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THE NATIONAL GEOGRAPHIC MAGAZINE

JULY, 1938

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ROADS FROM WASHINGTON

By John Patric

ALL roads from Washington are measured from the zero milestone, south of the White House. From a sightseeing blimp, floating high in the summer air above the Potomac, I saw them: rolling roads to the mountains, planters' roads to the sea, twisting roads to historic towns, and commerce-crowded highways to cities far away. They radiate from the Capital like threads of a giant spider's web, broken by the Alleghenies, by wide tidal rivers, and by Chesapeake Bay.

With this issue of the NATIONAL GEOGRAPHIC MAGAZINE is a map, "Reaches of the Nation's Capital." * I planned three journeys within its area. The first was a circuit of Chesapeake Bay.

The summer day I drove to Annapolis with Willard R. Culver, National Geographic photographer, the country was fragrant with honeysuckle.

We traversed farmland rich in colonial times where tobacco, once used for money, still is grown. Some abandoned fields are woods again, splashed with white dogwood blossoms in spring, and with bright-red berries of holly trees in winter. Other fields have been cleared once more, for homes of suburbanites who work in Washington.

Maryland's capital began as a Puritan settlement in a Catholic colony, and soon became a center of wealth and culture.

Two shiploads of Acadians, expatriated from Evangeline's country, were landed here, and some found refuge in this hospitable town on the Severn. Annapolitans, like Bostonians, resented the pre-Revolutionary tax on tea; when the *Peggy Stewart* brought a tax-paid consignment into her home port, the owner was compelled to burn his ship as well as his cargo.

NAVAL ACADEMY PRESERVES ANNAPOLIS

After brilliant service in the War of 1812, the American Navy waned for a time. In the early forties training methods and appointments were severely criticized. In 1845 the United States Naval Academy was established in Annapolis.

"We lost much of our water front to the Academy," an Annapolis banker said. "Industry and commerce, which might have changed the colonial appearance of our town, moved to Baltimore. Today we have no factories except those serving our local needs. The enthusiasm of visitors for our old streets and homes has made us cherish them even more."

"Near Annapolis," a newspaperman told us, "is the smallest incorporated town in Maryland. Arundel-on-the-Bay has just one inhabitant, and he's the policeman!"

That afternoon we drove southward to see this deserted village, and found it full of people. Dozens of well-built houses stood on shady, hard-surfaced streets. Children were playing everywhere. Seven town commissioners, one of whom would act as mayor, had just been elected for the next year.

"I'm the only inhabitant," insisted an old sailor in reply to my puzzled query. "The U. S. census says so. When warm weather is over, everybody else goes home for the winter, and then I'm alone here. The town pays me to keep an eye on it."

* Members wishing additional copies of the Map of Historic and Scenic Reaches of the Nation's Capital may obtain them from the National Geographic Society's headquarters in Washington, D. C., at 50 cents, paper (unfolded); $1, mounted on linen. Postage prepaid in United States and Possessions; for mailing elsewhere, add 25 cents per item.

Photograph by Willard R. Culver

THREE SEAMEN SAIL THIS CRISFIELD YACHT: ONLY THE DOG IS A PASSENGER

One boy must handle gingerly the patched sail, weakened with age, lest it be rent by a sudden squall. Another continually bails the leaky craft, while the third holds the tiller. When these youngsters are older, such early training may help them find berths on cargo sailboats.

Next morning we ferried Chesapeake Bay to Matapeake, on Kent Island. We drove eastward, crossing a short bridge to the low-lying Eastern Shore of Maryland. The beaver-shaped peninsula where we were is often called "Del-Mar-Va," from the first syllables of the States represented in it. It separates the Chesapeake from Delaware Bay and the Atlantic, and includes all of Delaware, eastern Maryland, and a bit of Virginia * (pages 8 and 9).

We went southward, through Wye Mills, where a water wheel is power for both a gristmill and a lumbermill, to Easton; there a pioneer family had asked us to visit them during the week that elapses between the Oxford and the Miles River regattas on Chesapeake Bay (page 29).

With easy Maryland hospitality, they had invited half the sailors, too, and many had accepted. Their white-pillared colonial home was packed with guests. People slept in easy chairs, crosswise on beds, even on the floor. Sails of Star boats, drying, festooned the lighting fixtures and were draped on classic banisters. Youthful skippers and their crews appeared in regiments at dinnertime, brought their plates, and helped themselves from smoking mountains of seafood and hot pyramids of corn bread.

Land hereabouts is flat, yet Bonfield, home of the author of *Anthony Adverse*, stands on a knoll overlooking an estuary of the Choptank River. "An early colonist," his wife explained, "courted a Carolina girl who loved her native hills. His slaves built this one, so that he could bring his bride to a hilltop house."

Next day we drove out country roads near Easton and down long, tree-lined lanes to visit colonial plantations. At Wye House we saw a glass-walled orangery, built to grow winter fruit. It is a toolhouse now. In a graveyard were tombstones of nine generations of the Lloyds of Wye.

In an Easton newspaper advertisement of May 2, 1803, "a valuable negro woman, excellent spinner and tolerable cook, with

* See, in THE NATIONAL GEOGRAPHIC MAGAZINE, "Maryland Pilgrimage," by Gilbert Grosvenor, February, 1927; "Annapolis, Cradle of the Navy," by Arthur A. Ageton, June, 1936; "Diamond Delaware, Colonial Still," by Leo A. Borah, September, 1935; "Approaching Washington by Tidewater Potomac," by Paul Wilstach, March, 1930.

Photograph by Willard R. Culver

AUTO TAGS COST TOO MUCH? THEN MOVE TO SMITH ISLAND, IN CHESAPEAKE BAY

In prosperous times islanders drove about 30 cars; now there are fewer than a dozen. Because these self-reliant men build their own roads, the State of Maryland does not enforce the law requiring license plates. There is no ferry to the mainland; autos are brought as cargo. A rust-eaten buoy marks the end of a short stretch of experimental pavement across the salt flats.

2 or 3 children," was offered "on credit."

Where oxcarts loaded with hogsheads of tobacco for waiting schooner holds once creaked over shell roads, through the pine woods and beside the cypress swamps, fast trucks now roar northward on smooth highways with melons, tomatoes, and sweet corn for city tables.

Today, the masters of many old plantations are men from the North who call them "country places."

Descendants of plantation hands work in the canneries. Sheep and tobacco, slaves and sailing ships, are gone with the loom and the spinning wheel.

WOMEN KNIT HOME-GROWN WOOL

Yet, even today on Smith Island old women knit socks and mittens from home-grown wool they spin themselves. At Salisbury on the Wicomico River I saw sailing vessels laden with watermelons (page 4). A few old negroes, smoking home-grown tobacco, live loyally still on the plantations, secure under the paternalism of the sons of their fathers' masters.

One wealthy outsider tried to buy a patch of woods from an impoverished planter for several thousand dollars.

"I just can't sell it," the old southerner said, gazing affectionately at the oaks, pines, gums, sycamores, and holly trees of the big woodlot his family had owned so long. "I get logs for my fireplace there."

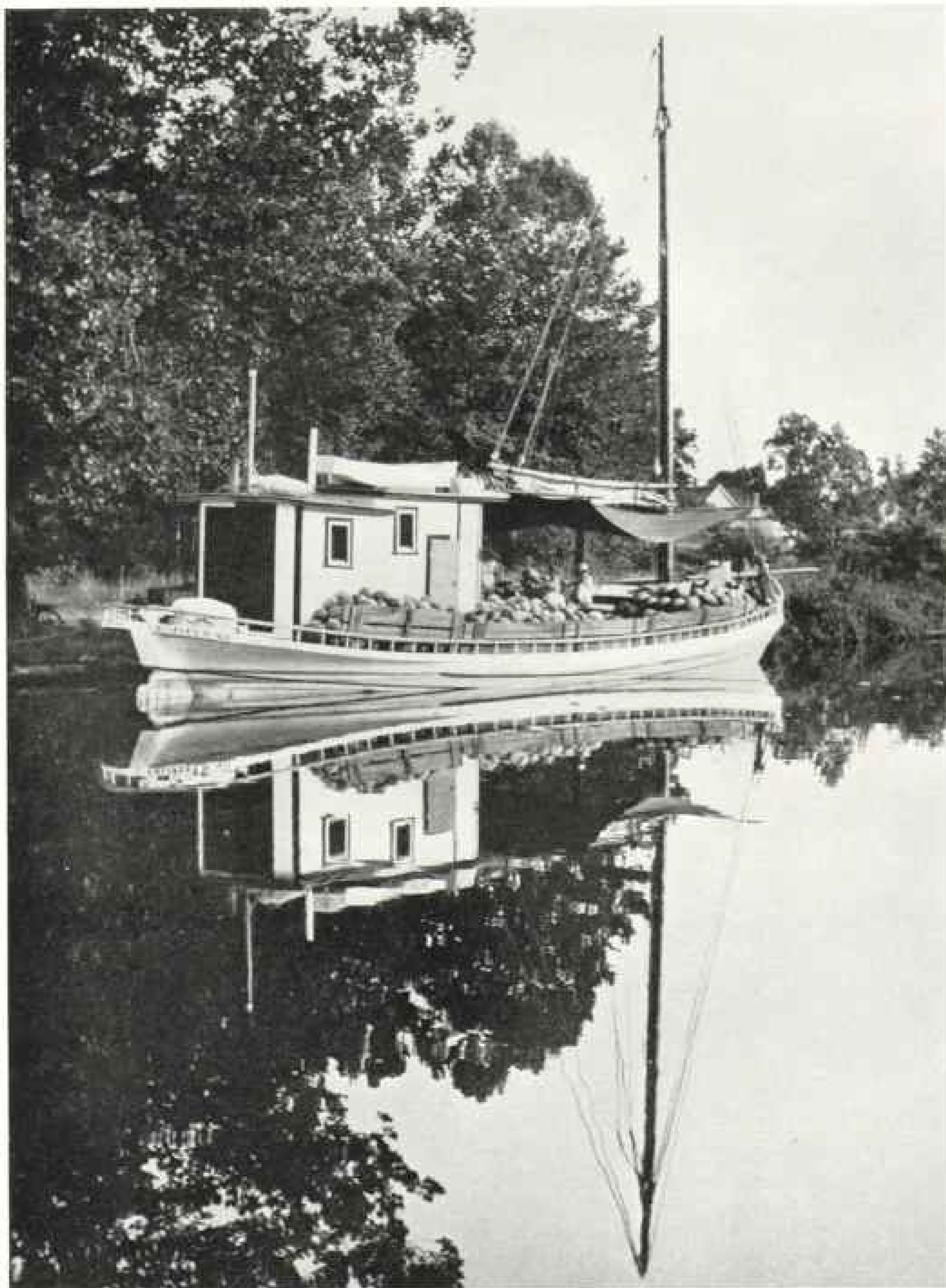
"But for fifty dollars you could buy plenty of logs!"

"I guess so," the gentle old man replied. "But a fire's nicer to sit by when your own wood's a-burnin'."

Not far from Salisbury, a modern town of more than 11,000, a man ferried my car across a wide estuary on a flatboat, as I have seen river coolies do it in China, by pulling on a rope stretched over the water. Waiting on the other side was a new five-ton road scraper.

"'Course I can get it across!" the boatman exclaimed. "'Taint hard—just *slow*."

At Princess Anne, south of Salisbury, we saw a hotel, built, its sign declares, "in 1744, in the reign of King George II." It is still open.



Photograph by John Patric

SAILING UP THE WICOMICO RIVER, A WATERMELON STORE COMES TO SALISBURY

The *Louise Travers*, of Crisfield, carries an engine as well as canvas. Piled high with her juicy cargo, she ties up at a park near the center of town. Such town-to-town delivery of crabs, fish, tomatoes, and other products of the Eastern Shore is made all along Chesapeake Bay and up its estuaries. The reflection in the water is so clear that the picture looks almost the same turned upside down, except for the wavy lines.

Near the Virginia line we crossed a new causeway to Chincoteague Island. Herds of wild ponies roam at will on Assateague, a 33-mile-long, narrow, sandy island farther out in the Atlantic. Every summer a few score are rounded up and driven, swimming, across the channel to Chincoteague, where some are sold (page 10).

"Pony pennin'," as they call it, is carnival time in the town of Chincoteague. We arrived after midnight. A merry-go-round whirled to a last halt; its music wheezed and ended. Ponies in a corral near by, accustomed only to cries of sea birds and the roar of ocean surf, pawed the earth and whinnied for their desolate, windy shores.

We asked a man at a lunch counter for hamburger sandwiches.

"We've only got crab cakes, oysters, and soft shells," he said.

"Oysters? There's no 'r' in 'August'!"

"Down here we eat 'em any time. Oyster sandwiches are always good."

John Montagu, ingenious fourth Earl of Sandwich, could never have tasted, in his most epicurean dreams, anything quite so good as these tender Chincoteague oysters in their big brown blanketing buns.

Next day I watched ponies being easily broken for children to ride. They seemed tame. Did they really roam the year round, uncared for, down the long reaches of Assateague Island? The barnstorming pilot of a tiny two-cylinder monoplane said he had seen them there.

In his plane we rose from a spongy field of salt grass near Chincoteague. We crossed the channel and flew out over the ocean, then over the breakers, the sand dunes, the brushwood, and the wind-crippled trees of this uninhabited coast, until at last we saw animals grazing in a salt marsh.

Before bridges came to Chincoteague, its people lived almost as if their snug little island were a thousand miles offshore. Oysters, clams, and crabs were as plentiful as wild fowl. There were channel bass, spots, rocks, and "right smart o' hardheads."

Native timber provided homes, boats, and churches. Some folk never left their island. Many had not gone to school.

Time, in the last few years, has raced to bring modernity to Chincoteague, as if its people, tired at last of a clock forever slow, had removed the pendulum. One couple gave us a glimpse of their yesterdays.

Aunt Myra Daisey, who envied us because we could read the Bible and she knew it only by hearsay, lived in a tiny cottage with her husband, Uncle Jack (page 15). She was ailing; he slept on the floor beside her cot, just to be near her.

"Up next September," Aunt Myra said, "we've been married sixty-nine years. I've been mother woman"—she meant midwife—"for hundreds of childern. I had eight myself; only one's a-livin'. I'll be with 'em all again pretty soon. I got plenty of gran'-childern, an' if all my great-gran'childern was to give me a penny a week, I'd live good. They don't do it, though."

"UNCLE JACK DAISEY—OFF DAVID"

She talked of the girls of today. "If I'd a-been like 'em, my mother'd a-took a switch an' cut my hide off. If some of 'em was mine, I—I'd jus' throw 'em out before the water boiled!

"An' their skirts! Why, when I was a girl you took 'em in your hand an' jus' towed 'em along behind you. You went barefoot to church, an' when you got there, you wiped your feet on a damp towel, put on your shoes an' stockin's, went in, an' *listened!*"

Uncle Jack "couldn't clam no more," yet he was not on relief. Neighbors brought clothes and wood, he said, "an' eatables—flourbread, an' such."

"Send us a picture," urged Aunt Myra. "Send it to 'Uncle Jack Daisey, off David, Chincoteague.' "

" *'Off David'?*"

"Yes. There's other Jack Daiseys, but only one's off David. David was his father."

"Look after your wife, Uncle Jack," said Culver, as we left them.

"Look after your soul, boy!" replied Aunt Myra.

CRISFIELD, FAMED FOR "SOFT SHELLS"

Next day we drove westward to Crisfield, seafood market of the Chesapeake, where many roads are made of oyster shells. Beside fishermen's wharves we were shown crab pounds.

As crabs grow, they shed successive shells which have become too tight. New ones are large enough to permit growth of the crab within. Some crabs were bursting their armor and struggling to withdraw soft bodies from skeletons they wear outside. They pulled thin muscles from their legs, thick ones from their pincers, and left their claws behind, fearsome, yet empty of power.

Then they lay limp and exhausted for

Photograph by Willard R. Culver

WHEN NO SHADOW SCARES THE GROUND HOG, SPRING IS NEAR

If the animal, emerging from its hole on February 2, sees a shadow, then back it scrambles, legend says, for another six weeks of sleep which connotes six more weeks of winter weather. The avowed public-spirited purpose of the Slumbering Ground Hog Lodge in Quarryville, Pennsylvania, is to see that nothing else ever frightens the little creature into prolonging the cold. Here it is blessed by the Exalted Inspirational Hibernating Patriarch, as kneeling Eye Rubbers wait upon the Prophets to rub their orbs with silken goods, to enable them the better to peer into the future.

several days, until new shells hardened a little, or until crab men shipped them away to be eaten as "soft shells," pliant husks and all.

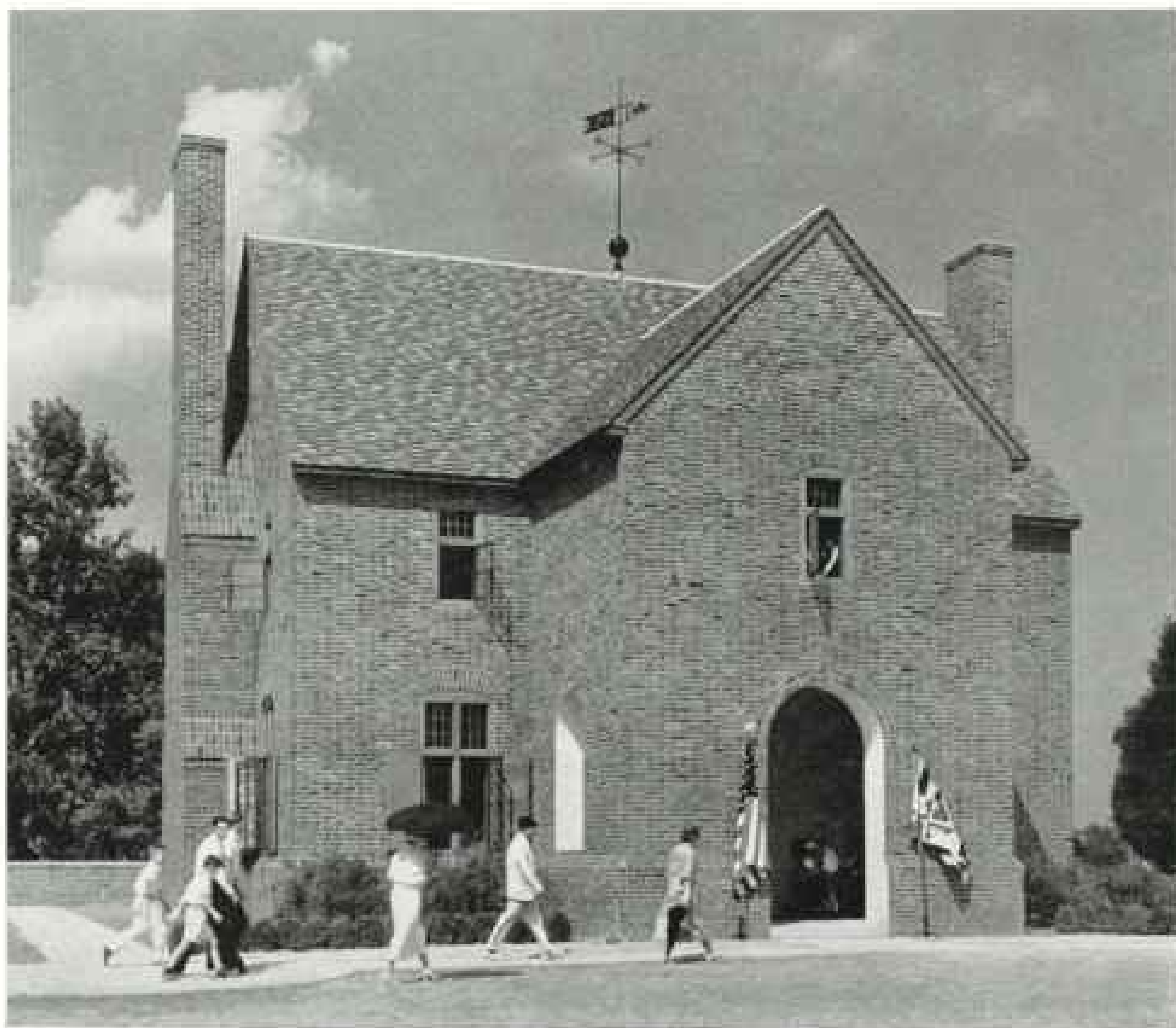
A little passenger boat carried us across Tangier Sound from Crisfield to Smith Island (page 3). We stayed the night there, in a fisherman's house, and dined on soft crabs and little preserved figs that grow in this mild climate.

Returning to the mainland, I continued alone, down the narrowing peninsula. From Cape Charles I crossed the mouth of Chesapeake Bay on a streamlined, air-cooled auto ferry, then drove through Norfolk toward the Dismal Swamp.

Portsmouth men drove me past sturdy old wooden locks of the Dismal Swamp Canal, then through marshy land where bamboolike reeds grew ten feet high. A roadside storekeeper takes visitors in a motorboat through a feeder ditch to Lake Drummond, in the heart of the swamp.*

Brown water foamed like dark cider in our wake as we passed an old burned sawmill. Among the black gums and the maples beside the ditch, mockingbirds, quail, and rabbits hide from marauding bobcats. Here come bears for pokeberries; we saw bushes they had broken. Along the banks grow honeysuckle, holly, wild roses, and bright evergreen leaves of bay that were fragrant when we crushed them in our hands.

* See "Dismal Swamp in Legend and History," by John Francis Ariza, in THE NATIONAL GEOGRAPHIC MAGAZINE, July, 1932.



Photograph by Newton Blakeslee

MARYLAND'S FIRST CAPITOL, REBUILT AT ST. MARYS, STANDS NEAR ITS OLD SITE

When the *Ark* and the *Dove*, after adventurous voyaging, brought the first settlers from England to Lord Baltimore's colony in 1634, St. Marys City was established on the lower Potomac (page 25). Sixty years later the capital was removed from there to Annapolis. St. Marys fell into ruins, and for decades all that remained of this early headquarters of colonial government were its foundation stones.

Near Lake Drummond a swamp dweller pushed a pole with his hands three feet into the soft peat of his garden. He showed us the dark, sleek fur of a newly trapped otter, more than five feet long.

Hundreds of wild ducks rose from the brown water as we entered tree-girt Lake Drummond. I was glad we were not hunters; ducks gave life to this dark lake where not even sunshine could dispel the melancholy.

PEANUT SOUP AND PIECRUST

Next day, in near-by Suffolk, capital of the Virginia peanut kingdom, I sampled peanut soup. One kind is made of milk, butter, flour, seasoning, and ground nuts. One peanut cookbook contains a hundred recipes. Piecrust, bread, doughnuts, and muffins acquire new flavor when peanut butter is added to the dough.

"When my crop is ready to dig," a peanut planter said, "I plow beside the rows, pull the vines, shake off the earth, and let them dry. Then I thresh them. The refuse is peanut hay. Hogs root up what nuts are left. Peanut-fed ham is good" (page 42).

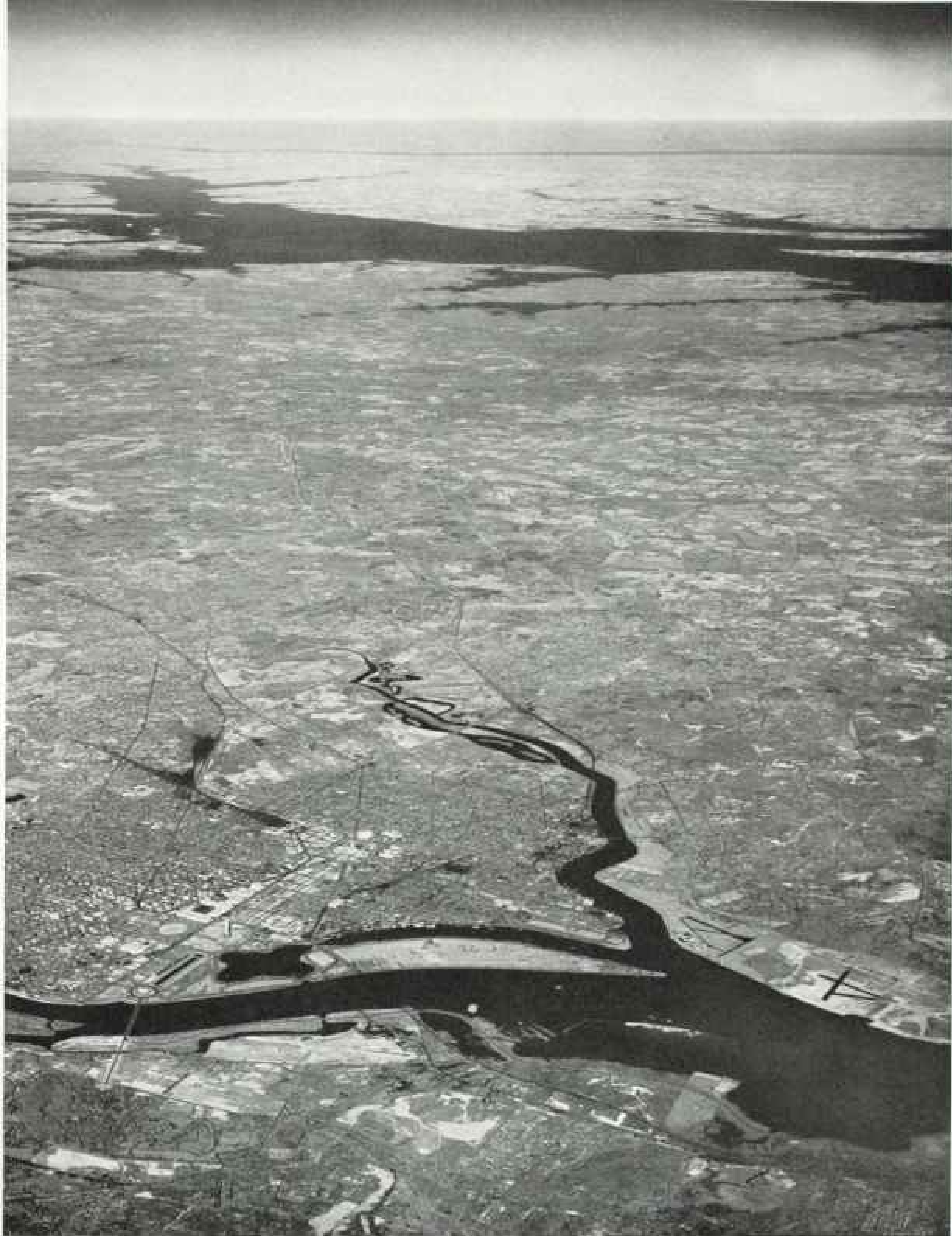
From Suffolk I drove to Petersburg where the three-masted *William Linthicum* was loading lumber for Philadelphia. She would proceed downriver under canvas, as if these were quiet days before the Civil War.

The road to Washington turned northward. I paused awhile in Richmond, the city that once had held so completely the attention of the whole American people, when the South's bravest defended their capital so stubbornly.

