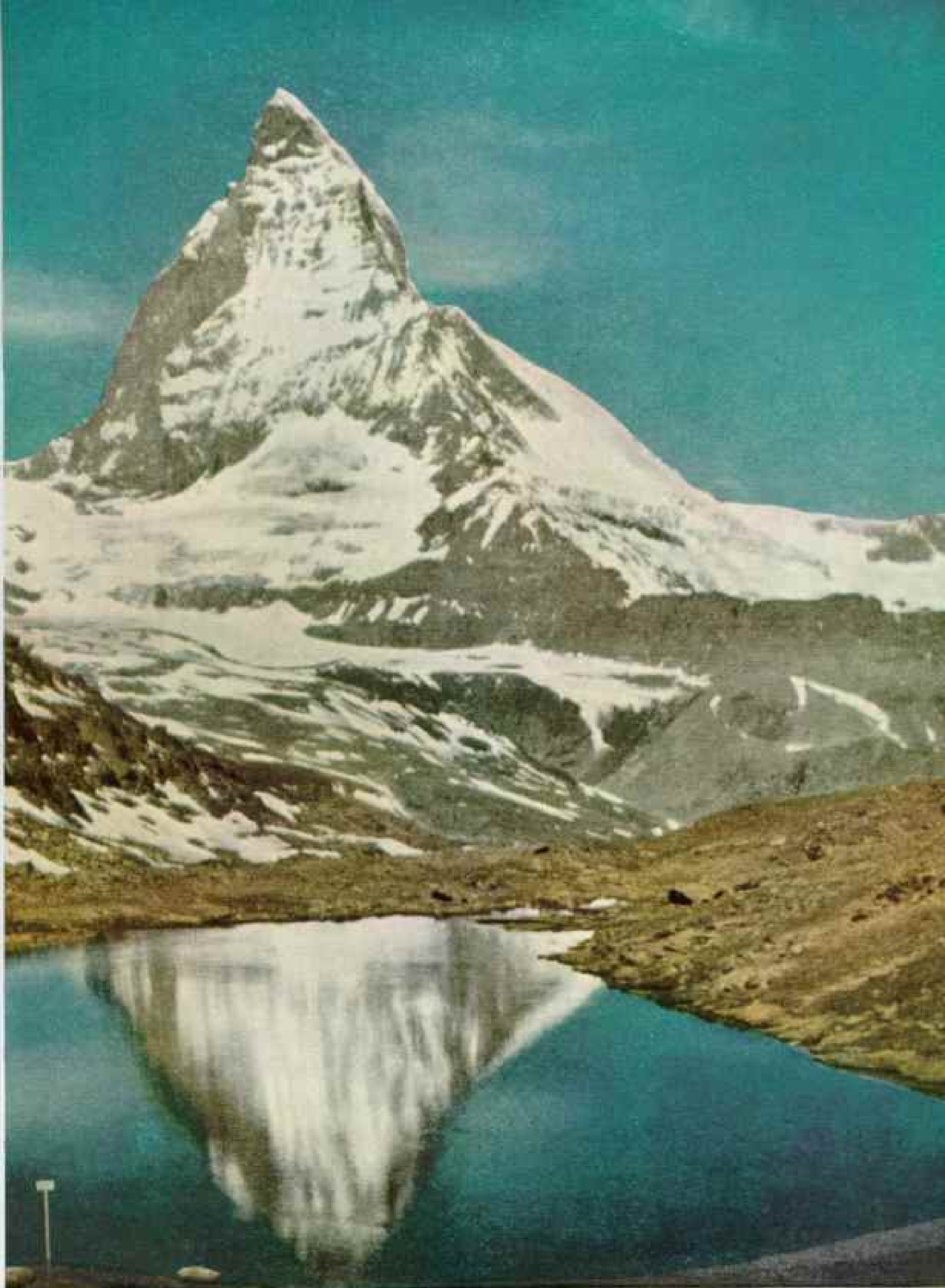
Illustrations by Willard H. Carter





Melting Snow Wells into a Natural Reflecting Pool for the Mighty Matterhorn

At Gornergrat ends the spectacular rack-and-pinion electric railway from Zermatt. The climb, past boulder-strewn torrents and waterfalls, is climaxed at the top with an awe-inspiring, 40-mile panorama of snowy mountains.



Mantled in White, the Matterhorn Soars 14,780 Feet Above Sea Level

Not until 1865 was the pyramid conquered. Then Edward Whymper's party of four Englishmen and three Swiss reached its top; but in the descent four were killed. Every summer scores of visitors make the climb.



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Illustration by William H. Coker

To Basel, Switzerland's "Seaport," River Boats Puff up the Rhine from Rotterdam Bringing Two Million Tons of Imports a Year

The vessels tie up to one and a half miles of quays. A score of traveling cranes, three pneumatic grain elevators, and 19 miles of railroad track handle cargoes. Swiss manufacturers send their exports back over the 500-mile waterway for transshipment at the Netherlands port to points around the world.

Wayfarers Dine on the Terrace of an Old Castle to the Music of the Majestic Falls of the Rhine

The culmnet's width of 370 feet, rather than its modest height, makes it one of the impressive sights of Europe. Half hidden by the foliage rise buildings of a suburb of Schaffhausen, a Swiss town in a small enclave cut off from the rest of the nation by the river.

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Illustration by Willard H. Curtis





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Kodachromes by Willard R. Carter

♣ Even the Dog Helps Do the Chores on a Small but Busy Bernese Farm

Swiss find many ways to get their milk to the creamery or cheese factory. Some carry it on their backs in wooden or aluminum containers. Others trundle the cans in wheelbarrows. Prosperous farmers employ horse-drawn, rubber-tired carts.

♀ Women of Zuz Whip a Sheet to and fro at Dizzy Speed in the Town "Laundry"

Throughout Engadine Valley such basins are common, adjoining the village pump or spring. People here speak a tongue of their own. Rhaeto-Romansch has been adopted as the fourth national Swiss language, along with French, Swiss-German, and Italian.



This independence our neighbors have respected until today. We shall see that they respect it to the end."

He sent them back to their posts in fighting mood; they communicated that spirit to their troops, and Swiss morale was restored.

Hitler did not attack. Since the war, officials told me, documents have been found which showed that Hitler was advised that it would cost 500,000 German casualties to subdue the Swiss. He was unwilling to pay that price.

New and Old Blend in Fribourg

The old town of Fribourg, on the linguistic dividing line between French-speaking and German-speaking Switzerland, stands on a rocky peninsula, edged on three sides by a bend in the River Sarine, 180 feet below. Tree-clad hill country encircles the town beyond the river. Entrances are by high bridges across the Sarine. Parts of the ancient wall and some of the watchtowers still stand.

Dominating the town is the Gothic St. Nicholas Cathedral, begun in the 14th century. Its organ is famous throughout Europe.

As we strolled through the vast interior, awed by the loveliness of the old stained-glass windows, the hand-carved choir stalls, and the massive altar, we suddenly heard the great organ. Unaware of his small audience, the organist high above us was practicing. We stayed to enjoy an impromptu recital.

The new home of the University, completed in 1946, is a huge modernistic structure of reinforced concrete. Last summer 203 students from the United States attended the University's summer school.

Six other Cantons—Basel, Bern, Zürich, Geneva, Vaud, and Neuchâtel—also maintain universities. The Federal Institute of Technology at Zürich has produced engineers who have made international reputations. Othmar H. Ammann, engineer and builder of the huge George Washington Bridge across the Hudson River, is a Swiss.

I went to Basel to visit the Swiss Industries Fair, which attracts buyers from all parts of the world. The town was in holiday mood.

I was astonished at the number and variety of displays. One hundred and twenty-six watch manufacturers had booths at the "watch fair" in which were displayed models at prices ranging from a few dollars to \$5,000.

The Rhine splits the city of Basel so that the smaller portion to the north is in an enclave, cut off from the rest of Switzerland by water.

At the point where the borders of France, Germany, and Switzerland meet, I looked

across the water to the north to see a German customhouse, and across the water to the southwest to see part of the fortifications of the ill-fated Maginot Line.

Warehouses and elevators line the basin from which the Rhine river boats depart for Antwerp (page 226).*

In Baden, Aargau Canton, I visited the plant of Brown, Boveri & Company, Ltd., builders of electrical and mechanical equipment.

Founded in 1891, this institution was the first in Europe to make steam turbines for land and marine use. In 1906 it electrified the Simplon Tunnel.

In the big plant, which employs 8,000 people, I saw huge insulators being tested in an artificial rainstorm, and men and women hard at work atop, inside, and under big transformers, turbines, and generators (page 244). An impulse generator in the high-voltage laboratory produces a maximum of 2,400,000 volts.

One of every four engineers in the company's employ is engaged in research.

Another Swiss industrial giant is Sulzer Brothers, Ltd., in the manufacturing city of Winterthur. As a family enterprise this firm goes back to 1775, when Salomon Sulzer opened a small brass foundry inside the town.

The first Sulzer Diesel engine was built in 1897, tiny in comparison with the Diesels in the *Oranje* (page 205). Today Sulzer Diesels are in service all over the world.

Sulzer locomotives operate on the Romanian state railways; an Australian mining company is Sulzer-equipped; an Algiers hospital has installed a Sulzer warming and air-conditioning unit; an irrigation project in Egypt is equipped with four big Sulzer screw pumps.

Steelmakers of Schaffhausen

In Schaffhausen, on the Rhine, is a third big plant, the George Fischer, Ltd., steel and iron works. Here, as far back as 1802, Johann Conrad Fischer began experiments in the manufacture of crucible cast steel, the invention of an English watchmaker which had been a guarded secret for 60 years. Within two years Fischer had produced the first crucible cast steel on the Continent.

Now Fischer's can turn out a variety of some 7,000 items, from a huge 30-ton steel casting, through forgings and machine tools, down to a tiny key (page 234).

I observed that many workmen seemed to be Italians.

"They *are* Italians," my escort said. "About

* See "Rediscovering the Rhine," by Melville Chater, NATIONAL GEOGRAPHIC MAGAZINE, July, 1925.

Monarchs of the Alps, Eiger, Mönch, Jungfrau Have Spellbound Many Generations of Visitors

Sister peaks, Ogre, Monk, and Virgin, are seen from a lower summit, the Schilthorn. The Jungfrau, 13,668 feet high, rises 200 feet above the Mönch and 627 above the Eiger.

Though the three mountains had been climbed by 1858, the almost unscalable north face of Eiger (Eigerwand—Ogre's Wall), shaded side at left, was not conquered until 1938. Many fatal attempts preceded the successful assault.

Clastic upthrusts of the Alps have been studied more thoroughly than any other mountains. But the great Swiss geologist, Albert Heim, after a lifetime of work, admitted that he was unable to explain them. The upheavals produced a series of vast rock sheets, driven over one another and overlapping like shingles on a roof.

Donald McIntosh



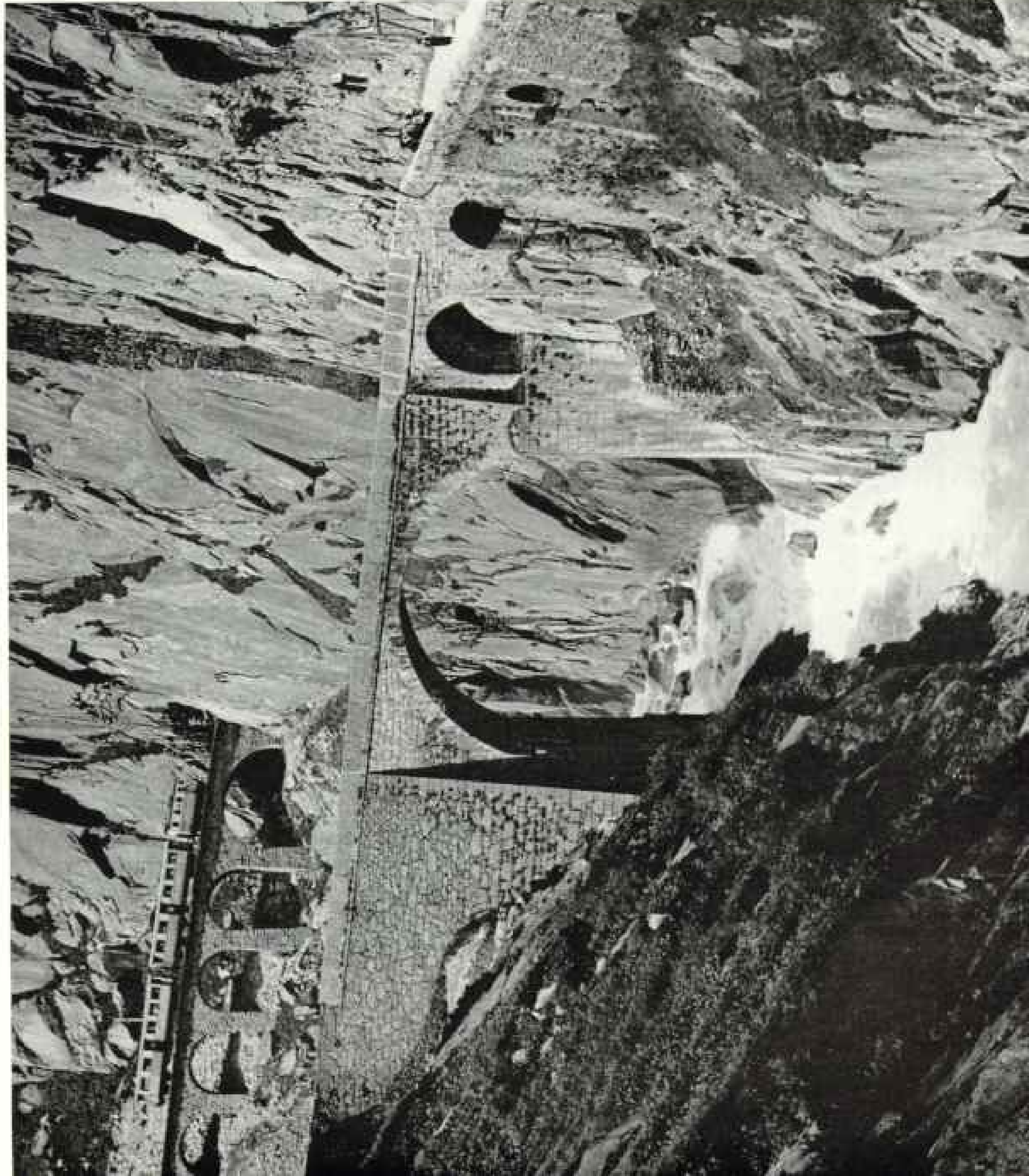
Dwarfed by Giant Cliffs,
an Alpine Train Climbs
Up Schöllenen Gorge
Above the Devil's Bridge

The story of this highway bridge which crosses the Reuss River, tumbling 100 feet into a deep abyss, is related by Longfellow in his *Golden Legend*. Abbot Giraldu of Einsiedeln built the span for pilgrims on their way to Rome. He promised the devil the soul of the first living thing that crossed, if the bridge remained unharmed. When the arch was completed, the Abbot tossed across a loaf of bread. A dog dashed over in pursuit; thus the devil was cheated of his bargain.

Below this span, the Gotthard, most famous of Alpine tunnels, enters the mountains in the German-speaking Canton of Uri, but emerges in Italian-speaking Ticino. Some 3,000 workmen blasted and dug for eight years to build the 9-mile tube, finishing it in 1883.

Nearly all Swiss railroads are Government-owned. They were electrified at a cost of some \$250,000,000, but the nation considered this cheap when World War II came. Had it not been for the change from steam to Swiss "white coal," transportation would have been paralyzed.

Masterpieces of mountain engineering. Swiss railroads cross 4,922 bridges and pass through 667 tunnels. Engineers the world over applied the daring and imagination of Switzerland's railroad builders.





Off Lucerne's Lido Beach, Three Girls Give a Buoy a Rough Time

The Swiss flag, white cross on a red background, flies from the pole. When the International Red Cross was organized in Switzerland the reverse of the national emblem was adopted as the Red Cross flag. For a century Lucerne has attracted more visitors than any Swiss resort. Around the shores of its lake began the struggle for independence. On Rütli meadow in 1291, three Cantons initiated the Swiss Confederation.

100,000 Italians are working in Swiss factories today, and we are glad to have them.

"When a man who is out of a job has the enterprise to leave his own country and go elsewhere to make a living for his family back home, he usually can be counted on to be a good workman.

"Here at Fischer's we have built comfortable dormitories for them. Most of their earnings go back home for their families."

The town of Schaffhausen lies in an enclave, part of a 15-mile strip of territory lying north of the Rhine but belonging to Switzerland.

During World War II the citizens lived in constant fear of invasion by the Nazis. Tragically, though, their only physical suffering came at the hands of American airmen who mistook the town for a German target and unleashed a violent aerial attack upon it about noon on April 1, 1944.

In the Mayor's office I saw a huge map on which each hit had been recorded. Singularly, not a bomb fell in the valley where the big Fischer plant stands.

Since the war, Congress has passed a reparations bill adjusting Swiss war claims, and more than half of the funds appropriated has gone to Schaffhausen.

Over the Rhine bridge which connects Schaffhausen with the rest of Switzerland, I drove a mile or so with friends to a pleasant restaurant which commands a view of the Falls of the Rhine. As we sampled Rhine trout, my companions told me to observe the hilly, tree-covered backdrop for the celebrated falls (page 227).

"A man wanted to build a factory on that hill," they told me. "But the town wouldn't let him. It would have spoiled the view."

Zürich, Switzerland's Metropolis

On my first trip to serious, hard-working Zürich, I found it in holiday mood, for I arrived on the day of the *Sechseläuten*, or "Six o'Clock Ringing," the last Monday in April.

That is when the entire Canton says farewell to Old Man Winter and burns him in effigy as the climax to a day of rejoicing.

I lunched in the huge railway station restaurant, which employs some 400 persons to cater to thousands of guests daily. Favors that day were little snowmen on sticks, replicas of the figure about to be burned.

In Sechseläuten Park across town, near the Lake of Zürich (Zürich See), Old Man Winter, looking like the snowmen fashioned by American boys, swayed in the breeze atop a high pole, awaiting his doom. Below him fagots were piled some 25 feet in the air, ready for the torch.

Soon the head of the parade came into view. The marchers, afoot and on horseback, were members of Zürich's historic guilds, clad in colorful traditional costumes.

The bakers were in the van. One group was baking bread in an oven on a float. Others tossed bits of bread to the spectators.

Then came the smiths (originally armorers, sword makers, pewterers, and bell founders); the guilds of near-by districts in garb of country folk of the 18th century, accompanied by their geese, chickens, pigs, cows, and horses; men in resplendent costumes of the Guild of Constaffel, founded by knights, noblemen, and scientists; guilds of fishermen, huntsmen, carpenters, boatsmen, tanners and shoemakers, weavers, and others.

Although interest among the onlookers was keen, I noticed an absence of cheering.

But suddenly far down the street I heard a rising crescendo of applause. Everyone around me burst into wild cheering. Then I noticed in the line of march a small gentleman of about 70, dressed in conservative civilian attire, who modestly acknowledged the plaudits of the crowd.

I turned to my Swiss companion. But I had to wait for my answer, for he, too, was on his feet cheering wildly.

"Why that is General Guisan," my friend finally said breathlessly. "He's the greatest man in Switzerland. He was our General during the war" (page 212).

Dusk fell and the parade marched on. At 6 o'clock the torch was put to the fagots. Soon a huge blaze roared skyward. Old Man Winter began to burn.

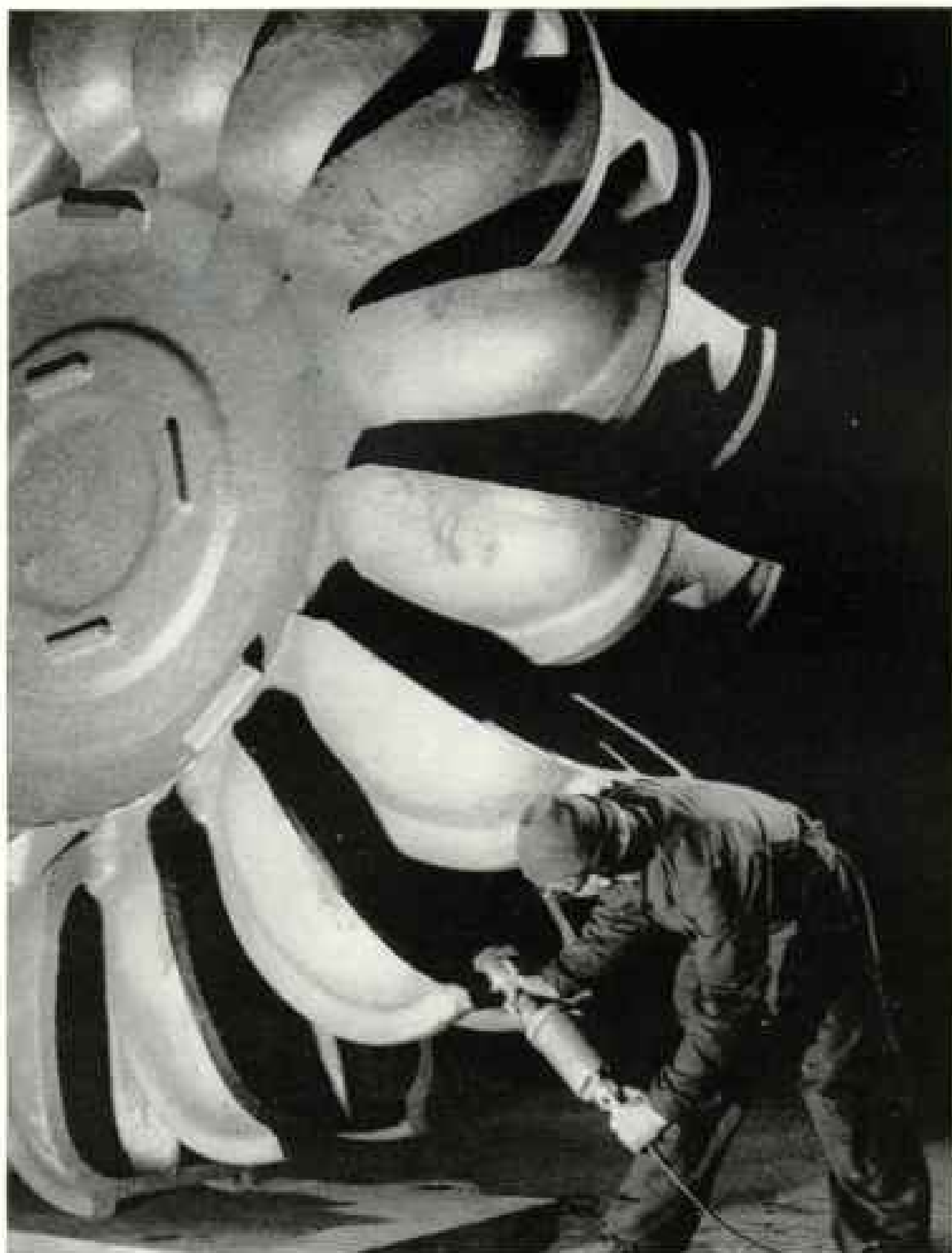
The crowd roared. Horsemen raced wildly and recklessly around the huge blaze. Firecrackers concealed within Old Man Winter's costume started to bang. Shouts grew louder. And all the time the innumerable bands, by this time spaced at intervals around the park, took turns playing the rollicking *Sechseläuten March*, especially composed many years ago for this ceremony.

Darkness fell and the crowds dispersed.

Chilly wind blew through the streets. Paraders and spectators shivered. But everyone was happy. Winter, officially, was at an end. Soon those delightful days of sailing on the Lake of Zürich and climbing in the mountains were to come again.

The next day the serious business of living was resumed. For Zürich is one of Europe's big banking, insurance, commercial, and industrial centers. Primarily it is a place of work, not of play.

For centuries Swiss-textile makers have been selling their cloth in all parts of the world.



Water Will Spin This 24-ton Steel Wheel Like a Top

Installed in a hydraulic turbine, it will develop 55,000 horsepower. A workman at George Fischer, Ltd., in Schaffhausen puts finishing touches on the huge casting, 13 feet in diameter. In 1804 Conrad Fischer, founder of the company, was the first man on the Continent to cast crucible steel. The process, first achieved in England about 1740, was long a guarded secret (page 229).

One important center of the industry is St. Gallen, founded about 614 by the Irish missionary for whom it is named.

The Abbey of St. Gallen, shrine of medieval music and one of the centers of the mystery plays and of early German poetry, was one of the early cultural centers north of the Alps. Much of the town's historic character remains, particularly the old patrician houses with their richly decorated oriel windows and façades.

St. Gallen and the neighboring Cantons of Appenzell and Thurgau long were famous for their rich hand embroideries and laces. At one time in this region 10,000 homes possessed

little "hand-sticking" machines at which the women of the households worked.

Modern textile factories have largely taken their places (pages 238 and 239). Today but a tenth of these machines are in operation, and they are employed mainly in finishing edges on machine-made handkerchiefs.

"Only a few elderly ladies now produce the old-style handmade lace," a St. Gallen handkerchief manufacturer told me. "It's a pity, but people no longer can afford to spend from two to six years on a single piece."

From St. Gallen I went on to the mountain-locked Canton of Glarus, from whence came the immigrants who settled New Glarus, Wisconsin.*

With Casper Hoesli, Glarus merchant, and his wife, I drove through the Canton—a memorable experience. For this isolated region, lying in the basin of the Linth River, is almost completely enclosed by high mountains, culminating in the Tödi, 11,886 feet above sea level.

In places the valley floor is less than a mile wide. To me, a stranger, the mountains pressing in on either side seemed overpowering and menacing.

Near the entrance to the valley lies the lovely Wallen See, into which the rampaging Linth was directed more than a century ago. A canal, whose flow is controlled, was cut from the Wallen See as an outlet. Standing at the head of the canal, I could see it stretch like a narrow ribbon down to the Lake of Zürich, 11 miles distant.

* See "Deep in the Heart of 'Switzerland,'" by William H. Nicholas, NATIONAL GEOGRAPHIC MAGAZINE, June, 1947.

At a small inn beside the Wallen See we stopped for an *apéritif*. Across the lake we could glimpse an international express train, Austria bound, as it flashed into view through a series of galleries cut into the rocky mountainside.

I noticed that the Hoeslis spoke English at first with a little difficulty, but as the day progressed they became more fluent.

"Our English is rusty," Hoesli apologized. "Some years ago it was much better."

"When I first met my wife she was working in a wholesale house in Zürich. I went there often to buy merchandise. She spoke French, I spoke Swiss-German. But we both spoke English: so we used that tongue during my courtship. Both of us had traveled in the United States."

"After we were married, I learned to speak French and she learned to speak Swiss-German. Soon we abandoned English entirely. Now that you are here, we are glad to have the opportunity to brush up."

Glarus, capital of the Canton, is an oddity in Switzerland. It has no old buildings as the term "old" is understood in Europe. A disastrous fire destroyed the town about a century ago. Some of the money to rebuild it came from New Glarus, Wisconsin.

For centuries Glarus has been a textile-printing center. In the museum at Näfels I saw old wooden cylinders with hand-carved patterns that looked singularly Indian.

"We once made printed cloth for Indian sarongs and exported it to India," said my Swiss companion. "Also, we once had a virtual monopoly on felt for Turkish fezzes. The Turks bought material from us. The secret of our process was that we mixed a certain amount of cow dung with the dye."

Switzerland's largest Canton, Graubünden, or the Grisons, is one of the most sparsely settled. The whole Canton is a network of mountain valleys, some as high as 6,000 feet above sea level. Its streams drain to the Danube, Rhine, and Po.

I entered the Grisons by way of the upper Rhine Valley, traveling by train to Chur, chief town of the Canton. This ancient community of narrow streets and tall houses was the seat of a Bishop as early as 452. The Cathedral, on a hill overlooking the town, is more than 650 years old.

The rail journey from Chur to St. Moritz is spectacular. Ruined castles perched on high mountainsides come into view every few miles. Huge boulders litter hillsides and project from the beds of rushing streams. The rocky, forbidding land is in striking contrast to the lush meadows of Glarus.

Loops, spiral tunnels, deep cuts, and high bridges followed one upon the other until the train emerged from the Albula Tunnel, nearly four miles long, to enter upon the floor of the Upper Engadine Valley. A few moments later we had reached the town of St. Moritz, 6,000 feet above sea level (page 214).

The famed winter resort lies high above its lovely lake and is bordered by still higher mountains, their summits capped with snow. These mountains, a skiers' paradise in winter, shed their white mantles late in spring. Then nimble Brown Swiss cattle climb high up the sloping sides to graze throughout the summer months (page 215).

In 1884 St. Moritz built its first toboggan run, the Cresta. A few years later the oldest bobsled club in the world was formed there and the old sport of curling was introduced. Then figure skating and ice hockey brought more color and glamour to St. Moritz, along with its celebrated ski jumps and ski runs.

A Tongue from Roman Times

Only 40,000 Swiss, about a third of the population of the Grisons, speak Rhaeto-Romansch, but in 1938 the nation voted to preserve it as a fourth national language. The Grisons were part of the ancient Roman province of Rhaetia, and their language stems from Roman times.

Despite infiltration of German settlers into the Grisons, the ancient tongue held its own in the Engadine, the Vorder Rhein, and Hinter Rhein Valleys.

In Samaden the old and powerful Planta family presented its ancestral home as a research institute for the study and promotion of Rhaeto-Romansch culture. Here Dr. John Pult, head of the institute, showed me its Rhaeto-Romansch library of more than 4,000 volumes, some printed as early as 1552. I saw the first complete edition of the Bible in Sursilvian, a Romansch division, printed at Chur in 1718. It contained a four-page dedication to George I of England.

"He contributed 50 guineas toward the printing costs," Dr. Pult explained.

On the library shelves were the works of Walt Whitman and Henry Wadsworth Longfellow, printed in Romansch, along with those of English writers—Shakespeare, Byron, Tennyson, and Dickens.

In the village of Zuoz (page 228) stand typical Engadine houses, stone structures with thick walls, from four to five centuries old. The general plan for each was the same—a court in the center, entered through stout doors wide and high enough to admit a loaded hay wagon; the kitchen and dining room on

one side of the court; sleeping quarters on the other; and in the rear a huge barn, with stables underneath.

The practical reason for this layout is to keep human beings and animals warm during the long and bitterly cold winters.

Most of the old Engadine houses were built by Italian stonemasons and carpenters, who came over the mountains from Italy to do the work in the summer months, sometimes working three or four summers on one home.

They built well, but were disturbed to discover that the stone of the Engadine was too soft to permit decorative carving.

So they applied a double coating of finish to the exterior stone, drew their designs upon it, and then scratched through the lighter, outer coat. Thus the dark-colored inner coating was revealed, making the design.

This art work they called *sgraffiti*, from the Italian word, *sgraffiare*, to scratch. Fronts of some Engadine houses are thus decorated.

Through Italy to Lugano

Going from St. Moritz to the southern lake resort of Lugano, I crossed the tip of north-central Italy. The Ticino, Switzerland's Italian-speaking Canton, thrusting southward to the Lake of Lugano, is bordered both on the east and the west by Italian soil.

By Swiss Federal Postal Service motorbus I headed southward through the Upper Engadine. For some 10 miles out of St. Moritz the road scarcely changed its level. The Italian-speaking Swiss village of Maloja is at virtually the same altitude as St. Moritz.

Then suddenly the bus began a spectacular descent into the Val Bregaglia, 2,000 feet below, on a steep road cut into the cliff. I was amazed at the dexterity with which the driver negotiated the 12 terrifying hairpin turns in the road.

Just beyond tiny Castasegna the bus crossed the border and wound its way through small, tumble-down Italian towns.

For 15 miles from the head of Italy's celebrated Lake of Como we skirted the western side of the beautiful lake, with its picturesque fishing villages and palatial summer villas. At Menaggio we swung westward and in a few miles were able to see the eastern tip of the Lake of Lugano. We followed the shore of the lake into the famous resort.

In a few hours I had moved from alpine to tropical surroundings. The evening before, I had asked my hotel proprietor at St. Moritz to place a small electric heater in my room for warmth. Now, 24 hours later, I was eating dinner on the balcony outside my room, which overlooked the lovely lake.

Along the lake's edge a promenade extended for several miles, bordered with formal rows of plane trees. The lake itself was dotted with pleasure craft—sailboats, motorboats, and lake steamers homeward bound with sight-seeing parties. Two miles south of Lugano, tree-clad San Salvatore, a sugar-loaf mountain, cast its bold shadow over the lake.

In Lugano the ancient and lovely old church of Santa Maria degli Angioli, overlooking the lake, stands alongside the fashionable hotels, shops, and numerous ticket-agency offices. Across the promenade scores of motorboats ranged in line for hire.

To reach the Canton of Valais, I again passed across Italian territory, this time by rail, and through the famed Simplon Tunnel, longest in the world. It extends for more than 12 miles, and where it pierces the main ridge of the Alps 7,000 feet of mountain lie overhead. The Swiss-Italian border is at a point about halfway through the tunnel. Just beyond the northern end the train came to a halt in the little town of Brig.

Brig is an important crossroads. It lies at the foot of the Simplon Pass, which leads over the Alps into Italy, and also is on the main road to the Furka Pass, which, with the near-by Grimsel and St. Gotthard Passes, affords communication across the mountains to central Switzerland.

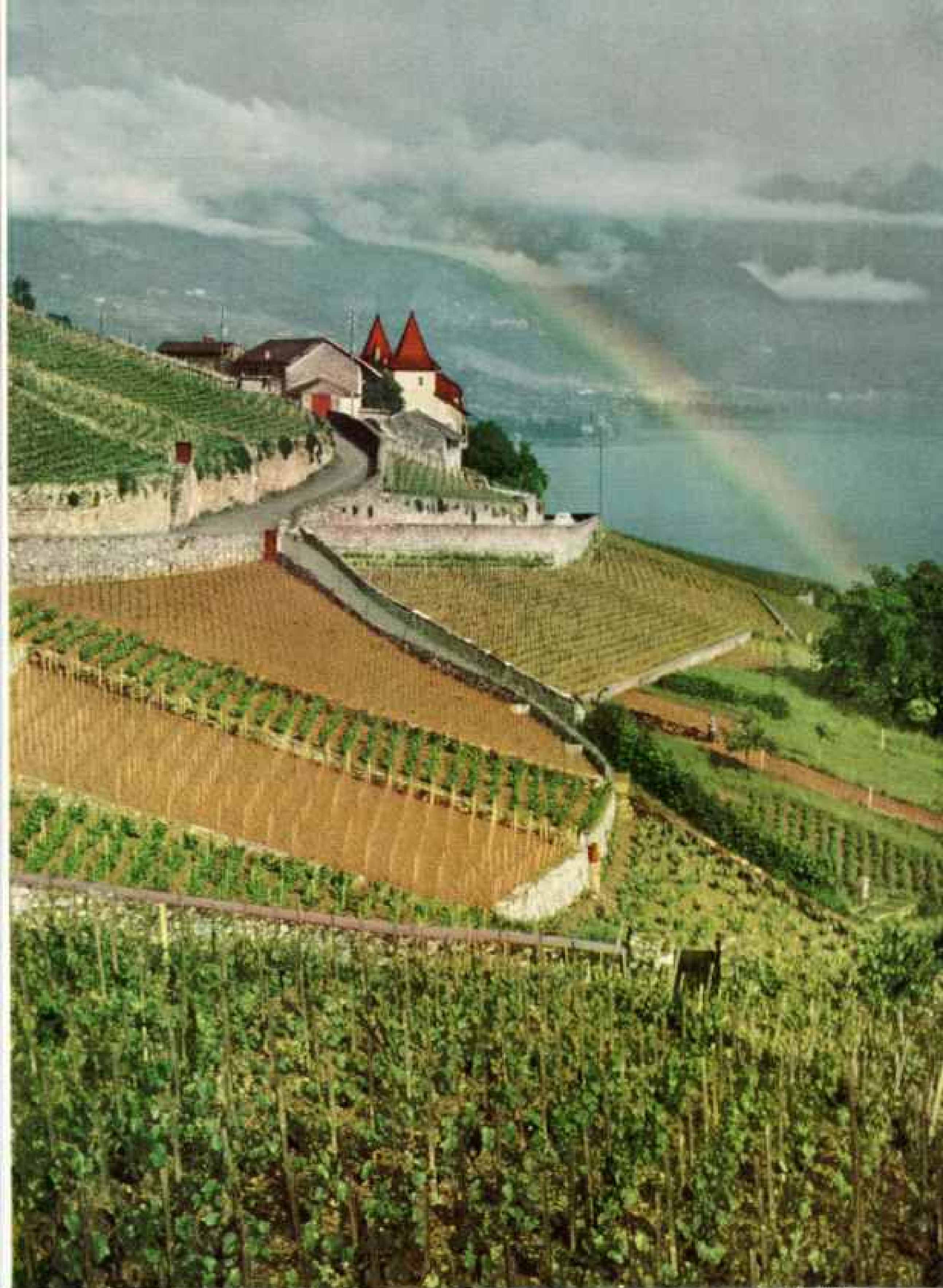
Roads wind over more than 25 major passes and numerous minor ones across the Swiss Alps. One historic pass is the Great St. Bernard, which crosses into Italy from the southwestern part of the Canton of Valais. Celts and Romans made their way over its trail before the time of Christ. By this route Napoleon led his army into Italy, to defeat the Austrians at the famous Battle of Marengo.

At the mountain hospice founded by St. Bernard of Menthon in the 11th century are bred the famous Saint Bernard dogs, which were trained to rescue snowbound travelers.

At Visp, a few miles from Brig, I boarded the narrow-gauge railroad for Zermatt and the Matterhorn. This steep line, which ascends the Nikolai Valley, climbs through rugged mountain country for 22 miles, gaining 3,150 feet in altitude in that length, aided by rack-and-pinion gear.

The mile-high, mostly single-street village of Zermatt, health resort and tourist and winter sport center, stands on a little plain completely surrounded by Switzerland's most impressive mountain giants—the Dom, the Matterhorn, and the Monte Rosa, Zinalrothorn, and Weisshorn groups.

The summit of the Monte Rosa group is the highest in Switzerland, 15,216 feet; yet



Grapes at the Foot of the Rainbow Are Pots of Gold for Growers of the Vine Near Vevey

Stone-walled vineyards in the Canton of Vaud, such as these rising in graceful terraces beside Lake of Geneva, produce such celebrated Swiss wines as Dézelay and Côte d'Attalens. Vineyards are cultivated in 18 of the 22 cantons.



Organdies and Voiles from Ancient St. Gallen Become the Latest Paris and New York Fashions

Old firms in this Swiss textile center once specialized in fine hand embroidery. Now they export a wide variety of machine-woven goods, costume fabrics, damask tablecloths, and low-priced cotton handkerchiefs for the world's department stores. Factories of St. Gallen have gone modern, but not the old town. Richly decorated façades and quaint oriel windows of its patrician houses recall the past. Its abbey library treasures manuscripts of the ninth and tenth centuries.



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Kodachrome by Willard R. Curtis

♣ Faster than Eye Can Follow, a Modern Dobby Loom Weaves Colored Fabrics

Swiss textile factories import their cotton. Nearly all of the country's raw materials come from abroad, since its only natural resources are timber and electric power. Although Switzerland builds many kinds of machinery, this loom was made in the United States.

✧ With a Sure Touch, She Color Prints a Scarf by Applying a Hand Block

The bolt of cloth, some 75 yards long, lies flat on a table. Patterns are applied by stencil. The operator, pushing the traveling ink container ahead of her, passes down the long table, stamping the inked block on one quarter of the scarf at a time.



**Apostles, Bears, Cocks
All Spring into Action
When Bern's Old Clock
Strikes the Hour**

When the cock crows, a blacksmith strikes his anvil, bells ring, bears follow each other about in a procession, and a king raises his scepter. At noon crowds of watchers gather to see the puppets go through their routine twelve times.

More than any other large town in Switzerland, the capital of the Swiss Confederation has kept its medieval appearance. Yet old arched sidewalks display the latest in modern furniture and household goods as well as antiques. On rainy days, the arcades make shopping pleasant.

Ornamental fountains grace the streets; some are 400 years old. From spring to autumn, geranium-filled window boxes adorn nearly all downtown buildings.

The bear, heraldic symbol of Bern, appears everywhere, from live ones in the municipal pits to figures over doorways, on fountains, and in scores of public places. Every novelty shop sells carved wooden bears in numerous sizes.

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Reproduction by Willard H. Carter



Huge Geranium-decked Farmhouse, Arched at Gable End, Marks Owner as a Wealthy Bernese Farmer. Girls Wear Eminentul Costumes

© National Geographic Society

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Illustration by William H. Cooper





↑ **Fluffy Eiderdown
Keeps Her Warm and
Cozy on a Cold
St. Moritz Night**

This comforter graces a bedroom in a private home. Luxury hotels in the Swiss resort also depend on eiderdown for their guests, in addition to steam heat and electric stoves. Thick stone walls and tiny windows of Engadine farmhouses shut out wintry blasts and keep heat indoors.

← **To Combat Winter's
Chill This Family
Just Sits on Its
Big Tile Stove**

Rich walnut paneling of the living room cannot be damaged by soot or smoke. The stove is built against the wall, door to the firebox opens into a back room. The father, Otto Herrenschwand, inherited his Bernese farm; it has been in the family for 700 years.