Federal troops, in the struggle between the States, had used observation balloons successfully. Confederates had none, and

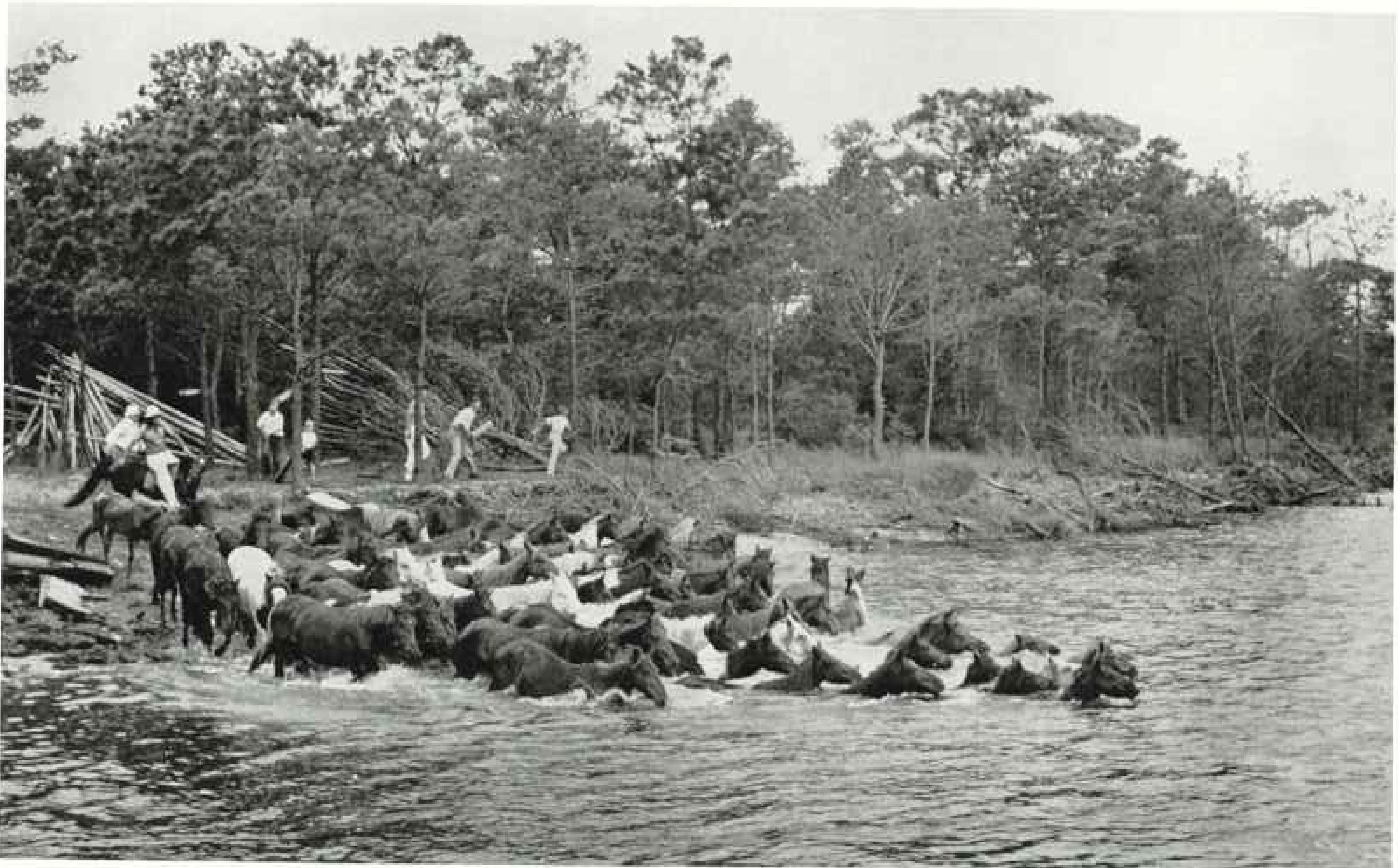
AT FIVE MILES ABOVE THE NATION'S CAPITAL, INFRARED FILM "SEES" FAR

Major Albert W. Stevens, of the United States Army Air Corps, made five flights from Wright Field, in Dayton, Ohio, before he found a completely cloudless day in the Washington region. Infrared photography from high altitudes, with a range much greater than that of the human eye, is successful today largely because of more than a decade of experiment by the U. S. Army personnel. On the ground, the temperature on this October day was 75 degrees; at 26,000 feet above the little town of Burke, Virginia, 12 miles west of Alexandria, it was 30 below zero when the picture was taken with a 1/10 second exposure. Looking northeastward from Virginia across the District and Maryland, the camera sees into Pennsylvania, Delaware, and New Jersey. The horizon is more than 200 miles away.



MOST OF THE DISTRICT OF COLUMBIA AND PARTS OF FIVE STATES ARE VISIBLE

Across the foreground flows the Potomac River, with the Anacostia River joining it beyond Hains Point. Near the Tidal Basin, famed for its cherry blossoms in spring, stand the Lincoln Memorial and Washington Monument. The Capitol is in line with them, and near it the Union Station is marked by fans of converging railroad tracks. In the distance lies Chesapeake Bay, its head 90 miles away. Baltimore is faintly visible at the end of the Patapsco River estuary, in the left half of the picture. Farther away is the dark line of the Susquehanna River. Beyond Chesapeake Bay is the Delaware River, widening at the extreme right into Delaware Bay. Where the Delaware River fades from view, near the center, lie Wilmington and Philadelphia, not quite discernible. Official photograph, U. S. Army Air Corps.



Photograph by John Patric

BACK TO THEIR ISLAND RANGE WILD HORSES SWIM AGAIN AFTER "PONY PENNIN'" ON CHINCOTEAGUE

Herds of small, wiry animals, said to be descended from survivors of a Spanish shipwreck, roam on Assateague, a 33-mile long, low, sandy strip of land in the Atlantic. Every summer some are rounded up and sent swimming to Chincoteague, where they are sold for children to ride. Unsold ponies are driven to the channel between the islands, chased into the water, and allowed to swim back to their insular freedom. Infusion of Shetland pony blood, long ago, reduced the animals' stature (page 5).

Photograph by Willard R. Culver

EASTERN SHORE FOLK LOOK FORWARD TO A TWO-WEEK CAMP MEETING

Built by members of the Siloam Methodist Church near Salisbury, Maryland, two dozen small wooden houses, open in front like stage sets, stand in a rectangle facing a simple church without walls, its roof supported by posts. During services old men smoke their pipes, and wives knit as they listen from rocking chairs to an evangelist and the choir. Each "tent," as the cottages are called, is occupied by a family that sleeps upstairs and cooks on the back porch.

Photograph by Willard R. Culver

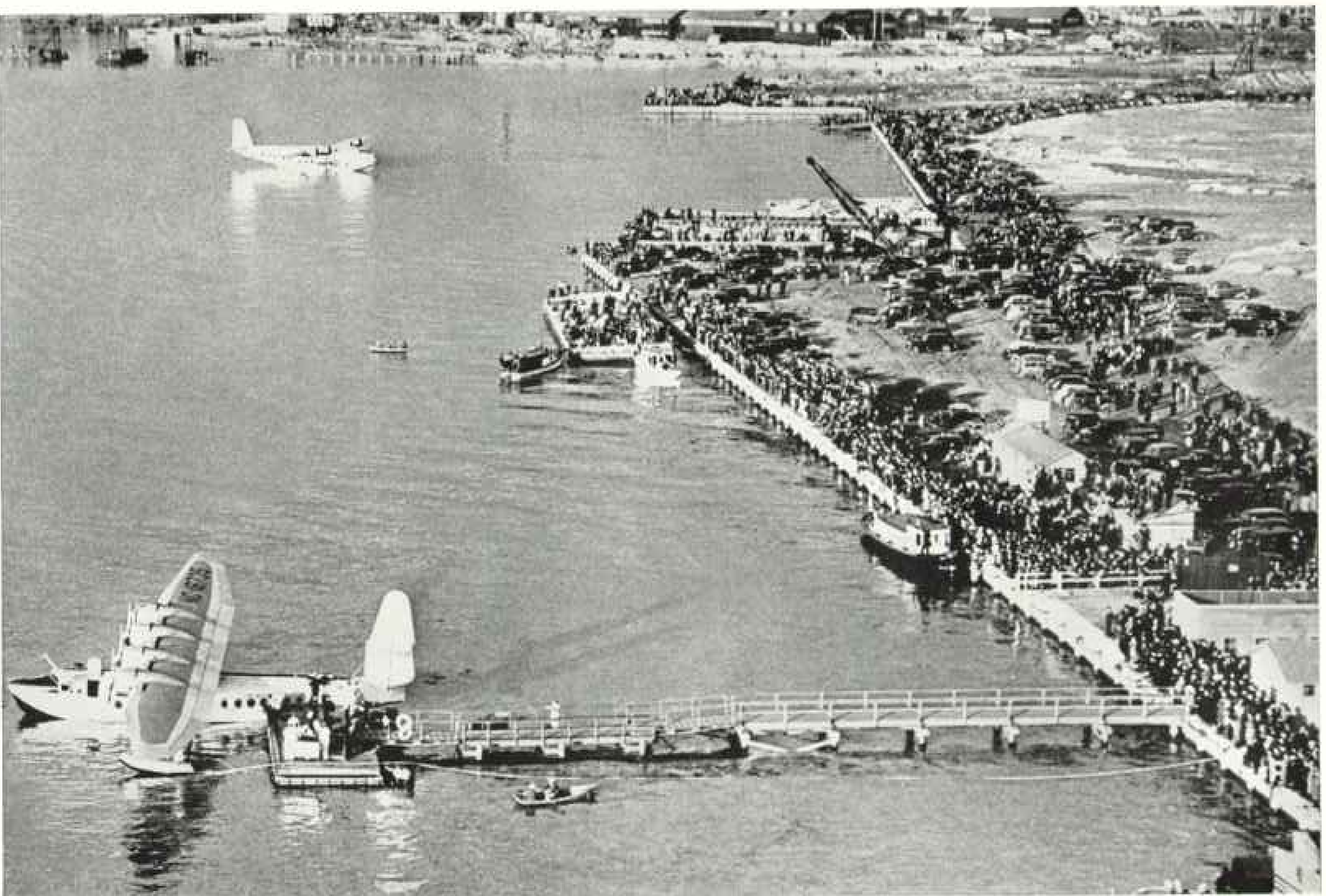
COOL WATER IS ALWAYS FLOWING FROM A VIRGINIA WILLOW TREE

Armies of '61 slaked their thirst at Willow Spout Spring. Underground water from a hillside above ascended a hollow trunk and flowed from a wooden spout. The old landmark is gone; an iron pipe penetrates the heart of a younger tree.

Photograph by John Patric

"MAH FEET WUZ COLD, BOSS, BEFO' AH GOT DIS IDEA!"

When winter comes to Baltimore, a colored newsboy stations himself among warm rags in a tall strawboard box. "Ah stands heah all day, boss. When mah feet's wahm, ah'm comf'table; but when mah feet's cold, dis job sho' is miser'ble."



Photograph by Acme

THOUSANDS AT THE BALTIMORE MUNICIPAL AIRPORT WATCH THE FLYING BOAT "CAVALIER" BEGIN SCHEDULED SERVICE TO BERMUDA

Photograph by Willard R. Culver

IN HAGERSTOWN A GERMAN SOLDIER GUARDS "OLD GLORY"

Before the Revolution, a Hessian tinsmith named Heiskell chiseled a sheet-iron weather vane for the Town Hall. The figure is that of a Hessian soldier, the size of a boy, with ruffles at the neck and sleeves. A Confederate sharpshooter, 75 years ago, put a bullet through the iron soldier's heart. Recently rust retired Little Heiskell to a dry place in the City Hall, while a new and unscarred reproduction, built by a modern craftsman, tops the cupola above the building.

The Tredegar Iron Works, once the arsenal of the Confederacy, is operated by the family of General Joseph R. Anderson, its Civil War time owner.

"WE ARMORED THE MERRIMACK"

"We still make shells for our Government," the present ironmaster said, "and we think this is the last water-power iron mill of its kind in the United States.

"Before we armored the wooden *Merrimack*, Confederate authorities thought three one-inch plates would be enough. When experimental projectiles pierced them, we rolled two-inch plates, and bolted four inches of iron to the ship."*

The brief, effective career of the Confederate ironclad tested a principle that changed world navies. She sank two wooden Union vessels; then the *Monitor* engaged her, and shot bounced harmlessly from both. Some gunners believed the *Merrimack's* guns could be loaded with gravel that would foul the *Monitor's* revolving turret, but the ships did not meet again.

A few old men in gray linger in rocking chairs on an almost empty veranda of the

no materials, so Richmond women were asked for their last few silk dresses.

"I was a little girl," one old lady said. "We had become so poor. I still had a silk Sunday dress, covered with pretty flowers. Giving them that, I cried. They sewed dresses into a big balloon, and varnished it. It looked queer with all the colors!"

The balloon ascended with Confederate observers. Despite its patchwork camouflage, Yankees shot it down. A piece of its patterned material is in the Smithsonian Institution, in Washington, D. C.

* See "Ships, from Dugouts to Dreadnoughts," by Capt. Dudley W. Knox, and the accompanying 16 etchings of ships by Norman Wilkinson, NATIONAL GEOGRAPHIC MAGAZINE, January, 1938.

Photograph by John Patric

UPON MARYLAND'S TERRAPIN STUDENTS POURED A CAN OF GEORGETOWN BLUE

University of Maryland students are called "Terrapins," or "Terps." After this picture was taken, Georgetown University men, traditional rivals, returning to steal the turtle, as Johns Hopkins students had done the year before, were caught blue-handed and forced to kiss its polished nose.

Photograph by Willard R. Culver

"IF ALL MY GREAT-GRAN'CHILDERN GIVE ME A PENNY A WEEK, I'D LIVE GOOD"

Aunt Myra Daisey, of Chincoteague Island, on the Virginia coast, still cooks for her husband, "Uncle Jack Daisey, off David." She has been "mother woman" for many of the islanders, who supply the old couple with everything they need (page 5).

Confederate Soldiers' Home in Richmond. Stonewall Jackson's horse is here, stuffed by hands less skilled than loving.

"Little Sorrel" carried his master unscathed through many a battle. In the same black week that fire swept the gun foundry at Tredegar, Jackson was accidentally struck down at Chancellorsville by a bullet from one of his own men. Little Sorrel bolted toward the Federal lines. In his declining years the horse lived with Confederate veterans at the Soldiers' Home.

FREDERICKSBURG, WASHINGTON SHRINE

Next day, 50 miles north, a gray-haired negro, whose wing collar and shabby tailcoat marked his dignity, showed me Fredericksburg, where Augustine Washington, George's father, had been a town trustee.

The Washington family, when George was a boy, lived on a farm across the Rappahannock. Homes of Mary, his mother, and Betty, his sister, are preserved in Fredericksburg, as is the Rising Sun Tavern, on a site owned by his brother Charles. The apothecary shop of Hugh Mercer, where George Washington * had an office, is still standing.

Civil War cannon balls are imbedded in old buildings. Here is a slave auction block, the home of John Paul Jones, the law office of James Monroe, and—

"Mah ol' massa taught me mah hist'ry by de boot method," remarked my guide, interrupting his own barrage of names and dates.

"The boot method?"

"Yessuh. Ol' massa was cap'n in de South'n ahmy, suh. W'en mah hist'ry slipped mah min', he jus' booted it right back in! Fine man, suh, mah ol' massa!"

There is so much history here! A week is not long enough to see all of Fredericksburg, where old houses with big brass knockers, name plates, and hedgerows are built close against brick sidewalks on streets with names as reminiscent of English rule as "Princess Anne" and "King George."

A LOST SPANISH COLONY

But had one forgotten chapter of American history ended differently, I might have seen patios, red tile roofs above plastered stone walls, and Spanish balconies.

Long before the English settlers came to Jamestown, Spanish explorers sailed up the Chesapeake. From a friendly Indian village they took the chief's brother as a willing shipboard guest.

In Mexico, baptized Don Luis Velasco after Don Luis de Velasco, the Viceroy of New Spain, the Indian learned Spanish. Later he went to Spain. Years afterward, the convert returned to Virginia with a party of Spanish priests who planned a settlement and a mission, nucleus of colonization, under his protection.

Don Luis Velasco heard tales from his tribesmen of the cruelties of Conquistadors to Indians in the south. Off dropped his loose mantle of civilization; leading painted savages against the white men, he killed all except one boy and destroyed their settlement so completely that now even the site is lost, somewhere in Virginia near the road to Washington.

SECOND JOURNEY FOLLOWS BOOTH'S TRAIL

In autumn I crossed the Anacostia River and began a second trip from Washington southward into the wooded western shore, a peninsula between the Potomac and Chesapeake Bay. The complete journey, roughly triangular, was to include central Maryland and southern Pennsylvania.

John Wilkes Booth fled into Maryland from Ford's Theater after assassinating Lincoln. He crossed the Anacostia River and paused a moment at the Surrattsville tavern. Mary E. Surratt, who had owned it, was hanged as a conspirator. Surrattsville was changed to "Clinton" on government maps. Officially it is Clinton still.

An old man, living in what used to be the Surratt tavern, said, "'Course, I was only 12, an' I wasn't here. But I never b'lieved Mrs. Surratt was guilty. Few of us do, in Surrattsville. Maps call this town 'Clinton,' but look at our new school an' see what we call it."

Big letters on the façade read: "Surrattsville School."

Dr. Samuel A. Mudd, an unassuming but talented country practitioner was awakened late at night to set Booth's leg, broken in the escape from Ford's Theater. Mudd was imprisoned on the Dry Tortugas.

"He was my relative," said John Mudd, as we sat in that attorney's home in Bryantown. "He was a Secessionist, knew Booth, and set his leg. He wasn't a conspirator, but his name was Mudd.

"Dr. George Mudd, my grandfather, lived in this house. Northern officers, in the

* See "Travels of George Washington," by William Joseph Showalter, NATIONAL GEOGRAPHIC MAGAZINE, January, 1932.

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FEATHERY ELMS AND MISTY WISTERIA WEAVE A GARLAND FOR THE CAPITOL'S DOME

George Washington officiated when, in 1793, builders laid the cornerstone of the Capitol. Congress met here first in 1800, the same year the effects of the National Government were brought in a packet boat from Philadelphia, earlier seat of national administration. During the Civil War, while armies camped across the Potomac and Washington several times was threatened, workmen were putting into place the huge iron dome. Union troops quartered in the building ate bread baked in the basement.

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Finlay Photograph by Harrison Howell Walker

GAY ROSES LIFT A VEIL OF LOVELINESS ACROSS THE SPARKLING SPLENDOR OF CHISELED STONE

The larger pediment surmounts the Government Departmental Auditorium on Constitution Avenue. At the right, a sculptured group represents "Communication"—apt adornment for the Interstate Commerce Commission Building. Charged with the enforcement of laws affecting railroads, express companies, bus and steamship lines, the I. C. C. has the power to establish freight and passenger rates.

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Finlay Photograph by Harrison Howell Walker

"PUCK" SEEMS TO SHIELD HIS EYES FROM THE PINK GLARE OF AZALEAS

The marble figure of the elf of *A Midsummer Night's Dream* overlooks a pool and garden beside the Folger Shakespeare Library, containing the world's finest collection of Shakespearean material. Of approximately 200 known First Folios of the plays, 79 are here. A vault contains one of Queen Elizabeth's corsets. Henry Clay Folger spent millions on the collection, which he bequeathed to Amherst College, his alma mater, to be administered for the American public.

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VIVID AZALEAS CHEER CONVALESCENTS AT WALTER REED HOSPITAL

War veterans, officers, soldiers, and their families are treated in this chief unit of the Army Medical Center in Washington, D. C. The building commemorates a gallant Army surgeon, head of the commission whose courageous experiments in Cuba proved that mosquitoes carry yellow fever, long the scourge of warm countries. To prove the theory, mosquitoes were allowed to bite infected patients, then to sting healthy volunteers, who contracted the disease.

RED ROSES FRAME A NATION'S TRIBUTE TO THE GREAT EMANCIPATOR

Each of the 36 exterior marble columns of the Lincoln Memorial represents one of the reunited States at the time of the martyr-President's death. From this shrine, visitors may look across the Potomac River to a high bluff in Virginia where stands the restored home of the Confederacy's general, Robert E. Lee (Plate VI).

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Finlay Photographs by Harrison Howell Walker

FLORAL SPLENDOR ECLIPSES THE COLOR OF GAY SPRING FROCKS

Azaleas glow against the gleaming background of the headquarters of the American Red Cross.

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A GRASSHOPPER'S VIEW EXALTS TULIPS, DWARFS A MONUMENT

Close to the spot selected by L'Enfant for a Washington memorial rises the marble shaft in honor of the Father of his Country. Many States, foreign nations, and individuals contributed suitably inscribed tablets, which are viewed by visitors who use the stairs instead of the elevator.

Finlay Photographs by Harrison Howell Walker

ARLINGTON HOUSE WAS HOME TO TWO GREAT AMERICANS

In a room of this mansion, built by George Washington Parke Custis, Colonel Robert E. Lee on the eve of the Civil War wrote the famous letter declining command of the United States Army. Quietly he rode from the plantation in civilian clothes to offer his services to Virginia.

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Finlay Photograph by Harrison Howell Walker

YOUTHFUL VISITORS FLASH BACK CONTAGIOUS SMILES OF PANSY FACES

Ranks of pansies, creeping phlox, candytuft, rock cress, and tulips adorn the U. S. Botanic Garden. Flowers like these grow in many places included on the accompanying map of Washington and vicinity. Public parks and gardens occupy more than one-eighth of the area of the District of Columbia.

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Finlay Photograph by Harrison Howell Walker

RED TULIPS, WHITE DOGWOOD, AND BLUE SKY FLAUNT THEIR PATRIOTIC POLYCHROME AROUND THE MONUMENT

Blossoming shrubs of many varieties scatter bright petals in gardens near the Washington Monument. Strollers and bicyclists find shady paths and broad stretches of lawns within sight of the towering marble shaft, tallest structure of unreinforced masonry in the world.

neighborhood, were looking for a clever Confederate spy who'd been getting through Union lines. My grandfather, a Union sympathizer, often asked them in for a card game.

" 'Your spy came to my house last night, all tuckered out,' he said to his friends one evening. 'Of course I fed him, and put him to bed same as I would anybody.'

"The officers jumped from their chairs. 'Which way did he go?'

" 'He's still upstairs—asleep.'

" 'What?'

" 'You're not going to touch him. He's my guest. We're not fighting the war tonight. Let's wake him and deal him in.'

"They played cards all evening in this room," finished John Mudd. "Next day they gave the spy an hour's start, and were after him again. In part, it was an old-fashioned, gentleman's war!"

Near La Plata, next day, I visited a ghost town, Port Tobacco. A weeping willow, twisted by time and wind, stands beside one ruin. From a once-fine old mansion, famed for chimneys as wide as the house, mantels are being sold, and even old flooring. As his home is slowly demolished around him, an elderly negro lives in the shell, fiddling happily.

At twilight I stood on the site of St. Marys City, first capital of Maryland (page 7). On a bluff overlooking an arm of the Potomac is a granite shaft with a chiseled tribute to Maryland, "where the persecuted and oppressed of every creed and of every clime might repose in peace and security."

Over dead leaves beneath old trees in a mossy graveyard, past an ivied church then being restored, I walked toward an arched gateway. Silhouetted there against the dusk were the iron words "St. Mary's Female Seminary."

A SEMINARY SERVES BUMPY STEW

The principal asked me to dinner. "We're having a seminary special, bumpy stew."

The school was founded about a hundred years ago to give life again to this long-forsaken site, and to help keep alive in Maryland the spirit of religious tolerance. Directors are Methodist, Catholic, and Episcopalian, the faiths then and now represented in the county.

"Our teachers—they're of many creeds—come from everywhere," my hostess said. "Girls must worship, but as they like. We would accept Mohammedans or Buddhists. I wish we had some. Catholic, Jewish, or Presbyterian, they all like bumpy stew. Married alumnae write for the recipe."

"I'd like it myself," I said.

"Fry chopped onions in butter until they're brown. Then fry ground beef in the mixture until that's brown. Sprinkle with flour; add milk, salt, and pepper. Keep stirring until it gets bumpy. Then," she added, "it's bumpy stew."

NORTH TO BALTIMORE

Next day I drove north to Baltimore where, weeks before, at the home of a Baltimore writer, I had eaten several helpings of home-baked spoon bread. This time we had dinner at a restaurant she chose. From the street it was unimpressive.

When fish was served with its sauce, I asked for catchup. The waiter brought the manager, who was visibly annoyed.

"We have gallons of catchup—*gallons* of it!" he sputtered. "You can have all you want. But why make fine sauce, if people order catchup? Why come here? Why not go where you need catchup?"

My dinner companion, who writes about homes of the Cavaliers of Maryland, told me of Hampton, built by the Ridgelys in Washington's time. Eight generations of that family have lived there. Age has mellowed their old home; Ridgelys seldom change it. Next day I drove northward beyond the suburbs toward Hampton where I hoped I might glimpse a bit of the graciousness of life in Maryland a century ago.

The head of the family received me cordially. Illness confined him to an enormous, high-ceilinged bedroom. He sent an old family retainer, a woman 50 years in his service, to show me the home.

She paused before a framed document. "This is one of our cherished things," she said, "a letter from Lafayette." It called Eliza Ridgely a bad correspondent, because his previous letter was unanswered.

"There's Eliza's picture, painted before Lafayette met her."

In a spacious hall the life-size portrait held queenly dominion. Stately in her white gown, Eliza looked even more radiant than the gilded angel on her golden harp.

"She played like that for Lafayette," my companion observed. Then she added, "We have that harp in the music room."

And there we saw it. Gone were the legs, the head, and even the gilt from the

Photograph by Willard R. Culver

THERE'S ALWAYS TIME FOR MUSIC IN THE QUARRYVILLE HARDWARE STORE

Some customers bring their own instruments; the proprietor keeps three fiddles handy for those who do not, and serves refreshments to all hands (page 32). More than a century ago, this southern Pennsylvania store was established by the father of the present owner.

plaster angel. I plunked two bass harp-strings that remained in place. A few others, once of gentler voice, lay mute and tangled on the floor.

We walked in the garden.

"The Ridgely cemetery is just beyond those hydrangea bushes," the woman beside me said, softly. "Eliza is buried there."

On a wide, hilly road I drove northward. In Philadelphia * next day I asked a former United States Senator how he would describe that city in a few words.

"I've heard Boston called a place where every idea has an executive secretary," he replied, "and Philadelphians in friendly jest have been called 'relaxed Bostonians.' There's something in it. We have the same interest in civilization, in the amenities of life, and in the sanctity of convention, that the Bostonian has.

"See the University of Pennsylvania, then go to the Franklin Institute——"

"Another museum?"

"Not a mortuary chapel!" he replied. "It's a living memorial to Franklin."

At the Institute a doorman lifted his hand, greeted me courteously, and added in a gentle voice, "I hope you enjoy your visit."

About to ask him something, I saw he was a robot! As I entered, I had intercepted a tiny beam of light; this affected an electric eye and set him going.

MACHINES DEMONSTRATE CHEMISTRY

Merely by pressing buttons, visitors may perform a hundred scientific experiments. One machine, a glassy array of tubes, broke water into its two component gases by electrolysis. An electric spark ignited the hydrogen. Exploding loudly, it recombined with oxygen from which electricity had separated it, and was water again.

In one long room a heavy-duty, 350-ton steam locomotive stood on a railroad track, electrified for a museum run. I joined a line of small boys. Ahead of me, a six-year-old climbed into the tender alone, nonchalantly yanked the throttle, and actually ran the engine down the track a few yards. Then he backed it, climbed down, turned his iron giant over to me, and swaggered off.

* See "Historic City of Brotherly Love," NATIONAL GEOGRAPHIC MAGAZINE, December, 1932, and "Penn's Land of Modern Miracles," July, 1935, both by John Oliver La Gorce.

Photograph by Willard R. Culver

ONLY SIX WERE ALLOWED TO SLEEP ON THE IN-A-DOOR BED IN THE BALLROOM

Early American taverns, often crowded, accommodated their overflow in the ballroom, though the luxury of a folding bed, rope spring, and straw mattress was unusual. "No more than six can sleep in a bed," reads a rule card preserved at Michie Tavern, rebuilt near Charlottesville, Virginia (Plate III). The inn, part of it dating back to 1735, long stood on an abandoned road near Earlysville.

They let me operate a "walking beam" steam engine, the type used on ferryboats and early locomotives. This example was built in 1849, yet its flywheel turned 3,000 revolutions a minute. The engine, trimmed in gold, was made of silver melted from one of his mother's teaspoons by a 16-year-old boy, and weighs half an ounce, with a cylinder bore of 1/16th inch. It runs by compressed air now, under a bell jar.

In the Union League Club a member said: "William Penn already had purchased Pennsylvania from the Crown, but he bought it again from the Indians. When they came to town to trade, they asked for a place to camp.

"'Camp on that vacant lot,' said Penn. 'I'll give it back to you.'

WIGWAM AMONG THE SKYSCRAPERS

"Penn had paid $80,000, about two dollars a square mile, for Pennsylvania. Land where we're sitting sold at $15,000,000 an acre. Yet across the street, behind that hotel, is a vacant lot for which no title seems to exist. At the City Hall they say no one pays taxes on it."

The little plot lay as the narrator had described it, in the shadow of the luxurious hotel. "Three or four years ago," said a doorman, "an Indian came to town from out West, heard about this place, pitched his wigwam, built a little fire to cook his supper, and camped there."

"Did you hotel people object?" I asked.

"We were nice to him. It's his land!"

I went to Girard College for orphan boys. It was endowed by Stephen Girard, mariner, banker, and merchant of early Philadelphia.

"Are you an ordained minister?" asked the polite gatekeeper.

"No. Why?"

Provisions of Girard's will, he explained, exclude all ministers.

"You've only a stranger's word that I'm not one," I said.

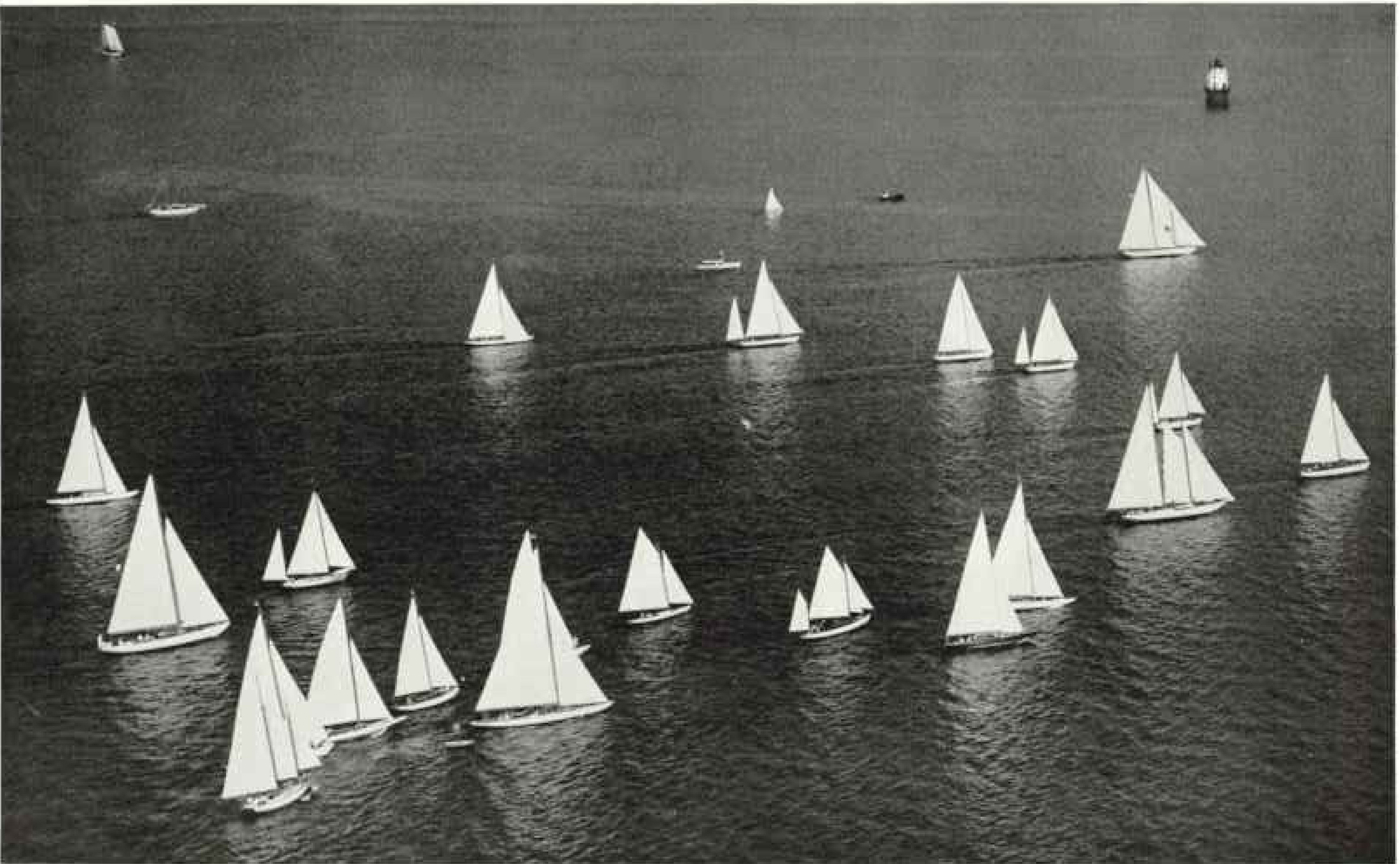
The gatekeeper smiled. "If you were a minister, of course you wouldn't lie!"

In Stephen Girard's time a man's religion was serious. Clashing doctrines provided material for bitter controversy. Girard wanted his boys to grow up before they had to choose. Nonsectarian chapel, however, conducted by laymen, is compulsory. It

Photograph by Fairchild Aerial Surveys

"MAIN STREET" IS JUST A FOOTPATH ON TANGIER ISLAND IN CHESAPEAKE BAY

There are no cars. Fishing boats and crab pounds fill the harbor. Beyond is Tangier Sound. At lower left, an estuary with lateral ditches is used to ferry supplies to the homes. The islanders long enforced a "porch ordinance" which prohibits loitering in public places during church services.



Photograph by H. Robins Hollyday

HARD ON THE WIND, GIBSON ISLAND YACHTS POUR ACROSS THE STARTING LINE IN THE ANNUAL 110-MILE RACE TO CEDAR POINT AND RETURN

At the mouth of the Magothy, between Annapolis and Baltimore, lies Gibson Island, yachting center and summer resort of upper Chesapeake Bay. These waters are crowded the year round. In summer white sails of the Yacht Squadron fleck the Bay, while in the fall and winter, bugeyes, skipjacks, and Bay schooners comb the shallow waters for oysters. This race, held in September, 1937, began in light, fair winds. Next afternoon a thundersquall, which turned into a northeast storm, came up and drove the smaller boats to shelter before the finish. Baltimore Light, upper right, marks the entrance to the narrow dredged channel to Baltimore, 18 miles distant.

Photograph by Willard R. Culver

SECRET TUNNELS AT WESTOVER WERE PROTECTION AGAINST INDIAN RAIDS

From a fireproof, well-provisioned cellar in the Virginia colonial mansion of Col. William Byrd, founder of Richmond, led two underground passageways lined with brick and stone. One went to the James River, where its opening was hidden by a thicket. This one ended in what appeared to be a dry well, with a disused well house above it. The tunnels provided easy access to the shelter of the house, or egress for messengers seeking help. Today they are walled shut.

is held in a fine new structure carefully built to resemble no extant religious edifice.

From Philadelphia I turned westward past Valley Forge, where Washington's ill-clad, undernourished army camped during the winter of 1777-78. I had always pictured that band of patriots suffering in the hollow of a little valley. The Valley Forge of history is on a cluster of high hills overlooking approaches in all directions; it was named for an old forge in the valley below, near the Schuylkill River.

I continued westward toward Lancaster, past stone farmhouses and hilly fields. On one roadside barn that might have been standing when settlers marched that way to join Washington, a farmer had painted a sign: "Save the Constitution."

Lancaster County is in the Pennsylvania Dutch country, famed for farms so spick-and-span that even back yards are swept. Here dwell Amishmen. A water wheel was the means of my first introduction to this branch of the conservative Old-World Mennonite sect. It was spinning below a brookside flume with not a house in sight.

The water wheel transmitted power by two heavy, seesawing wires. I followed them a hundred yards through an orchard, and to a barn where they ran a pump. A farmer greeted me. He wore a flat, wide-brimmed hat. His roughly woven coat was fastened with hidden hooks. Buttons would have been "ornamental." He had long chin whiskers, no mustache.

TIME LAGS AMONG THE AMISH

Near the towns of Goodville, Churchtown, Bird in Hand, Bareville, Blue Ball, Intercourse, and Paradise, the horse-drawn vehicles of the Old Order Amish are as common as automobiles. Five little black-topped buggies stood by hitching posts at a store in Intercourse.

The merchant was measuring fine imported white Swiss organdie, for Amish women to make dainty house caps. A boy asked for a package of "chawin' goom."

"Amishmen keep their word, and pay their bills," said the storekeeper, later. "Their methods are direct. Once there was a tavern in the town of Intercourse. They

thought it a bad influence on young people, but made no fuss about it; just bought the tavern, and closed it.

"They're generous and helpful. When a farmer needs a new barn, 50 or 75 men come in the morning for a barn-raising and by night it's almost finished. I've seen them harvest 10 or 15 acres of corn in a day for a sick neighbor.

"Recently, to enlarge my store, I had to tear down the long brick side wall. I told a group of customers that it would interrupt trade for a long, dusty week.

"'We'll have a frolic,' they said.

"When the day came, forty Amishmen were here at eight o'clock. They worked all morning, with some horseplay, trying to see who could do the most. My wife and the neighbors gave them dinner. By four o'clock the wall was down. Every brick was cleaned, and piled for the masons."

That night in Lancaster I complimented a restaurant man on his fine Pennsylvania Dutch cooking. He spoke of Amishmen.

"They've been courteous," I said, "but I'd like to see the inside of one of their homes."

"Maybe I can help," the restaurateur said. "I buy 800 bushels of potatoes every year from a farmer near Bird in Hand."

Next day we drove through the country, pausing often to talk to the Amish. Beside a horse and buggy, we waited for a long, slow freight train at a grade crossing. A little boy watched, fascinated, from his buggy seat. At last, glimpsing the caboose coming round a bend, he said to his mother: "Ain't, mom? When it makes the little red house, it's all!"

At dinner time we called at a farmhouse, where a bearded man stepped onto his porch and closed the door. "What brings you?" he asked.

"You Amish have no telephones," my companion explained, "so I had to drive out to cancel my potato contract."

The worried farmer invited us in. His wife asked us to stay to supper. We sat around a big table with four little Amish boys and their parents.*

Fried cornmeal mush, crisp on the surface, soft inside, was served hot with molasses. We had home-preserved tomato sauce, cooked with a little flour and poured on crackers. There were dried apples and dumplings—called "snits and nep"—Lancaster County Swiss cheese, hot roasted peanuts grown in the back yard, and pear

* See, in this issue, the color series, "Pennsylvania Dutch—In a Land of Milk and Honey."

Photograph by John Patric

FROM A FIREMAN'S LADDER THE CAMERA SEES MONTICELLO FROM A NEW ANGLE

Below the hedge is a hook and ladder truck driven to Jefferson's "Little Mountain" by the Charlottesville Fire Department (page 46 and Plate II). A friendly fireman brings a color filter to the photographer.

butter with corn bread. My companion said he had not been serious about the potato contract.

In Lancaster I found a tobacco shop that has been eight generations in one family. Beside the cash register stood a 20-pound jar of finely powdered snuff, still sold in bulk. Tobacco is an important Lancaster County crop, and the shop uses much native leaf in its factory.

There is in Lancaster an eight-room house, built on a wager in a ten-hour working day. At nightfall a family moved into a substantial brick dwelling where a vacant lot had been that morning.

THE FACE ON CARTERS HILL

On Carters Hill, near Robert Fulton's birthplace, south of Lancaster, stands an old yellow house. Dark-green shutters hide all upper windows, except one in the attic from which a cold, ashen face has looked for more than 30 years (page 45).

In Lancaster they said a woman, finding her lover faithless, willed her home to a relative for "only so long as my death mask looks from an attic window for my false lover to see." Then she hanged herself.

At Carters Hill an old lady opened the door at my knock. The day was cold; for that reason she asked me in.

"Death mask?" she repeated, smiling at my query. "No indeed. There are twenty stories about the 'Face on Carters Hill.'

"I was a young schoolteacher when I came to live here. Henry Carter, who studied phrenology, owned a plaster head. Years after her father's death, Miss Kate found it while house cleaning.

"'Poor thing!' she said. 'If you looked out the window, what would people say?'

"It's been there ever since. During her declining years, Miss Kate, a shut-in, liked to sit behind the curtain and watch puzzled passers-by. When she gave me this house, she asked me always to keep the face in the window."

On my way north that evening, I heard the lively music of fiddlers in a Quarryville hardware store (page 26).

"I keep three fiddles handy f'r my customers," said the proprietor, as he passed cider and doughnuts.

"It's sociable," I said, "but if you go on like this, aren't you apt to go broke?"

"My dad started this store more'n a hundred years ago. I been runnin' it quite a while myself. Haven't gone broke yet!"

The man is president of the Quarryville bank. He has been guardian of many an orphan, and looks after affairs of the aged.

"I like kids—an' old folks," he said. Quarryville people say that any boy who wants to build a birdhouse can wangle free nails from the hardware dealer.

The merchant is widely known for his likeness to Clarence Budington Kelland's "Scattergood," and for his Slumbering Ground Hog Lodge (page 6).

A rivalry that began in the 15th century between the houses of York and Lancaster in England is carried on in southern Pennsylvania now in a fashion less sanguine than the bitter Wars of the Roses.

The towns of Lancaster and York, somewhat similar in size, origin, and appearance, are friendly rivals today. They are 20 miles apart, with the Susquehanna River about halfway between them. East of the river bridge, red roses of the House of Lancaster grow beside the highway. West of it are white roses of the House of York.

THE TOWN OF LITTLE HEISKELL

Near York is Gettysburg, a town of about 5,600, almost surrounded by Civil War battlefields.* From there I drove southwest to Hagerstown, Maryland, to see Little Heiskell (page 14).

Months earlier, near Hagerstown, I had watched U. S. Army men re-enact a part of the Battle of Antietam. When the last blank cartridge had been fired, old soldiers spoke into a broadcaster's microphone.

"If we'd had the chance the Yankees had," exclaimed one, "the war'd been over in six months, an' I'd still be a citizen of the Confed'rate States of America."

"What do you think," he was asked, "of Yankees now?"

The gray-clad centenarian kissed the nearest old Yankee veteran.

In the hills near Boonsboro is an arch erected by the efforts of George Alfred Townsend, the writer "Gath," to "the army correspondents and artists of 1861-65, whose toils cheered the camps, thrilled the firesides, educated provinces of rustics into a bright nation of readers, and gave incentive to narrate distant wars and explore dark lands."

At Keedysville, south of the Hagerstown-Frederick highway, lives a man who boated for 20 years on the Chesapeake and Ohio

* See "Most Famous Battle Field in America," NATIONAL GEOGRAPHIC MAGAZINE, July, 1931.

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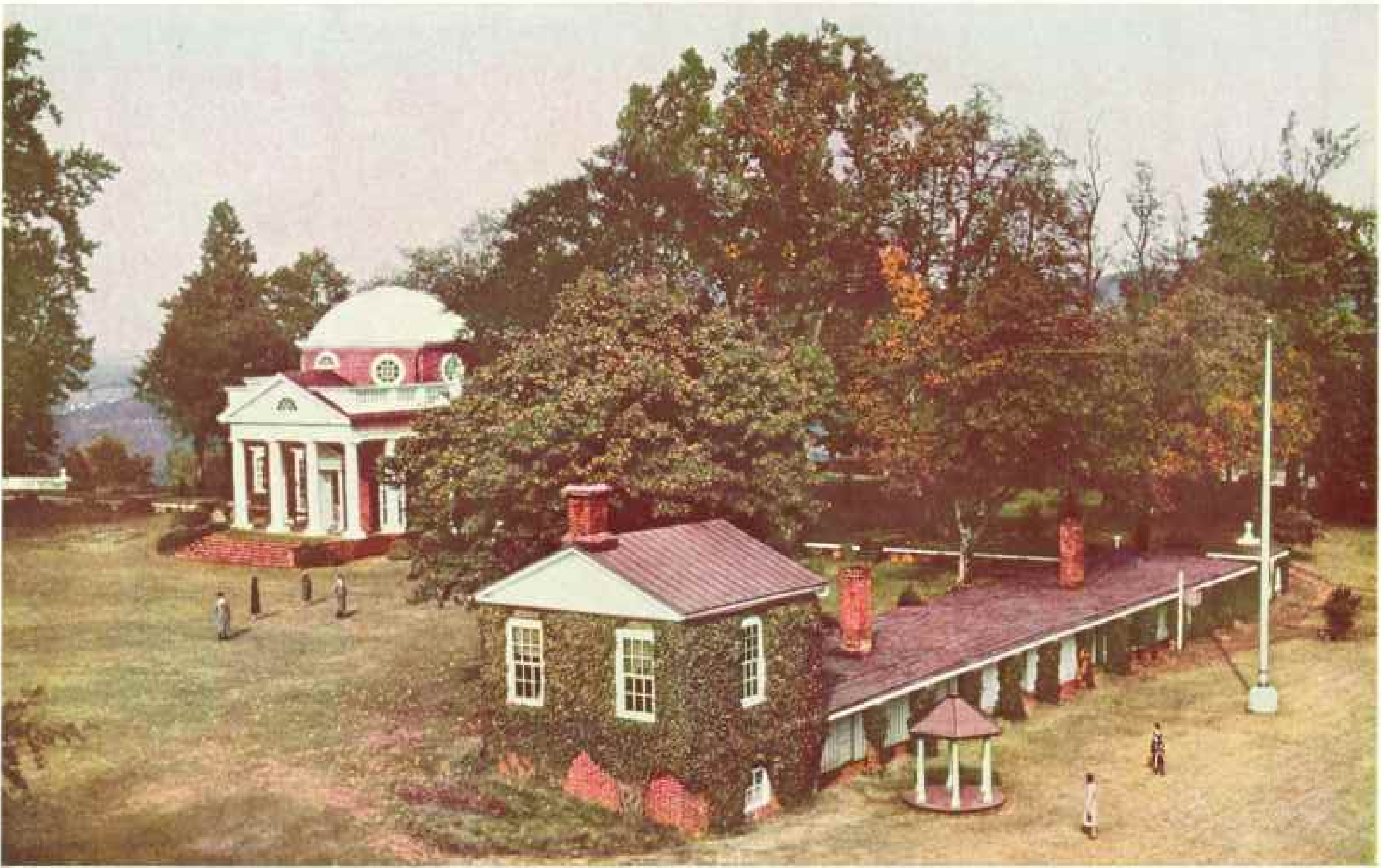
"OCEAN, I LOVE THEE!" A WINDJAMMER'S FIGUREHEAD SEEMS TO MURMUR, WISTFULLY

Columbia is a wooden woman of mystery; unknown are the names of her sculptor and the vessel she adorned. She rests now with other ships' relics, paintings, and models in the extraordinary Mariners' Museum, near Newport News, Virginia, one of the country's important shipbuilding centers. The city received its odd name from two men—Captain Christopher Newport (an associate of Captain John Smith) and Sir William Newce, on whose advice the site for the settlement was chosen.



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Dufaycolor Photograph by Willard R. Culver

FROM A 65-FOOT FIREMEN'S LADDER THE GEOGRAPHIC PHOTOGRAPHER LOOKS DOWN ON MONTICELLO

Charlottesville firemen brought a ladder truck up the steep winding road to Monticello to make possible a picture of a familiar American shrine from an unfamiliar angle. The structure covered with English ivy was occupied by Jefferson and his bride in the winter of 1772, while the mansion was being completed. Shaded by Norway maples, copper beeches, and tall lindens, a covered underground walk connects the servants' quarters with the big house.

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Finlaycolor Photograph by Willard R. Culver

OLD-STYLE COLONIAL DINNERS MAY STILL BE COOKED IN THE KITCHEN OF MICHIE TAVERN

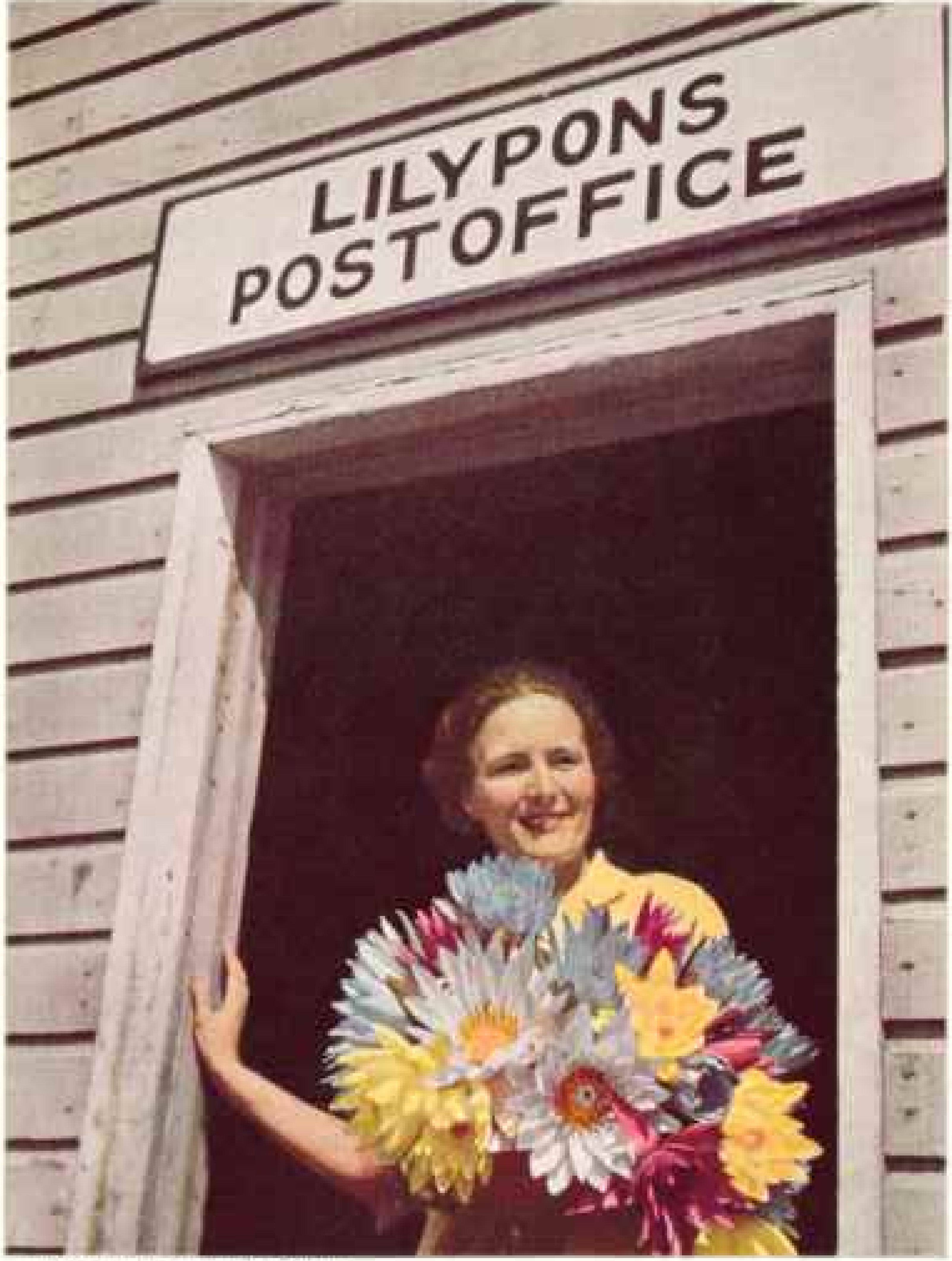
A drawn turkey, baked with its feathers on, is pulled from the hot ashes. The weather-beaten inn, partly built by Patrick Henry's father, was dismantled on its original site a few years ago, and then reassembled on the hilly road to Monticello. It is furnished and equipped as it was when first built.

© National Geographic Society

Dufaycolor Photograph by Willard R. Culver

PICKANINNY POWER GENTLY SWINGS THE DINING TABLE FAN IN AN OLD VIRGINIA MANSION

A wedge-shaped framework, covered with wallpaper depicting scenes from *Don Quixote*, hangs from a wooden shaft that extends into a modernized kitchen. A negro boy operates the punkah by pulling two ropes. The relic of ante-bellum days is preserved to amuse guests at Tallwood, near Scottsville.



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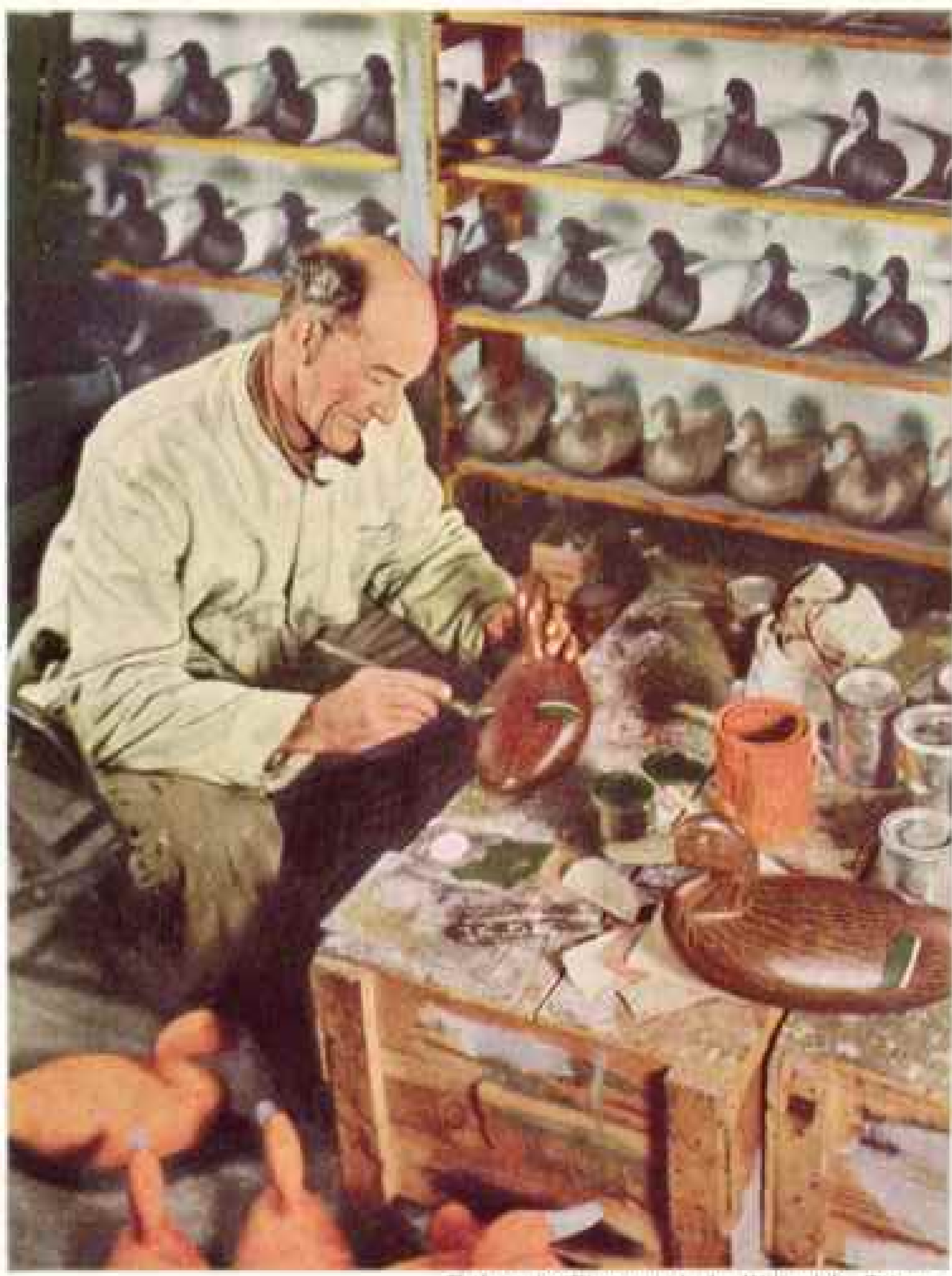
WROTE LILY PONS: "I'M DEEPLY TOUCHED"

Big shipments of goldfish catalogues and lily bulbs made possible a new post office near Frederick, Maryland. Postal officials rejected the two-word name "Lily Ponds" and adopted the contraction, pleasing the opera singer, who sends her Christmas cards here for postmarking.



Dufaycolor Photographs by Willard R. Culver

IT'S AN UNLUCKY DUCK THAT KNOWS ITS OWN IMAGE!