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Kolorchromes by Wilford R. Carter



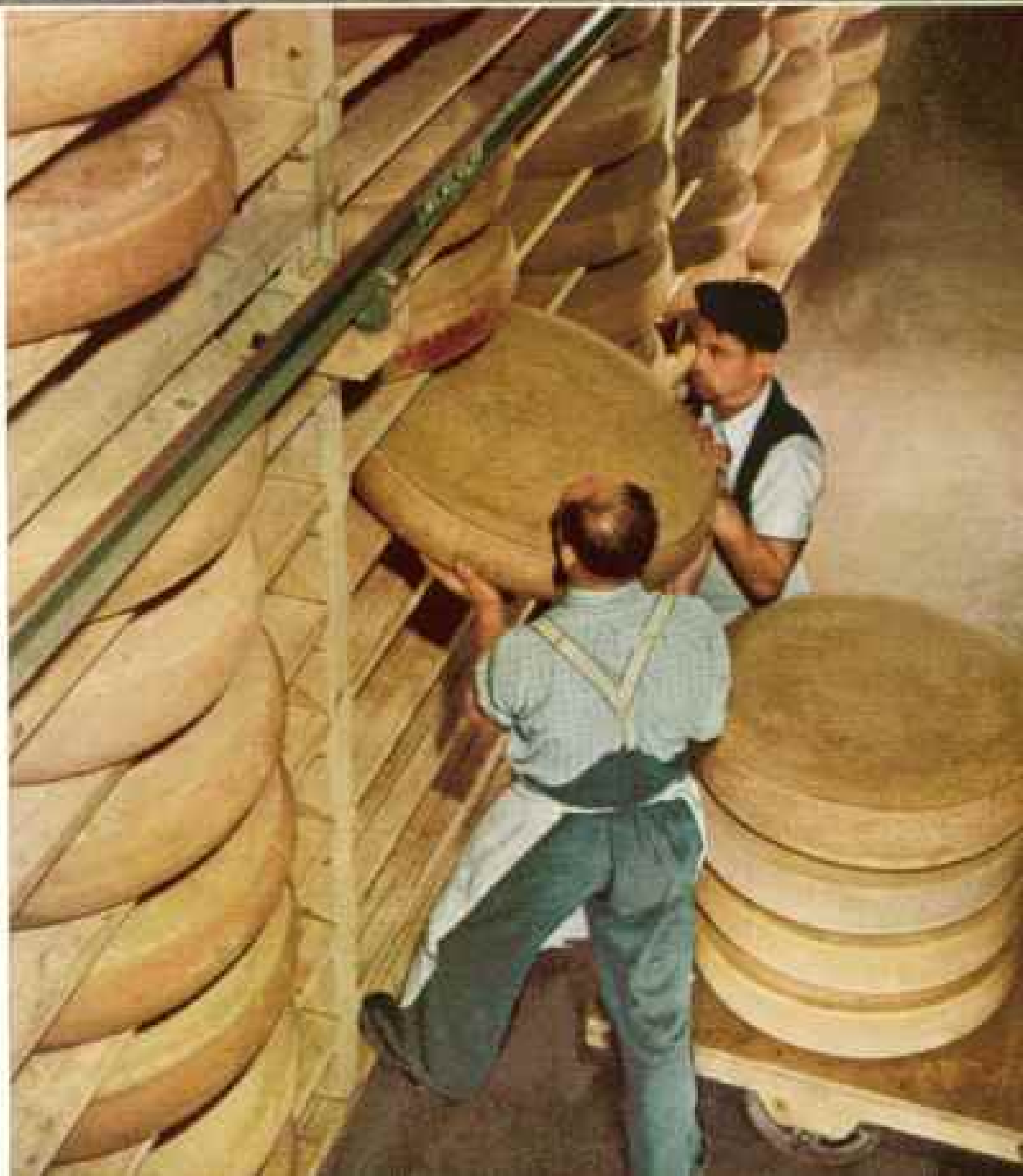


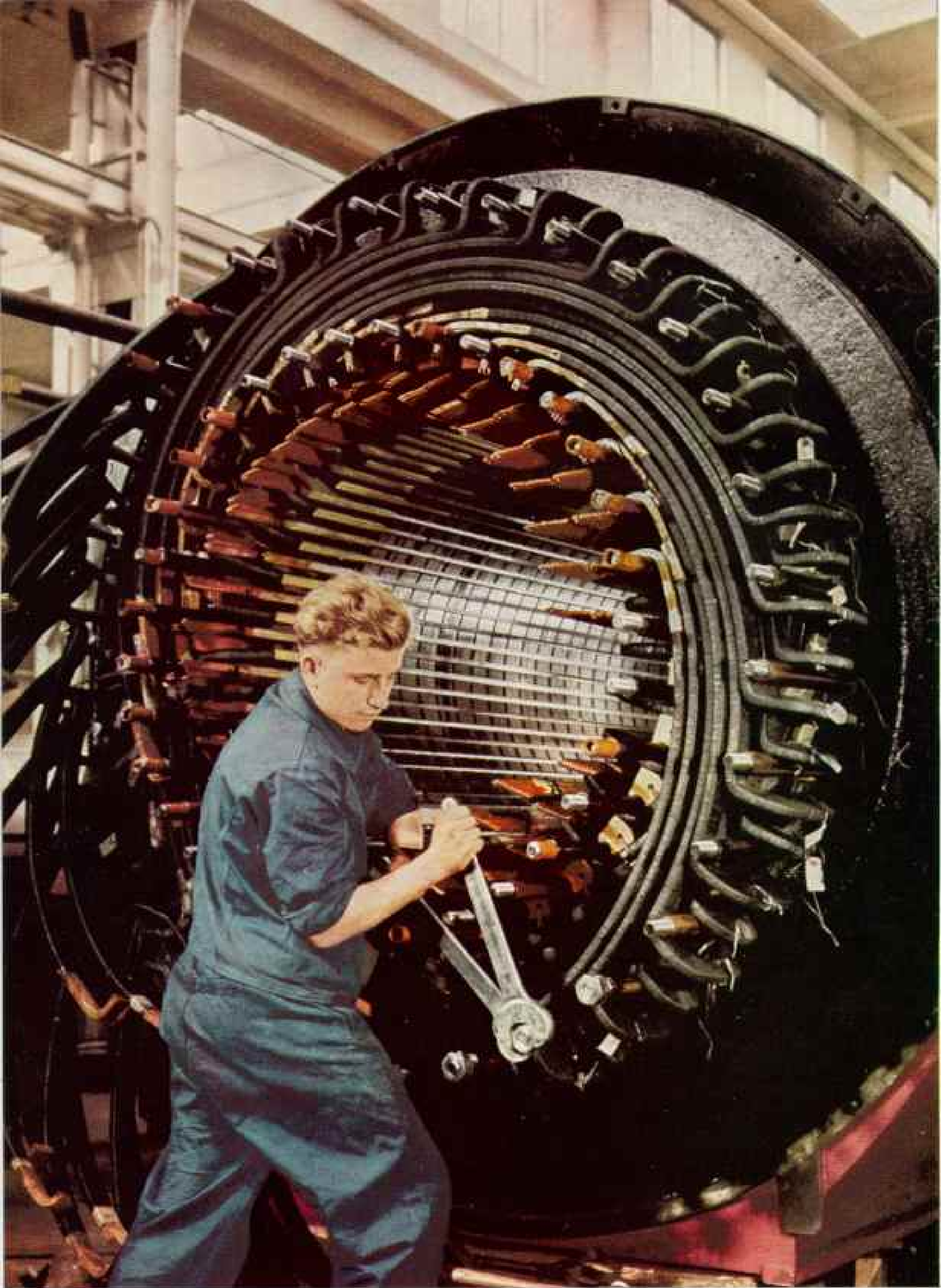
♣ A Village Cheese Maker Works in the Mountains Near the Cows in Summer

Every day he curdles the herd's milk with rennet, making cheese in his tiny factory in the Säntis mountain area of Appenzell. Wood for the fire to heat his copper kettle he cuts outside his door. On Sundays herdsmen carry a week's output down the mountainside on their backs.

Big Cheese Wheels, ➤ Melted Down, Are Molded in Tiny Foil Triangles

Processors near Bern cut the wheels into quarters and put them into heaters, adding salt. When melted, the cheese flows automatically into little aluminum-foil molds. After the cheese cools and hardens, the triangles are fitted into circular boxes for shipment.





This Giant Alternator Will Produce Enough Electric Power for a Town of 25,000

Here one of 8,000 workers of Brown, Boveri's plant at Baden assembles armature of a 15,000 KVA unit. Largest Swiss producer of electrical and mechanical equipment, the firm installs power stations on nearly every continent.

it is not so impressive as the Matterhorn, 436 feet lower, which stands alone in lofty splendor (pages 224 and 225).*

So visitors may view the Matterhorn at close range, the Swiss have built the highest open-air railway in Europe. The line ascends from Zermatt to its terminus at Gornergrat, 10,289 feet above sea level, to afford a breathtaking panorama of some 50 snow-capped peaks and more than 50 glaciers.

My journey next led through the upper Rhône Valley, the wine- and fruit-producing region of the Valais. The train flashed by vineyard after vineyard whose grapes produce chiefly the excellent white wine known as Fendant du Valais.

The name comes from the French verb *fendre*, to split. When grapes of this variety are ripe, if they are pressed between thumb and forefinger they will split lengthwise without spurting juice from their pulp.

Heading westward, my train now was approaching some of the strongholds of Switzerland's important industry of entertaining visitors. Soon I was in Montreux, a name generally applied to an area embracing half a dozen resort villages, all fronting on the Lake of Geneva at its eastern end. In normal times fashionable Montreux attracts some 80,000 visitors annually.

No excursion from Montreux is more popular than the one to the Castle of Chillon, made famous by Byron's poem, *The Prisoner of Chillon*. Not far south of the hamlet of Veytaux the medieval castle stands on an islet in the lake, connected with the shore by a wooden bridge.

Between Montreux and Lausanne the lake shore is dotted with villas and hamlets. Among them is the resort town of Vevey, just as "white, clean, English, and comfortable" today as when Victor Hugo so described it (page 237). Vevey is a production center for famed Nestlé Swiss chocolate.

I had not been in Lausanne many moments when I realized that this Swiss city boasted few bicycles. It is built on steep hills. On the highest stands the imposing Cathedral of Notre Dame, consecrated with great pomp in 1275 in the presence of the Emperor Rudolph of Hapsburg.

Here, too, is the professional school of the Swiss Hotelkeepers Association. The Swiss have long enjoyed the reputation of being Europe's finest innkeepers. The aim of the school, founded in 1893, is to foster that reputation.

Closed down during World War II, the school has reopened, refurnished with the most up-to-date hotel equipment available.

Its modern buildings front on Lake of Geneva. Escorted by the director of the school, I walked through the gleaming kitchens where earnest lads, each wearing a chef's tall white cap, were learning the art of cooking under the eyes of experienced instructors.

"We have students from 23 different nations," the director told me. "Some come from Australia, others from South Africa. That big fellow there is from Ireland. Many are from England and Canada. We have had students from the United States, attending under the provisions of your GI bill of rights.

"Here they all learn the hotel business from the ground up. About a third are in the cooking class, another third in the service, or waiters' class, and the rest in the secretarial class. Girls learn how to become managers' assistants, take care of stockrooms, and supervise chambermaids."

After a student graduates, he takes another five-month course of practical training in a Swiss hotel.

Watches, Watches Everywhere

One day I departed from Lausanne to visit the French-speaking hamlet of L'Orient in the Jura Mountains, a typical watchmaking community made up almost entirely of the Lemania Watch Company, its 250 employees, and their families.

All the parts for Lemania watches are made here except the springs and jewels. Jewels for modern watch bearings, incidentally, are synthetic rubies, considered better for the purpose than genuine rubies.

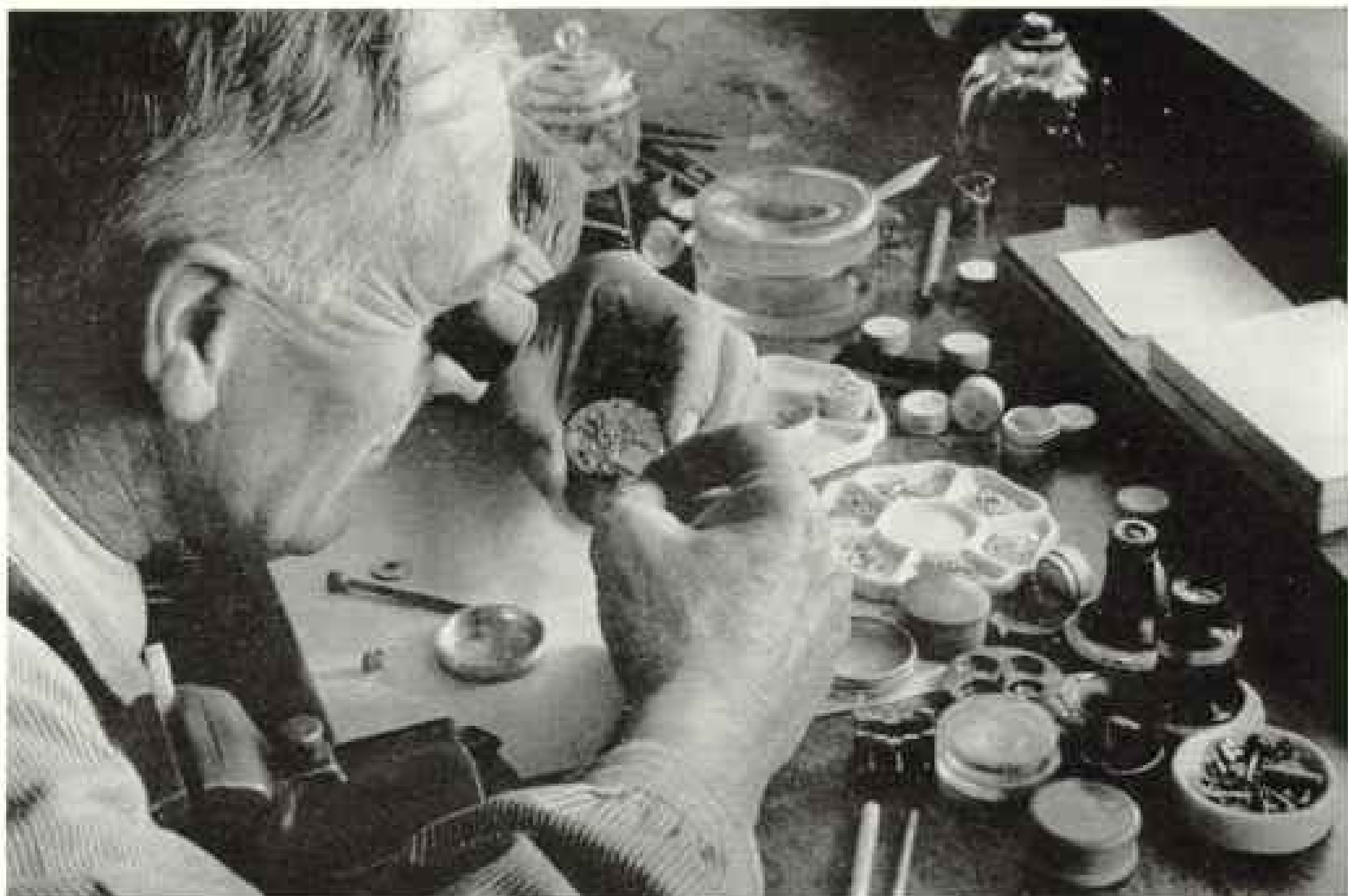
I was amazed at the requirements for accuracy, at the numerous inspections of the various tiny parts, and at the patience of the workers who handled them. Fine jewelers' lathes, punches, drills, and other special automatic machinery were in evidence everywhere; but no matter how precise the machines were, each individual piece turned out was carefully filed and polished by hand, and inspected, in the constant drive for perfection.

I had my lunch that day at the near-by hamlet of Pompaples at the pleasant Café du Milieu du Monde (Center of the World).

The ambitious title arises from the fact that from a pond less than 200 yards away two tiny streams emerge, one flowing into the Rhine, the other into the Rhône.

Later in the day I visited the Laboratory of Horological Research at Neuchâtel, where every device known to science is employed

* See "Manless Alpine Climbing," by Miriam O'Brien Underhill, NATIONAL GEOGRAPHIC MAGAZINE, August, 1934.



This Old-school Patek, Philippe Watchmaker Scorns Assembly Lines

He is one of a passing generation that helps to make the world's finest precision watches. In the firm's ultramodern Geneva factory, a special section is set apart for these irreplaceable veterans who refuse to share a workroom with more than one colleague. But Patek, Philippe wishes it had more old-timers like them. Switzerland's watch industry employs about 50,000 workers.

to keep Swiss watchmakers in the forefront of their craft.

Outstanding in the making of precision watches is Patek, Philippe & Co., of Geneva. With output limited to about 5,000 watches a year, the company keeps a "case history" of every watch it has made.

Equally famed is the house of Vacheron and Constantin.

As I walked through the Patek, Philippe factory fronting on the lake, I learned that each model is assembled, then taken apart again and reassembled three times before it is oiled.

A stroll through Geneva business streets, either in the old town or the new, is convincing evidence of the wide scope of Swiss watchmaking. Thousands of models gleam from windows in the course of a few blocks' walk.

Geneva Modern and Thriving

Geneva is thoroughly modern. Bern may forbid electric advertising signs, but Geneva welcomes them. At night they flash from the tops of business houses all along the tip of the lake and the banks of the Rhône.

The International Red Cross, founded in

Switzerland, was holding a diplomatic conference to revise its existing conventions and to draft a convention for the protection of civilian populations.

The passing of the League of Nations did not mean that its buildings on the outskirts of Geneva were to stand idle. I found them well filled with the hard-working personnel of European committees of the United Nations.*

Geneva was thriving. Hotels were filled with men and women from all parts of the world. Strolling along the Quai Woodrow Wilson, I reflected that here was one of Europe's most sophisticated, cosmopolitan cities.

Then I glanced across the lake. The sun was shining. In the distance rose the snow-blanketed ranges, extending into French soil where the mighty Mont Blanc raised its head. I suddenly forgot about Geneva, and Bern, and Zürich. For man's efforts seemed puny and trifling in the face of Switzerland's enduring mountains.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Lake Geneva: Cradle of Conferences," by F. Barrows Colton, December, 1937; and "Millennial City (Geneva)," by Ralph A. Graves, June, 1919.

Porcupines, Rambling Pincushions

BY DONALD A. SPENCER

I HAD lived and camped in the mountains of the West many years before I was first startled from a sound sleep by a weird and unfamiliar cry. It set my scalp to prickling. Cautiously, I felt under my bed for flashlight and pistol.

I couldn't imagine what creature had found its way into that deserted mountain shack. The sound was like someone singing the scale using the word, "Unh." The ghostly vocalist's wail ascended note by note until quite shrill, then dropped and dwindled away in an evenly spaced "Unh, unh, unh."

Several minutes I listened while this call was repeated again and again. Then I set about to locate its source.

Imagine my chagrin when I located a pint-sized baby porcupine under the cabin floor! I had believed the porcupine to be practically voiceless. Since that night I've learned a great deal about the fascinating pincushion-on-legs; yet I'm always making new discoveries about these lovable (yes!) woodland wanderers.

Pest or Pet, Porky Has Personality

The porcupine is an entertaining member of our wildlife family. It runs the gamut from an economic pest to a position of semideity among some Indian tribes of the Southwest. In days gone by its quills were widely used for ornamentation of garments, weapons, and implements (pages 249, 258, and 259). The long guard hairs were fashioned into cockscomb headdresses.

In Henry Wadsworth Longfellow's *Song of Hiawatha*, the hero appealed to Kagh, the hedgehog, for quills to decorate a new birch-bark canoe. "Take my quills, O Hiawatha!" generously responded the porcupine.

From the ground the quills he gathered,
All the little shining arrows,
Stained them red and blue and yellow,
With the juice of roots and berries;
Into his canoe he wrought them,
Round its waist a shining girdle,
Round its bows a gleaming necklace . . .

Fact and fantasy weave queer patterns about the porcupine. Many an amusing tale springs from encounters with this prickly quarry. Its eating habits cause serious forest damage; the injury it brings to crops and domestic animals merits serious concern.

How many of us credit the porcupine with writing its own history, planning meals a year in advance, with coming when called out of its wild retreat, or with being an affectionate pet?

Perhaps you are one of the thousands of Americans who take tent or bedroll and strike out for woods and mountains in vacation time. The first time you've been awakened by a rustling in the grub box or among the pans, and your flashlight picks out a porcupine, you may be excused for cringing.

In a tent the porcupine may look as large as a small bear. Still more disconcerting is it that, instead of running when spotlighted, the intruder whirls about, roaches up a 4-inch-deep thatch of sharp quills, and makes a few warning "whacks" with its clublike tail, also thick with quills.

The experienced camper keeps his light on the intruder, makes a noise, and may indulge in profane allusions to the ancestry of all porcupines. Porky will hesitate briefly, then leave the tent at a clumsy run. It's as easy as that!

Porky's armor of some 30,000 multibarbed quills is formidable enough. Besides, the strong incisor teeth can sever a finger in one bite (page 253). However, there is little danger from a porcupine except through ignorance or sheer accident. I recall one night years ago on a highway in the western Colorado Rockies.

Three of us were intent on capturing a big porcupine alive, aided only by the car lights turned into the willow scrub. The quarry took refuge in a willow clump. One of us went around to the opposite side to drive it out.

Porky came out unexpectedly, right at our feet. Startled, my brother stepped backward. He bumped into me, and we both lost our balance. My brother fell across the porcupine that hadn't got clear.

The chase ended then and there. The porcupine went its indifferent way unharmed. We spent the next hour in front of the car headlights jerking out, one by one, the maze of quills that nailed the trousers to the victim's thigh. A painful operation!

A Walking Arsenal of 30,000 Spears

Along the back and sides, from eyebrow to tip of tail, the porcupine is armed with needle-sharp quills (page 260). Only the face, legs, belly, and undersurface of the tail are free of them. If there are 30,000 quills on one porcupine, that is a lot of protection, especially when you consider that they are replaced when lost in combat or dulled through normal wear.

One cold winter night in Wisconsin I de-



Gerard Hultsard

Ending a Hunger Strike, Greta Sinks Her Teeth in a Slice of Bread

The photographer captured Greta in a pack basket. Behind chicken-wire "bars" at Cranberry Lake, New York, the porky refused food until the sixth day in captivity. Then she accepted a slice of watermelon, and other fruits and vegetables. An ear of corn she ate like a human, holding it in both forepaws and gnawing neatly at the yellow kernels. But bread—fed to her here by Alexander G. B. Grosvenor—always was Greta's first choice. Contrary to legend, porcupines cannot throw their quills.

cided to verify the total quill count. I took a porcupine and, starting with the tail, sat there patiently slapping it with a rolled-up sock and counting the quills which became embedded in it and pulled free.

By the time I counted 1,900 without completing even the tail, I was willing to accept the figure of 30,000. If an error has been made, it's probably on the conservative side.

Porky's quills are under perfect control and may be laid flat or erected at will. The outer dark tip feels only slightly rough when drawn between the fingers, but the microscope reveals thousands of diamond-shaped scales. These serve much the same purpose as barbs on a

fishhook, preventing the quill from being readily extracted.

Quills, once embedded in the flesh, tend to work deeper and deeper, their movement caused by the victim's muscle action. I have had short quills show up under the skin of my forearm, "point out," days after my last contact with porcupines. In the excitement of capture and the activity of field work, it is common for single quills to become embedded and work into the flesh without being noticed.