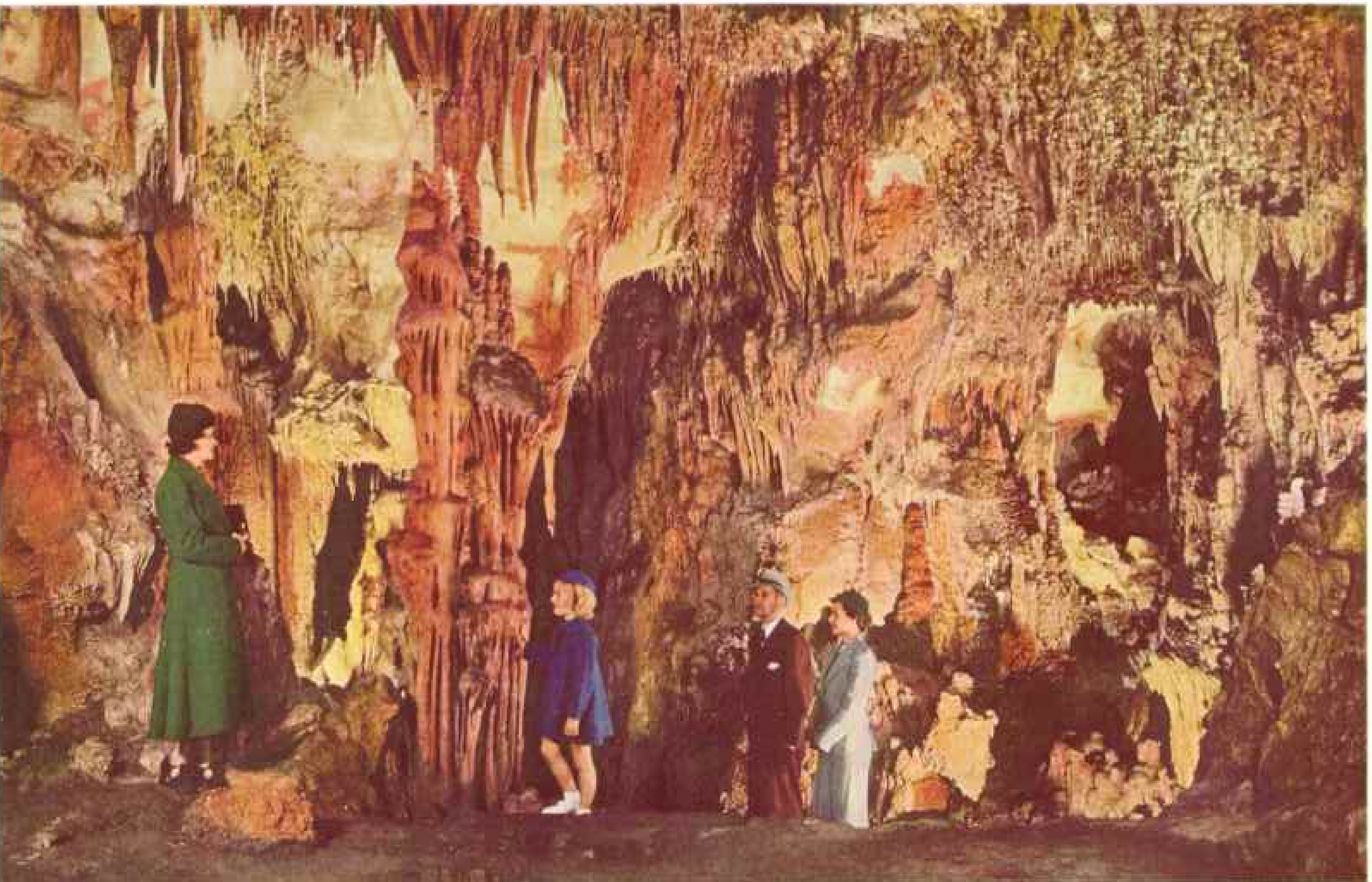
To lure game birds within shotgun range, Robert F. McGaw, of Havre de Grace, Maryland, manufactures decoys of nine varieties of migratory waterfowl. Set out in long strings or anchored individually around the blind, the wooden ducks bob and tip on the waves as if alive.

© National Geographic Society

Dufaycolor Photograph by Willard R. Culver

THERE'S ROOM FOR EVERY DELAWAREAN ON LONG REHOBOTH BEACH, RIVIERA OF THE DIAMOND STATE

From near the mouth of Delaware Bay, an almost continuous line of narrow, grassy islands and peninsulas extends southward for more than 60 miles. Below Rehoboth are Bethany Beach, Delaware, and Ocean City, Maryland. Farther south, herds of wild horses roam Assateague Island. Then come smaller islands, glamorous with tales of shipwreck and pirates. South of Chesapeake Bay is Virginia Beach, the "Atlantic City" of Virginians.



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Dufaycolor Photograph by Willard R. Culver

SEEPING WATER DEPOSITED THE MINERALS THAT FORM THE DRAPERIES OF THIS CAVERN MURAL

Iron-stained surfaces are brown and orange; pure calcite formations are lighter, often snowy white. Stalactites are usually hollow, like soda straws, and grow downward. Stalagmites are solid and build upward; those the child is looking at in Endless Caverns may be an inch higher when the child is 70. Other well-developed limestone caves like this are open to visitors all year in the Shenandoah Valley of Virginia.

SPECTRAL BALD CYPRESS HELPED GIVE DISMAL SWAMP ITS GLOOMY NAME

Though most were cut into lumber long ago, a few gaunt veterans, sometimes gray-hung with Spanish moss, still fringe Lake Drummond, near Norfolk. Near by are primeval forests of these trees. Branching knees are breathing organs, supplying roots with air so trees will thrive in water. To the ancients, the cypress was symbolic of the dead, and sacred to Pluto.

© National Geographic Society

Kodachrome Photographs by Willard R. Culver

HIS MASTER'S MAILMAN RARELY FAILS TO MEET THE CRISFIELD BOAT

When this Chesapeake retriever is not hunting ducks, his job is to carry packages for the storekeeper to and from the mailboat at Tylerton, on Smith Island in Chesapeake Bay.

Canal, between Washington and Cumberland.

"I used to haul 125 tons of coal at 40 cents a ton," he said. "The canal was 186 miles long, with 75 locks. There was a long tunnel near Cumberland. Often it took four days from Georgetown, going up empty, and five days from Cumberland, coming back loaded—if we boated day and night.

"In the forward cabin we kept mules that weren't working. We carried four to six; they pulled in shifts. Often we had fiddles on the boats, and some men used bugles for boat horns."

Francis Scott Key is buried in Frederick. On his grave I saw a flag that had never been taken down, even for thunderstorms, since it was hoisted months before. Thinking to give it to a country school, I bought a new one and made an exchange.

RAGS, THE DOG THAT WENT TO WAR

On a back road north of Washington, a few miles from Silver Spring, is a cemetery for pets (page 47). The 2,600 interments include dogs, horses, canaries, cats, and even raccoons. A white rabbit that used to follow its master like a dog was given a free funeral because a bereaved little boy had no money.

"The most distinguished dog here," said the custodian, "is Rags. He was picked up by Sergeant Donovan in France. Donovan was with the Seventh Artillery, First Division, A. E. F. In the Soissons action, the intelligent dog learned to fall at the sound of shellfire. Participating in an attack on a machine-gun nest, Rags bit the enemy. A soldier took him aloft in an observation balloon. It was shot down; the dog descended safely by parachute in the soldier's arms.

"Once, when Sergeant Donovan's unit was advancing into enemy lines, it was surrounded. Its telephone line was cut. Rags took back a message that brought support and saved their lives. Wounded twice in action, the dog was lamed, and lost an eye. After the Armistice he came to America.

"When Rags was nearly 20 years old, he was brought to my kennels for care. I kept him in my home. The old dog made friends with a puppy, and wouldn't eat unless that pup shared his dinner."

Army officers came from Washington to attend his funeral. One of them put a little American flag on the grave, and there I saw it, on my road to Washington.

My third journey from Washington took me into the mountain region southwest of the Nation's Capital. Far different in historic background, way of life, climate, and vegetation are the mountains of the Virginias from tidewater coastal plains. Here plantations were impossible. Hard winters and the difficulties of transportation to distant markets developed self-sufficiency on the farms and independence in the people.

OFF FOR A MOUNTAIN TRIP

One morning in late fall I found myself in Winchester, from which thousands of carloads of apples were being shipped away, even to Europe. English commission merchants have offices here, on Piccadilly Street.

"Why is this 'Hanging Rock'?" I asked a roadside storekeeper and postmaster west of Winchester. "Where's the rock?"

"Once it extended far over the road—almost a natural bridge," he replied. "Contractors, building Highway 50, blasted away Hanging Rock to get the stone. To us the old landmark was commonplace; to travelers it would be a wonder. We've got a fine highway now, but we haven't got the Rock!"

"Near here Nancy Hanks, Lincoln's mother, was born," said a hotel clerk in Romney, West Virginia. "If you want the history of the town, see Miss Sydney Pancake. The Pancakes are old settlers."

I talked to several Pancakes. One relative runs a service station that is a museum of relics of the war that split Virginia into two States. "My uncle Joe Pancake carried this single-shot Sharps rifle when he fought the Yankees," he said.

INDIAN TRAIL STILL VISIBLE

From Romney I went towards Elkins, West Virginia. The road wound higher and higher into the mountains. In the distance, ridge upon ridge, each a dimmer tone of blue, the Alleghenies lost themselves in the mist.

In the spring rhododendron and mountain laurel bloom, and mountaineers boil maple sap into syrup along the old Seneca Trail. This Indian warriors' path roughly followed the Alleghenies from New York to the South. Though made centuries ago by moccasined feet, some of it may be seen today. Near Mingo, Indians of that name, branch of the Iroquois, left embers of the last Indian campfires in West Virginia.

On Droop Mountain, where horsemen still carry winter mail, there are one-room

Photograph by Willard R. Culver

PEANUT PORK AND HARDWOOD SMOKE MAKE DISTINCTIVE HAMS

In this Smithfield, Virginia, smokehouse, fumes are too dense for photography when curing really begins. Hogs roam for months in woods and fields, gaining flesh, then they are fattened on soybeans and corn before being loosed in peanut fields to root up what nuts are left after harvest (page 7). Fresh hams are packed in salt for about three weeks, then washed. Smoking is done on dry, cool days, and often requires a month's time. Then the hams are peppered and rehung in the smokehouses to drip grease during the long, hot summer. After that, at least six months old, Smithfield hams are ready to sell.

Photograph by Willard R. Culver

"THE GRAVE OF THE FEMALE STRANGER" KEEPS HER SECRET FOREVER

One autumn day, more than a century ago, there arrived at a hotel in Alexandria, Virginia, a gentleman accompanied by a lady who was ill. The taciturn man gave no information except to a doctor and a nurse who, sworn to secrecy, never divulged it. At the lady's death, her companion purchased a lot in St. Paul's Cemetery and paid for this tomb with drafts on England. In part, the inscription reads: "Female stranger, whose mortal suffering terminated on the 14th day of October, 1816, aged 23 years, 8 months. Stone placed by her disconsolate husband, in whose arms she sighed her latest breath, and who, under God, did his utmost to soothe the cold dead ear of death."

schoolhouses with fat iron stoves and oil lamps. To the hill children in one of them I gave the ragged American flag from the grave of Francis Scott Key. As they saluted it, I asked them what it meant.

"It means freedom; it means we haven't got a king," said one little girl.

"What does it mean to you?" I asked a big boy in the back row.

"Nothin'. But, mister, did yuh know Dan'l Boone shot a bear down the road a ways?"

The Virginia-West Virginia State line, following a divide, meanders so much that at one point in Virginia a hiker may walk three miles north, south, east, or west and go out of the State.

Through this forested mountainous region I drove south to old Sweet Springs to see the only general store designed by Thomas Jefferson. Actually, Jefferson planned only the once-fashionable hotel there, its pillared porticoes vaguely reminiscent of Monticello. Only a corner of one wing nearest the highway is occupied—by an old-fashioned general store.

The people still tell how Jerome Bonaparte, brother of Napoleon, courted Betty Patterson here. His marriage to the Baltimore belle displeased Napoleon, and became a topic of conversation all over the world. For years, though still furnished, the hotel has been closed and the old piano gathers dust in a silent ballroom.

Photograph by Willard R. Culver

JOHNS HOPKINS UNIVERSITY WAS BUILT IN GEORGIAN COLONIAL STYLE TO HARMONIZE WITH AN OLD BALTIMORE MANSION

A Baltimore merchant bequeathed a fortune to found the University and Hospital that bear his name. Noted for research and advanced scholarship, the institution outgrew downtown quarters and, in 1901, Homewood House, built just a century earlier by Charles Carroll of Carrollton, was presented, with its adjacent estate, to the University. Other buildings, conforming to it architecturally, were erected around the old mansion, now restored and refurnished as it was in Carroll's time. On Charles Street, near the campus entrance, stands this monument to the founder. Famed Johns Hopkins University Hospital is in another part of the city.

Photograph by Willard R. Culver

SOME PANTRY SHELVES AT BREMO ARE ON THE PANTRY DOOR

Prepared food is placed by the cook in an open cupboard built against a door that turns on a central pivot to swing the dishes into the dining room, ready for serving. In many details the mansion at Bremo reflects the genius of its architect, Thomas Jefferson (page 47).

Photograph by John Patric

FEW HAVE SEEN THE PROFILE OF "THE FACE ON CARTERS HILL"

But to passers-by on a road near Conowingo Dam the face in the attic window has been a mystery since they rode in buggies. Some local legends call it a death mask, others term it a mummy. From an old lady who lives in the shuttered house on Carters Hill, the author learned the true story (page 32).

Photograph by Charles Martin

OLD "ATLANTIC," BUILT BY A WATCHMAKER, RUNS 8 MILES ON A TON OF COAL

Phineas Davis, of York, Pennsylvania, won a $4,000 prize in 1831 for designing a similar grasshopper-type locomotive for the Baltimore and Ohio Railroad. At the Fair of the Iron Horse, near Baltimore in 1927, these "passengers," dressed in the fashion of the 1830's, rode in double-decked Imlay coaches as their forefathers did when trains like this ran to Frederick, Point of Rocks, and later to Harpers Ferry, from the Maryland metropolis. The locomotive, operating at 20 to 30 miles per hour, was the first to enter Washington, D. C., on rails, and was in continuous service until 1893. It still chugs along for exhibition, resting between times in old Bailey's roundhouse at Baltimore.

The near-by village of Gap Mills is the birthplace of Andrew Summers Rowan, the man who, without question, carried President McKinley's "Message to Garcia" at the time of the Spanish-American War.

One member of the Rowan family keeps a store in Gap Mills today; another runs the service station. "We pronounce it 'Roawn,'" said one. "Andrew was born here in 1857, and is still living, out in San Francisco. He was a mountain boy who'd learned to depend on himself. He didn't talk much. Maybe that's why the message went through."

In the headwaters of Dunlap Creek is Beaver Dam Falls, where a meandering stream drops into a deep pool. By it grow ferns and wild columbine. Rambler roses cover old cabins not far away.

South of Lexington is Natural Bridge. Thomas Jefferson, recognizing it as one of the world's wonders, bought it for 20 shillings. Its value has so increased with the years that today it costs a similar sum for a small family to look at it.

Next day in Lexington, a student showed me Washington and Lee University, endowed by George Washington. He explained how General Robert E. Lee, who is buried here, became president of the school after the Civil War.

Students, he said, are expected to speak to everyone by name, if they can, otherwise by the expression "Hi, gentleman." Long ago an undergraduate, who is called "the unknown soldier," escorted a travel-stained stranger around Washington and Lee. Afterwards, the will of a wealthy New Yorker conveyed much of his fortune to the school, because of his courteous reception there.

From Lexington I went northeastward to Charlottesville to meet Culver again. We took the steep, winding road to "Little Mountain,"* where Thomas Jefferson built a home with an unobstructed view.

* See "Jefferson's Little Mountain," by Paul Wilstach, NATIONAL GEOGRAPHIC MAGAZINE, April, 1929.

Photograph by John Patric

TWO PEKINGESE VISIT THE GRAVE OF A DEPARTED SCOTTIE NEAR WASHINGTON

Hundreds of animal tombstones stand in a pet cemetery near Norbeck, north of Washington. One chiseled canine epitaph is a long poem, "The Little Dog Angel." Napoleon, a weather-prophet cat of Baltimore, who used to howl lugubriously at the approach of a storm, has a stylish marker. An impressive memorial is planned for the grave of Rags, the dog that went to war (page 41).

"Every picture I've seen looks upward at the house," Culver said. "I want one from above it." That afternoon he asked Charlottesville firemen if they could take their 65-foot extension ladder to Monticello (page 31 and Plate II).

DINNER AT JAMES MONROE'S

Near by is Ash Lawn, open to visitors, where lived James Monroe. Its present owner invited me to dinner in Monroe's dining room, preserved much as he left it.

The ham that was served had come from Monroe's old smokehouse. The beaten biscuits looked a little like hardtack. To make them, a dough of flour, salt, and water had been pounded on a meat block with heavy sticks "at least a hundred times."

Southeast of Charlottesville, near the James River, we visited Bremo (page 45). Here lived General John H. Cocke, early American advocate of moderation in drinking, who built a temple to temperance along classic Greek lines at a spring below Bremo Bluff, beside the old James River Canal, now abandoned.

The General thought hard-drinking canal boatmen might prefer cold water to fiery alcohol if only they could get it. So, near an edifice dedicated to sobriety, he placed a cast-iron pitcher almost as high as a man. Into it he piped spring water.

The pitcher was tipped a little, and from its lip poured a crystal stream; even from canalboat decks it could be seen sparkling in the afternoon sunlight. Bargemen, to Cocke's delight, carried the cold water away in buckets. Around the bend, out of sight, they used it to cool their drinks. Today the pitcher stands on the lawn of the restored mansion at Bremo.

General Cocke taught his slaves reading, writing, and Christian principles in a basement schoolroom of his mansion. When a negro republic was founded in Liberia, Cocke encouraged his slaves to emigrate. Members of the family possess beseeching letters from many who had learned to write at Bremo, begging to be returned to Virginia and their kind old master.

As I traveled back toward Washington over the Skyline Drive, I almost wished it were night. For then the lights in the valley look like reflections from the sky

above them, and "Shenandoah" seems indeed the "Daughter of the Stars."

West of Shenandoah National Park are the Caverns of Luray. A Civil War veteran developed them; though almost a centenarian, he is still active. He had noted the constant clear, cool air of limestone caves. It filters through porous rock, is never stagnant, contains little dust and few bacteria. About forty years ago the old soldier built a wind tunnel from the cavern to his home. Huge electric fans, pushing cool air into the big white house, keep it at 70 degrees on hottest days. In winter the clean air from the caves, heated, warms the house.

Warrenton is one of the Piedmont towns famed for horses and fox hunting. Socialites in pink coats ride fine horses to hounds, while farmers, who never appear in society columns, go fox hunting on mules.

WALL STREET IN WARRENTON

"Behind this house is Wall Street," a broker's clerk said. "That sign on our little lane once marked Wall Street in New York. It was borrowed, brought to Warrenton, and put up as a joke. Most customers of the office have been wealthy investors with estates near by, though farmers occasionally bought a little stock.

"Once in a while someone who saw our sign, 'Member of the New York Stock Exchange,' asked what we paid for cattle. Country folk have often read the ticker for hours as if they owned hundreds of shares on a rising market."

Not far away is country almost untouched by the 20th century. Once I followed a man who rode a mule through the woods with saddlebags of corn. We came to an old water mill, built so long ago that giant oaks stood on the earthen dam of the millpond. I was allowed to open the sluice gates, watch tan foam on a mossy wheel, hear the rumble of meshing hickory teeth, feel hand-hewn timbers shake beneath my feet, and grind a little corn.

Traveling northeasterly toward Washington, I passed the scene of the Battle of Bull Run, where southerners, in '61, first convinced the North that victory would not be easy. At Great Falls of the Potomac, on the Virginia side, I saw a small boy hook a catfish almost as big as he was.

In a big house near McLean lives a man who calls himself "Skippy's daddy."

"Sometimes," he said to me, as the comic strip character might have talked, "I get to dreamin' an' thinkin' about days when I was a kid. An' I can dictate Skippy's dialogue for two or three weeks ahead. There was criticism of the first Skippy prayers, but people seem to like them now."

I remember one: "Oh Lord, give me strength to brush my teeth every night and if Thou canst not give me that strength, give me the strength not to worry about it."

Old stone piers of Chain Bridge, part of the road to Washington, were being rebuilt to carry a higher, wider span above the wildest floods. Instead of continuing to Key Bridge and crossing to Georgetown, I went to Alexandria.

This was George Washington's home town when Mount Vernon was his farm. Alexandria is near enough to the Capital to be its suburb; yet these neighbors are almost as different as if they were a continent apart. Architecturally, Washington changes as it grows. Alexandria, treasuring, even adding to its colonial atmosphere, guards a few old cobbled streets as if the stones were gold.

"OSCAR" HAUNTED A SPARK-PLUG WORKS

Years ago I used to pass a spark-plug factory in Alexandria that had been a cotton mill before the Civil War. One day it was closed. When I had last seen it, its dark old weathered walls, pierced by windows with broken panes, rose several stories above weeds in its littered yard.

One eerie sign of life remained, a dummy known as "Oscar," said to be a murdered watchman's effigy, seated by a window.

On a Sunday afternoon, beside the broad new Memorial Highway that sweeps into Washington, I saw the old building once more. It was gleaming white; windows were glazed again; stately pillars lifted a portico above its well-kept lawn. Oscar sat in a cupola above its gabled roof. That old factory had become a colonial-style apartment house.

Incredible thousands have crowded into the Capital to staff the growing bureaus of expanding government. They must have somewhere to live; and little escapes the architect, on roads near Washington.

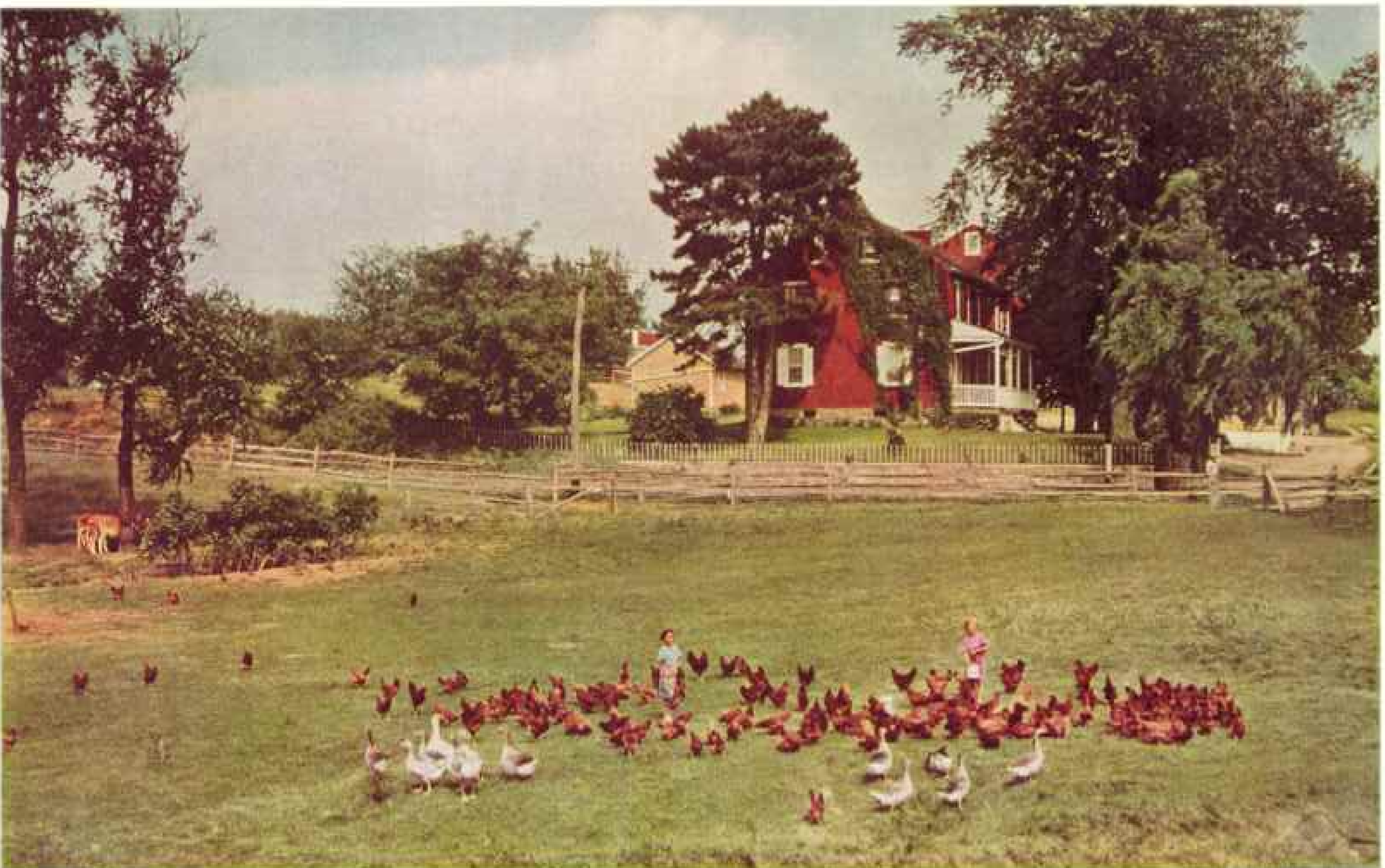
INDEX FOR JANUARY-JUNE, 1938, VOLUME READY

Index for Volume LXXIII (January–June, 1938) of The National Geographic Magazine will be mailed upon request to members who bind their copies as works of reference.

© National Geographic Society Dufaycolor Photograph by J. Baylor Roberts

"COME, YE THANKFUL PEOPLE, COME; RAISE THE SONG OF HARVEST HOME!"

Lutherans in the little church at Neffs, near Allentown, sing the old hymn by Lowell Mason at their annual service of thanks for bountiful crops. Fruit and vegetable offerings are banked high about the chancel. Members are Pennsylvania Dutch, descendants of Germans from the Rhine Valley and Swiss who settled in the southeastern part of the State from 1683 to the middle of the eighteenth century. The name applied to the industrious folk is a corruption of their own term for themselves, "Deitsch." Some, however, prefer to be called "Pennsylvania Germans."



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Dufaycolor Photograph by J. Baylor Roberts

DAINTY DAUGHTERS NEVER GROW UP TO BE "SHUSSLES" WHEN THEY DO THEIR SMALL CHORES WELL

Lancaster County mothers constantly warn against the *shussle* state, a dreaded combination of shiftlessness and carelessness. On this farm pleasant tasks are assigned to train the young girls. Celebrated in song and story are the thrifty Pennsylvania Dutch who have clung to the soil and their old ways of living. Among them are members of such plain sects as the Schwenkfelders, Dunkards, Mennonites, and Amish.

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Kodachrome Photograph by J. Baylor Roberts

"SPOOKS" WERE AFRAID TO "FERHEX" CATTLE WHEN WHITE SYMBOLS COVERED THE RED BARNS

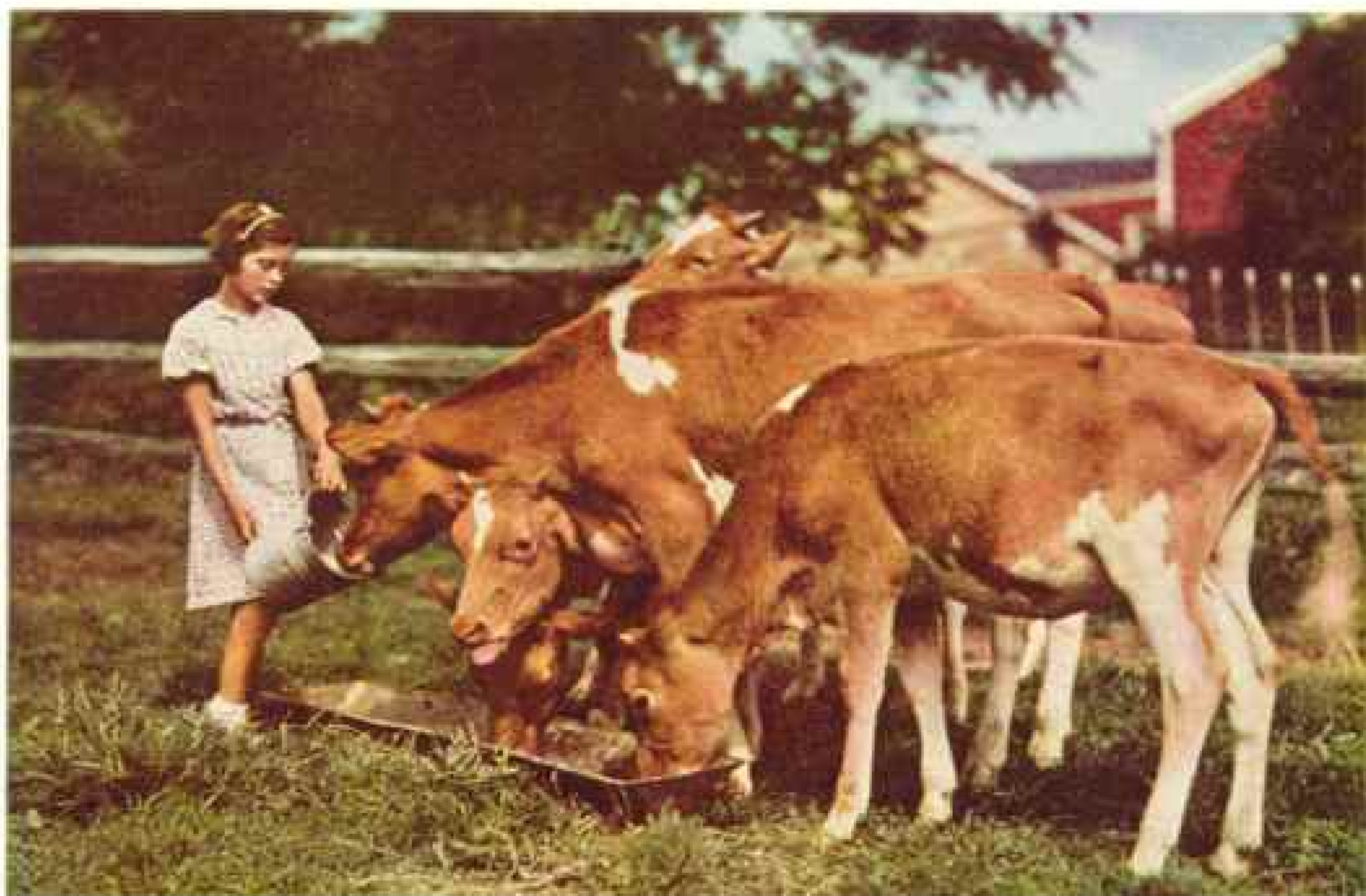
Today motifs on the outbuilding of this flourishing farm in Powder Valley, south of Allentown, are purely for decoration. Linked arches, simulating false tops, originally were painted over the doors to deceive evil spirits, causing them to bump their heads when they tried to enter! Eastern Pennsylvania was one of the first sections of the United States to improve dairy breeds. Today the industry is one of the most important in the State.