The quills are not poisonous and rarely carry infection themselves. But imagine the serious plight of a wild predator, such as a coyote, that is foolish enough to tackle a



National Geographic Photographer John B. Fletcher

Porcupine Quillwork Decorates the Sleeve of Crazy Bull's Rich Trappings

Recently this Sioux chief visited Explorers Hall in the National Geographic Society's headquarters in Washington, D. C., to see the exhibit of more than 100 paintings by W. Langdon Kihn which have illustrated articles on United States and Canadian Indians in the NATIONAL GEOGRAPHIC MAGAZINE. Here he admires the portrait of his kinsman, Chief One Bull, one of the Indians who overwhelmed Gen. George Custer's men on the Little Bighorn in Montana in 1876. Crazy Bull wears a breastplate of bone beads and a necklace of bear claws and colored beads. Eagle feathers form his war bonnet and fan.

porcupine and get its muzzle, lips, and tongue filled with quills. The pitiful creature can do no more than break off the protruding shafts. The truncated points work deeper into the mouth and throat until, unable to eat, the victim dies of starvation.

Domestic animals frequently run afoul of porcupines. The hunting dog often falls victim, and some never learn to leave this prickly quarry alone.* Range cattle, dairy cows, and even horses pay dearly for the curiosity that makes them nuzzle that strange brown form wandering in the pasture (page 250).

Many are the home remedies for removing embedded quills. Folks say, "Cut the shaft. That will let out the air so the quill collapses and is easily withdrawn." Others recommend swabbing the quilled area with vinegar, sweet oil, or other lotion to soften the barbs before pulling. Still others counsel twirling the quill to "twist" the barbs out.

A sharp, quick jerk is the only way, for the quill shaft is not hollow, it does not collapse, nor will any solvent soften embedded barbs.

* See "Quills of a Porcupine," by Frederick V. Coville, NATIONAL GEOGRAPHIC MAGAZINE, January, 1912.



Horton Henshaw

"This Is for Your Own Good, Pal! It Won't Hurt (Much!)"

"Coyote" has come off second best in a brush with a porcupine. Microscopic scales on the quill tips act like fishhook barbs. If not extracted, needles tend to work deeper and deeper, yet they are not poisonous and rarely carry infection. A wild animal, knocking off only the shafts, may die of starvation if the points stick in the mouth and throat.

Who, then, would deliberately become intimate with live porcupines? An inquiring biologist, perhaps, and many others interested in our native wildlife.

Want to Capture a Porky—Barehanded?

Suppose I relate the capture of a porcupine, alive and uninjured, from its perch high in a 60-foot pine tree (page 254). As I climb, so will the porcupine, either to the highest stem of the tree or to the swaying tip of a lateral branch. Often as not this is beyond the point where a man dares trust his weight.

Luckily, this time porky stopped where it could be reached. First I had to brace myself

on that high perch and leave both hands free. The porcupine was there at arm's length, tail toward me. At my slightest movement the tail lashed about. Although it's only a superstition that a porcupine can throw its quills, the tail can drive them through a heavy glove.

The task is to make a quick grab for the long, harmless bristles that extend beyond the tip of the tail while that weapon is poised to one side and temporarily quiet (page 255). Clamp those bristles between thumb and forefinger of the left hand, lift the tail, and in a continuing movement slide the right hand beneath the tail and grasp it firmly near the base (no quills there, remember).

I had but a split second for this action, but once I had a firm grip on the tail I stopped to catch my breath. Unlike other animals that turn and attempt to bite, the porcupine seeks only to pull away. Now porky could be dragged off the limb and allowed to dangle in mid-air. It was so heavy-bodied that an occasional jiggle kept it

from reaching up to bring its teeth into play on my hand.

Then followed the feat of climbing down the tree with only one free hand, the other being engaged in holding a clutching, twisting 20 pounds of determination. I have done this hundreds of times, occasionally with near-disastrous consequences. There was the episode near Brattleboro, Vermont.

A co-worker and I discovered a porcupine near the top of a 40-foot spruce. I went up after it. Since four feet of snow blanketed the ground, I planned to push the animal out of the tree for my partner below to retrieve unharmed. I carried a wand cut from a near-by

bush, for the tree was dying back at the top and I dared not go high enough to grab the porcupine by hand.

The trick was to reach up and over the porcupine with the wand and rap it on the nose, being careful not to touch the animal's back in so doing. After several such raps porky began to back down toward me.

I hurriedly dropped the wand and slid my hands and feet out along lateral branches, so that the descending animal passed between me and the trunk of the tree within inches of my face. Remaining motionless until it reached the level of my feet, I put my foot on its head and shoved.

Alas! While dislodging the porcupine, I had paid too little attention to the size of the lateral branches. The one in my left hand snapped, throwing my entire weight on the right branch. This also gave way and sent me out of the tree backward.

Porky a Night Wanderer

Four feet of snow make a good cushion if one insists on falling out of trees. Luckily, I didn't land on the porcupine, which my partner caught the easy way by upending a metal pail over it and sliding the lid underneath.

The porcupine is more commonly abroad at night. During the day it hides in the crevice of a rocky ledge (page 264), in the labyrinth of a loose rock talus, or in a hollow log.

There are no comforts of home in this den—no nest, no bed of leaves, no stored food. In fact, porky may be sitting unconcernedly on a cake of ice, for the den serves only for protection against predators (including man) and the weather.

Porky doesn't hibernate in winter, but is abroad whenever the weather is suitable. At times it will spend one or several days in a tree without leaving.

Its habits are somewhat different in the Rocky Mountains and southwestern States, where the yellow-haired porcupine uses a "rest tree" instead of a den in which to pass the daylight hours. Scattered throughout the forest are trees with high, broad, lateral limbs where the animal sprawls asleep, often with all four feet dangling overside.

All these habits pertain to the winter months, when the porcupine is feeding in the trees. During the rest of the year it feeds on ground vegetation and sleeps during the day in some thicket or ground retreat.

No longer dependent on the den area and its forest cover, it is more evenly distributed over the range and is found in open parks, along streams and lakes, in agricultural regions, and on the prairie miles from timber.

In spring each year the single young is born, much blacker than its mother, and with quills fully formed. Of course the quills are soft and in proportion to the baby's size, but within half an hour they are ready to protect their bearer, as I have learned through taking a score of these one-pound infants by Caesarean operation.

What always interests me is the fact that, without an adult to imitate, one of the newborn porcupine's first actions, 15 minutes from time of birth, is to whirl with tail toward any unusual movement or noise and strike from side to side.

In other ways this youngster is an able little fellow. It follows its mother about on the ground within a few hours. The nursing period is usually short, for within about three weeks it is feeding on succulent green vegetation. Family ties are usually terminated in a couple of months.

Paradoxically, the porcupine makes one of the most interesting and lovable of pets.

"Who'd want a pincushion for a pet? And how do you pet them?" you may ask. It's easy when you start with very young individuals, although my wife may disagree with that statement. She has had much of the early feeding and care of some 11 different "quill pigs" (page 257).

We start them on diluted cow's milk, administering it first from a rubber ear syringe, later from a larger tube, finally graduating to bread and milk in a saucer. Very quickly they are eating many things—fruits of all kinds, certain vegetables, dandelion and other greens, and all kinds of cereals and breads (page 248).

It's comical to watch a young porcupine holding half a slice of orange in its front paws and trying to bend its head so as not to lose the drops of juice that tend to drip off.

"Rarin' to Go" at Humans' Bedtime

Hilarious times are in store, especially if two or three of these little fellows are raised together. They're as playful as puppies and fully as noisy.

Along about dusk is the youngsters' period of greatest activity. They first want to be fed, then, if free to do so, will follow one about the house like shadows, keeping up a low-pitched, plaintive cry.

When you pause, they swarm about your feet attempting to climb a trouser leg or reaching for the hem of a skirt (the "new look" kind, of course). They even like to be picked up and handled. This should be done by sliding the hand under the animal, never picking it up by the tail as you would a wild adult.

The quills normally are held flat to the body, except when the animal is angered or frightened. Only if you attempt to pet "against the grain" will you be pricked.

Porcupines soon learn to reach up and grasp the lowered hand with their forepaws and permit themselves to be swung up into your arms. The girls will have to wear slacks, for not only are porky's long claws rough on silk stockings but they inflict unintentional scratches.

After the meal they probably will go into a characteristic dance or game. They make short running dashes about the room and end up by spinning about several times, much as if shadowboxing with their tails. This performance will be varied by rushing up to each other and whirling.

Sulker Gets Picked On

If one of the group doesn't care to play and objects with an annoyed cry, then, like human children, he gets picked on the rest of the evening. They also like to wrestle, placing their forearms about each other and rocking back and forth in mock battle until they tumble over and separate.

When tired of play, do they go off to the box prepared for their sleeping quarters?

They do not! They come waddling over to where you sit in your chair reading, crawl up your sloping pants' leg, and nose about in your lap. If you absent-mindedly rub their noses or scratch their tummies, they finally snuggle down to sleep. Put them down, and back they come.

For animals so solitary in habit, they exhibit an unusual desire for man's company that first year of their lives. Nor do they lose the play instinct after the first couple of months. Our pets, a year old and weighing all of 10 pounds, liked nothing better than a romp on the lawn. This included being tumbled over backward and roughed upside down like any puppy.

You must understand that it is porky who initiates this play; you don't. That's one characteristic wherein a porcupine pet differs from others. When it has finished playing, any insistence on your part results in raised quills—about as emphatic a "No" as you will ever experience!

An Albino Is Born

I made my first successful Caesarean operation to acquire a baby porcupine more than 20 years ago, in Arizona. Although I've made many since, in all parts of the United States, the outstanding one took place near Carthage, New York, in the spring of 1941.

I wanted Kodachrome photographs of mak-

ing Caesarean operations, so I shot a female and busied myself for 20 minutes taking preliminary pictures. When I finally opened the uterus, there was an albino embryo (page 256)!

I worked feverishly to save the little fellow, for records tell of very few albinos found in this country. One outstanding albino was photographed in its natural habitat on the Upper Peninsula of Michigan by George Shiras, 3d, for six consecutive years, from 1901 to 1906.*

Pinkie, the albino I took near Carthage, is alive today. The pink eyes and feet, white hair and quills, make him truly outstanding among porcupines. He even became a movie star in a Government film entitled, *The Canadian Porcupine*. Twice he has traveled across the United States and back for public appearances.

After Pinkie was a year old, and only because my duties as biologist for the U. S. Fish and Wildlife Service forced me to be forever on the move, I gave him and several other normal-colored porcupines to my friend, Dr. Albert R. Shadle, of the University of Buffalo.

Dr. Shadle maintains a sizable colony of porcupines, and Pinkie has since featured in many scientific experiments and resulting publications. He now weighs about 25 pounds, which is large for the species.

Young Porcupines Are Vociferous

I've learned that young porcupines are far from silent. Those pets of ours repeated that scale-running cry many a night during the first months of their lives. The adults are quieter, and it is unlikely you will hear them except during the breeding season in the fall.

At that time porky's peculiar call may drift downwind to your campfire from some distant tree. You may also hear two porcupines in the same tree at that season quarreling sharply. But at almost any time of year you may hear a low-pitched "Unh, unh, unh" given in monotone.

It was mid-November and the first snow lay on the ground. With a young forester, Harland Burmeister, I was cruising a timber stand on the Nicolet National Forest in northern Wisconsin. We located a porcupine almost obscured in thick foliage high up a large hemlock. My companion had been born and raised in these woods and to him a porcupine was nothing new; but still . . .

Instructing Harland to stand perfectly still,

* See "Flashlight Story of an Albino Porcupine and of a Cunning but Unfortunate Coon," by George Shiras, 3d, NATIONAL GEOGRAPHIC MAGAZINE, June, 1911.



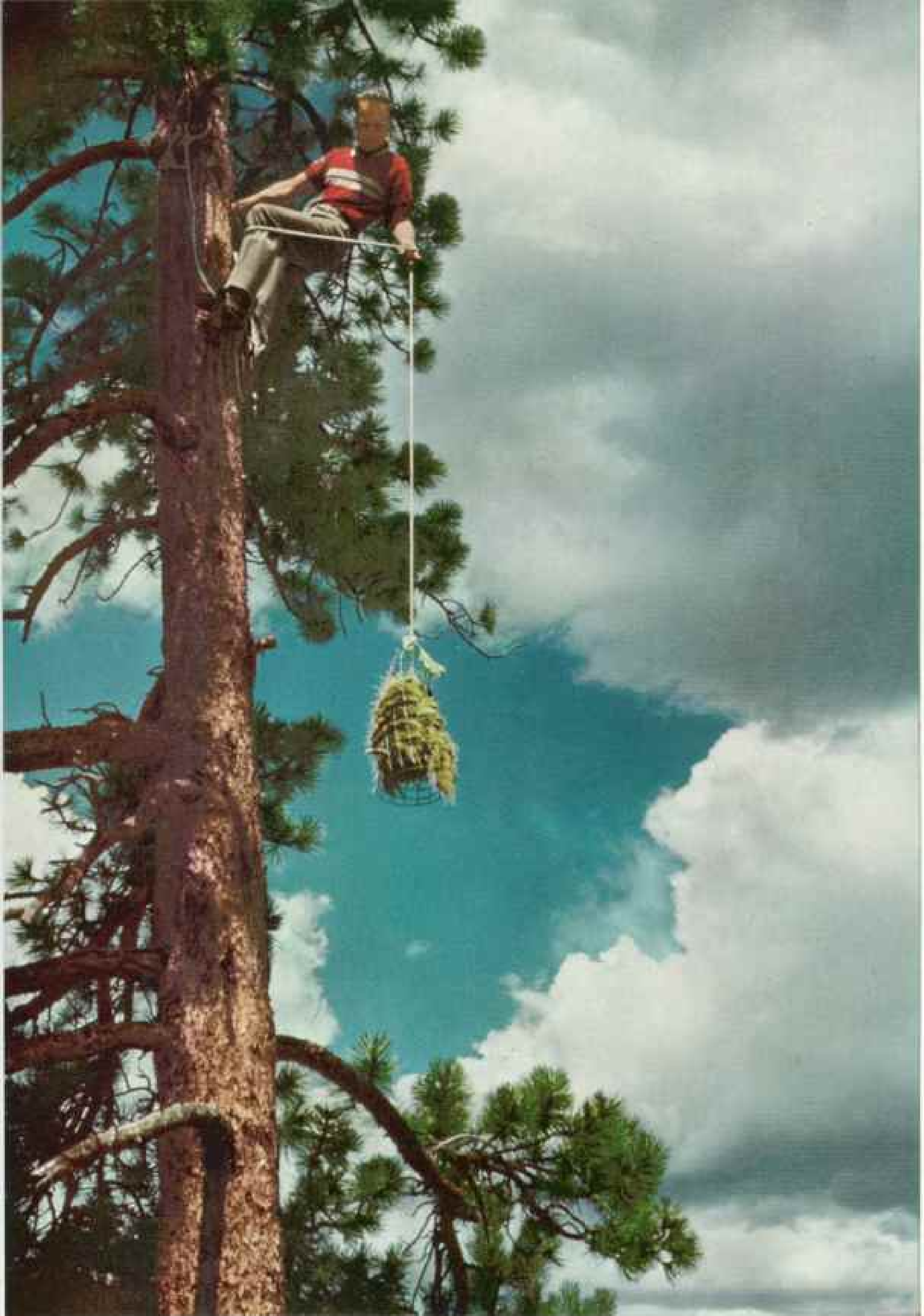
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Kodachrome by Donald A. Spencer

Buckteeth Bared for Action; but Porky Is Set to Feed, Not Fight

This Canadian porcupine's stout teeth will chip away the outer bark to reach the succulent inner layers. Enamel of his incisors is naturally orange; gnawing cleans them, keeps them from growing too long. He grips the branch with long, curved claws. If danger threatens, he whirls about to present raised quills and pincushion tail.



Down Drops Porky in a Wire Cone. Author Lowers Away from 50 Feet Up



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Kechichirimi by Donald A. Fremont

↑ Grab a Porky Barehanded? Absurd! Yet Alice Spencer Does It Often

Here the author's wife feints at a western yellow-haired porcupine to make it present its lashing tail in defense. Then, with a quick movement, she grasps the tail from beneath (lower left), folding the quills upward. The prickly rodent tries to pull away, not bite.

✚ Turning Its Back to the Foe Proved This Porcupine's Undoing

After capturing the big fellow, the collector placed the wire cone with its point aimed at an escape tree. Porky, held by the tail, pulled toward the tree—and walked right into the cone's open end. Two sticks thrust through the wire will close the trap.





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Kodachrome by Robert Weigel

"Pinkie," a Sleek, Fat Albino Porcupine, Grew from a Tiny Snowball (Below)

Dr. Albert R. Shadle of the University of Buffalo introduces nine-year-old Pinkie to a friend. Regular soap-flake shampoos groom the glistening coat and quills of this unusual pet. He is the "fair-haired boy" of a group of porcupines used in behavior studies.

Newly born Pinkie, scarcely bigger than a fallen leaf, was just 15 minutes old and not yet dry when pictured below. Though dwarfed by a normal-colored adult, Pinkie is much bigger news—no more than one porcupine in 50,000 is an albino. Named for pink eyes and feet, Pinkie was delivered by the author in a Caesarean operation near Carthage, New York, in 1941. Porcupine quills harden to sharp spears within the first half-hour of life.

Kodachrome by Donald A. Sawyer





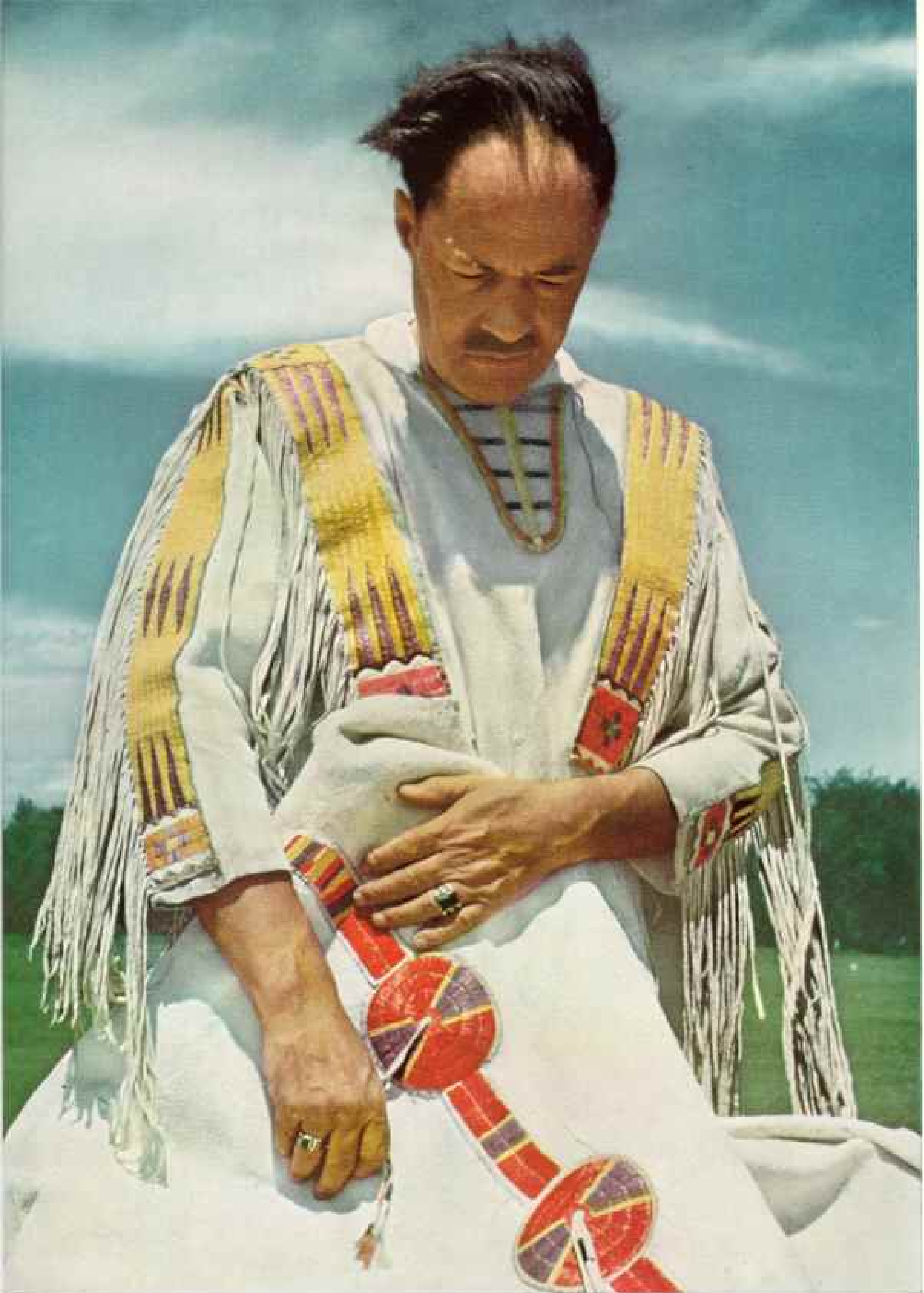
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Kodachrome by Donald A. Spencer

Young "Mac" and "Sticky" Raise a Ruckus If They're Not Fed at the Same Time

Mrs. Spencer feeds two "boarders" milk from dolls' nursing bottles. "Quill pigs" soon learn to eat fruit, flowers, greens, toast, cookies—even candy. Babies quickly accept human attention and become playful pets.



Old-time Indian Shirt and Robe Glow with Dyed Quills

F. H. Douglas of the Denver Art Museum displays a Sioux deerskin shirt and a Crow elkskin blanket. Quills are dyed, water-softened, and flattened for sewing and weaving into patterns. Beads largely replaced this craft.



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Knickknacks by Donald A. Spencer

✦ Quill Flowers and Eared Owl Adorn Ottawa Indian Knickknack Boxes

Luster and smoothness of porcupine quills make them a natural choice for decoration. Tightly woven quill "veneer" completely covers the birchbark containers at right. For this handiwork, commercial aniline tints replace vegetable dyes.

✧ Here's One Way It's Safe to Step on Porcupine Quills!

Thousands of "wrap-around" stitches with quills beautify this flashy pair of Sioux deerskin moccasins. The Indian maker used beads for edging and for fancy work on ankle straps. All the artifacts on these two pages are from Denver Art Museum collections.





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Kodachrome by Donald A. Emmert

✦ "One Foot Closer and You'll Get an Armful of 'Souvenirs,'" Says Cornered Porky

The boy knows this western yellow-haired porcupine has drawn back his tail (under beam), ready for a quick swipe. Sun gleams on the long guard hairs that are quill protectors and warning antennae.

✧ "This Fellow Can Drive Those Quills Clean Through a Heavy Glove"

Chief ranger Jack Wade holds a porky by the tail and shows his son the short, heavy needles on the rodent's rump. The wise foe is wary of this "business end," unless he knows how to grab it (page 255).

Arms Color by Donald A. Emmert



I began calling the porcupine in the language I had learned from my captive pets. The animal moved to a point where he could peer down at us, but since we made no movement he was unaware of our presence.

I repeated the call insistently. Presently the porcupine began backing down from his 40-foot-high perch. He was halfway down before we could hear his low, continuous back talk. Several times he stopped as if not quite sure my "porky talk" was all it should be.

Reaching the snow-covered ground, he ambled in our direction, talking back all the while. At last he stood up beside my leg and sniffed at my trousers, puzzled. Our first movement set him off in an awkward gallop for the nearest tree, wholly disillusioned.

Calling doesn't always produce results, but it's worth a try. Next morning, in another part of the forest, I called a large porcupine out of a hard maple. He waddled across 40 feet of snow-covered brush and fallen logs to stand at my feet. This fellow I captured alive and took to Rhinelander, Wisconsin, for exhibition.

Many a hunter has learned to imitate the call of a wild animal or bird and used the deception to locate his quarry. Were it not for the widely accepted idea that the porcupine has no voice worthy of the name, calling them would hardly be new.

Many are the times I've lain down where a snow trail enters a pile of rocks and talked into the mouth of the den. If porcupines were present back beyond the reach of my vision, I could establish that fact by eliciting an answer. The response to my call was not always friendly, for often the disturbed animals "swear back" by chattering their teeth.

Eyesight None Too Good

Someone is sure to ask: "You were standing in plain sight when calling those porcupines to you. Couldn't they see that you weren't another porcupine?" No, apparently they couldn't. Like many another wild animal, they seem to discern and take alarm at a moving object readily enough, but pay little or no attention to a motionless one.

Besides, their eyesight is relatively poor. I regularly release our captives for a romp on the lawn. They follow about at an awkward gallop as long as I keep up a grunting call and don't get too far away. If I stop at a distance of as little as 20 feet and make no noise, they are unable to locate me except by chance.

They sit up, sniff the air in all directions, but even their noses don't prove much help.

That seems strange, too, for they carefully and thoroughly smell over every bit of food before venturing a bite. But many a naturalist can relate an instance when he encountered a porcupine along a forest trail and saw the prickly rodent proceed along the path right up to him, seemingly unaware of the presence of a human until he moved.

The porcupine spends almost half its life in trees, for frosts and winter snows destroy or cover up the more desirable plant food on the forest floor.

It is comical to watch a baby porcupine learn that he has to back down from high places. A little slow to learn and more than a little stubborn, he will start down a tree headfirst, only to take a tumble.

On the next try he will worry over the problem, hunt for a more sloping way down, but almost invariably fall again. Eventually he discovers the "back down" through trial and error. With instinctive caution, he is soon a capable climber.

Porcupines Feast on Trees' Inner Bark

Equipped with four remarkable wood chisels in stout incisor teeth that grow throughout its life, porky chips off the outer corky bark of trees and then feeds on the inner bark (page 253). Unfortunately for the tree, that inner layer is its life line, carrying starches and sugars.

The porcupine can draw on this abundant source of food no matter how deep the snows. Since he prefers to feed in comfort and safety, he barks the upper surface of branches and those places on the trunk which can be reached from some convenient perch. If the feeding completely encircles the trunk, then the tree above that point must die.

But even spot damage weakens the tree, leaving it subject to drought and storm and the inroads of fungus and disease. Since the porcupine usually eats but a small fraction of the bark of any one tree, he is wasteful indeed of this forest resource.

These general statements hardly seem to prove the case that losses inflicted on the forest by porcupines give cause for sober thought. Few of us ever have seen more than a few porcupines and an occasional damaged tree.

But the reader may be surprised to learn that the owner of a small apple orchard in Maine trapped 65 porcupines among the trees at fruit-picking time one fall; that on a national forest in Wisconsin there is a porcupine population of better than one animal for each 10 acres of hardwood-hemlock growth; and that over an extensive area in the piñon-

juniper belt of southwestern Colorado 85 percent of the piñons more than four inches in diameter show scars from porcupine feeding.

With the melting of winter snows porky abandons bark for the more appetizing flowers, catkins, and new green leaves of such trees as willow, maple, and cottonwood. As the countryside begins to green and bloom, he may desert the forest entirely and invade gardens and orchards, grain and hayfields. He appreciates variety in his diet.

In settled parts of our country the porcupine's craving for salt gets it into trouble. Anything human hands have touched repeatedly is apt to be impregnated with a slight amount of salt from perspiration, enough to whet porky's appetite (opposite). This applies to handles of farm and lumbering tools, to farm equipment, parts on tractors, trucks, and the like.

Salty spots in the home include edges of tables, chairs, stair rails, window sills, and doorjambs. Grease and salt may have spilled on floors and stairs. Urine also contains salts; so barn, stables, and outhouse come in for their share of his attention.

How often I have walked into an abandoned house, whether a farmhouse in Vermont's Green Mountains or an isolated miner's shack in Colorado, to find great holes eaten in the floor. Where the cellar stairs had been, only the stringers and a fragment of one or two steps remain.

There's a common saying in the north woods that "there is no need to move a lumber camp, as the porkies will eat it down." This applies equally well to ghost mining towns of the Rockies.

Insatiable Craving for Salt

But also in our modern world when the city dweller builds a summer home in the woods and hills, leaving it closed and untended during winter months, the porcupine's insatiable craving for salt results in gnawed doorjambs and window sills. On occasion he even breaks into a poorly secured cabin to wreak havoc on the furniture within.

The Forest and National Park Services get thoroughly out of patience with porky when they have to replace, almost yearly, the seats of those "Chick Sales" annexes that serve our recreational areas.

You don't have to own a house to come up against this salt-eating habit. Were you ever on a vacation trip, to awaken one morning and find that overnight a porcupine had neatly scalloped the paddle handles and the gunwale of the canoe? Or perhaps on a pack trip you failed to hang up your saddle, and a porcupine

effectively shredded the sweated girth, stirrup leathers, and seat. There is even one report in my files recounting a porcupine's fondness for synthetic automobile tires!

As you become more familiar with porcupine tree feeding, you grow aware that frequently the animal returns to feed a second time on a given tree. These feedings are a year or more apart, and *the second meal is characteristically above the first*. This practice may be repeated year after year, until the wound is so large that the tree dies.

Porky Makes Trees Store Food

One maple with an 8-inch trunk bore marks showing that the original feeding scar had been enlarged upward on each of 11 successive years. The explanation? Tree roots pick up moisture and dissolved minerals from the soil and send them up through the inner core of the tree. The leaves, with the aid of sunlight, manufacture starch and sugar that return to the roots and trunk through the inner bark (the soft cambium layer).

Removal of the inner bark by porcupine feeding creates a dam, impeding the flow of nourishment. Thus an excess of food accumulates *above* the wound the following season.

How do we know that the porcupine selects the inner bark because of its sugar content?

Well, a number of years ago, Dr. Henry L. Baldwin was conducting experiments in artificial thinning of northern hardwoods in Maine. Selected trees were ring-girdled with an ax and left standing, to die within one to five years.

During the winter one year later Dr. Baldwin noted that porcupines feeding in this particular block of trees confined themselves very largely to the girdled trees, leaving the unmarked trees alone. The feeding was always *above* the ax ring cut. A chemical analysis of the inner bark above the ax girdle was compared with an analysis of the inner bark below, and of that of unmarked trees. From 20 to 300 times more sugar was found above the ring than below, and double or treble the amount found in the unmarked trees.

Whether this food storage is deliberately planned or not, the porcupine instinctively understands his tree physiology.

Porcupines long dead have left a recorded history almost as complete as that of the Cliff Dwellers of the Southwest. I hesitate to explain the nature of these ancient "writings," unique among mammalian archeology, for it robs the story of some of its strange and unbelievable character.

But true it is, and this is the way of it. In



Donald A. Spencer

Caught in the Act of Eating a Stable Wall, Porky Bristles in Rage

His quills and antennalike guard hairs stand on end as if charged with electricity. A porcupine's taste for salt makes him a nuisance around cottages, farms, and camps. Stair rails, tables, tool handles, canoe paddles—any wooden object that's salt-soaked from food or sweaty hands—is meat for his long incisor teeth. Quills of a porcupine average a total of only eight ounces; feather light, they count about 4,000 to the ounce. Porky has perfect control of his quills; he can lay them flat or erect them at will.

feeding upon living trees, the porcupine characteristically leaves spot areas denuded of bark. If the feeding is not too extensive, an individual tree may live for centuries.

The science of dendrochronology (dating past events by evidence found in trees) was developed by Dr. A. E. Douglass and his associate, Dr. Edmund Schulman, of the Laboratory of Tree Ring Research, University of Arizona.*

This branch of science, among other things, enables us accurately to date timber from a tree long since harvested, or determine the years when scars were made on living trees by fire, lightning, or other injury.

We have adapted this technique to the study of the relative abundance and distribution of porcupines among the conifers of arid southwestern Colorado. With an increment drill we remove a long pencil of wood from a selected scar face to the center of the tree, and from it determine the exact date when a porcupine made a meal at that spot.

From thousands of such core samples taken in a given forest habitat, we know that the porcupine population over the past 150 years

rose and fell in repeated fluctuations. We know which canyons were favorite feeding areas, and even which trees formed the major part of the diet.

These "translations" of the records the porcupine himself left for us are still in their infancy, but the past is beginning to unfold. For example, the porcupine living in the year 1707 in what is now Mesa Verde National Park has by this means passed down to us that specific information.

A Welcome Emergency Ration

It is a common misconception that the porcupine is protected by law over much of the United States because it is the only animal that may be readily caught and killed without a gun. Thus the unsuspecting "quill pig" might save the life of a lost or stranded person.

The truth is, the porcupine is *not* protected by law except in a few localities. Second, how many hunters do you know, say, over the last half-century, whose lives were saved by

* See "Secret of the Southwest Solved by Talkative Tree Rings," by Andrew Ellicott Douglass, NATIONAL GEOGRAPHIC MAGAZINE, December, 1929.



Donald A. Spencer

Caught by the Tail, Rebellious Porky Is Pulled from His Rocky Den

"Capturing porcupines is easy compared to photographing them!" the author commented after nabbing this one in a crevice south of Denver, Colorado. Porcupines usually range at night. During the day they hide in caves, boulder piles, or hollow logs. They make no bed of leaves nor do they store food; they seek only protection from enemies and the weather.

being able to find and eat a porcupine? Many hunters are lost each big-game season in the United States, but their deaths are due largely to injury or exposure, not to starvation.

In northern Canada and Alaska conditions are entirely different. There the hunter or trapper is usually well able to cope with the elements when lost or stranded by storm. But his survival is dependent on the availability of food.

That hunter of the far north knows the habits of porcupines and relishes the meat for food. Neither fact applies to our city deer hunter in the States.

A Patient Tree Sitter

A porcupine's instinct to stay put is a boon to the traveler in remote areas threatened with a dwindling grub supply. A porcupine will often spend days or weeks in the same tree.

An observant fur trapper, covering lines extending 50 to 100 miles from his base camp, might return to a spot where he had seen a porcupine a week or more before with a good chance of locating the animal.

From northern British Columbia come several stories in native jargon sent me by

Har Quick, now serving with the Arctic Institute of North America. One trapper, when asked about porcupines replied, "Porkypine pretty important. When crust is on snow and you can't stalk anything, you might be able to find a porkypine because he don't travel so fast."

Still another native pointed out that the old people like porcupine and hunt it a lot as they cannot "hunt hard or do the hard work of butchering an animal as large as a moose."

As for the method of preparation: "Build a big fire. Throw porkypine in. Burn off all the quills and hair right down to the skin, then pull it out. Gut it and cut off head and feet. Roast it on hook. Cooks fast, about half as any other animal."

In the States I have been asked for freshly killed porcupines by a French-Canadian lumberjack in northern New England, and by Navajo Indians in southwestern Colorado. In each case, they stew the meat and add vegetables. Nevertheless, I doubt if it will ever gain general favor in the States as food. It is difficult to prepare for the table, and the excessive parasitism of porcupines by tapeworms and roundworms would rule against it.

St. Helena: the Forgotten Island

BY QUENTIN KEYNES

With Illustrations from Photographs by the Author

EVER SINCE I first read an impelling sentence about St. Helena which my great-grandfather, Charles Darwin, had written in *The Voyage of H.M.S. "Beagle"* after a week's visit in 1836, I had dreamed of going to that remote island.

"St. Helena," he wrote, "situated so remote from any continent, in the midst of a great ocean, and possessing a unique Flora, excites our curiosity."

My boyish curiosity was whetted further by collecting stamps and by reading about the last days of Napoleon in textbooks.

After diligent study of a map, I found the mysterious island—a spot no larger than a pinprick, stuck in the immense blue wastes of the South Atlantic Ocean, 1,000 miles south of the Equator. It was underlined in pink to denote a British possession (map, page 271).

Consulting the reference sources, I discovered that the pinprick is 10 miles long by 6 wide, has an area of 47 square miles, and is fully 2,000 miles from the nearest point on the South American coast. Though the West African mainland seems, from the map, to be comparatively close, it is 1,200 miles to the eastward.

Cape Town, nearest cosmopolitan center, is just short of 2,000 miles southeast. As for Washington, D. C., it is at least 6,000 miles away! In effect, the only point of land under a thousand miles distant is the even smaller pinprick called Ascension, 800 miles northwest, a dependency of the larger island (279).

A Letter from St. Helena, South Atlantic

With the help of a stamp collectors' magazine I got into correspondence in 1937 with a retired Englishman who had retreated to St. Helena to escape the madding crowd. He didn't appear to mind writing long, informative letters to a teen-age schoolboy full of Darwin's "curiosity."

On old-fashioned lined note paper headed "Island of St. Helena, South Atlantic," he wrote: "There is no place in the world I like better than St. Helena; everything is quiet and beautiful, no noise and bustle; conditions are somewhat similar to those existing in any remote English village a hundred years ago. I have rather a passion for islands. . ."

Last year I realized my fondest and most romantic dream. I went on a 30,000-mile trip with three friends from New York through

Africa, Cairo-to-Cape Town, and back to New York—via St. Helena.

From the Sudan I wrote to Dr. Philip Gosse, author of the only book about St. Helena published in recent years, and asked him for a letter of introduction to one of the islanders, just in case I ever succeeded in getting there.

A month later I found a reply awaiting me in Nairobi, capital of Kenya Colony. Dr. Gosse had written to Mr. Humphrey W. Solomon, senior member of the oldest English family on the island (whose great-grandfather, Saul, had sold macaroni to Napoleon), asking him to show me around when and if I arrived.

When I finally reached Cape Town, I hastened to the offices of the Union-Castle Mail Steamship Company, Ltd., the only line in the world maintaining regular service with St. Helena and Ascension. To my joy I learned that a ship would be leaving for these points within two weeks. I talked a companion into coming with me.

Ships Call Seldom; Airplanes Never

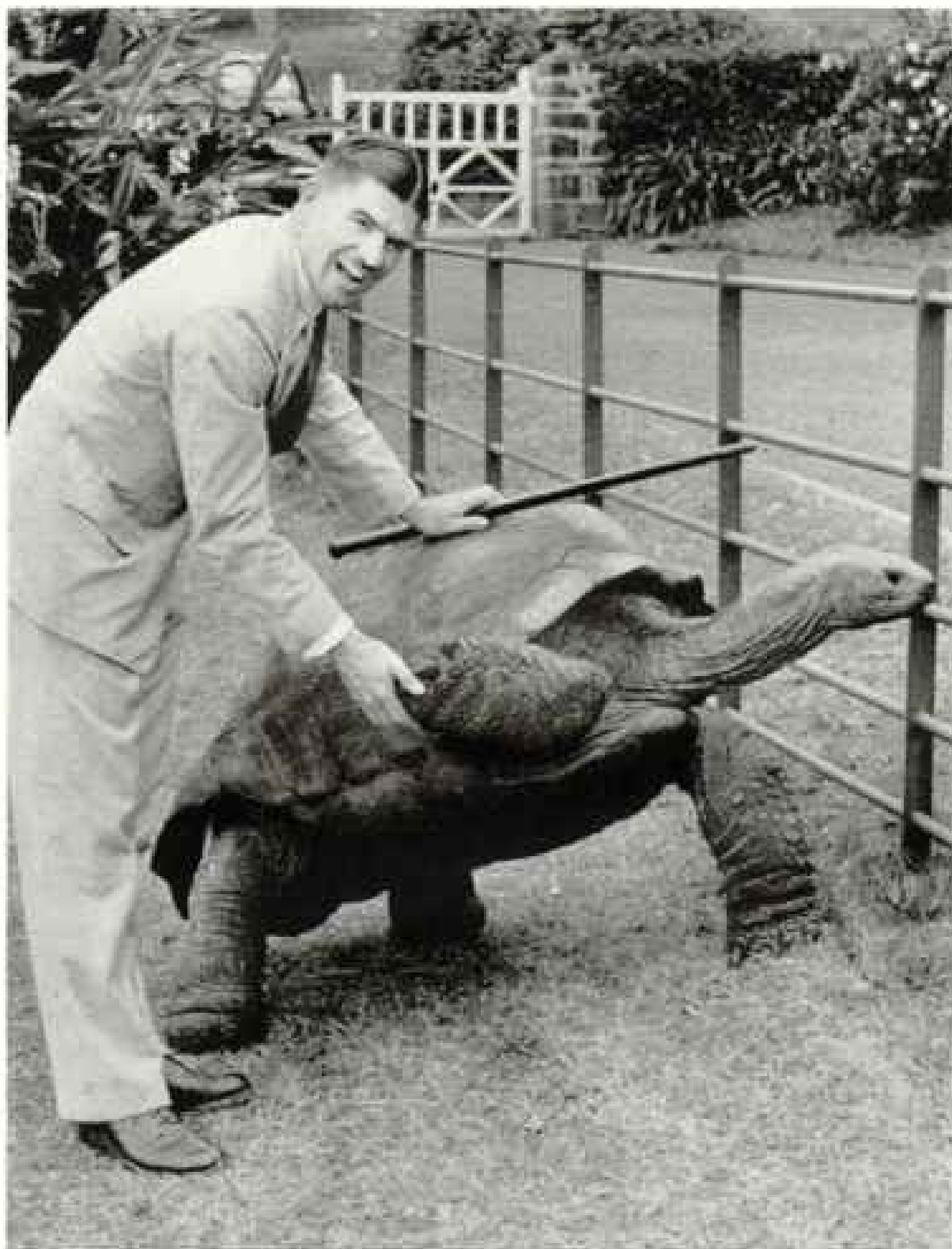
Luck was with us, as the company's ships call at the islands only every five or six weeks, on their way to England, and no airplane has ever landed on St. Helena.

My excitement knew no bounds as we made our way, through the Cape rollers, to our destination. At dawn on the fifth day out I was awakened by a cabin mate to hear that the steep cliffs of St. Helena were about two miles away, enshrouded in mist.

With a leap I was dressed and up on deck. There in the distance was a sight I hope never to forget: the sheer, massive crags of the forbidding island which I had come such a long way to see, rising, just as Charles Darwin had promised, "abruptly like a huge black castle from the ocean."

The sun was trying to peep through the clouds which hung low over Sugarloaf Hill, and I shivered, more from nervous exhilaration than from the dank cold. It was indeed an awe-inspiring sight, and I could well imagine Napoleon's feelings as he saw these towering cliffs for the first time, in 1815, from the decks of H.M.S. *Northumberland*. Although he had approached from the northwest, the prospect must have been equally overwhelming.

His recorded remark, however, which was made to an aide, Gen. Gaspard Gourgaud, seems rather to understate his inner emotions.



Napoleon Himself May Have Seen This Venerable Tortoise

The aide-de-camp to St. Helena's present Governor shakes hands with the island's most ancient inhabitant, said to be at least 175 years old. The tame tortoise rambles freely about the grounds of Plantation House, the Governor's official residence (page 272).

All he said was: "It is not an attractive place. I should have done better to remain in Egypt. By now, I should be Emperor of all the East."

We sailed slowly around Sugarloaf Point until we could make out some rowboats bobbing about in James Bay, the only open roadstead on the island. Behind them, in a V-shaped ravine between volcanic precipices, huddled the close buildings of Jamestown, the capital and sole settlement (page 268).

We could see a barge just about to put out from the jetty, and beyond it, to the right, the sharp spire of St. James Church, built in 1772, surmounted by a fish instead of the usual weathercock.

Dozens of native St. Helenians began to

gather around our ship as we dropped anchor, waiting to embark any passengers who might wish to go ashore in their little boats.