© National Geographic Society

Dufaycolor Photograph by J. Baylor Roberts

HOMEMADE BREAD, PIPING HOT, STILL EMERGES FROM THE OLD OUTDOOR BAKING OVEN

Once found on nearly every Pennsylvania Dutch farm, only a few remain. This structure, near Allentown, has been in constant use for generations. Wood is fired directly in the brick heating chamber. Later the glowing embers, pulled over a grating with the rake, fall into the fire pit. Dough is placed in the chamber with the long paddle here resting at the left against the shed. After the housewife has finished removing the loaves with the smaller paddle, she will put in to dry beans, apples, and other fruits and vegetables. Heat is retained for many hours.



TOO YOUNG TO GO A-MILKING, A PRETTY MAID FEEDS THE CALVES

Pure-blooded Guernseys are raised on this Lancaster County farm. Ayrshires, Jerseys, and Holsteins are the other favored dairy breeds among the Pennsylvania Dutch. Beef cattle generally are bought from western ranges and fattened for market. Herefords are the principal type of "feeders" purchased.

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Dufaycolor Photographs by J. Baylor Roberts

"BY THE PORCH MAKE NICE 'KINDER' FOR YOUR PICTURE"

Amish boys usually have their hair cut at home. Often a crock is placed over the head and held just above the ears. Scissors, snipping along its rim, produce the desired "bobbed" effect.

© National Geographic Society

Dufaycolor Photograph by J. Baylor Roberts

FOUR GENERATIONS HAVE PLAYED BALL AT RECESS IN THE YARD OF THIS LANCASTER COUNTY ONE-ROOM SCHOOLHOUSE

On the porch stands the teacher, a Mennonite, wearing her dainty lace cap. She instructs 21 pupils in eight grades. Last fall, Amish in a near-by township unsuccessfully opposed sending their children to a new consolidated school. A movement has been started to preserve one "little red schoolhouse" as a State shrine.

© National Geographic Society

Dufaycolor Photograph by Willard R. Culver

SLABS OF SMOKEHOUSE MEAT AND MOTHER'S BREAD FILL AMISH SCHOOLBOYS' LUNCH PAILS, TOPPED WITH "SHOO FLY PIE YET"

Bananas are the only "store food" on the oilcloth-covered kitchen table. Crumbs of flour and brown sugar, over a molasses base, went into the filling for the traditional Pennsylvania Dutch pie. Cherries and peaches, put up in summer months, came from a storeroom in the cellar where hundreds of tightly capped jars filled with preserved fruits and vegetables are massed. Never is the larder empty in this Lancaster County farmhouse.

CITY MERCHANTS MATCH WITS WITH SHREWD FARMERS AT EPHRATA'S OUTDOOR AUCTION

Philadelphia dealers bring in truckloads of fruit not grown in this region, wearing apparel, household goods, and farm implements. The town, between Lancaster and Reading, is the site of the old *Kloster*, a monastic community of Colonial days that became a celebrated cultural center.

© National Geographic Society

Kodachrome Photographs by J. Baylor Roberts

APPLE LOVERS HAVE A CHOICE OF 64 VARIETIES AT THE YORK COUNTY FAIR

For two and a half centuries the Pennsylvania Dutch have planted apple trees back of their houses and nearly every farm has its orchard. York Imperial is a type extensively grown. Stayman Winesap, Winter Banana, and Smokehouse also are held in high esteem.

THE SOCIETY'S MAP OF HISTORIC AND SCENIC REACHES OF THE NATION'S CAPITAL

FROM the corrugated Allegheny Mountains there slopes down to the indented shore line of the Atlantic Ocean a rich area of farms, factories, and fisheries which was once a major threshold of America's settlement and today is a repository of precious national shrines.

Here emerged, by counsel and debate, not by regal edict, the two cherished charters of New World freedom—the Declaration of Independence and the Constitution.

Hub of this portentous region, where the Nation's laws are made, administered, and interpreted, is the District of Columbia, itself a pilgrimage place visited annually by hundreds of thousands of Americans.

The Capital City and the myriad points around it easily accessible by automobile, train, motor coach, and boat, are charted in detail on the decorative map, "Historic and Scenic Reaches of the Nation's Capital," distributed to the more than a million member-families of the National Geographic Society with this issue of their Magazine.

The map encompasses the Federal District, all of Maryland and Delaware, most of Virginia, southern Pennsylvania, and parts of New Jersey and West Virginia.

The size of the chart, 26½ x 31¼ inches, permits a scale of ten miles to one inch, thus enabling cartographers to locate many places of scenic beauty or hallowed historic interest not shown on maps of smaller scale. No place shown is farther than 225 miles from Washington.

Random names, without adjectives or further description, bring to mind stirring events or mellow associations: Valley Forge, Gettysburg, Bull Run, and Appomattox; Mount Vernon, Annapolis, Fort McHenry, Yorktown, and Fredericksburg. Others hark back to primeval Indian days, before Jamestown or St. Marys City—such euphonious derivatives as Yeocomico, Piscataway, Patuxent, or Conococheague.

Gropings of early mariners are revealed by the sequences of New Point, Point Lookout, Point Lookin, and Point No Point; while other Bay names seem to chime with strumming guitars on decks of Chesapeake pleasure boats—Choptank, Piankatank, Rappahannock, and Pungoteague.

An important feature of the map is the delineation of Chesapeake Bay, scalloped by estuaries and tributaries.

"It's a pity your State is one-fifth water," remarked a statistical visitor in Maryland.

"A pity, my eye!" retorted a blunt Eastern Shore Free Stater. "Chesapeake Bay is our richest asset. Show me any farm land its size that yields as much cash as its oysters and crabs and shipping."

THE LAND OF FIVE RIVERS

Study the fanwise spread of major Maryland and Virginia rivers—the Patuxent, Potomac, Rappahannock, York, and James—like five giant fingers thrust between slender peninsulas of the tidewater country.

By pouring their sediment into the Bay, these rivers, and others, enriched the "pasturage" for fish and crustaceans, and thus helped nourish the early Bay colonists.

Here waterways still are traffic ways. Railroads and highways usually do not cut across them. In this New World Punjab (five-rivers land) life flows serenely, often unchanged since plantation days.

Ox teams plod along dirt roads, jars of peppermint lozenges and boxes of licorice sticks are displayed amid ready-made clothes and sunbonnets in country stores, while melons, oysters, and groceries are delivered by boats to front doors.

Travelers may trace the trails of early settlers by the homes of their descendants.

In the stoneless Tidewater are brick Tudor and Georgian mansions, set amid gardens that might have been transported direct from England. Sometimes the bricks were brought over in ships. Here families live on farms, many now called "estates"; towns are mere shopping centers.

However, in the German and Dutch inland settlements of western Maryland and Pennsylvania, farmers live in towns, with row houses jam against the sidewalk, and drive out to tend their fields and orchards where often only a caretaker resides.

Such communities as Hagerstown, York, Waynesboro, and Hanover have aspects of medieval towns along the Rhine or Zuider Zee and their business sections are as congested as downtown Baltimore.

Swedish settlements have left their traces in Delaware communities; in the West Virginia hills there even is a Swiss village, Helvetia, where they make goat cheese and hold church services in their native tongue.

Striking is the progression inland from the fertile, almost rock-free, tidewater territory of the Cavaliers to the more frugal Piedmont area, with old stone houses and smaller farms, up to the ranges of the Blue

Ridge and Alleghenies, where pioneer days are recalled by isolated log cabins. In the rich, self-contained valleys between them distinctive local customs persist.

Tidewater Virginia is very different in its aspects and agriculture from the Old Dominion's Piedmont region or the verdant Shenandoah Valley.

"The Valley's" travel and trade are more with its extensions northward into Maryland and Pennsylvania, whence many of its early settlers came, than with Tidewater Virginia. Western Maryland shops and sells in Winchester, Harrisburg, York, and Baltimore; the State's "panhandle people" have little dealing with the Eastern Shore.

TWO FAMOUS BOUNDARIES

Cutting across the map are two famous boundaries. One is the Mason and Dixon Line, accurately surveyed more than 150 years ago by two Englishmen. The other is the Potomac River, which cleaved North and South during civil strife, but now symbolizes a united nation by such historic shrines as Mount Vernon, Arlington, Wakefield, Antietam, Harpers Ferry, and our country's Capital City.

Delaware's northern boundary discloses the only part of a circle used anywhere in the United States as a State boundary.

Designed by C. E. Riddiford, the 10-color map is framed by a decorative border uniting top and bottom friezes of miniature drawings alternately depicting memorable scenes and illustrious people of the region. Hashime Murayama, Geographic staff artist, prepared the sketches.

The pen-and-ink portraits portray Washington, Madison, Monroe, Jefferson, Franklin, Captain John Smith, and Edgar Allan Poe. Less familiar faces are those of Matthew Fontaine Maury, pioneer oceanic geographer who was first to chart Atlantic coastal currents and winds, and J. P. G. Muhlenberg, Lutheran clergyman, Revolutionary general, and legislator.

Then there are Cecil Calvert, the second Lord Baltimore, who ruled but never visited Maryland; John Marshall, "most notable of American jurists"; Cyrus H. McCormick, inventor of the reaper; and Walter Reed, distinguished Army doctor who helped eradicate yellow fever.

Scenes in the decorative border show the battlefield at Gettysburg, site of a memorable victory and Lincoln's immortal address; Valley Forge, zenith of Washington's courage in the Revolution's darkest hour; Mount Vernon, where a hero's home rather than ornate memorial or luxurious edifice has become the Nation's beloved shrine; and Independence Hall, where men signed the Declaration that set America free and chartered democracy in many other lands.

Also depicted are the White House, oldest public structure in Washington; the revered Tomb of the Unknown Soldier; the gracious Rotunda of the University of Virginia, and the venerable State House at Annapolis, where Washington resigned his commission as Commander-in-Chief (1783) when Annapolis was temporarily the national capital.

Other sketches portray an old Dutch house in Delaware, a truck garden of that tiny State which is a giant food producer, a fox-hunting scene in the Piedmont horse country of Virginia, oystermen plying their "rakes" along the Chesapeake's shores, and the queen of the annual Apple Blossom Festival at Winchester, Virginia.

Appropriate symbols locate on the map significant battlefields, notable ruins, churches, sites, and monuments, historic shrines, fine architecture, racing and hunting centers. Parks and recreational areas are shown in pink; black-and-white "name plates" tag the counties.

The long, unbroken mountain ridges seem to rise in bold relief. By a bird's-eye perspective method, newly developed by J. J. Brehm, of the National Geographic Society's map department, each ridge, peak, gap, and deep-cut river valley stands out as if viewed from an airplane.

Brief statements of events in many places and their dates furnish headlines and date lines for stirring chapters of American history in this area. How many newspaper extras and movie newsreels would the momentous news stories here spotted require if they happened in our time!

The map has been planned for artistic beauty and is suitable for framing. It is offered as a comprehensive chart, equivalent to many pages of a gazetteer and a history.

Primarily, it will serve as authoritative guide to the multitude of pilgrims who visit Washington, whether they traverse their Capital's environs by railroads (black lines), highways (red lines), ferryboats (dotted red lines), or in imagination where many of the place names will stir memories and arouse patriotic pride.

PILGRIMS STILL STOP AT PLYMOUTH

By Maynard Owen Williams

COMFORTABLE, shiny, and a bit aloof, the Plymouth boat train chugs away toward London Town, familiar faces at every window.

Standing there, watching this puffing monster as it climbs from Mill Bay for its dash across Devonshire, one regrets that these shipmates, who seek Old England's flavor, hurry through New England's mother-city and its historic port on their way to Piccadilly and Leicester Square.

All night we had ridden at anchor while Eddystone Light (page 63) blinked its sleepless eyes at the Channel shipping and festive lights on the Hoe died out, leaving behind the sky-glare of the hidden town.

What a place to conjure old memories! For from this many-armed harbor sea dogs of Devon set out on Spanish treasure hunts and here they outfitted many of the fleets that established Britannia's rule of the waves.

PIRATES, PRIVATEERS, SLAVE TRADERS

A late start they had, for when Columbus was hawking our hemisphere from court to court, Henry VII turned it down. Drake made such amends as he could for Henry's myopia, but not till 1607, with two Henrys and Queen Elizabeth already in their graves, did the English language have a New World home.

All that time, Plymouth pirates, privateers, and slave traders were sticking their thumbs into the Spanish pie, sometimes getting burned, often pulling out rich plums.

When Columbus arrived in Barcelona, presenting a spherical earth to people who had thought it flat, the Pope cut it in half. This imaginary line, confirmed by the Treaty of Tordesillas, separating Portuguese and Spanish zones, came to be as real as the Equator, yet its exact position still is in dispute.

Although no one knew it at the time, that longitudinal line, fifty degrees west of Greenwich, crossed the mouth of the Amazon and so made Portuguese the language of Brazil. Europe-sized coffee-land was visited when Cabral's India-bound ship, skidding off Vasco da Gama's route around Africa, touched Brazil by accident.

England was then in no position to dispute the Pope's geography and Peru's silver was more easily coined into money than John Cabot's codfish. So Spain was welcome to build and load the treasure ships as long as British sea rovers were privileged to capture them.

A SHIPWRIGHT HELPS HARNESS THE WINDS

As a big-navy man, Henry VIII had two formidable rivals in Francis I of France and Charles V of Spain. When he divorced Catherine of Aragon, he not only offended Spain but defied the papal edict. An almost unknown shipwright, Fletcher of Rye, gave his king, Henry, such control of the winds as no seaman had ever known. The defeat of the Spanish Armada was still half a century off. But, with the discovery of the art of tacking in 1539 and Drake's birth soon afterwards, it was on its way.

Queen Elizabeth, holding both scepter and purse, did not let her right hand know what her left was doing. While keeping peace with Philip, she opened her purse (slightly) to back sea ventures at which Plymouth's men were adepts, and opened it (widely) for her share of the profit.

Two great Englishmen, a patient planner and a dashing opportunist, served her ends. They were Sir John Hawkins and Sir Francis Drake.

Hawkins has the questionable honor of being the first English trader to engage in the slave trade to America—a trade against which English statesmen protested until the Emancipation Act of 1833 abolished slavery throughout the British Colonies. Spain could not harness Indians to labor, although many were enslaved, and the humanitarian, Las Casas, to save his beloved Indians, who did not stand domestication, urged the use of negro slaves, who did.

Before the *Mayflower* left Plymouth a Dutch ship had landed negro slaves in Virginia. Thus were the seeds of civil strife sown before a Pilgrim foot touched Plymouth Rock.

Hawkins, like his father, had sailed from a small port near the mouth of the Plym, and American visitors go there first. At the time of my visit, a monument was being erected to take the place of the laconic stone in the paving on the pier. "Mayflower, 1620" it read (page 61).

What epitaph in Westminster Abbey—what inscription in the British Museum

Photograph by Maynard Owen Williams

MOST ANCIENT OF PLYMOUTH'S HARBORS IS SUTTON POOL

Before the breakwater shut out the southwest storms from 4,500-acre Plymouth Sound, tiny Sutton Pool, and later the adjoining Cattewater (page 64), sheltered the ships. Now a few fishing boats, with drying nets, rising or falling beside the quay wall, lend color to this nucleus of the proud seaport whence sailed Drake's *Golden Hind*, the *Mayflower*, and Captain Cook's *Endeavour*.

—means so much to us? Like the King James Version of the Bible, and Shakespeare, the Mayflower Stone links us with England's Golden Age.

FROM CARAVEL TO AIRPLANE

Aviation could not wait for a tercentenary celebration. On May 31, 1919, Lieutenant Commander A. C. Read and five companions arrived at the Barbican in the Navy-Curtiss seaplane *NC-4*, after a flight by way of Newfoundland, the Azores, and Lisbon (page 61).

Two weeks later Alcock and Brown made the first non-stop transoceanic flight, and the same year the British dirigible *R-34* made the first round trip across the Atlantic.

As I stood on that little Plymouth pier, beside the enclosure hiding the new monument, a trawler not much smaller than the *Mayflower* came in on the tide and a seaplane swooped down to its nest beside Mount Batten.

The old castle from which the Barbican takes its name is no more, but this end of the Hoe ridge is occupied by a Citadel which Charles II erected, as much to awe Plymouth as to defend it.

Charles came to power with the "good liking of his people." But being both easy-going and merry, this handsome athlete soon caused his subjects to remember grim Cromwell with regret. Men of character and foresight, impatient with Charles, followed the *Mayflower* trail to the raw New World.

A clean-cut gateway which Wren may have designed leads into the Citadel. But inside are barracks, and while soldiers are hospitable fellows their impulse here is cramped by sentries. I stayed outside.

A more prominent landmark than the

Photograph by Topical Press

PLYMOUTH'S MAYOR UNVEILS "THE GATEWAY TO THE UNKNOWN," A MEMORIAL TO THE "MAYFLOWER" PILGRIMS

Crowds gather for the ceremony on the Barbican, the old quay from which the Pilgrim Fathers—and Mothers—set out on September 6, 1620, on their momentous voyage to "settle in New Plymouth and to lay the Foundation of the New England States." At the left of the monument is a bronze tablet commemorating the arrival of the United States Navy seaplane *NC-4* at Plymouth in 1919, completing the first transatlantic aircraft flight, just short of 300 years after the Pilgrims set sail.

Citadel is the Marine Biological Laboratory, rich in marine fauna, an aquarium and a reservoir of sea water. Those who love swimming will gladly leave this to the fish, for the whole rocky façade of Plymouth Hoe is devoted to sea bathing (pp. 65, 73).

For sixpence you have a clean dressing room with a newly sunned grating for your feet and for another sixpence a tray of tea. That is luxury. Plymouth's younger lads drink their tea at home and, if unusually modest, hold towels in front of one another as they undress on the cement terraces which rise like balconies up the rocky cliff.

Tides are high here and on a warm day sun-hunters in deck chairs follow the water down the pebbly beach or reluctantly give way before a rising tide. The slide from which one enters the water with a pleasant splash at high tide administers a sound spanking when the gap from slide to water widens to the height of a man.

Rafts and catamarans may be rented for very little, and several pools, filled from the sea at high tide, remain full after the water of the Sound has retreated down the rough rocks.

A TOWER WITNESS OF HISTORY

As the tide recedes from the open pool, workmen scour the cement slope with quicklime, cleaning it thoroughly. When the tide returns, its bottom is spotless white. The attendants are cordial and the water, at 61 degrees, was exhilarating.

The central part of Plymouth, hiding behind the high Hoe, is dominated by the

Photograph by Maynard Owen Williams

FROM THIS WIDE, FLAT PROMONTORY, THE HOE, PLYMOUTH HAS WATCHED ENGLAND'S SHIPS SET FORTH FOR MANY CENTURIES

Devon and Cornwall, that sun-blessed West Country of which Plymouth is resort and metropolis, call themselves England's Riviera. In all that stretch of southern coastline no promenade surpasses the historic Hoe (pages 65 and 74). A steamer chair on the Hoe is like a seat on the sun-deck of a ship. Overlooking the scene is Smeaton's Tower, an old lighthouse "home from the sea" (page 77).

Photograph by Central Press

PLYMOUTH'S FOURTH BEACON, EDDYSTONE LIGHTHOUSE, LOOKS DOWN ON CRUEL ROCKS AND THE BASE OF ITS PREDECESSOR, SMEATON'S TOWER

On Eddystone reef, menacing Channel shipping 14 miles from Plymouth, several lighthouses have stood. Winstanley's Tower, begun in 1695, was swept away November 20, 1703, and its builder drowned. Rudyerd's Tower, completed in 1709, was burned in 1755. Smeaton's Tower, begun 20 years before the Declaration of Independence, withstood the elements for more than a century and now stands at Plymouth in honorable retirement (page 62). Plans for the present lighthouse, designed by Sir J. N. Douglass, were made by Trinity House in 1877. Its incandescent oil vapor lights, 133 feet above high-water level, can be seen for 17 miles.

Photograph by Maynard Owen Williams

HOME PORT OF FAMOUS SEAMEN WAS PLYMOUTH'S CATTEWATER

During the centuries, Plymouth's harbor, like her men, has gone to sea, for shipping has outgrown first Sutton Pool, then the Cattewater, at the mouth of the Plym. Today the main harbor is the Sound, which, protected by its long breakwater, covers two-thirds as much area as the "Three Towns"—Plymouth, Stonehouse, Devonport—now one. But in earlier days these narrows, between the Barbican and Mount Batten's shadowy walls in the background, marked the home port of many of England's greatest seafaring men.

© Arthur W. Hobart

IN PLYMOUTH, THE HIGH HOE OF HAWKINS, DRAKE, RALEIGH, AND FROBISHER HAS NOTHING TO DO WITH A SONG

Irresistible to the punster is the name of the parklike expanse at the left, the Hoe—from the Old English "hoe," meaning promontory. Although it hides most of the town from Plymouth Sound, the Hoe here appears flattened out. From the plane, the tall white Naval War Memorial seems to dwarf Boehm's statue of Sir Francis Drake (page 75) and the Armada Memorial. To the right of Smeaton's Tower (page 62) is the Marine Biological Laboratory, with the Citadel beyond and the Barbican seemingly bridging the gap between Sutton Pool (page 60) and the Cattewater. In lower right is the Promenade Pier, with bathing pools beyond.

© Arthur W. Hobart

SERRIED RANKS OF NEW HOMES HAVE SPRUNG UP IN THE ENGLISH COUNTRYSIDE

This housing in the suburbs of Plymouth is in contrast to the older parts of the city (page 75). Back-yard gardens, not front lawns, distinguish it. The postwar building boom brought traffic problems, but freedom from grade crossings. The railroad, curving to the right, ducks under or hops over roads.

Photograph by Topical Press

NAVY WEEK PUTS A SMILE IN A 16-INCH GUN MUZZLE

H. M. S. *Rodney*, with nine of the mighty weapons in three grim turrets, is one of the most formidable fighters afloat (page 76). But for the annual celebration in August, the battleship relaxes a bit as a young publicity expert, within the strong-arm protection of Jack Tar, gives a cheer for the "King's Navee."

Photograph by Maynard Owen Williams

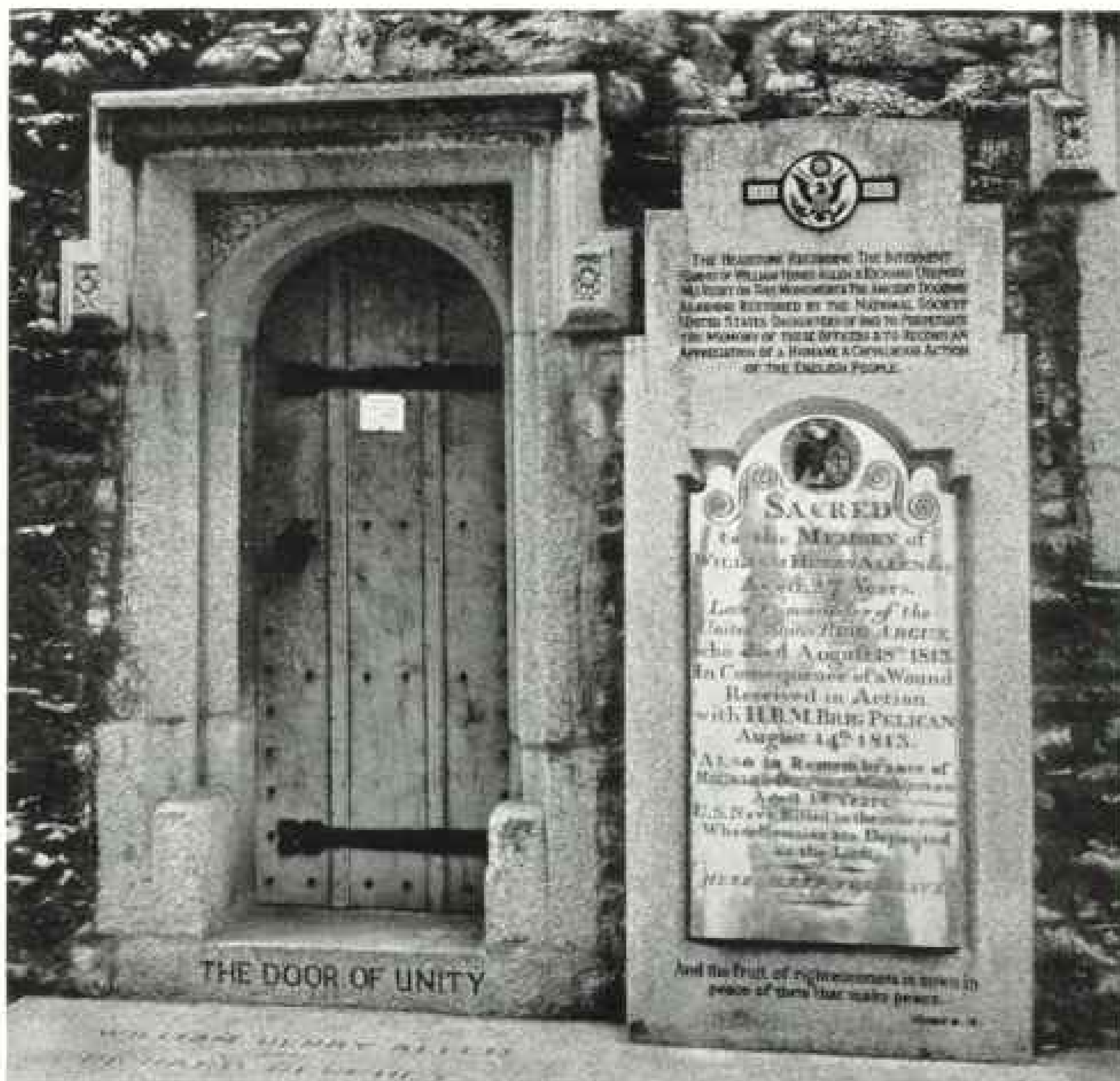
"GLARE, LEO, GLARE; YOU'RE ONLY A FIGUREHEAD!"

Once this British lion rode the prow of a 74-gun ship. Today it is a mere curiosity, as obsolete as a cigar-store Indian. "H. M. S. *Drake*," as the Devonport Naval Barracks is known (pages 70 and 72), has a rich collection of such old-time carvings, borne by historic vessels now no more.

Photograph by Maynard Owen Williams

WORKMEN ATOP CAPTAIN SCOTT'S MONUMENT ON MOUNT WISE BURNISH THE WINGED FIGURE OF IMMORTALITY, WON AMID ANTARCTIC COLD

Returning from the South Pole, where they found Amundsen had preceded them, Captain Robert Falcon Scott, Dr. Edward A. Wilson, Captain L. E. G. Oates, Lieutenant H. R. Bowers, and Petty Officer E. Evans met heroic death. "Had we lived," wrote the leader in his journal, "I should have had a tale to tell of the hardihood, endurance, and courage of my companions which would have stirred the heart of every Englishman." Devonport was the birthplace of Scott, here depicted in bronze facing the South Pole.