The barge and a smaller craft hove to. The latter contained officials—the medical officer, chief of police, and Government secretary (page 270). In the barge was a large gang of laborers ready to unload the tons of supplies we were bringing for the island's sustenance.

Unfortunately, the little isolated community is not entirely self-sufficient and cannot produce enough food for its own population of just under 5,000 people. Its main imports are, therefore, foodstuffs (flour, rice, sugar, butter, milk, and meat) and tobacco, drink, and machinery.

Though there are 32 fishing boats to help eke out the islanders' meager existence, and, in 1948, about 290 pigs, 1,060 cattle, 3,370 sheep, and about 7,500 chickens to fall back on, the chief crop is the potato.

I was halfway down the gangway, about to

go ashore, when the first officer called me to the captain's cabin. There I was introduced to the aide-de-camp to the Governor and to Mr. Solomon. The ADC said His Excellency wished my friend and me to have lunch with him at Plantation House, his official residence (pages 269, 273).

The Island's First Automobile

Mr. Solomon, who in 1929 had been the first St. Helenian resident to import an automobile, offered to conduct us after lunch around the island in his Austin sedan. Before lunch we were to be driven to Napoleon's tomb and Old Longwood, the house the Emperor had lived in until his death (269).

On the 10-minute row to shore, for which we paid the princely official tariff of 20 cents, I was intrigued by the Old World dress and manners of the benign native fishermen who handled the oars. They were of mixed origin, as are all but approximately 50 of the island's population.

Most are descendants of settlers brought from England by the British East India Company and of slaves introduced from Africa and Madagascar.

Though their skins were dark, they had European features and spoke English, the only language of the island, with a fascinating accent.

As we stepped ashore, a band of St. Helenians watched us curiously; we evidently constituted a great event for them, and, as such, were like a waft of fresh air being blown in from the big, unknown world beyond the shaggy cliffs of their circumscribed home. Mr. Solomon beckoned to a smiling driver, and we squeezed into a baby English car, vintage 1928.

Our St. Helenian driver was a friendly and intelligent man, and in his own way gave us some illuminating sidelights on the conditions of life of himself and his fellow islanders.

"Mister," he said, "we island people don't have no fortune, you understand; and we don't have nothin' much to buy, neither, because there ain't but a couple of shops in the town. Most of what them shops has is expensive, on account of the ships has got to bring them goods all the way in from England and Cape Town."

I asked him how much, for instance, he made as a motor driver and mechanic.

"Oh, I reckon about three bob (42 cents)

a day. The fellas what work in them flax mills makes more; I should say about three-and-six (49 cents), and they works 48 hours a week."

To my query about the women's wages, he answered disdainfully that they, being of the weaker sex, make about 14 cents a day less than the men.

Ways the Islanders Earn a Living

We then went on to discuss the occupations of the islanders.

Apart from the 70 other men who follow his profession, he said the flax mills employed about 200 men and women; 50 worked as



Jamestown's Castle Yielded Only to White Ants

St. Helena's town hall, still its main administrative offices, was completed by Governor John Roberts in 1708. A gala hall was given here in honor of the visiting Duke of Edinburgh in 1860. Later the building crumbled, victim of voracious termites. The insects were imported unwittingly when a slave ship from Brazil was condemned and her infested timbers deposited in Jamestown. The Castle was rebuilt of stone with iron stairs and teak woodwork (page 278).



St. Helena's Only Town Huddles in a Rocky Ravine Below Ladder Hill (Left)

Dwarfed by St. Helena's steep cliffs, S.S. *Llangibby Castle* lies at anchor in James Bay, the island's only port, an open roadstead. The road winding through Jamestown leads 5 miles to Longwood, where Napoleon lived. Motor travel was unknown here until 1939. The British Royal Family visited St. Helena in April, 1947, returning from their African trip.

boatmen and fishermen; about 350 were skilled and general laborers; and 80 or so were building tradesmen and apprentices.

"And there's them farm workers, about 165 of them. If they're employed by the Government, they gets a tanner (7 cents) a day more than the ones what work for the rich men."

This called for fuller explanation. "Who are the rich men?" I asked.

"Them's the men—and I think there's nine of them—who own bits of land over 100 acres each."

The rest of the land is divided among some 475 of the island people who have holdings of under 100 acres.

His attitude was philosophical; yet he did add: "We don't have nothin' to say about what we're paid, 'cause the Guv'nor decides what's right, after his men have had a talk with our bosses. But we gets along as best we can, and we leads a quiet life, though I do like a quick beer at the Consulate

on a Saturday night, you know, mister!"

As the car started with a reluctant put-put, I had a weird sensation that both the car and I were 20th-century anachronisms. The whole atmosphere of the island was early-19th century; and the houses on the main street of Jamestown seemed like a convincing Hollywood set constructed for a film about the end of the Emperor Napoleon Bonaparte.

Since there was no electricity at the time of my visit (though there is now), a lamp-lighter still went on his evening rounds, but only if the moonlight was not strong enough to light up the streets with its own power! It was almost as if the death of Napoleon in 1821 had so shattered everything on the island that even Time had stood still ever since.

This is not entirely true, however. The Consulate, the one hotel, has a brilliantly colored memento hanging on the dining-room wall which celebrates the coronation of

Edward VII in 1902; and movies have at last reached St. Helena. Once a week a 20- to 30-year-old veteran of the silent screen is shown at the only theater.

We drove through the town, past the Briars, where Napoleon suffered the first two months of his imprisonment—it's now the cable station—and on up into the higher parts of the island. The metaled road was wide enough for only one car, and the gradients were alarmingly steep. Gradually the bare volcanic clinker of Jamestown gave way to occasional prickly pear bushes and then to gorse, small trees (Kaffir booms), and semitropical vegetation.

After about two miles we came to a sad yet lovely place called Geranium Valley. Here lies the blank, empty tomb of Napoleon, surrounded by cypress trees.

It is blank because the Emperor's aide, Count Montholon, disagreed with the Governor, Sir Hudson Lowe, over whether the stone slab should bear the name NAPOLEON, which he favored, or NAPOLEON BONAPARTE, which the Governor preferred. As a result of the dispute, the French decided that no inscription at all should be carved on the face of the tomb.

It was emptied when the Prince de Joinville took Napoleon's remains back to Paris with him on *La Belle Poule*, in 1840, for interment in the Invalides.

Near the tomb we drank some cool water from the spring from which the tragic prisoner used to get his drinking supply.

A Visit to Longwood House

A mile and a half farther on, I spotted Longwood House, familiar to me from old photographs (page 272). The buildings themselves, begun in 1753, were securely locked. They looked almost bare inside and seemed to be going to rack and ruin from the depredations of the voracious white ant, or termite.

The whole estate now belongs to the French Government, necessitating the presence of the only foreign official on St. Helena—M. Georges Peugeot, a vice consul for France and in charge of all Napoleonic relics.

This custodian not being accessible, I examined the little garden behind the main house which the captive had taken great pleasure in designing himself. I was delighted to discover that a sod wall had been constructed in a corner which, although somewhat like an air-raid shelter, had been carefully molded into the shape of the Emperor's famous three-cornered hat!

No one seems to have recorded the reason

for this. It is known, however, that in the rectangular space which had been cut out of the center of the wall Napoleon sometimes used to take his afternoon tea.

In the foreground was a semicircular tank which Napoleon had intended for goldfish, and to the right a small gazebo from which he could get a good view of the surrounding countryside.

Secret Peepholes Used by Napoleon

I then turned my attention back to the house and noticed a very poignant thing: one of the green jalousies barring a window had had two peepholes cut in it from the inside (page 279).

After prolonged research I have found out the intriguing reason for them.

They had been cut at the express order of the prisoner so that he could rest his spyglass in them when the shutters were in place and quietly watch the troop movements and race meetings at Deadwood Camp, more than a mile away, without being observed by the sentries.

The top hole is five feet from the ground, suitable for a man about 5 feet 6 inches in height when standing. The lower, 3 feet 10 inches, is intended for the same man sitting in a chair right up against the window.

I was so fascinated with these obscure discoveries that I almost forgot to ask our driver to take us over to Teutonic Hall, the house in which the kind old correspondent of my school days had lived.

When we arrived, I found that it too had been forgotten. The unknown old man had left, or died, and the building had become a rather run-down farmhouse.

By now it was nearing lunchtime, and we hastened over the winding lanes to keep our appointment in the one really grand old mansion on the island: the Governor's residence, known as Plantation House, some three miles from Jamestown (page 273).

It is a fine country home of more than 40 rooms, begun in 1791 and beautifully kept up. The grounds cover 176 acres and include luxuriant vegetation and fine indigenous and imported trees. Over the front door is the quaint shield of St. Helena.

We were escorted into the living room by the young ADC and presented to Governor George Andrew Joy, C.M.G., and Mrs. Joy. (The governor has since been knighted.) Other luncheon guests included the Chief Justice of the Gold Coast (who had been our fellow passenger), the captain and chief engineer of our ship, and the chief treasurer of St. Helena.

The exotic setting for the meal was com-



In a Small Boat St. Helena Officials Board the Author's Ship

Passengers and cargo must be ferried between ships and island. When the Atlantic unleashes its huge rollers, small craft bob like corks, making landings exciting. In the days of sail and before the Suez Canal diverted traffic, 1,458 vessels bound around the Cape of Good Hope stopped at this "Inn of the Ocean" one year. Now only about 30 ships a year drop anchor.

plete. While absorbing its atmosphere, I learned something of the history, administration, and economy of the island from its commander in chief. He said he had been at his post since May 31, 1947.

St. Helena was discovered by the Portuguese navigator, João da Nova Castella, on May 21, 1502, the feast day of the mother of Constantine the Great, and named after her. The Portuguese kept this uninhabited island a secret, however, until Capt. Thomas Cavendish, third circumnavigator of the globe, touched there on his homeward voyage in 1588.

Thereafter, English and Dutch ships called

at frequent intervals to water and refit until the year 1633, when the Dutch decided to annex it. They held it with only infrequent occupation until 1659, when Capt. John Dutton of the East India Company arrived, found it unoccupied, took possession of it, and became the first English governor of the island.

In 1673 the Dutch seized it again, but within six months the British had it back, and it was successfully held by the Honorable East India Company under charter from Charles II until 1834. It then became a fully fledged colony directly under the Crown.

It is now administered by the Governor, who makes ordinances, aided by executive and advisory councils. The latter consists of six people not holding any office under the Crown but appointed by the Governor.

Ascension Island (pages 276, 279) was made a dependency in 1922, and Tristan da Cunha and Gough in 1938.* Because there is no local shipping between these scattered

islands, the Governor confessed to me that he has never been able to visit any of his dependencies.

Economically speaking, the island's fortunes have been on the decline since 1821. Real prosperity and the Emperor died together that year, and despite some noble efforts by the Colonial Office, I feel that St. Helena has been receding in the world's memory ever since.

In an attempt to bring revenue to a small community trying "to live on an inadequate

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "New Life for the 'Loneliest Isle,'" by Lewis Lewis, January, 1950; and "Tristan da Cunha, Isles of Contentment," by W. Robert Foran, November, 1938.



Crumbling Longwood Housed the Emperor During His Exile

Another home was built later especially for Bonaparte by workmen brought from England, but he refused to move into it, saying its railings too much resembled an iron cage. The French Government acquired Longwood in 1857 and restored it, but time and termites have made destructive inroads (page 269).

10 constables. Education, compulsory between the ages of 5 and 15, is served by 12 schools; and there is one hospital. The Governor added that unemployment was a continual worry and that the few natives who emigrate to England and South Africa each year as domestic workers are being encouraged to do so.

As the delicious lunch was served, I had again that sense of arrested time. The Napoleonic furniture, the brass plates screwed to the doors of each room in the mansion identifying the correct occupants—"The Governor's Room," "The Admiral's Room," "The Baron's Room"; the gentlemanly manners of the whole gathering; the seeming anachronism of my being there at all—all these contributed to my feeling.

A Living Link with Napoleon

But it wasn't until after lunch when the Governor introduced me to what is popularly

believed to be a living symbol of this timelessness that I knew my senses had not entirely deceived me.

There it was on the lawn in front of the house, where it had probably been during my great-grandfather's visit, and where it may have been grazing contentedly on October 17, 1815, when the most celebrated man of his time first set foot on the island: a giant land tortoise! It is said to be the only living link in the world with Napoleon (page 266).

I have in my possession a colored print published in 1851 showing Plantation House with this same veteran and another in the foreground. The text accompanying it says that no one at that time remembered when they were brought to the island.

It is known, however, that three such tortoises were originally imported, two probably in the 18th century, from the island of Mauritius in the Indian Ocean. One died in 1877, the second fell over a cliff in 1918, breaking its



Home of St. Helena's Governor Suggests a Transplanted English Manor

Plantation House, built in 1791, gets its name from the site where vegetables were grown for governors and officials of the East India Company. Some 1,790 feet above the sea, the grounds contain a great variety of beautiful trees. St. Helena's verdant heights contrast with its bleak shore line. "Stone" in front of the mansion is the island's famous huge tortoise (page 266 and opposite).

shell, and the surviving member of the trio, which I saw, continues its placid existence on the grounds of the Governor's mansion.

After we had recovered from the surprise of seeing what may have been a living Napoleonic relic, Mr. Solomon took us on a lovely drive into the highlands, through scenery dotted with white farmhouses and low hedges, sometimes reminiscent of southern England and at other times of the wilder parts of Scotland.

He explained that partridges, pheasants, and rabbits abound, but only one indigenous form of wildlife—the wirebird, which is a small plover (*Charadrius sanctae-helenae*).

Almost anything can be made to grow in these very fertile uplands, St. Helena having an equable annual temperature varying between the 60's and the 80's. He pointed out Mount Actæon, which is 2,685 feet above sea level and the highest peak on the island.

Rounding a corner, we came upon what was the most romantic scene of all: the rightly named Fairyland with the delicate Rose Cottage to the left, the jagged summits of Lot and Lot's Wife to the right (page 274), Sandy Bay and the limitless ocean in the distance, and acres of flax drying on the grassy slopes right in front of us. The small figures of men working in the flax fields could just be discerned at the center.

After we had gazed at this spectacle for half an hour, we saw some other residents coming toward us in a car. The driver got out, saw my Leica camera, and politely asked if I would sell him a couple of rolls of 35-mm. film. He had been unable to procure any in St. Helena for years!

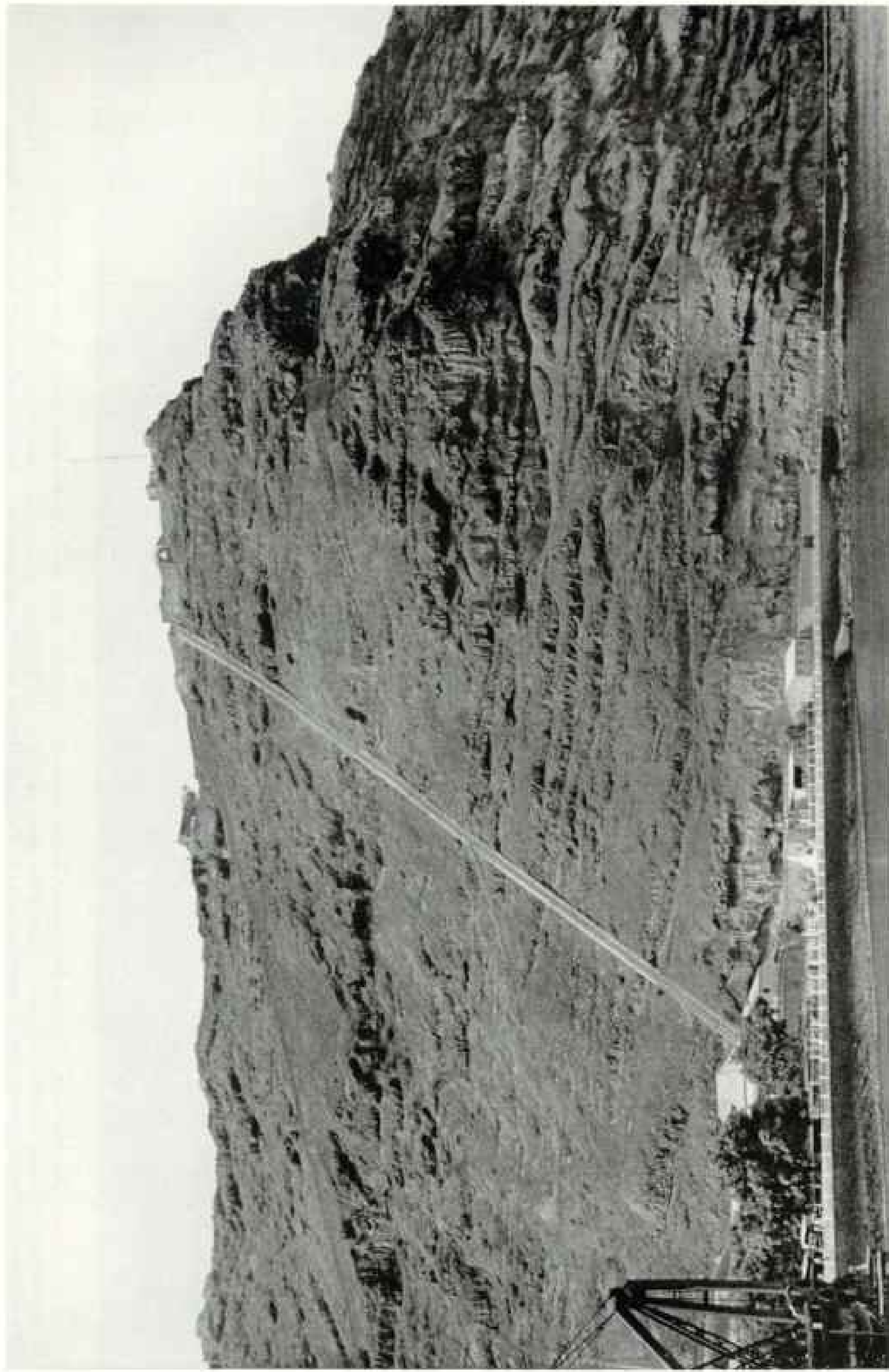
I did him this small favor, and we proceeded to High Knoll fort, built by the East India Company and now used as an animal quarantine station. Standing on the stalwart walls,



374

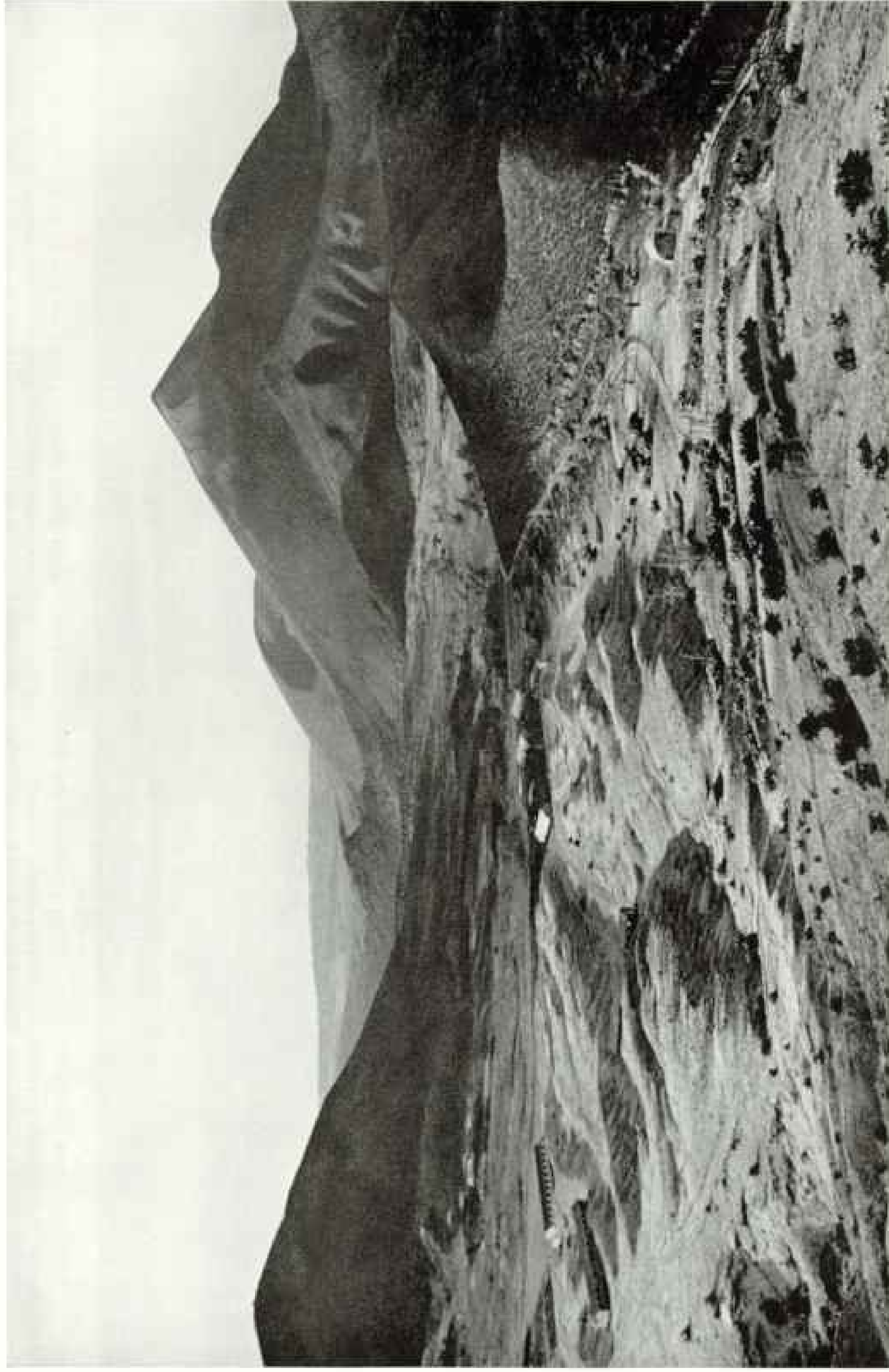
Mists Borne on Trade Winds Nourish Lush Fields of Flax on the Highlands Overlooking Sandy Bay

The cut leaf, carried downhill on donkeys, is laid out to dry and later carted to the mills. Hemp and tow extracted from the raw fiber, as well as rope, twine, and matting made from it, account for 96 percent of St. Helena's exports. Farmers cultivate well over 3,000 acres of flax. Volcanic peak is named Lot; another near by, Lot's Wife.



Islanders Must Climb 600 Steep Steps to Reach the Port Crowning Ladder Hill; Sturdy Legs Can Do It in 10 Minutes

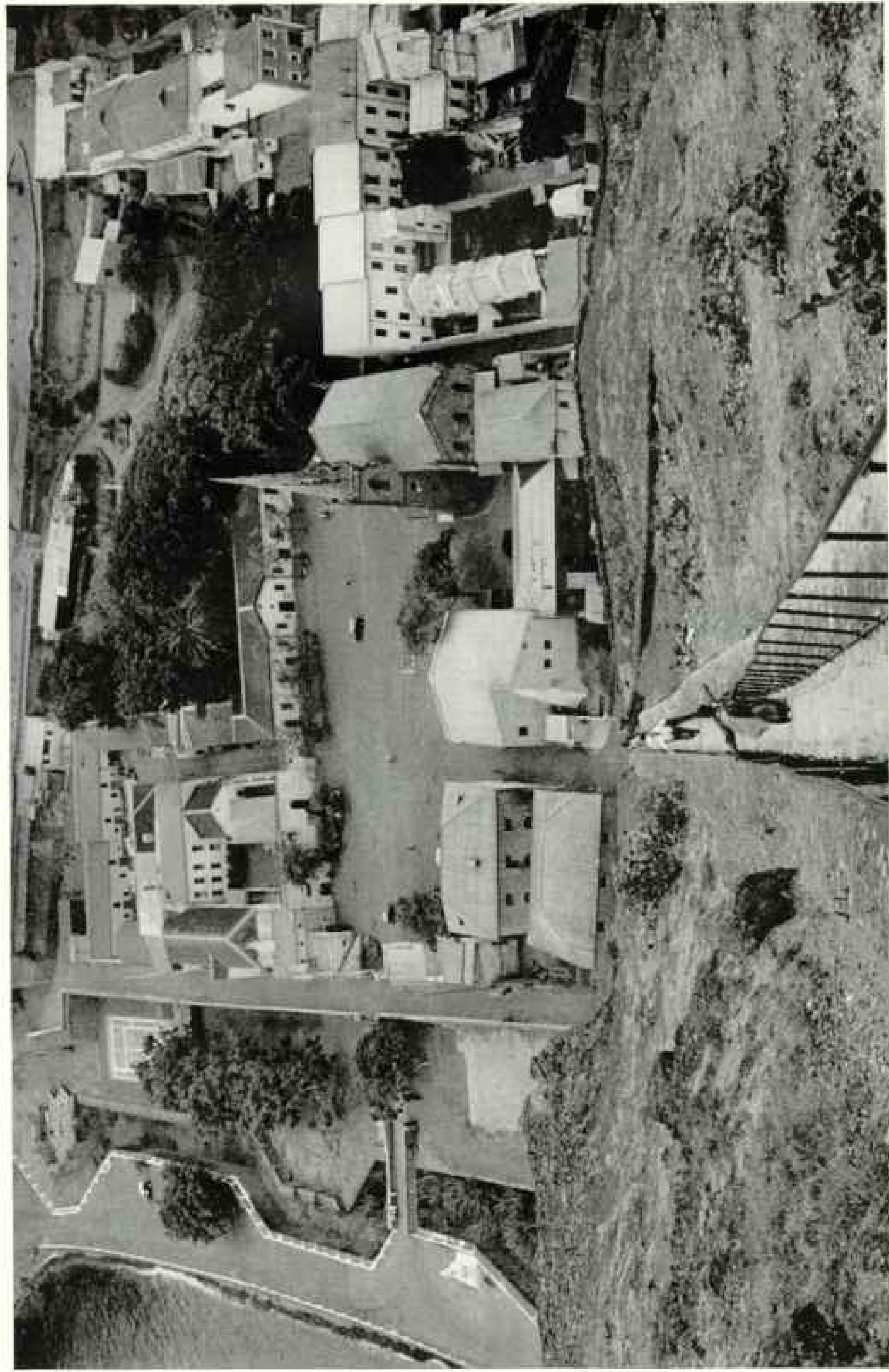
To get about St. Helena's steep mountains and valleys, a climber declared, "One must choose between breaking one's heart going up or one's neck coming down." Treeless volcanic cliffs rise abruptly from the sea, but the island's summit reveals fertile inland hills. The sea wall protects Jamestown from fierce Atlantic swells.



270

St. Helena's Nearest Neighbor, Bleak Ascension Island, Dots the Atlantic 800 Miles to the Northwest

On this tableland at the foot of extinct volcanoes, United States Army Engineers erected barracks to house Air Force personnel during the recent war. They flattened the lava to make a 7,000-foot runway, vital for refueling planes on the South America to Africa run (page 279). Portuguese discovered the island on Ascension Day, 1501.



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Below the Dizzy Top of Jacob's Ladder Spreads Jamestown, Its Centuries-old Houses Wearing Pink, Blue, and Gray Tints

Between sea and town stand sturdy walls with gun ports and tennis courts and a bridged moat for the island's defense in the 17th and 18th centuries. Inside the gate are the Castle entrance (page 267) and the law courts, to the left of St. James Church steeple. Warehouses for flax lie at the base of the stairs.



Beside a Muzzle-loader Stands the Last Boer War Prisoner

Although he was soon liberated, 75-year-old Charles Smith liked St. Helena so much he has left it but once since he was brought here by the British from South Africa. Among the nearly 6,000 other prisoners interned on the island was the Boer general, Piet Arnoldus Cronje.

we had an uninterrupted view of the South Atlantic for many miles in every direction.

As if our guide hadn't been kind enough already to a couple of complete strangers, he proposed that we have tea with him at his house; and then with overwhelming generosity he presented me with a first edition of the classic book, *Napoleon in Exile; or A Voice from St. Helena*, which Napoleon's physician, Barry Edward O'Meara, had published in 1822.

We said good-bye to him gratefully, devoted some time in the town to examining the old inscriptions built into the walls of the Castle (St. Helena's town hall, founded in 1659, page 267), and repaired to the Consulate Hotel for a frugal dinner by candlelight. The raucous songs of the sailors from our ship drifted in

to us from the bar.

On returning to the ship, I found the captain and Mr. Solomon in a business session, and forthwith had a brilliant idea. Since we were due to sail that night, and I passionately wanted more time on the island, why couldn't Mr. Solomon deliver more hemp from his mills for shipment to England so that it would take the captain longer to complete loading? Everyone would make more money, and we would have more precious moments on St. Helena.

Climbing Jacob's Ladder of 699 Steps

My plan worked. We stayed overnight and next morning rowed ashore with the captain, to climb the 699 steps of Jacob's Ladder (pages 275 and 277).

This is another unique feature of St. Helena. It is built straight up the face of the cliff across from the Castle, and can be seen long before one's ship docks in James Bay. The Royal Engineers constructed it in 1829

for quick access to Ladder Hill fort.

We soon found out that the climb took a panting 15 minutes, and no wonder, when we realized we had traveled at more than a 45° angle for 923 feet!

It was worth the exertion, however, because up on the fort stood a very interesting old man: Charles Smith, 75, St. Helena's last surviving Boer War prisoner. He was captured by the British in South Africa and had been shipped along with the Boer general, Piet Arnoldus Cronje, and 512 other captives to this island, which had already been the rocky cell for another distinguished man of action.

He told us that he had been liberated in 1903, but that, liking his insular prison, he had elected to stay there forever. He had married a native and for many years had run

a bakery. Only once had he ventured into the outside world, and that was in 1912 when he traveled to Durban to see his ailing mother.

I took his photograph, and then we literally ran down the "rungs" of Jacob's Ladder to have what turned out to be our final St. Helenian adventure. Mr. Solomon had told us about the only safe spot for swimming off the island, and now that we were hot and tired we decided to try it. Together with several other younger passengers, we rented a jeep and bumped over a near-precipice to Rupert Bay.

It was a godforsaken spot with dark water and purple volcanic sand—not in the least inviting. But how many people can claim they have been swimming off the coast of St. Helena?

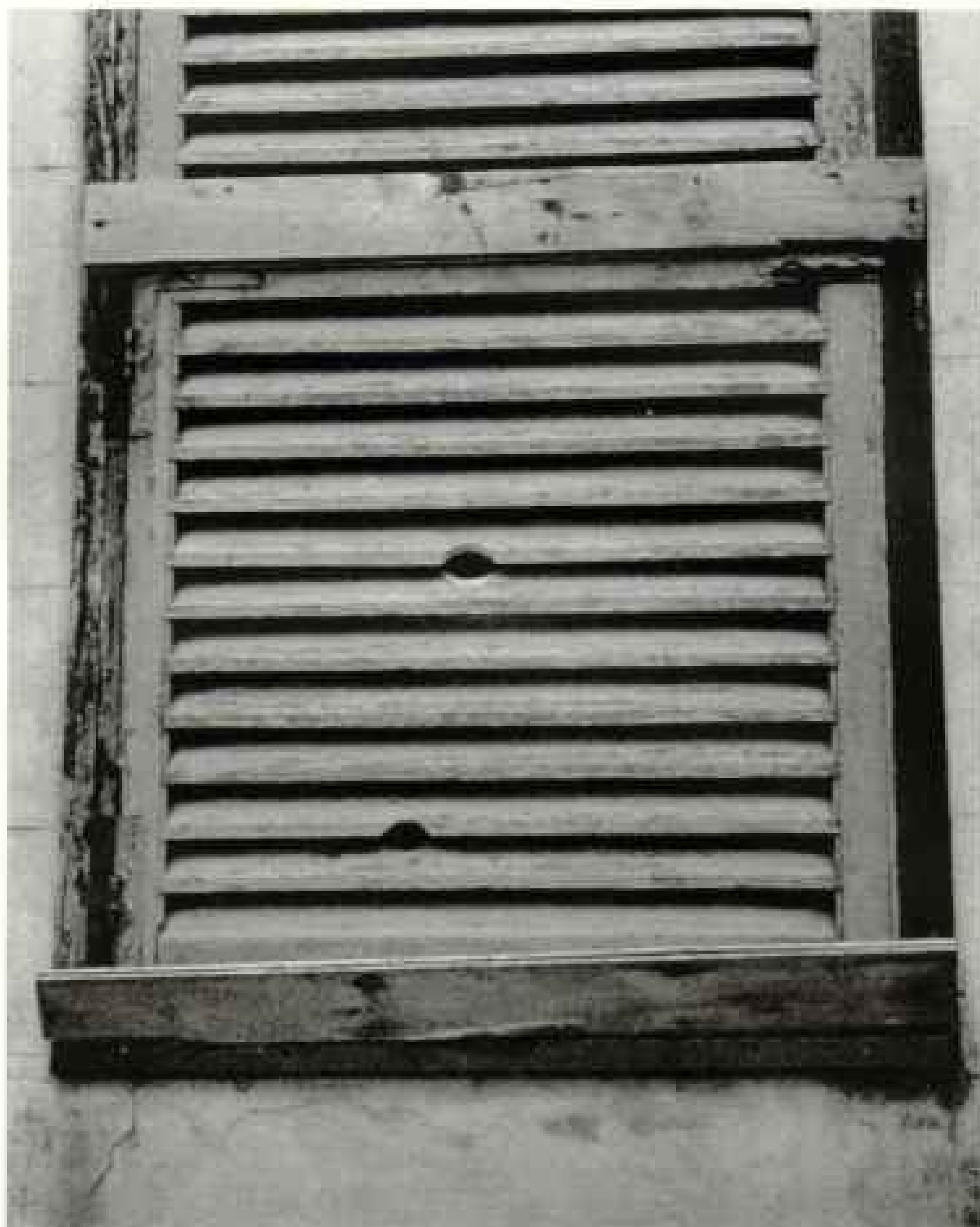
We had been in the water for only a few minutes when, to our dismay, we heard a blast from our ship and saw that she was getting ready to put to sea.

We shouted frantically to a fisherman 100 yards away to come and get us, but because of the waves he couldn't do so. We were obliged to collect our clothes, watches, and cameras from the beach and maneuver out to his boat as best we could, on our own.

We clambered in and were rowed out to the big ship towering over us. A rope ladder was lowered, and, much to the general hilarity of the other passengers, six sodden figures appeared on the deck.

Hard-won Permission to Land on Ascension

As the stark walls of Napoleon's prison diminished on the horizon, we turned our course toward Ascension Island, and within three days its 34 square miles loomed up out



Standing or Sitting, "Boney" Could Peer Through His Spyglass

Though permitted outside whenever he wished, Napoleon was watched constantly. To conceal himself from sentries, Napoleon had the window shutters closed (page 269). Through peepholes he could see approaching visitors, building activity, and the horse races or troop movements at Deadwood Camp, more than a mile away.

of the ocean. So much has been written about this practically bare volcanic isle since the war, because of the airfield and refueling station built on it for the Air Transport Command by the U. S. Army Engineers, that I always think of it as the "remembered" island.*

However, Union-Castle ticket holders seldom go ashore there, since the line displays a stern edict in Cape Town about this port of call: "No passengers may land without permission from the Ship's Commander and the Resident Magistrate of the Island."

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Greens Grow for GI's on Soilless Ascension," by W. Robert Moore, August, 1945; and "Ascension Island, an Engineering Victory," by Lt. Col. Frederick J. Clarke, May, 1944.

Accordingly, I had made strenuous efforts before leaving South Africa to be accorded this rare privilege, directing my requests to Cable and Wireless, Ltd., whose resident manager acts as magistrate and administers the island for St. Helena's Governor.

At first the authorities had been doubtful, even though I politely told them I wished to take photographs; but soon they had softened and wired the resident magistrate.

He replied: "Pleased to arrange/but will depend on factors/time ship calls/weather and duration stay/he should arrange with captain for reasonable time ashore if conditions favorable."

Luckily our captain was a photographer also, and after I had made myself known to him he suggested that we might go ashore with him.

Apparently there are two valid reasons for this red tape. One is that the island amounts to what might be called a private office, and the other is a legitimate worry about the "rollers."

Mystery of the Giant Waves

These giant waves suddenly appear on an otherwise calm sea from the north against the prevailing southeast trades. They make all contact between a passenger ship and Ascension's little jetty impossible and sometimes last for several days. Most oceanographers believe they are caused by storms moving in the North Atlantic.

Practically the whole cable company staff of 28 men and their families met us in their motor launch, as we anchored off the jetty, because their wives like to use the customary two-hour stop to get in a quick coiffure in the ship's hairdressing parlor!

Mr. V. W. Oelrichs, the cable station manager and resident magistrate, invited the captain, my friend, and me to accompany him back to Georgetown, the island headquarters, telling us meanwhile how much most of the employees liked their two-year stretches of duty on the lonely outpost.

He laughingly suggested that perhaps this was due to the fact that no taxes or customs duties are paid by them, nor do their little cars need any license plates to run around the island.

Even more likely as a reason might be the local cost of whisky and gin, \$1.35 and 70 cents a bottle!

While showing us the machinery in the actual cable office, Mr. Oelrichs proudly mentioned that the first news flashed around the world of the fall of Paris in 1940 had been transmitted to London from Ascension.

At my request, we piled into the magistrate's jeep and started the circuitous drive around 24 hairpin bends to the top of Green Mountain, the 2,800-foot peak of the island (page 276). Georgetown and all its surroundings, as far as eye can see, lack any vestige of greenery, but up on this summit is a tropical paradise of misty vegetation.

As we reversed the car to get around a particularly sharp corner, Mr. Oelrichs told us that all members of his staff are given six days' leave every six months so that they can spend a short holiday in the bungalows on this lush peak, pretending to themselves that they are on another planet. They then return to "town" in a refreshed mood to tackle their daily jobs in the bare clinker area again.

At the top, we saw some of the 17 St. Helenians who are employed to look after the company's farm there. All kinds of vegetables were growing in the rich soil, and there were signs of the 18 cattle, 704 sheep, and sundry pigs and poultry which supply the settlement below with fresh food and milk.

On the way down, I heard how the famous green turtles of Ascension were formerly caught for export. As the unfortunate creatures lay on the beaches, men would quickly attach empty kerosene cans to their flippers, turn them on their backs in a helpless position, and wait for the tide to come in and float them out to sea. Then a fishing boat equipped with a derrick would approach, hoist the 500 to 600 pounds of potential soup to its deck, and prepare the turtles for shipment alive to England.

At Last, the Talkies

The last piece of information I picked up in Ascension was a minor one, but it set me off on a train of thought which seemed to bear out my description of St. Helena as the "forgotten island." It was that talkies have now reached this bastion of solitude. I compared this sign of modernity with St. Helena's silent screen. I then thought of Ascension's airstrip and how simple and quick communications with its barren contours could always be.

This reminded me of something the Governor had told me. No spot could be found on St. Helena, after a thorough survey of its terrain in 1943, on which an airport could be built. Thus it was assured of a permanent remoteness from the bustle of modern life.

And finally I remembered some astonishing statistics I had seen. In 1845, 1,458 ships had called at Jamestown, and in 1948 only 31. Surely even the giant tortoise might be permitted the observation that his historic island had been forgotten?

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To carry out the purposes for which it was founded sixty-two years ago, the National Geographic Society publishes this Magazine monthly. All receipts are invested in The Magazine itself or expended directly to promote geographic knowledge.

Articles and photographs are desired. For material The Magazine uses, generous remuneration is made.

In addition to the editorial and photographic surveys constantly being made, The Society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, The Society's researches solved secrets that had puzzled historians for three hundred years.

In Mexico, The Society and the Smithsonian Institution, January 16, 1939, discovered the oldest work of man in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November 4, 931 B. C. (Spinden Correlation). It antedates by 300 years anything heretofore dated in America, and reveals a great center of early American culture, previously unknown.

On November 11, 1933, in a flight sponsored jointly by the National Geographic Society and the U. S. Army Air Corps, the world's largest balloon, *Explorer II*, ascended to the world altitude record of 72,105 feet. Capt. Albert W. Stevens and Capt. Orvil A. Anderson took sleds in the gondola nearly a ton of scientific instruments, and obtained results of extraordinary value.

The National Geographic Society-U. S. Army Air Forces Expedition, from a camp in southern Brazil, photographed and observed the solar eclipse of 1947. This was the seventh expedition of The Society to observe a total eclipse of the sun.

The Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda, during which a world record depth of 3,038 feet was attained.

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

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1850

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1950



"All up and down the whole creation..."

... wherever Americans roamed, they took with them the lilting melodies of Stephen Foster. From prim eastern drawing rooms to the roaring gold-rush camps of California, men lifted their voices in praise of the Swanee River, Old Black Joe, and an unforgettable girl named Jeannie, who had light brown hair.