Photograph by Maynard Owen Williams

FROM ONE OF THE MANY WAR GRAVES FRIENDSHIP HAS FLOWERED

Two young American sea fighters killed in the War of 1812 were given honored burial at Plymouth by their British foes, the headstone bearing the new Republic's eagle and the words "Here Sleep the Brave." The chivalrous action was recognized more than a century later by the National Society United States Daughters of 1812, which reset the headstone on this monument and restored the ancient doorway at the left, "The Door of Unity." It leads to one of Plymouth's oldest buildings, the Prysten House, which has reverted to ecclesiastical use after serving commerce for centuries.

tall tower of the Guildhall, whose stained glass commemorates the departure of the Black Prince in 1355, the arrival of Catherine of Aragon in 1501, the Armada alarm of 1588, the sailing of the Pilgrims, and Napoleon's visit aboard the *Bellerophon* after Waterloo had been lost and only St. Helena remained. Organ recitals and concerts are held in this great hall with its picture-book windows.

In the Mayor's parlour, under a portrait of Sir Francis Drake, are two lines which recall his circumnavigation of the world and suggest the part he played—not in making the sun stand still, but in preventing it from setting on the British Empire. The anonymous poet was a bad speller, but he had a good line:

> The sunn himself can not forgett
> His fellow traveller.

When the United States, with preparedness as a slogan and 6,700 men as an army, entered the War of 1812, *Old Ironsides* captured the *Guerrière*, but a far-ranging United States brig, the *Argus*, was less fortunate.

In a fight with the British brig *Pelican*

Photograph by Maynard Owen Williams

EVEN SUBMARINES WELCOME VISITORS DURING NAVY WEEK

Beyond the submarine *L18* are the 1,100-ton destroyers *Warwick* and *Watchman*, the aircraft-carrier *Hermes*, and the battleship *Royal Oak*, at the far end of the Prince of Wales Basin. Navy men stationed at the Royal Naval Barracks at Devonport wear caps bearing the inscription "H. M. S. *Drake*" (page 72).

off St. David's Head, the western tip of Wales, Commander William Henry Allen was mortally wounded and Midshipman Richard Delphey was killed. Over their graves beside St. Andrew's Church the English erected a tombstone with the inscription, "Here Sleep the Brave."

In 1930 it was incorporated in a monument which the United States Daughters of 1812 erected in appreciation of "a humane and chivalrous action of the English people" (page 69).

Beside it is "The Door of Unity," leading to Prysten House, one of Plymouth's oldest buildings, where priests were lodged. After nearly four centuries it has been restored for use as a Church House.

Back on Dartmoor is the bleak granite prison of Princetown where American prisoners were confined in 1813, but the Door of Unity is less forbidding and more significant. When German submarines threatened to starve Great Britain, American sub chasers helped convoy the men and supplies of Old England up the Channel where the Invincible Armada fled before Drake's tallowed ships.

A LIBRARY CENSORS RACING RESULTS

Plymouth has a Carnegie library in which Puritan influences evidently linger on, for racing results published in the newspapers were so blacked out that patrons of the free library could not check their winnings or losses. This in the land of the Grand National and the Derby!

No kill-joy atmosphere is Plymouth's. Splendid center for excursions by car or steamer, it has the theaters and cinemas of a city rather than those of a summer resort. And when a Scottish kiltie band plays on a sunny Sunday the Hoe is as gay as any spot in England, with circles of easy chairs surrounding the bandstand and crowds stretching away across this splendid expanse (page 74).

Photograph by Maynard Owen Williams

WHERE DRAKE PLAYED AT BOWLS, HISTORY STILL REPEATS ITSELF

Appropriately, the white shaft of the National Naval War Memorial looks down on the green where Britain's captains, home from the sea, indulged in this 13th-century sport. Behind it is the Armada Memorial. From such a game, tradition says, Drake went to win a mighty naval victory over Spain's seagoing army, the Invincible Armada. In this game, played with biased balls, heavier on one side than the other, the object is to roll them close to a stationary ball, the "jack."

Farther away Plymouth's men, wearing galoshes to protect the green, play at bowls.

Jutting out from the land is a pleasure pier from which excursion boats meander up the Tamar or venture out beyond the breakwater to the estuary of the Yealm, a delightful inlet in the process of being spoiled by those who sacrifice stately trees to build bungalows. Folk with reliable stomachs bob out to the Eddystone Light and occasionally there is a choppy trip along the Cornwall coast to Looe.

Extraordinary beauty lies even closer at hand, for just across the entrance of the Hamoaze is Mount Edgcumbe, an estate with enviable views, wonderful grounds, and a pseudo-Gothic ruin held together by ivy.

The story goes that Medina Sidonia so coveted this property that he was willing to command the Armada in order to lay his hands on it. This, were it true, would be high praise; for the seasick Admiral did his best to escape command of Spain's fleet, even when it was thought invincible.

"I am always seasick," pleaded Drake's destined victim. "The person at the head (of the Armada) should understand navigation and sea fighting, and I know nothing of either."

AN IMMORTAL EXPLORER

Opposite Mount Edgcumbe, at the tip of that part of Plymouth which once was the town of Stonehouse, the Royal William Victualling Yard spreads its impressive buildings over an area half quarry, half dump. Where bully beef was barreled, sowbelly salted, and hardtack petrified, skilled chemists now count vitamins.

Scurvy has been transformed from common noun to slang adjective and even a toothless sailor could now eat Navy bread, which is baked aboard ship as needed.

On Mount Wise I found three workmen

Photograph by Maynard Owen Williams

NAVY WEEK VISITORS WATCH A PERSPIRING DIVER "TAKE A DIVE" ON DRY LAND

Sweltering in the heavy suit on a hot August day, he patiently endures a demonstration of how a diving helmet is adjusted and how air is supplied. Navy Week at Plymouth and Portsmouth widens British understanding and appreciation of their Jack Tars. Say "Malta," "Suez," or "Singapore" to a Briton and the word Navy springs to his mind.

clinging to the winged figure of Immortality at the top of the monument to Captain Robert Falcon Scott and his men, Wilson, Oates, Bowers, and Evans (page 68).

With death close at hand, Scott wrote the sentence here engraved: "Had we lived, I should have had a tale to tell of the hardihood, endurance, and courage of my companions which would have stirred the heart of every Englishman."

Death added unsurpassed dignity and drama to that tale. In a driving blizzard, Oates stumbled off alone to die lest he impede his comrades who, it turned out later, also were doomed.

AN IMMOBILE H. M. S. "DRAKE"

No one has accused the British Navy of frivolity, but during Navy Week a holiday atmosphere settled on Devonport (p. 70).

Women and children were helped down into submarines, tea and dancing occupied the spacious interior of the airplane carrier *Glorious*, divers dressed and undressed before gaping crowds, pretty girls invaded the gigantic *Rodney*, and Jack Tars publicized the affair by sending twelve-word messages anywhere in England for "thruppence."

If the spirit of Sir Francis still lingers on the Hoe, the letters "H. M. S. Drake" on a sailor's hatband must irk the fiery admiral.

Mobility was his trump card. Yet H. M. S. *Drake* was never launched, never put to sea, never answered a helm. Present-day H. M. S. *Drake* is the Royal Naval Barracks at Devonport, steady, unsinkable, and vaster than any ship from Noah's Ark to the *Queen Mary*. But what a landlubberly craft to bear the name of Drake!

It is forbidden to photograph toward the Navy Yard, and, being an "alien," I expected trouble with my camera. But the censor gave me a free hand. He merely inspected each film after it was developed, and passed every one.

Standing high on a seagoing airport, I looked down on the tiny model of the *Golden Hind* (page 76).

In a ship like that and only twice as large, Drake circled the earth, safely returning from such a voyage as cost Magellan his life. I imagine that colorful little model, "sailed" by seemingly gigantic men

Photograph by Maynard Owen Williams

A SPOT O' SUNSHINE AND A SPOT O' TEA SPREAD CHEER ALONG PLYMOUTH'S STONY FAÇADE

Dressing rooms honeycomb the cliffs, cement walks lead from one level to another, and a variety of tidal pools serves the bathers of Plymouth. Sixpence buys a tea tray, with the pot of tea, a pitcher of hot water, and a bowl of sugar. But youngsters who drink their tea at home and use a spare towel as a dressing room are as welcome as those plutocrats who spend a shilling for a private booth and a steaming cup.

Photograph by Maynard Owen Williams

SUNSHINE AND A KILTIE BAND BRING SUNDAY CROWDS TO PLYMOUTH'S HOE

In England, where sunshine is measured along with temperature, this limestone plateau between Sound and Town is a favorite playground (pages 62 and 65). When Sunday lives up to its name, the Hoe is one of the gayest spots in England. This view from Smeaton's Tower looks toward Cornwall, shadowy duchy beyond the boundary river, the Tamar, in upper left. For a trifling fee one may sit in a steamer chair and listen to the band or dream of the seamen who have put forth from the Hoe to win glory, fame, and loot on the Seven Seas.

PLYMOUTH'S HERO WAS A NAVIGATOR AND GEOGRAPHER

Not as seaman or mayor has Sir Joseph Edgar Boehm pictured the conqueror of the Invincible Armada and builder of British sea power. His statue on the Hoe represents a student and a circumnavigator of the globe.

Photographs by Maynard Owen Williams

OLD HOUSES LINE NEW STREET WHERE CHILDREN PLAY

Mayflower pilgrims, resting in Plymouth on their way from Southampton to the New World, slept in these houses, one of which is now a museum. Far different are the city's newer suburbs (page 66).

Photograph by Maynard Owen Williams

GIANTS STILL RIDE IN THE "GOLDEN HIND"

Because this is a half-scale model of Vice-Admiral Sir Francis Drake's famous flagship, the men on her deck seem twice life size. In the Strait of Magellan on its world cruise, the ship, originally the *Pelican*, was renamed the *Golden Hind*. On returning home, the first Englishman to circumnavigate the globe knew not what to expect when Queen Elizabeth called for a "sword with a keen edge," but with it she knighted—rather than decapitated—her bold sea rover.

in 16th-century costumes, would have pleased Sir Francis more than the stationary "ship" beside which the thundering *Rodney* lay. Her 16-inch guns, in revolving turrets, could hurl over nine tons of shells more than ten miles at a single broadside. The *Golden Hind* had six guns on each side, each firing a 10-pound shot 500 yards! But the *Golden Hind* made history. And for all her power and courage, the *Rodney's* prayer is that she won't have to.

On the anniversary of the Battle of Gravelines, east of the Straits of Dover, the American Consul, Mr. Rollin R. Winslow, and I were entertained by the Commander-in-Chief of Plymouth, Vice Admiral Sir Eric J. A. Fullerton (now retired).

To celebrate the whole repulse of the Armada one would have to be a house guest for more than a week, since the engagement was a running fight all the way from Plymouth Sound to the Firth of Forth.

Unequal contest between an awkward fleet of army transports and the shiftiest battleships of their day, the defeat of the Armada was a triumph of superior gunnery. Even Queen Elizabeth's thriftiness with powder and ammunition could not spoil the seamanship and versatility of the admiral, who had once knelt before her expecting to lose his head, but arose as "Sir Francis Drake."

Rough sea dogs these men of Plymouth could be on occasion, but several of them

stepped from captain's cabin to mayor's chair without loss of dignity, and even during dangerous voyages dressed like dandies, dined from gold plate, and won respect and friendship by their courtly manners. The proud title of "Sir" sits well on them. "Sir John," "Sir Francis," "Sir Walter," "Sir Humphrey"—history, recording these honored names, gave no suggestion of having its tongue in its cheek.

One hero of *Westward Ho!* bore the honest, simple name of John Oxenham. Before painting the magnificent mural, "The Discoverer," which graces Hubbard Memorial Hall at the National Geographic Society's Washington, D. C., headquarters, N. C. Wyeth had illustrated an elaborate edition of Kingsley's classic.

"Mayhap some of the spirit accumulated during this work carried over into the Balboa subject. John Oxenham has always, to me, resembled Balboa physically," writes the artist.

One sailor from Plymouth clung to the title of Captain. Because he expanded the largest ocean to its proper share of the earth's surface, Captain James Cook is known to GEOGRAPHIC readers as "The Columbus of the Pacific." *

Much of my interest in Plymouth's sea rovers was due to the valiant explorers in the stratosphere: Stevens and Anderson.†

Of their amazing ascent I knew nothing until in Plymouth one of those separate news posters which carry England's headlines caught my eye. I thought Captain Stevens might like one as a souvenir, and while asking for one I met a Plymouth editor who wrote a splendid biography of Sir John Hawkins and dashes off mystery novels for fun. As we chatted he made Drake and Hawkins, Raleigh and Frobisher live again.

At that time workmen were cleaning the Drake statue, restoring to jerkin, slashed doublet, and hose a silky sheen after a salt-spray patina which made the "Dragon's" beard look as if it had barnacles in it (page 75). So I sat there on the Hoe, watching the patriotic explorer being prettied up—and probably resenting it.

Not far from the Drake statue is the Armada Memorial, thus facetiously described by William Dean Howells:

"On top of this we saw Britannia leading out her lion for a walk: lions become so dyspeptic if kept housed, and not allowed to stretch their legs in the open air."

Just as prominent and more vital is the top portion of Smeaton's lighthouse, home from the sea and now a mere view tower, its red and white bulk cut into diamonds by electric-light wires (page 62).

The original Eddystone Lighthouse, a wooden structure gilded and carved like a Chinese temple, lasted only four years.§

The second lighthouse defied the sea but yielded to fire. John Smeaton began the third, of Portland stone, in 1756, thus making his structure a geological sister of half of London. Dovetailed to the gneiss ledge, the present Eddystone Light took over the task of serving Channel shipping in 1882 and marks the spot where Drake's little ships worked to windward of the Spanish Armada.

MAYOR DRAKE AND RALEIGH, M. P.

While waiting for a chance to die at sea, Drake served as Mayor and gave an adequate water supply to Plymouth before London had one.

The Burrator Reservoir fills a picturesque hollow of Dartmoor near Sheeps Tor, and so well chosen was the site that its capacity has been increased to more than a thousand million gallons.

Sir Walter Raleigh, who gave Virginia its name, was a Member of Parliament from Devonshire. Many years later Plymouth elected as the first woman to sit in the House of Commons a daughter of Virginia—Lady Astor. Raleigh was not a complete success as a colonist, but in Parliament he championed free speech, a worthy cause still carried on by the Lady from Virginia.

No boat train existed to carry the *Mayflower* Pilgrims away from Plymouth Rock. That "stern and rock-bound coast" helped shape America's destiny, before her people pressed on to the conquest of a continent. Where better than in Old Plymouth can a returning visitor savor the Merry England of Drake and Hawkins, Bluff King Hal, and the Good Queen Bess, before going on to Exeter and Winchester, Windsor Castle, and Trafalgar Square?

* See "The Columbus of the Pacific: Captain James Cook, Foremost British Navigator," in THE NATIONAL GEOGRAPHIC MAGAZINE, January, 1927.

† See "Exploring the Stratosphere," by Capt. Albert W. Stevens, in THE NATIONAL GEOGRAPHIC MAGAZINE, October, 1934, and "Man's Farthest Aloft," January, 1936.

§ See "Beacons of the Sea," in THE NATIONAL GEOGRAPHIC MAGAZINE, January, 1913, and "New Safeguards for Ships in Fog and Storm," August, 1936, both by George R. Putnam.

OVER THE ROOF OF OUR CONTINENT

By Bradford Washburn

Leader of the National Geographic Society–Pan American Airways Mt. McKinley Flight Expedition

Late one brisk summer evening in 1794, a weather-beaten British sea captain wrote his log as his staunch little ship slipped silently along the murky waters of Cook Inlet in far-away Alaska. On that day, now nearly a century and a half ago, he and his crew had made a thrilling discovery. Over the low, forested country along the northern shore of the inlet, they had sighted a new range of "distant stupendous mountains covered with snow and apparently detached," lying many miles behind the coastal ridges.

Little did George Vancouver realize, as he added these routine words to a record already bursting with marvelous adventures, that he and his men were probably the first Englishmen ever to see the highest mountain range on the Continent of North America.

Whether or not Vancouver actually saw the summit of Mount McKinley remains a mystery. But even today a thrilling experience in Alaska is to glimpse, if for only a fleeting moment, that final summit cone of McKinley, sharp and crystal-white, as it peers a hundred miles away, across the emerald lowlands of the Susitna River Valley north of Anchorage.

THE "HIGH ONE" AND "DENALI'S WIFE"

The oldest natives of the forested lowlands which stretch to the north and west of the Alaska Range still know their great peak as "Denali," the "high one."

Not until the close of the last century did magnificent Denali receive its present name. In the summer of 1896 W. A. Dickey made an extensive trip along the valleys of the Susitna and Chulitna Rivers, which have their sources among glaciers at the foot of the southern cliffs of the Alaska Range. He described his experiences in a letter to the New York *Sun*, estimating the height of the mountain as fully 20,000 feet, and concluded by telling that, upon his return to civilization, "we named our great peak Mount McKinley after William McKinley, of Ohio, the news of whose nomination for the Presidency was the first which we received on our way out of that wonderful wilderness."

No sooner had Denali been rechristened than beautiful "Denali's Wife," that superb 17,000-foot neighbor of Mount McKinley, was named Mount Foraker, for a distinguished Senator from Ohio.

Two years after Dickey's trip, George H. Eldridge and Robert Muldrow, of the United States Geological Survey, estimated the altitude of Mount McKinley as 20,300 feet. It was not long before a series of expeditions was launched to see which could be first to reach the capstone of our continent.

On July 7, 1913, Hudson Stuck, Harry P. Karstens, Walter Harper, and Robert G. Tatum stood upon the crest of the snowy summit dome. Their courageous efforts marked a fitting climax to the superb work of Pete Anderson, Billy Taylor, Charles McGonogill, and Thomas Lloyd, Fairbanks miners who had pioneered the route up the Muldrow Glacier, two of them reaching the summit of the north peak in 1910.

100 YARDS FROM VICTORY—THEN, DEFEAT

Nor can explorers ever forget the grit and sportsmanship of the Parker-Browne expedition of 1912 which, after two tremendous years of exploration, with its food supply inedible and nearly exhausted, fought their way on hands and knees through a wild blizzard to a point less than 100 yards from the actual top of the peak. There they were finally forced to yield to the storm and admit defeat.

Since the first ascent only one other party has succeeded in reaching Mount McKinley's summit. This was an informal expedition organized by Harry J. Liek, present superintendent of Mount McKinley National Park, and Alfred D. Lindley, of Minneapolis. Guided by Erling Strom, of Lake Placid, New York, and accompanied by Grant H. Pearson, stalwart park ranger, these men ascended both the north and south peaks of Mount McKinley in 1932 (page 90).

Allen Carpé and Theodore Koven perished in the tremendous crevasses of the upper Muldrow Glacier almost at the very hour when the Lindley-Liek party was rejoicing in its success (pages 93-95).

Although its summit has been reached only twice, a score of expeditions have explored its approaches from almost every conceivable angle, and for 20 years the co-

Drawn by Ralph E. McAleer

AN AERIAL PHOTOGRAPHIC EXPEDITION REVEALS THE CAPSTONE OF NORTH AMERICA

In "The Conquest of Mount Crillon" Bradford Washburn described the first ascent, in July, 1934, of 12,728-foot Mount Crillon in southeastern Alaska (NATIONAL GEOGRAPHIC MAGAZINE, March, 1935). During the winter and spring of 1935, the National Geographic Society Yukon Expedition, led by Mr. Washburn, surveyed nearly 5,000 square miles of previously unmapped territory in extreme northwestern British Columbia and southwestern Yukon Territory. Two newly discovered peaks were named "Mount King George" and "Mount Queen Mary" in honor of King George V and Queen Mary on the occasion of His Majesty's Silver Jubilee ("Exploring Yukon's Glacial Stronghold," NATIONAL GEOGRAPHIC MAGAZINE, June, 1936).

lossal peak has been the chief attraction of a magnificent national park. Yet, in April, 1936, when the first plans for the Mount McKinley Flight Expedition were discussed, scarcely any excellent photographs of the mountain could be located.

Mount McKinley is difficult to photograph from the ground. Rising to such high altitude and in almost complete isolation, it is virtually impossible to find a spot from which a truly undistorted view of its whole mass may be obtained.

The most beautiful views to be had of nearly every big mountain in the world are either from a lofty neighbor or from the air. Unfortunately for the ground photographer, Mount McKinley stands entirely alone in its glory. Mount Foraker, the only large mountain near it, rises fully 15 miles to the southwest of its summit.

MONTHS OF PLANNING FOR A FEW HOURS' FLYING

In the spring of 1936, plans were carefully laid at the National Geographic Society, in Washington, D. C., and at the

Institute of Geographical Exploration, at Harvard University, for a series of photographic flights around and over Mount McKinley and Mount Foraker which would take a complete group of pictures, showing in its entirety North America's highest range of mountains.

An aerial photographic flight over such rough country as the Alaska Range, where a forced landing is entirely out of the question and where few if any repairs can be made on delicate and complicated camera equipment, must be planned with extreme care. Although our two flights around Mount McKinley lasted but three and a half hours each, every detail had been painstakingly worked out for nearly three months before we actually took off.

FAIRBANKS BASE OF FLIGHTS

After our rather harrowing experiences with single-motored planes not equipped with radio during the Yukon Expedition of 1935, we were determined, if possible, to have both a multimotored airplane and a two-way radio on the Mount McKinley flights of 1936. From the Pan American Airways the expedition chartered a magnificent Lockheed Electra monoplane, also a crack pilot and radioman. The flights could safely be made with this airplane and crew operating out of a well-equipped base at Fairbanks, about 160 miles from McKinley's summit (page 89).

Major Albert W. Stevens, of Wright Field, in Dayton, Ohio, leader of the National Geographic Society's Stratosphere Expeditions, loaned us a large Fairchild K-6 aerial camera.

Other important equipment, such as light filters, small instruments and film magazines for the Fairchild camera, was loaned by Dr. Hamilton Rice, Director of the Institute of Geographical Exploration. Parachutes were donated by the Irving Air Chute Company, of Buffalo, and the breathing oxygen, which was used constantly during photographic work above altitudes of 15,000 feet, was furnished by Walter Kidde & Company, of New Jersey.

Actively participating in the flights were S. E. Robbins, pilot; Robert L. Gleason, radio; Bradford Washburn, photographer and director, and A. Lincoln Washburn, assistant (not a close relative of mine), who had been an important member of the Mount Crillon Expedition of 1934. Gleason and Robbins, regular employees of Pacific Alaska Airways, lived in Fairbanks. Lincoln Washburn, his wife, and I left Seattle on the S. S. *Alaska*, July 4, 1936. We were safely at Fairbanks with all of our equipment installed in the ship and ready to operate by the morning of July 11.

Although visibility appeared better during March and April, the lowlands are still white with melting winter snow until about the middle of June, and it is not until July and August that the real immensity of Mount McKinley, rising a sheer 18,000 feet above the broad green plains of the interior, can be appreciated.

The morning of July 12 dawned gloriously clear except for a few low cloud banks to the southwestward at an altitude of between six and eight thousand feet. We keenly desired to get pictures showing the peak of McKinley towering, as it so often does in summer, thousands of feet above a sea of low-lying clouds.

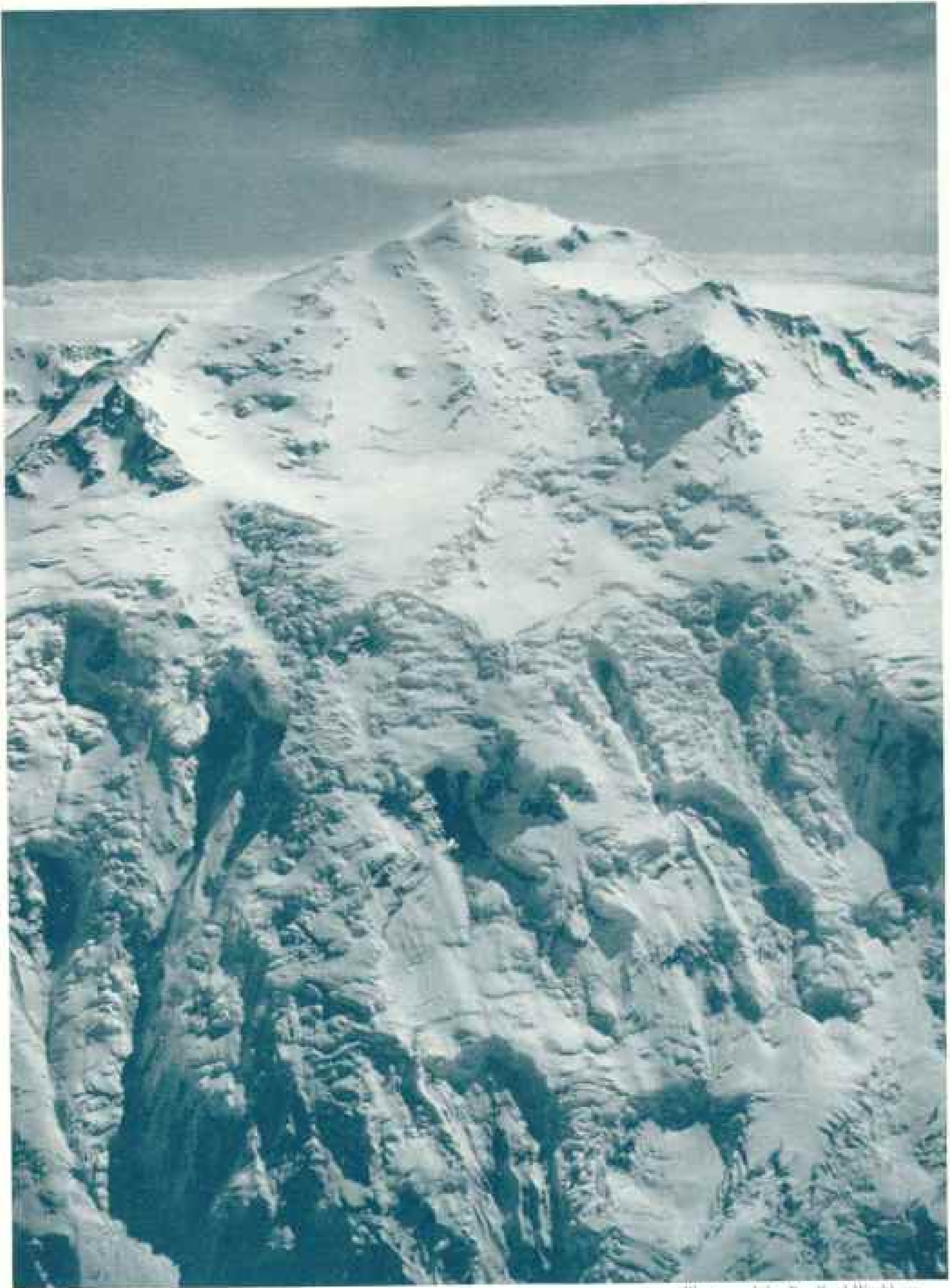
A telephone call to the Savage River Camp in Mount McKinley National Park ascertained that it was foggy and raining there. To make certain of the conditions around the upper part of the mountain, we made a short hop directly over Fairbanks to a height of 10,000 feet in our Fairchild 71 monoplane. We climbed lazily up in wide circles, finally breaking through the top of the overcast at about 8,000 feet.

As far as the eye could reach, a sea of silvery fog stretched off to the southwestward. At 9,000 feet the white summit of McKinley slowly appeared, nosing its way upward between two puffy cumulus clouds on the distant horizon, over 150 miles away. At 10,000 feet the peak rose, clear and distinct, into the deep-blue sky over the shifting banks of clouds.

A PERFECT TAKE-OFF

Radioing down to the airport, lost beneath the broken clouds below, to warm up the Electra and prepare it for our first flight, we circled speedily back to earth, landing shortly after ten in the morning. At 11:10 the oxygen equipment and camera had been given a final check, the motors were warmed, and Robbins made a perfect take-off.

The clouds were melting above us and the sun was hot (72 degrees) as we left the ground at Fairbanks. Our fur flying suits, mufflers, and mittens were heaped on an unoccupied seat in the front of the cabin till the air cooled enough to put them on!



Photograph by Bradford Washburn

ONLY TWICE HAVE CLIMBERS STOOD ON THE HIGHEST SUMMIT OF MOUNT MCKINLEY, NORTH AMERICA'S TALLEST PEAK

"The world's mightiest precipice, . . . one stupendous cliff plunging to the plains 17,000 feet below." Thus Bradford Washburn describes the northwest face of the 20,300-foot Alaskan mountain monarch, which rises higher above the land at its base than any other peak in the world (page 97). Bradford Washburn made the first complete camera record of Mount McKinley in July, 1936, during a series of flights sponsored by the National Geographic Society and the Institute of Geographical Exploration at Harvard University.