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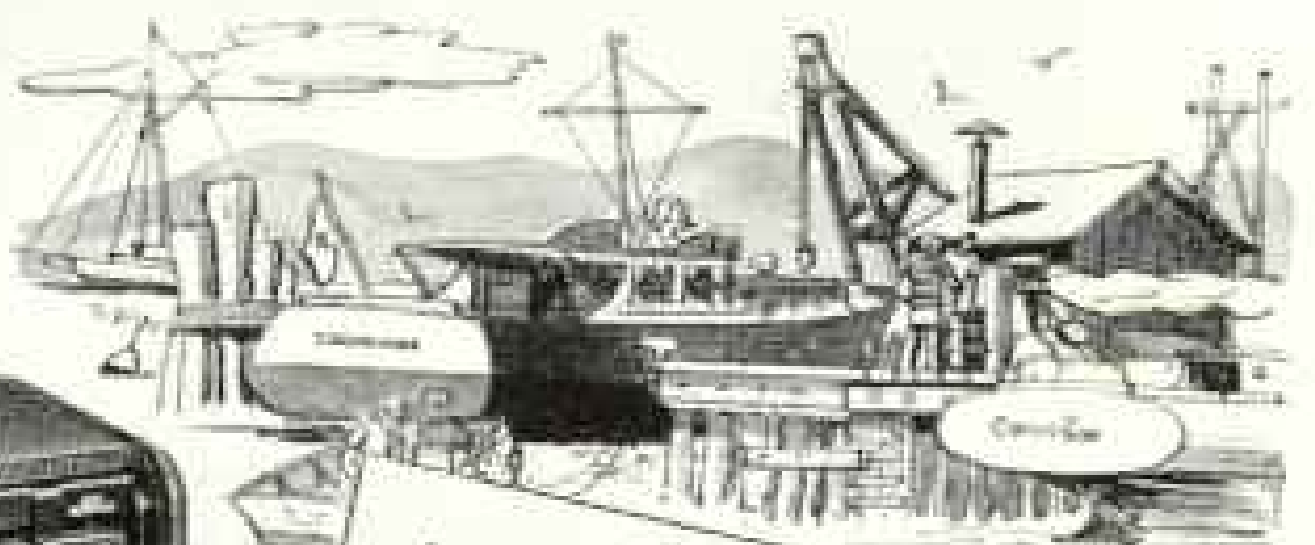
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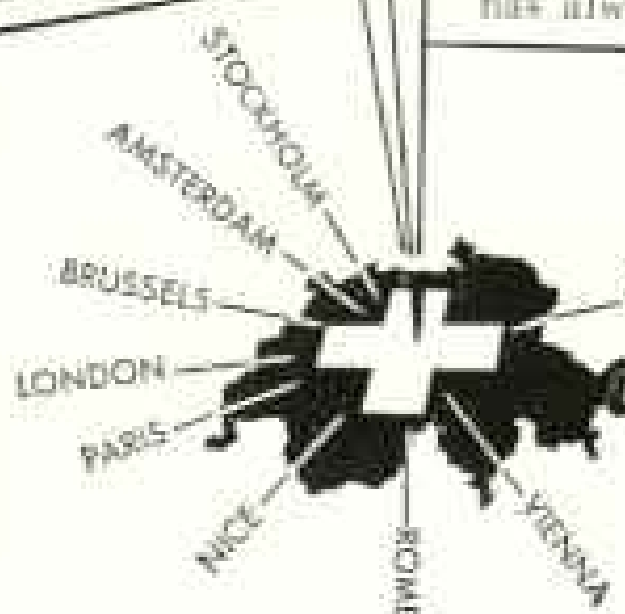
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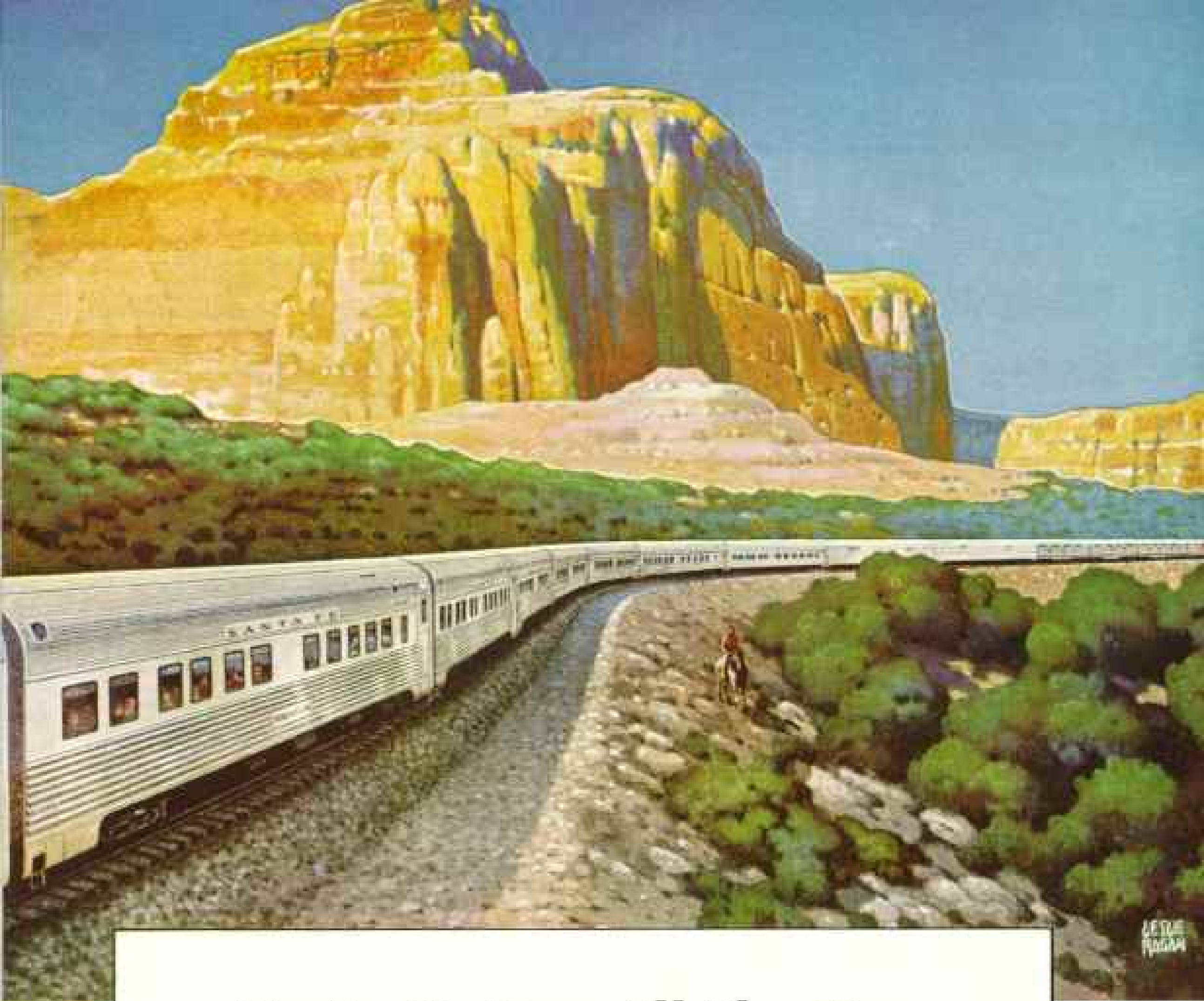


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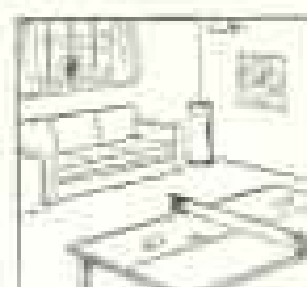
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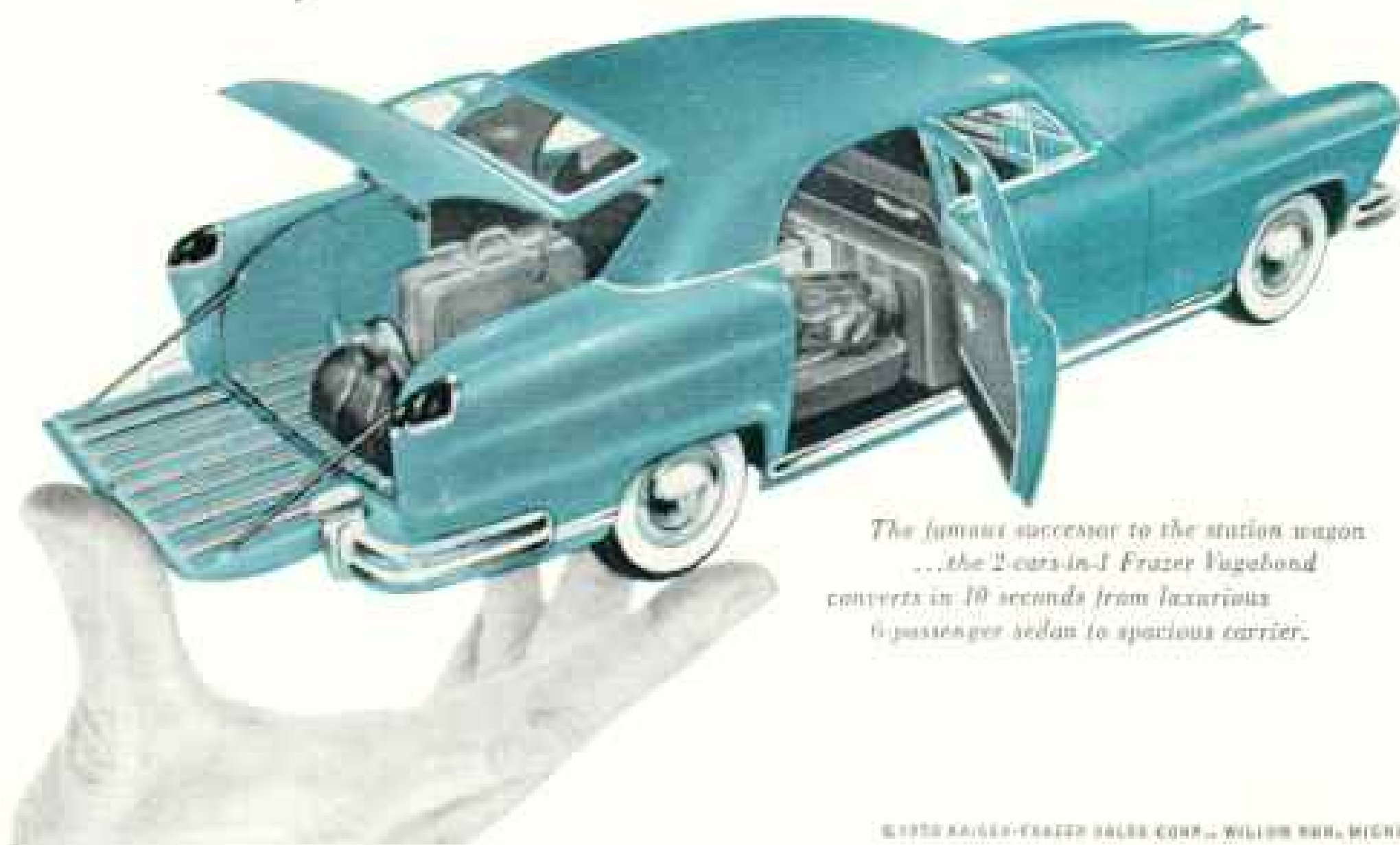
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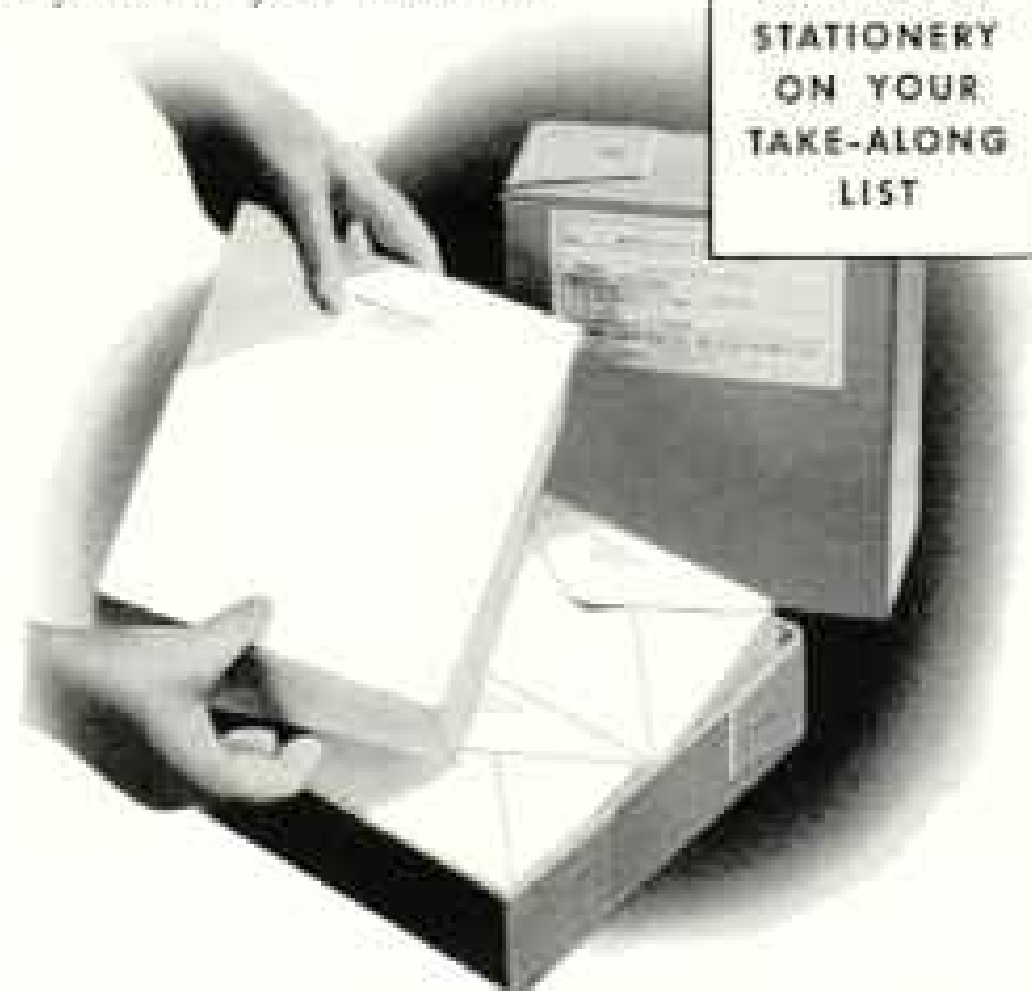


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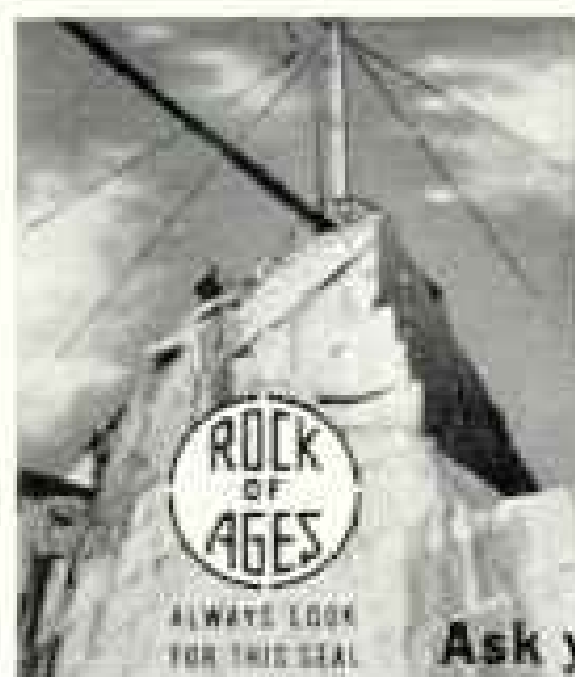
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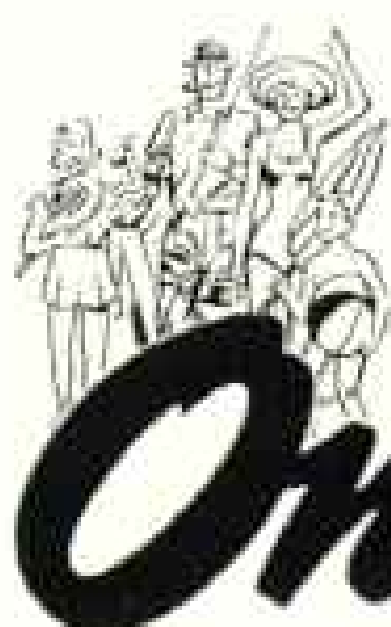
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PATIENT: "Just what is high blood pressure?"

DOCTOR: "It is a condition that results when the blood flowing through the body's small vessels meets increased resistance. This is usually brought about by the narrowing of these small vessels. This narrowing may occur in response to emotional or other factors."

"Everybody's blood pressure varies from time to time. However, when these blood vessels remain *constantly* tightened up, persistent high blood pressure results."

PATIENT: "How does high blood pressure cause harm?"

DOCTOR: "Mainly by placing an additional strain on the heart and blood vessels. This, in turn, causes enlargement of the left ventricle of the heart. As a result, the efficiency of the heart's chief pumping chamber is lessened. Then, too, the arteries wear out sooner than they would if the blood pressure were normal."

PATIENT: "I understand. Now, Doctor, what can I do to help myself?"

DOCTOR: "First, *learn to avoid worry and mental strain*. For example, if there are situations which always upset you, make a special effort to avoid them. Slow down—go through your daily routine without undue fuss or hurry. The calmer you become, the more your blood vessels tend to relax—and thus help to lower your blood pressure. You must also *get your weight down to what is normal for you and keep it there, you must get plenty of sleep and rest, and you must not neglect having periodic health examinations.*"

PATIENT: "What about the new treatments . . . special diets and drugs?"

DOCTOR: "In *selected* cases, the newer forms of treatment are often helpful. Some of the newer drugs may be helpful in many cases but owing to the wide variation in the causes of high blood pressure, these should only be taken with the advice of your physician. Various diets in which salt, protein, and fats are restricted have often benefited some patients. But in your case, like many others, simple common sense treatment usually produces good results."

Knowledge of what causes high blood pressure is increasing; thanks to research supported by the Life Insurance Medical Research Fund and others. In fact, there is hope that both preventive and curative measures may be found as research continues. For more information about high blood pressure, write for Metropolitan's free booklet, 80N, entitled "Your Heart."

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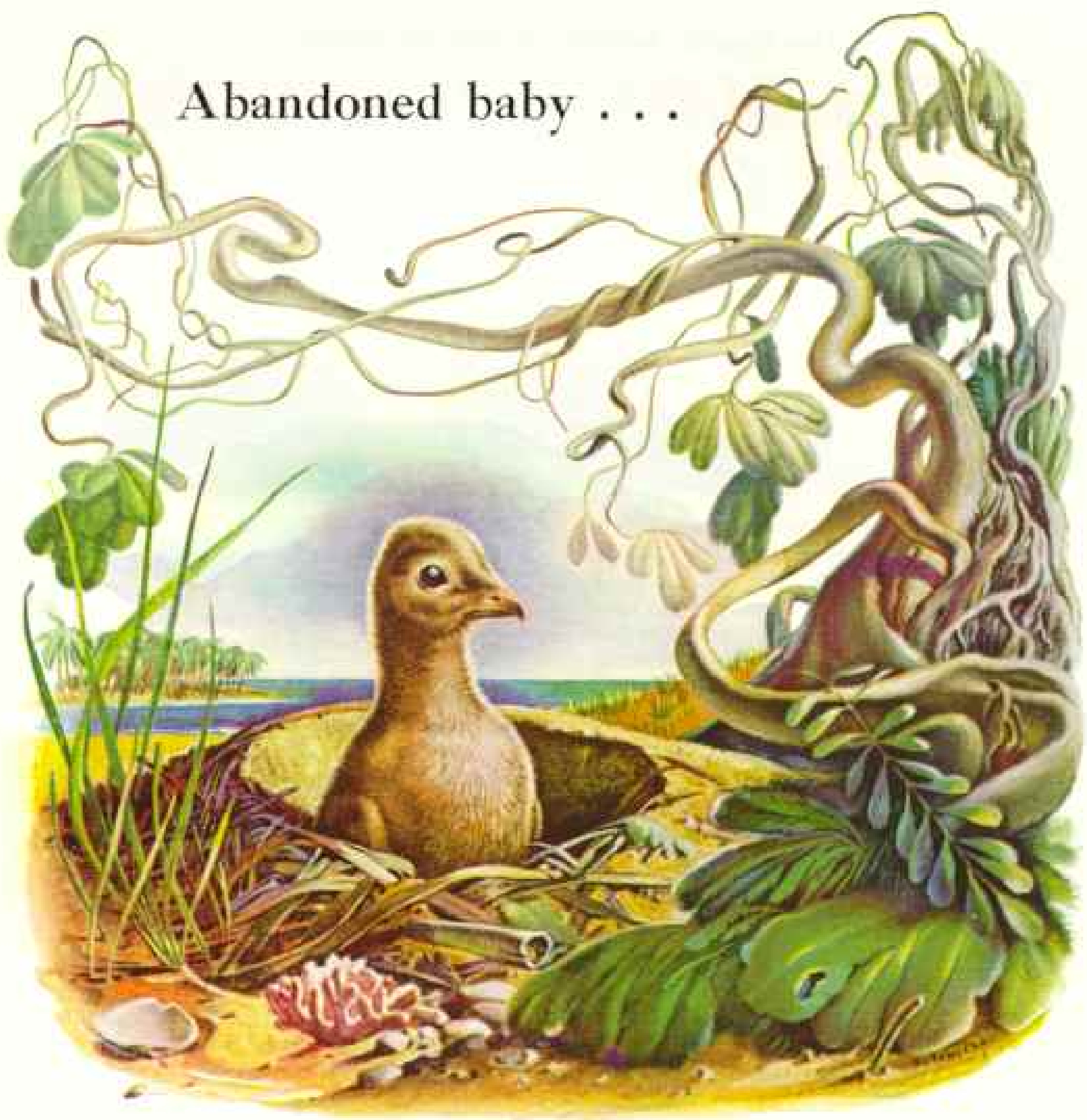
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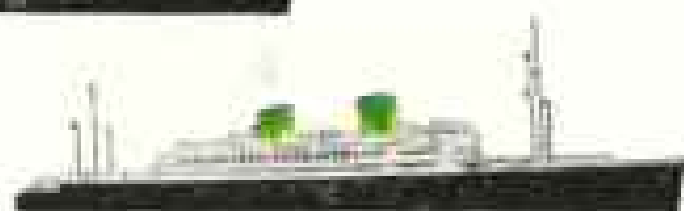
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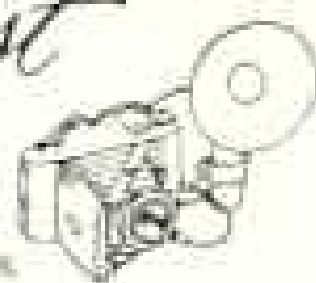


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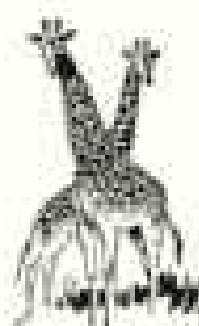
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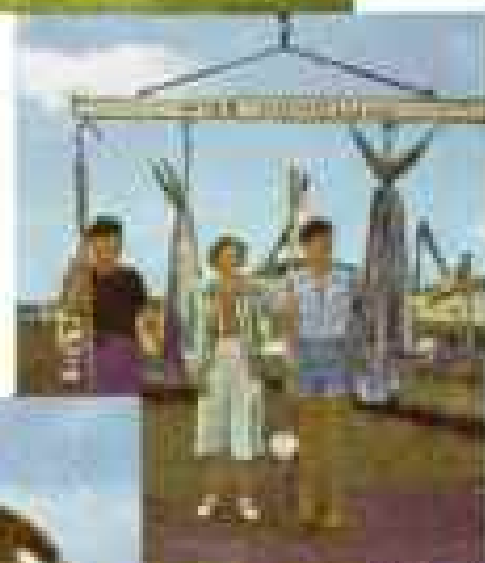
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