Photograph by Bradford Washburn

LIKE A HORNY-HIDED SERPENT WRITHING THROUGH FOAMY SEAS, "DENALI" AND "DENALI'S WIFE" THRUST RUGGED SUMMITS ABOVE A FLEECY MANTLE OF CLOUDS

The musical Indian name for Mount McKinley (left) means "the great one." Mount Foraker ("Denali's Wife"), with an altitude of about 17,000 feet, lies approximately 15 miles southwest of its more exalted neighbor, which, in this view, is 30 miles south of the camera. Flying nearly three miles above sea level, the Expedition plane was 7,000 feet above the clouds. Central Alaska's two highest peaks frequently rise into clear atmosphere while heavy rains drench the hidden lowlands.

EXPLORER WASHBURN GRASPS HIS BULKY "MAGIC EYE"

The Fairchild aerial camera takes 110 7-by-9 inch pictures with one loading.

Photographs by Bradford Washburn

"CANNED AIR" FOR FLIGHTS IN RARE UPPER ATMOSPHERE

A rubber hose conducts the oxygen from cylinder to user's mouth.

Photograph by Bradford Washburn

PEAK ON PEAK "IN CLUSTERS SWELLING, MIGHTY AND PURE, AND FIT TO MAKE THE RAMPARTS OF A GODHEAD'S DWELLING"

Thomas Moore's description of the Alps is also applicable to the tumbled peaks and avalanche-scoured precipices that buttress Mount McKinley on the southeast.

Photograph by Bradford Washburn

RIVERS OF ICE, STRIPED WITH ROCKY DEBRIS, VANISH BENEATH A SILVERY SEA OF CLOUDS

From an altitude of 18,000 feet, yawning crevasses resemble ripples on a brook. Flowing southward from Mount McKinley, the Ruth Glacier (left) and the Tokichitna Glacier bear off to the lowlands millions of tons of rock scraped from the mountain flanks. The bands of eroded material are called "moraines."

Photograph by Bradford Washburn

CLOUDS HANG LIKE BATTLE SMOKE WHERE STORMS AND FEARFUL PEAKS WAGE CEASELESS WAR

Peerless McKinley far overtops even the ranks of ice-plastered giants south of its shining crown. Two early climbing parties, attacking from this side, were promptly turned back by baffling cliffs and ice-gouged gullies. Wintry as it seems, this scene was snapped with practically the minimum snow cover on the peak (page 84).

Photograph by Bradford Washburn

LIKE REEFS UPTHRUST THROUGH GALE-CHURNED SEAS, SUMMITS OF THE ALASKA RANGE SHOULDER THROUGH BILLOWY THUNDERHEADS

From an altitude of 18,000 feet, close to Mount McKinley, the camera captures noonday rain clouds piling up over the lowlands to the south. Lightly veiled by mist (right center) looms the top of Mount Hunter, higher than Mount Whitney, tallest peak in the United States.

Photograph by Bradford Washburn

RADIANT MCKINLEY, 180 MILES AWAY, HOVERS ON THE HORIZON LIKE A PUFFY SUMMER CLOUD

A red filter and a film sensitive to infrared light (which the eye cannot see) eliminated the obscuring effect of haze, making possible this distant view of the mountain across the central Alaskan lowlands. Other high peaks appear as pearly beads of light strung along the horizon. The picture was taken at an elevation of 16,000 feet, from a position about 20 miles north of the town of Fairbanks. That wilderness "metropolis" is faintly visible in the center foreground on a meandering tributary of the Tanana River, whose irregular course cuts diagonally across the landscape from left to right.

Photograph by Bradford Washburn

RYE, OATS, WHEAT, AND BARLEY GROW IN THE VALLEY CRADLING FAIRBANKS, ONLY 120 MILES SOUTH OF THE ARCTIC CIRCLE

Shaped to wide bends of the Chena, a side channel of the Tanana River, lies the town from which were made the photographic flights around Mount McKinley. Fairbanks is a regular stop on the Juneau-Nome airline and inland track's end of the railroad from the Pacific ports of Anchorage and Seward.

Photograph by Bradford Washburn

HUGE MCKINLEY'S TWIN PEAKS BECKON VISITORS TO ALASKA'S ONLY NATIONAL PARK

Mount McKinley National Park, a vast wilderness of ice-capped peaks, grinding glaciers, moss-mantled slopes, and valley spruce forests, has an area approximately that of Rhode Island and Delaware combined. A native Alaskan, Walter Harper, was, fittingly, the first human to set foot on the top of the higher, or south peak (left). He was a member of the four-man party under Archdeacon Hudson Stuck that made the first successful ascent of the mountain (page 78). The north peak (right) is more than 1,000 feet lower than its giant neighbor.

Photograph by Bradford Washburn

COUNT THE ELDRIDGE GLACIER'S TRIBUTARIES BY THE ROCK BANDS ON ITS SURFACE

Winding ridges of loose rock (moraines), plucked from the mountain spurs between merging glaciers, are revealed as blanketing snowfields and flanking ice melt.

Photograph by Bradford Washburn

FRIGID CLOUD MASSES, DRIVEN BEFORE A 100-MILE-AN-HOUR GALE, SWEEP OVER MOUNT MCKINLEY'S HOARY HEAD

At high noon in midsummer, with the temperature ten degrees below zero, this view was taken from a flight altitude just above the summit.

Photograph by Bradford Washburn

IN THE MIGHTY PEAK'S GLITTERING ARMOR, CLIMBERS HAVE FOUND BUT ONE CHINK—KARSTENS' RIDGE, ON THE NORTHEAST FACE

All conquerors and near-conquerors have trudged up the Muldrow Glacier (right). To avoid impassable icefalls between that glacier and the Harper Glacier above, climbers have taken to the ice-buried knife-edge of Karstens' Ridge (center, left of ice cliffs). Then the way follows up the Harper Glacier to either the north peak (right), or the higher south peak. Two Alaskan sourdoughs, pioneering the route in 1910, attained the north summit. The south peak was first subdued in 1913 by the party under Archdeacon Hudson Stuck. In 1932 the Lindley-Liek expedition climbed both peaks (page 78).

From two photographs by Bradford Washburn

"DENALI" FOUGHT HUMAN PLUCK AND TOUGHNESS WITH BLIZZARDS, LACK OF OXYGEN, SUB-ZERO WINDS

From top to bottom, this panorama covers a vertical drop of 9,000 feet. It corresponds with the upper central part of the photograph on page 93. Dots show the route taken by all climbers up Karstens' Ridge (lower left) and the alternative courses up the Harper Glacier to the "capstone" of a continent. Staggering cliffs of the north peak slant up on the right from the extreme head of the Muldrow Glacier (bottom). The arrow (left center) indicates the point where a minimum-registering thermometer, left by Hudson Stuck and recovered 19 years later by Lindley and Liek, recorded a low of more than 100 degrees below zero!

Photograph by Bradford Washburn

"WHILE FAR BELOW MEN CRAWL IN CLAY AND CLOD, SUBLIMELY I SHALL STAND ALONE WITH GOD"

Lines written of Mount Everest, in the Himalayas, fit McKinley as well. Mountaineers believe ascent from the west may be possible, though the only attack from this side was stopped just above 10,000 feet. Turn the picture so the left edge is down, and lower ridges on the right appear as forehead and feather headdress of an Indian in profile whose aquiline nose is shaped by the south summit. The north peak is the red man's chin.

The cabin door had been taken off and left at Fairbanks. I was supplied with an old gasoline case to use as a chair directly in front of the opening, and a stout rope, knotted around my waist and made fast farther up along the floor of the cabin, let me lean just far enough out the opening to take pictures—and no farther.

TELEPHONE IN PLANE'S CABIN

The cabin of an Electra is so long that it was quite impossible to call to the pilot even at the top of one's lungs when the sound-proof door had been taken off, so Gleason had prepared for me a telephone mouthpiece connected to a set of headphones on Robbins. This allowed us to co-ordinate perfectly in getting the ship into the correct position for each photograph.

After leaving Fairbanks, we climbed slowly and steadily at a rate of about 300 feet a minute, on a course bearing exactly toward Mount McKinley, which lay far ahead, completely hidden behind banks of black clouds. Fifteen minutes after the take-off, the scattered overcast above us had rapidly consolidated into a compact, unbroken ceiling. As we climbed into the mist, the dim line of the Alaska Railroad was just visible beneath us.

All was gray for ten minutes and then, as we climbed, the sun began to burn through the ever-thinning fog above us. At 11:40, just a half hour after leaving Fairbanks, we rose out of the murky clouds into an indescribably beautiful silver fairyland. In every direction stretched an unbroken, billowing sea of clouds, its surface almost exactly 8,000 feet above the sea. Far to the east a rugged white island poked its head out of the mist. This was the lofty summit of Mount Hayes, almost a hundred miles away.

To the west and north nothing broke the silver curtain separating us from the world below. Dead ahead, and still nearly 80 miles away, towered McKinley, its massive bulk rising full 12,000 feet out of the gloomy rains from which we were climbing.

Eighty miles away this mountain looks as impressive as does Rainier from Paradise Valley, or Mont Blanc from the valley of Chamonix. But as we drew closer and circled McKinley, not its beauty but its colossal size impressed us. The tremendous precipices which guarded its summit from almost every angle were mute evidence of why no one has yet succeeded in climbing it by any side save the northeast.

Every side except that down which cascades the Muldrow Glacier is guarded by an almost vertical cliff of rock or ice. The walls to the south, at the head of the Ruth Glacier, are the most stunning of all, dropping in a dizzying series of avalanche-swept crags and gullies for 10,000 feet to the almost flat glacier surface.

Most impressive from the standpoint of sheer greatness, however, was the famous northwest wall. From the summit of the north peak, whose altitude is well over 19,000 feet, this side of McKinley drops in a terrific slope of glittering ice and rock —one unbroken, stupendous cliff—to the plains of the Kantishna, 17,000 feet below.

WORLD'S BIGGEST PRECIPICE

So far as I can ascertain, this is the mightiest precipice rising out of level country on the face of the entire earth. It is almost half again as high as the largest cliff on Mount Everest (page 81).

As we approached McKinley, we leveled off at 15,000 feet, adjusted our oxygen regulators and made our usual 15-minute report of altitude and position to Fairbanks. Then we shifted our course a trifle westward to fly parallel to the northern wall of the range. Robbins first made a complete circuit about both McKinley and Foraker, maintaining a constant altitude of 15,000 feet, and keeping about ten miles away from the big peaks so that we could get their entire mass in our photographs. Then, as we crossed the valley of the Muldrow Glacier, we began to climb once more, slowly, steadily.

Gleason now kept unbroken contact with Fairbanks by radio and Lincoln was feverishly busy most of the time keeping our two small DeVry movie cameras constantly loaded with fresh film. He and I each had a separate oxygen outfit, because of the heavy work handling the camera. Robbins and Gleason shared one cylinder, taking alternate puffs at the gas at frequent intervals.

As we rounded the western precipices on the second trip around the mountain, we climbed past 17,000 feet and rose in a wide spiral around the peak, about two miles away from the great dome. On the north and east sides the summit is completely blanketed in eternal snow and ice, with scarcely a rock visible anywhere for nearly a thousand feet below. On the south and west, however, only the very tiptop of the peak is covered with a snow cap. Imme-

diately below this summit tremendous precipices of deeply gullied, avalanche-swept rock drop almost vertically more than 8,000 feet to the heads of the Ruth and Tokichitna Glaciers.

At 12:45 we had gained an altitude of 20,200 feet, just a trace lower than the top of the south peak. This was our third circuit of the summit and this time we flew less than a mile from the top of the south peak and directly over the summit of the north peak. There was scarcely a breath of wind as we closed in on the summit to photograph it as near as it was safe to fly.

This absence of wind was a piece of good fortune. Flying so close would have been out of the question with the usual northwest gale that prevails at this altitude nearly all over northern North America.

ONE OF THE EARTH'S COLDEST SPOTS

Despite the fact that we were circling the peak of Mount McKinley at high noon on one of the warmest days of the year, the temperature outside the cabin registered 14 degrees below zero, a solemn reminder that we were flying over one of the coldest spots on earth.

At one o'clock, after taking several infrared photographs of the summit, we completed our pictures for the day and headed northeast once more, our nose pointed gently downward toward Fairbanks, our cameras stowed safely forward in the cabin. The radio told us that the skies were rapidly clouding in at Fairbanks, but that the lower ceiling was still about 6,000 feet.

Traveling a compass course above the overcast, we flew till dead reckoning placed us well beyond the area where we knew mountains below us were poking their peaks into the lower side of the clouds.

Once more we dropped into the mist. The sun faded away and our silver fairyland was gone. Five minutes later the fog below us thinned and melted away. Beneath us lay the little cluster of houses of the town of Nenana. Robbins' calculations had been perfect. We had picked up terra firma exactly where he had predicted.

At 2:15 we circled the Fairbanks airport, headed into the wind for a landing, and the first flight over McKinley was completed.

This first flight had given us excellent shadowed cross lighting for pictures of the eastern and western faces of McKinley, but our pictures of the north side at that time of day were directly into the light and lacked detail in the shadows, while those of the south side had no shadows at all. To get a complete group of pictures with good lighting, it was necessary to make one more flight, either early in the morning or late in the afternoon.

July 13, 14, and 15 were heavily overcast at Fairbanks, with a storm raging about the Alaska Range. However, on the evening of the 15th, radio reports from several of the western Alaskan towns indicated that fair weather was returning. Before going to bed we loaded cameras, clothes, film, and oxygen aboard the Electra, and filled her gas tanks to the brim in hope of good luck in the morning.

The 16th dawned magnificently clear. We took off again at 9:30, and in another three-and-a-half-hour flight with perfect lighting conditions we succeeded in getting exactly the pictures we wanted of the two unphotographed sides of the mountain.

Our luck with the weather was phenomenal, for again, on the 17th, sunrise came without a cloud in the sky and we completed our last flight early in the morning—a three-hour trip northeastward to make infrared photographs of the Alaska Range from long distances across the great central Alaskan lowlands. Forest-fire smoke, swiftly rising high into the sky the moment that the rays of the sun had warmed the air near the surface of the ground, shattered our hopes of getting a picture of the mountain from a distance of 300 miles or more from over the valley of the Porcupine River.

We did, however, succeed in obtaining one exposure on this flight which shows the peak clearly from a distance of 295 miles, right over Fort Yukon, its summit dome just peeking from behind a rising bank of smoke. Two other photographs taken over the Chatanika River Valley on the same flight show McKinley and Foraker with the central Alaskan lowlands in the foreground from distances of 220 and 180 miles.

All of the pictures taken on the last flight were made with infrared light on a specially treated infrared sensitive film and a red filter.

On July 18, the Mount McKinley Flight Expedition broke up, its work successfully completed in less than a quarter of the time that we had expected it would take. The summer of 1936 and its glorious weather will linger long in the memories of Alaskans. No summer in many, many years has been so continually bright and sunny in the Northland.

GUAM—PERCH OF THE CHINA CLIPPERS

By Margaret M. Higgins

GREEN, warm, and inviting, Guam lies in the path of the Pan American Clipper ships as once it lay on the direct route of the Spanish treasure galleons that plied between Manila and Acapulco. It is no longer an isolated and forgotten spot on the map, but an important link in a chain that encircles the globe.*

The Clipper service has wrought magic. To be more than 5,000 miles from the United States mainland and receive from home a letter written less than a week ago is something that, to quote one of our houseboys, "no tongue can appreciate."

Before the coming of the air Clippers, Guam had no regular direct mail communication with the United States and by the time a letter arrived it was often more than a month old. Mail either came on irregular and infrequent naval transports requiring a full three weeks for the voyage, or else went by liner all the way to Manila, whence it was brought back to Guam on one of three transports visiting the island from the Asiatic side each month.

Today the trans-Pacific clippers, on a regular schedule of a plane a week in each direction, carry mail and passengers from Guam to Alameda, California, and vice versa, in four days.

The approach by air is very beautiful. But it is no lovelier than sailing into the harbor as we did for the first time one late afternoon nearly three years ago. Eager to go ashore and to see the island and the house in which we were to live, we were ready for the first boat that put off from the transport. Guam is surrounded by coral reefs, and ships must anchor a mile or more from the landing dock. The narrow channel is banked on either side by ironwood trees.

HAPPY MOVING DAYS

There are just so many houses available for American occupancy, and it is necessary for the departing personnel to go aboard the same transport that brings replacements. The departing families leave their houses in operating order, with well-stocked refrigerators, and servants already installed. This makes moving day practically perfect.

*See "Flying the Pacific," by William Burke Miller, in The National Geographic Magazine for December, 1936.

Flowers found in almost every room when we arrived had been sent in by one of my kindly Chamorro neighbors.

Guam is a land of brilliant sunshine and deep shadows; happy children and forlorn, neglected dogs and cats; canned milk and cow-drawn vehicles. The natives pack the cinema houses to see western pictures, sing cowboy songs in praise of the great open spaces, and go home to sleep, ten or more in a room, with all the windows closed and locked to keep out evil spirits!

SETTING-UP EXERCISES FOR CHILDREN

We were still at breakfast on the first morning after our arrival, when the Navy band, in Plaza de España, burst into a lively march. Hastily we left the table and went to the windows overlooking the plaza.

On that morning, as on every morning during the school year, except rarely when rain makes it impossible, the children of the Agaña native schools were marching to the plaza for the setting-up exercises which follow the ceremony of raising the flag in front of Government House (page 105).

The children marched into the historic old plaza from every direction—boys and girls of all ages in clean, fresh school uniforms of white drill or khaki. The idea of a school uniform has done much to promote personal cleanliness among native youngsters, many of whom come from extremely poor homes.

After the flag was raised, our ears were assailed by some of the strangest words set to music that I have ever heard. It was several months before I was able to reconcile what the children were singing with what they surely had in mind. It started off like this: "Aw, hell to dee ou' nobu' fra'."

I hesitated to ask what they were singing, for I was sure that I was supposed to know. I should not have been able to guess, even yet, if I had not somewhere come across the words of the Guam hymn, "Oh, Hail to Thee, Our Noble Flag."

A BABEL OF TONGUES

The Chamorro language, one of that great family of Malayan tongues, is the vernacular of the island. All instruction in the schools is carried on in English, by native teachers, but the moment school is out the youngsters begin to chatter in their preferred language, and forget all about Eng-

Photograph by Mayhew

WHEN THE U. S. S. "CHARLESTON" SHELLED FORT SANTA CRUZ IN 1898, THE SPANISH GOVERNOR MISTOOK THE FIRING FOR A SALUTE

Isolated Guam had not heard that the United States and Spain were at war. The Spanish captain of the port put out in a rowboat to pay a courtesy call, only to learn the island had been "captured." Upon his return, he met a Spanish artillery detachment about to return the "salute." The officers of the *Charleston* discovered that the fortifications they fired on had been dismantled years before.

lish until school opens the following morning.

They call their language *Fino-jaya*, the "Idiom of the South," and refer to Spanish, which many understand and speak to some extent, as *Fino-lago*, or the "Idiom of the North," because the Spaniards first appeared here from the north.

While an increasingly large number of Chamorros now have a working knowledge of English, there remain many who speak only their native language. There are Spanish residents who speak only Spanish and Chamorro, Japanese who have acquired a knowledge of Chamorro, but little English. Thus amusing difficulties often arise, sometimes requiring a battery of interpreters.

One such situation was the setting off of the fireworks display on Guam militia night at the Guam fair two years ago. The fireworks, which had been purchased in Japan, were not unpacked until the hour set for the celebration. The young United States Marine who had charge of the affair saw, to his dismay, that all directions were printed in Japanese. He sent out frantic appeals for help while the eager spectators waited impatiently in the plaza.

A Japanese was found in the crowd who could read the directions, but could speak neither Chamorro nor English. A half-Japanese arrived on the scene who could speak that language but couldn't read it.

At last arrangements were completed, and few in the mass of spectators knew that the directions were read by the Japanese to the half-caste, who translated them into Chamorro for a native patrolman, who passed them on in English to the Marine, who gave the order to fire!

INVITATION TO THE FANDANGO

With mixed feelings of delight and apprehension, a few weeks after our arrival, I accepted an invitation to a fandango. I did not know what a Guam fandango was, but strongly suspected that it might mean some terpsichorean performance in which we should probably not be able to acquit ourselves with credit. Imagine my sigh of relief when it was explained that a fandango is the dinner party and general fiesta that a bridegroom gives on the eve of his wedding.

The lot of the Chamorro bridegroom is, to my mind, a hard one. More often than not all the wedding plans are made by the parents of the contracting parties. The

Photograph by Dr. Spencer L. Higgins

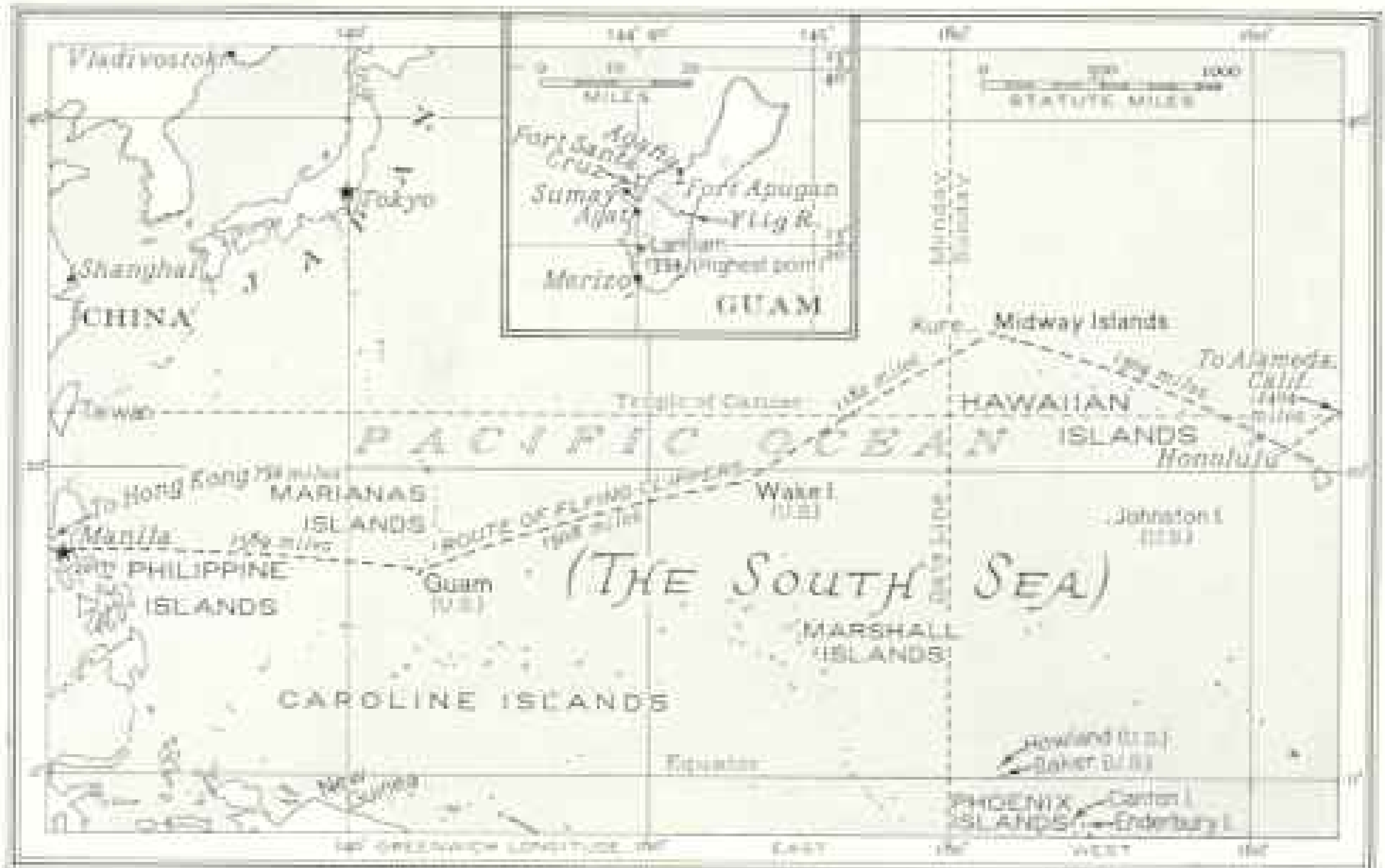
HERE COMES THE BRIDE!

The newly married couple must walk home after the ceremony, which has taken place in the Agaña Cathedral (background). Few girls are married in native dress; a white satin gown with several yards of veil is the proper costume, and the bridegroom must pay for it (page 103).

Photograph from Margaret M. Higgins

PROUDLY THE CHAMORRO BOY RIDES HIS SPIRITED COW!

Cattle take the place of riding horses, trotting along at fair speed and sometimes breaking into a gallop. Often a cow, native rider astride, passes down a road with her calf trotting nimbly alongside. These animals are used as beasts of burden on Guam, as are water buffaloes.



Drawn by Ralph E. McAleer

GUAM, WAY STATION OF FLIGHTS ACROSS THE PACIFIC

Fifteen hundred miles southwest of Wake and 1,600 east of Manila, this southernmost island of the Marianas group is a vital link in trans-Pacific air routes. Huge seaplanes that leave Alameda, touching at Honolulu, Midway, and Wake on their way, roar into Guam for their last stop before reaching the Philippines. Ultimate goal of their 8,746-mile journey is Hong Kong. The flying boats alight at Sumay (inset), formerly the U. S. Marine aviation base on the island.

Photograph by P. Simpson

FROM A COCONUT GROVE CREAKS ALONG A NEW ROOF FOR THE HOUSE

A water buffalo pulls the primitive cart which the Chamorro boys have piled high with palm leaves (page 112). These animals are the hardest workers on an island where human life is easy-going. They carry heavy loads over wet, slippery trails, sometimes sinking to their shoulders in mud.

house in which the couple is to live, its furnishings, even the bride's wedding gown and fandango dress and all the bridesmaids' costumes, are planned by the elders, but the bridegroom has to pay for them.

The bride does not bring a trousseau to her new home. The prospective husband must supply everything.

By no means the least expensive item is the fandango. Any young man of standing in the community is expected to provide a feast for a hundred or more of his friends.

We arrived at the home of the bridegroom's parents at the appointed hour of seven, and were met at the door by a very nervous bridegroom and several of his sisters, cousins, and aunts. His father and mother did not appear until some time later, for it seems they were overseeing final preparations for the feast that was to be served to about 150 guests. These were already arriving, some from Agaña, where the bridegroom lived, and others from the outlying villages.

All the girls were wearing evening dresses, Guam reproductions of pictures in the American fashion magazines. Only the older women wore the native costume, which is the Manila dress, adopted by the women of Guam during the early days of the Spanish régime.

As soon as the bride and her godmother arrived, dinner was announced. Two large rooms in the spacious old Spanish house had been thrown together and long tables were set for the party. I was glad when we were placed at the bride's table, for this was my first fandango and I meant to make the most of it.

CARABAO STEAK AND BROILED FANIJI

The dinner began with soup and ended with ice cream. Roast pig is always the main course on such occasions. Mountainous platters of this delectable food were brought in. The pigs had been roasted almost all day in Spanish outdoor ovens.

There followed roast turkey, fried chicken, carabao steak, and *faniji*, or flying fox. I did not inquire too closely into the manner in which the latter was prepared, and am glad now that I did not, for I have since learned that these large fruit-eating bats are dropped into boiling water, fur and all, without even being drawn. Since learning this I have lost my appetite for faniji, which is really delicious if one likes the gamy flavor of squirrel.

After several meat courses had been served, we were offered steaming platters of native rice, cooked in coconut milk and colored with *achote* (annatto) berries which, besides tinting it a deep orange, give the rice a pleasantly pungent flavor. The native guests doused every course generously with a fiery sauce made of vinegar in which had been steeped small, extremely hot red peppers.

All through the meal, which lasted about three hours, native brandy, *aguardiente*, or "aggie" as it is affectionately called by its admirers, flowed freely. When dinner was over and a string orchestra set about its evening's work, everybody was apparently ready to keep up the festivities until morning.

When the dancing began, my husband led off with the pretty dark-eyed bride. As soon as the dance was well under way, the bride disappeared, and we learned that she had gone back to her own home to await the bridegroom and all his guests, who were supposed to be at her house some time before midnight. While she was at the bridegroom's fandango, her parents had served an equally elaborate dinner to those relatives and friends of the family who were immediately concerned with the conduct of the wedding.

THE BRIDEGROOM TAKES HIS GUESTS TO CALL ON THE BRIDE

About 11:30 o'clock our young host announced that he was ready to pay his call on the bride, and would we please go with him? Off we went, the orchestra in the lead, the bridegroom next, and all the guests trooping after him, to the other side of the town, where the bride lived.

Her house was already so full of people I couldn't see how we were going to get in, but we managed it, and after talking a few minutes with her parents, took our leave, for the dancing would continue until morning, and one time was as good as another to say good night.

We were up early next morning, for the wedding ceremony was to take place at the early Mass in the cathedral, near the plaza, and just a few steps from our quarters.

The bridal party arrived promptly, looking singularly fresh, considering that no one had slept. The bride was gowned in the sort of white satin wedding dress that every Chamorro girl desires. It was made with a very long train, and with it she wore several yards of veil, carried by four sleepy little brown girls in fluffy organdy

Photograph by Dr. Spencer L. Higgins

HOUSETOPS OF AGAÑA, LANDMARKS FOR THE CHINA CLIPPERS THAT SPAN THE VAST PACIFIC

The large smokestack of the power plant, which supplies the island with electricity, looms as the most prominent feature of Guam's capital. The break in the coral reef offshore marks the original mouth of the Agaña River. Under a Spanish governor in 1852, a new channel was dug which led the stream through the city, providing a water supply and laundry facilities close at hand. The river now flows into the sea beyond the outskirts of the town, not visible in this view from Fort Apugan.

Photograph by F. Simpson

CHAMORRO MILITIAMEN LINE UP FOR INSPECTION IN FRONT OF THE GOVERNOR'S PALACE AT AGAÑA

Photograph by Mayhew

CHILDREN START EACH SCHOOL DAY WITH A SALUTE TO "OLD GLORY" AND MASS CALISTHENICS

Photograph by P. Simpson

NEAT PLANK COTTAGES WITH THATCHED ROOFS LINE "CORAL ROW" IN THE CHAMORRO SECTION OF AGAÑA

The street, built under U. S. Navy supervision, is of *cascajo*, a form of coral limestone. A few of the roads that crisscross the islands are of macadam, including a military highway between Agaña and Sumay. Drying racks for clothing are made of palm leaves supported on bamboo sticks.

Photograph by Mayhew

FROM THE PALM-FRINGED SHORE OF GUAM, ISLANDERS PUT OUT TO MEET MAGELLAN AND HIS STARVING CREW FOUR CENTURIES AGO

A scene like this met the eyes of the explorer, when he sighted the island while circumnavigating the globe—the first land he had reached for three months and twenty days. The seamen, beset with scurvy, had been reduced to a diet of rats and leather. After provisioning, Magellan noticed one of his small boats had been stolen. With 40 armed men, he landed, avenged the theft, then sailed away.

Photograph from Margaret M. Higgins

JULIET IN A CHAMORRO BALCONY

Although this maiden of Guam learned English in school, her mother taught her to speak the native tongue. Throughout Spanish and American rule, the aboriginal language has been handed down from one generation to the next, although English has been taught in classes for almost 40 years.

dresses. Their headgear was somewhat awry, but their small faces bore a look of grim determination.

We were invited to attend the wedding breakfast at the bride's house, but this we had to decline. The newly married pair walked from the church to the bride's home, according to the old Chamorro custom.

After breakfast, they went from house to house, still in their wedding finery, to call upon their friends, many of whom had to rush home after breakfast to be ready to receive them.

FRIDAY FAVORITE WEDDING DAY

Because Friday is the favorite morning for weddings, we are awakened early almost every Friday morning by the clatter of the cathedral bells, announcing that another knot has been tied, and that perhaps, for some time to come, another young lad will be trying to pay his fandango bills!

In Agaña, the capital of Guam, where more than half of the island population lives, there are many native families of means, very often of wealth, according to the local scale. They are business men, government employees, and schoolteachers. They read books and magazines, go to the movies, and in other ways keep more or less abreast of the times.

They are, for the most part, mestizos, with Spanish, German, Scottish, or American blood. The natives of this upper stratum of Guam society claim descent, on the Chamorro side, from the ancient chieftains. It is unlikely that there are any persons of unmixed Chamorro ancestry on the island, even in the back country, but of course the mixture of European blood is most noticeable in Agaña, which has always been the capital city.

Many of the men and women of the upper class have had educational advantages that place them above their neighbors. Some have attended school in Manila, Hong Kong, or the United States. The girls and women of this group are handsome, often

Photograph from Margaret M. Higgins

EVERY CHAMORRO BOY WANTS TO OWN A FIGHTING COCK!

Seldom do children keep cats and dogs as pets, but to be the possessor of a promising rooster is a mark of distinction. Baseball has made inroads into the popularity of cockfighting.

beautiful, and are dressed in the latest fashion from Manila or San Francisco.

The most important official function of the year is the reception at Government House on New Year's Day. Then daughters of the old families of Guam present a picture one does not forget.

There are very definite social divisions among the 20,670 native inhabitants of Guam. I have noted that the town resident feels somewhat superior to the man from the back country, and villagers display a marked envy of dwellers in Agaña.

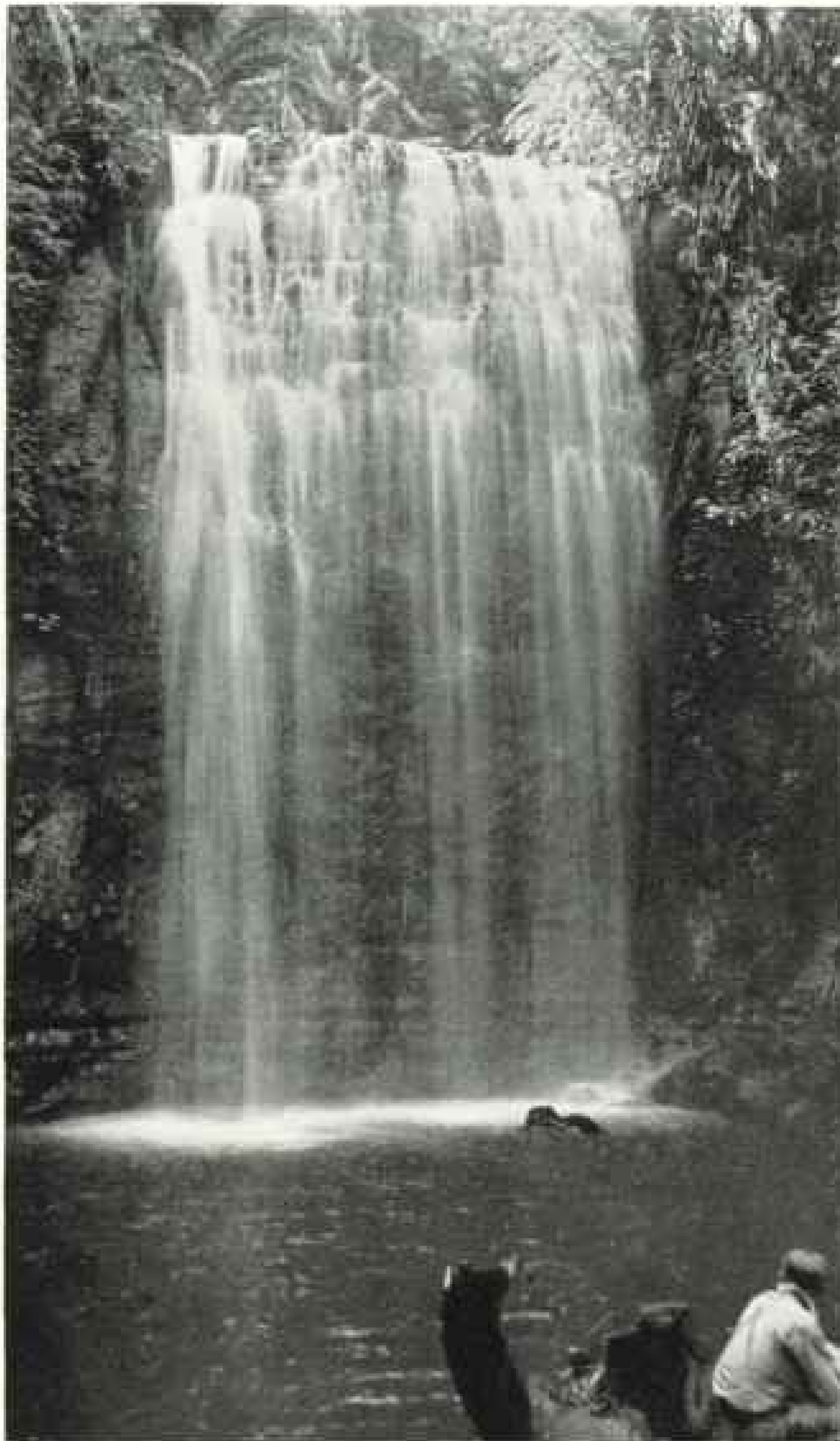
CHAMORROS ARE STAY-AT-HOMES

Many Chamorros with whom I have talked in some of the remote settlements have never traveled beyond the limits of their own village. They appear to have very little curiosity about the island on which they live, and are sometimes incredulous when we speak of interesting places we have visited which may be within a short distance of their homes, but which they have never seen.

A journey of ten or twelve miles is looked upon as a formidable undertaking. Formerly it meant an all-day journey in a bullcart, or perhaps on foot. Even now that there are automobiles, the trip from an outlying village to Agaña, a ride of perhaps 40 minutes, is still a serious matter, and it is not unusual for the traveler to seek a telephone at once to communicate to his family, through the village patrolman, that he has arrived safely in the city and is well.

Within a few weeks after our arrival we found that we had just about exhausted the possibilities of the motor roads—some 85 miles of improved highways—and that if we were really going to see Guam we should have to see it on foot. The roads over which a motorcar can pass serve only the principal villages, and these are near the seashore. Only footpaths and carabao trails reach into the hills and the jungles, where no wheeled vehicle can travel.

Merchandise and farm products are packed in and out on the backs of the



Photograph by Dr. Spencer L. Higgins

HIKERS BRAVE MILES OF JUNGLE TO SEE GUAM'S CATARACTS

Reaching Maulat Falls, with the deep, cool pool at its foot, entails a hot pilgrimage along liana-hung trails, bare savanna and tall sword grass. Many waterfalls dot the island, but seekers must cut their own path with a *machete* through tangled growth, and fight off hordes of mosquitoes and flies.

strong, patient carabao, or water buffalo, which, in the rainy season, sometimes sinks to its shoulders in mud.

We have had no difficulty in finding guides to take us over the island, but have had to engage a different one for each district we wanted to visit. Each man knows only his own immediate surroundings. In many places the trails are not clearly defined; indeed, we often have to cut our way through the jungle with machetes. Since a mosquito-infested jungle would hardly be a comfortable place to get lost in, we invariably have a native as guide and carrier.

A few weeks ago we planned to explore the Ylig River, following its course up from the seashore in hope of finding, near the source, a spring that was said to be in that vicinity, called by the natives "Dangis Bobo," Candle Wax Spring.

We were told that candle wax "spouted" from it and that the natives had, in former times, made use of the product. Of course we doubted the existence of anything even remotely resembling the spring as described, but it was a good excuse for another hike to that portion of the interior which we had previously visited from another direction.

A guide who lived in that district was engaged; we were to find him at his ranch a mile or two up the river. He was waiting for us with all his large family, at his thatched ranch cabin. He looked me over with an air of disdain that led me to believe that he thought I would never be able to make it.

While the three male members of our group were closing a bargain with the guide, I talked with his grandmother, who, complacently chewing betel nut, sat under a coconut tree weaving thatch for a new roof. Children of all sizes and ages poured out of the little house, which consisted of one room and a small lean-to.

One little girl was looking after all the others and was handing out banana-leaf cornucopias of boiled rice, their breakfast. No other food was in sight, nor had that house, typical as it was of back-country homes, any other utensils than two iron cooking pots and a few bowls and ladles made from coconut shell.

THE WIFE DOES ALL THE WORK

Meanwhile the final check-up of cameras, canteens, and lunch kit was completed, and we were ready for the trail. I was surprised to note that our guide brought up the rear, instead of going out ahead as we had expected. However, here the trail was clearly defined, so I thought he was just letting us go on without his leadership until the jungle closed in.

I looked up a few minutes later, to see a woman at the head of the line. Mariquita, the guide's wife, had come up behind us, and, shod with sandals made from bits of inner tube secured with fiber thongs, had trotted past us so quietly we had not been aware of her. She, it developed, was our real guide, and her husband, the grand personage at the end of the line, just a sort of general manager.

Photograph by Lawrence Dieu

DEER GIVE THIS BEAN-PATCH SCARECROW A WIDE BERTH!

A brown paper bag placed over a coconut husk and stiffened into shape with varnish supplies the head. A few sticks and some gunny sacks make the figure. Chamorro gardeners spend much time creating the fierce effigies, intended to discourage animal visitors as well as birds.

She was bareheaded, barearmed, barelegged, and virtually barefooted, for those flapping bits of rubber were a poor protection against the rough, jagged coral rock of the trail, or the thorns of the *limón de China*, or limeberry, bushes that border it, or the miles of sword grass on the savanna that we reached later in the day. Her husband called out an occasional command, which Mariquita hastened to obey. One readily got the idea that she wanted her man to be pleased.

She it was who, with a machete nearly half as large as herself, cut our trail through well-nigh impenetrable jungle, felled large bamboos at three places along the route, and with them quickly improvised bridges over which we passed to the opposite bank of the river.

At her belt she wore, besides the sheath

Photograph by F. Simpson

CHAMORRO ROOFERS NEED NIMBLE FINGERS, NOT HAMMERS AND NAILS

Fronds from coconut palms are plaited and tied to the framework, beginning at the ridgepole and working down the steep slope. Wooden walls are painted white, with blue slats covering the cracks. Huge hardwood logs, like those in the foreground, serve as foundations. They are hewn from *ifil* trees and last for generations.

in which her machete was carried during those brief intervals when it was not in use, a small pouch containing her betel nut supply. To this she had recourse several times that day.

The Chamorros do not carry water on the inland trails. They drink from any stream or pond, even when it is obvious that carabaos or other animals have recently been there. Besides, in the jungle one can always get a drink that will at least prevent actual suffering from thirst by cutting a couple of feet of *guiji* vine, which grows everywhere. Sap literally gushes from the vine so cut, and it is not unpalatable.

One cannot go many miles here without coming upon a coconut plantation. It is generally understood that travelers afoot may help themselves to green nuts. This is another good reason for having an agile guide, for the trees are tall, and the only way to get the nuts is for someone to go up after them.

One blow from a machete slices off the husk at just the right angle and at the same time cuts a hole of the right size in the nut itself, from which to drink.

A good nut contains a pint or more of cool, not too sweet juice, which is sometimes referred to as "coconut milk." Real coconut milk is that which is expressed from the ground or grated meat of the ripe nut after it has been steeped a short time in warm water. This product has many culinary uses in tropical lands.

Could Mariquita climb a coconut tree and bring down the nuts? Mariquita was equal to any emergency and appeared to delight in seeing us refresh ourselves with the product of her strength and agility.

THE HUSBAND TAKES THE MONEY TO BET ON COCKFIGHTS

We found Dangis Bobo, and, just as the men of the party had suspected, it was no more than an outcropping of gypsum on a rocky slope. Late in the afternoon we completed our 18-mile circuit, Mariquita always trotting along ahead, eager to point out interesting things that we might like to see. As we left her, she dutifully turned over her guide's pay to the head of the family, who probably tucked it away in his cockfight purse.

Photograph by P. Simpson

U. S. SAILORS AND MARINES KEEP AGAÑA MARKETS PROSPEROUS

Dried coconut meat (copra) was once the only crop sold for money. Demand from officers' families for fish, chickens, and vegetables soon taught the islanders that other products could be sold for cash, too. The market was set up in the old Marine Barracks, which once housed the Spanish garrison. Even today the Chamorros supply most of their own wants by barter.

The Chamorros are incurable gamblers who will bet on anything, cockfights preferred. Even a poor man is sure to have a cockfight purse in which he hoards every cent he can get, convinced that next time his bird will win. His wife may fall ill, his youngsters may need clothing, but the cockfight money remains inviolate (page 109).

The people in the back country have very little cash. Their economy does not seem to call for money. Needs, which are simple, are satisfied for the most part by what can be grown at home or obtained by barter from a neighbor. When clothing must be purchased or when tax time comes around, the Chamorro cuts some copra and thus gets the necessary cash.

Throughout the year he grows enough vegetables for the needs of his own family. He works hard, for it is no easy task to clear the jungle, and this he must do if he is to plant a crop. Much of the land is rocky and has little topsoil. Good land is often covered with such thick jungle growth that to clear it by primitive local methods is an endless task.

There are many fertile valleys yet to be developed, and this a patient government has for many years tried to persuade the Chamorros to do. Unfortunately, Chamorro youths are not interested in any back-to-the-land movement. They all hope to obtain teaching positions or government employment after graduation from junior high school.

I once asked a native boy who was job hunting in Agaña why he didn't stay on the family homestead and learn to be a good farmer.

"Oh," he said, "we can't do that these days. The girls won't marry farmers any more. They want their husbands to be dressed up and go to the movies."

NATIVE FRUITS ARE DELECTABLE

We like to use the native fruits and vegetables and resort to canned products only when fresh foods cannot be obtained. Invariably a local product can be made to serve in place of almost everything from home that we should like to have and cannot get here. Since the mangoes are second only to those of the Philippines, we can

Photograph from Margaret M. Higgins

MYSTERIOUS PREHISTORIC BURIAL MARKERS DOT GUAM

No one knows the age or significance of these stone pillars. Long before the arrival of Magellan in 1521, knowledge of their meaning had been lost. This *latte* is the only one on the island whose stone capital has not been shaken off by earthquakes (page 121).

worry along very well for a few years without strawberries. Guam pineapple is delicious, and papayas at one cent a pound make me wonder whether, after all, I really want to go home.

People who do not like spinach have a happy time in Guam, because spinach will not grow in this climate. However, I often hear spinach haters sing the praises of the Guam substitutes, taro tops and pumpkin tips. The young, tender leaves of taro, or the pale green tips of the pumpkin vine, cooked with coconut milk and a dash of lime juice—well, I have known spinachphobes of long standing to succumb after the first taste.

Most of the products we buy in the local market are to be had by the natives for nothing more than the effort of gathering them. Bananas, breadfruit, custard apples or sweetsops (*atis*), pineapples, papayas, coconuts, yams, and taro grow wild in many parts of the island. The surrounding reefs abound in small fish, crabs, mussels, and other sea creatures that the natives use.

Though Nature has lavishly provided the island people with all the real necessaries of life, the Chamorro would rather have a can of salmon than any fish in the Pacific. They love American tinned and packaged goods. Canned peas have a special lure, because peas are not grown here. The natives will pass up their own delicious fruits in favor of commercial jam, jelly, or syrup. Oh, how they love store syrup!

Jesús, a lad of 14 who lives near us, has brought me flowers and has served as messenger or errand boy many times, always refusing payment for his services. A short time ago I asked him what I could give him that he would very much like to have, expecting him to suggest a bicycle or perhaps some athletic gear.

"I think, ma'am, I would like to have a can of sardines," he said after a moment

of serious consideration.

A goodly portion of my Christmas shopping for last year was done in the home shop of Maria, the mat weaver. Her baskets, purses, golf bags, table mats, and even large floor mats, are so delicately woven that they are soft and pliable as silk.

When I first went in search of the weaver's house, I had no other directions for finding her than her name, Maria, and that she lived in Merizo, on the southern end of the island, a drive of some 20 miles from Agaña. There are many Marías in Guam, and I hesitated to drive so far without more definite information.

Photograph from Margaret M. Higgins

"NOW DON'T FALL OUT OF THAT SWING AGAIN!"

The pharmacist's mate, second class, in charge of the health department outpost at Agat, on the west coast of Guam, sets broken arms and treats many ailments. He also vaccinates villagers, enforces health and sanitary regulations, and performs the duties of midwife if occasion demands. Each district dispensary is connected with the Naval Hospital, from which ambulances are dispatched in emergencies.

I was told, then, to inquire for the house of *Marian Pedro*—María who belonged to Pedro. Now, to be sure, there are as many Pedros as Marías; therefore, to distinguish her from others of similar name, she is designated as Marian Pedro Taimonglo—*i. e.*, María, belonging to Pedro of the old Chamorro family Taimonglo.

Chamorros do not generally use the surname unless the family is wealthy or prominent, or bears one of the old Chamorro names. They are very proud of the ancient family designations which, even to the stranger, are easily distinguished from Spanish or other foreign names. One soon learns to recognize as Chamorro such names as Taitano, Taitingfong, Aguigui, Megofna, Fegurgur, and Namauleg.

The letter "n" added to a proper name ending in a vowel has the value of the preposition "of." Thus Joaquinan José means Joaquina of José, and Antonion Julia is Antonio (husband) of Julia.

NICKNAMES ARE POPULAR

The natives are fond of nicknames. A man is more often than not referred to by a

Photograph by Lawrence Dieu

"CAREFUL WITH THAT RAZOR, DAD!"

Sending all the children of a large Chamorro family to a barber shop often is too expensive, so the head of the household takes care of the haircutting. When the girls grow up and start to consult fashion magazines from the United States, which are avidly read on the island, they probably will patronize the beauty shop in Agaña.

nickname of forgotten origin which may once have belonged to his grandfather. All proper names are shortened, and seldom is anyone called by a full Christian name. Vicente and Jesús are known as Ben and 'Sus. Da, Doy, Nic, and Chon are four sisters, Felicidad, Dolores, Nicolasa, and Asunción.

I found Maria, whose friends call her "Na," seated on the floor of her small thatched house, surrounded by piles of *aggak*, a species of pandanus leaf, from which she was weaving a star-shaped floor mat. Her two helpers were making table runners, while a small apprentice was busy outside, stripping the spiny keels from dried pandanus leaves. The leaves in this form may be used to lash or secure the framework of houses or thatched roofs (page 112).

When they are to be used for mats or other woven articles, the stripped leaves are made into tight rolls and laid aside several days to stretch. They are then unrolled and hung in the sun for two weeks. When they are thoroughly cured, they are ready to be split into strips for weaving.

Maria weaves without the use of frames, merely counting the strips, and has only one tool, a chisel-like piece of steel slightly curved, wide at one end and narrow at the other. With this she effects a flat fold in the aggak, to make a perfect edge.

For very small articles, cigarette cases and the like, Maria uses the young green leaves, which, after being steeped for a few minutes in hot water, are curved in the same manner as the large leaves for floor or sleeping mats.

Her home was typical of the middle-class home in Guam, two rooms set about six feet above the ground on stout posts (pages 106 and 112). The roof was of nipa thatch,

with no chimney. Smoke from the small fire over which meals were cooked had to find its way out through the openings under the roof (page 119).

Clean, crisp pink curtains hung at the two small windows, which had no glass, but were equipped with wooden shutters that could be tightly closed at nightfall.

In one corner of the room was a small round table, with a vase of red-paper roses so cleverly made that, although I knew there were no large red roses in Guam, I examined them closely, just to make sure. Religious pictures almost covered the walls.

A long bench stood on one side of the room. Often such a bench is the only kind of seat in the house. Families are large, and to supply chairs enough to go around would, in many cases, be impossible. Chamorros can sit for hours in a squatting position, whether at work or merely in social conversation.

Photograph from Margaret M. Higgins

BESIDE A WAYSIDE SHRINE, A CHAMORRO WOMAN SPLITS PALM LEAVES FOR WEAVING

Many religious markers dot the island of Guam. This one commemorates the establishment, in 1875, of a road, and the development of a tract of land as a coconut plantation. The fence in the background is of plaited palm fronds.

The floors and bench were of *ifil* (ipil), choicest hardwood of the island, often called "Guam mahogany." Years of polishing with coconut husks had imparted to it a rich waxy glow.

In one corner of her small living room I saw the shrine that is to the Chamorro household what the *tokonoma*, or place of honor, is to a Japanese home. Native women can give free swing to their ingenuity in arranging household shrines, and I have seen these in many homes, with every imaginable sort of decoration from fine old Spanish silver pieces to alarm clocks.

Maria's mind was not entirely on her business affairs the first time I called, for she was holding a novena in her house, and that night, the ninth evening of the observance, she would have to serve a feast of roast pig to the thirty-odd participants who had attended her nine evenings' devotions.

Because I felt that she would like to terminate our interview promptly and get on

with the pleasanter business of preparing the feast, I departed, leaving my order for future delivery—the far-distant future, as I later learned.

LAUNDRESSES ARE HARD ON CLOTHES

We were apprised before we left San Francisco of the destructive methods of Chamorro laundresses, and were told that it would be well to bring a supply of plain, sturdy household linens.

In accord with popular custom, I sent our first bag of laundry to one of the villages in which the women make a business of contract laundry for Navy and Marine Corps personnel and for families as well at a flat monthly rate. When, after a few days I got back a white, starched, and beautifully ironed pile of shreds, scarcely recognizable as anything that belonged to us, I decided to do a little follow-up work.

There they were, a dozen or more *lavanderas*, some waist-deep in the stream that flowed near their village, others on the bank, bending over shallow wooden troughs of soapy water, all seemingly intent on the utter destruction of those piles of clothing at the river's edge.

I looked on in amazement as one piece after another received its drubbing, saw flimsy bits of table linen slapped on the rocks as viciously as were the khaki uniforms from the Marine Base. They play no favorites, these sturdy laundresses, who, with a corncob for weapon and a rock in the stream as a base of operations, can render any garment practically useless after one or two treatments.

It seemed that I might better arrange to have the laundry done at home, under some degree of supervision. We engaged Josefina, and for a few days I was hopeful, but was to learn, after all, that instead of a corncob she was using a stiff coir brush. There seems to be nothing one can do about it.

MILDEW AND FRIENDLY LIZARDS

Despite minor annoyances, life in Guam is, for the most part, very pleasant. Throughout the greater part of the year the days are agreeably warm and the nights comfortably cool. In the hottest season, April, May, and June, people who can do so remain indoors during the early afternoon hours, usually turning out for a refreshing swim before sunset.

Next to giant roaches ("Guam eagles"), our most destructive household enemy is mildew. Clothing, shoes, luggage, and books all take on an undesired fur trimming, almost overnight, during the rainy season, if they are not closely watched. Electric lights are kept burning the year round in all closets and trunk rooms.

Ants, large and small, those that bite and others that merely annoy, are everywhere. Centipedes may crawl out from under almost anything, and one soon learns to be on the alert for them. Their sting is painful though not dangerous.

We have in our house many small lizards, both geckos and the blue-tailed skinks. They are pleasant little things, often making overtures of friendliness, such as dropping in one's lap unexpectedly or perching on the arm of one's reading chair.

Sometimes baby lizards scarcely an inch long jump from the wall to my desk and scamper about, quite unafraid. They eat insects, thus making themselves useful, living most of the time in the large clusters of bird's nest fern, sometimes called air plants, which we use on our walls here instead of pictures or other decorations.

These plants, which seem to me just right for tropical houses, are brought in from the jungle, where they are found on many forest trees. They are epiphytes, not parasitic, and cling to the trees, their own small roots taking sustenance from the air and such vegetable matter and dust as they may find on the bark of the tree.

Set in joints of bamboo or nailed to wooden panels, they are hung throughout our houses, a truly tropical background for the bamboo, wicker, and ifil furniture with which most of the American homes are equipped.

RED FLOWERS FOR TAILLIGHTS

Of flowers Guam has an abundance, but by no means the profusion that song and story would have us believe exists on all tropical islands. Few of the garden flowers grown so easily at home can survive the tropical heat or prolonged rains.

The Antigonon, or *cadena de amor* ("chain of love"), both pink and white, is plentiful, as is bougainvillea. There are many flowering shrubs and trees, most of which have been imported from Hawaii, Mexico, or the Philippines, including the exquisite night-blooming cestrum called *dama de noche* ("lady of night"), the fragrant ilang-ilang, and the colorful royal poinciana, or flame tree. Bright crotons are seen at every hand, their gay foliage of

BRIGHT-RED HIBISCUS SIGNALS DANGER AT THE TAIL OF A LOAD OF LUMBER

Truckmen merely pick the flowers from the roadside when they need them, for this variety grows in profusion on Guam all year. *Cadena de amor*, both pink and white, and bougainvillea also are plentiful (page 118).

Photographs from Margaret M. Higgins

A BED OF COALS IN A WOODEN TROUGH MAKES A KITCHEN RANGE IN GUAM

Heavy hardwood framework does not burn through and lasts for many months. No chimneys are necessary; the smoke passes out through openings under the thatched roof. Cooking that requires great and prolonged heat, such as roasting, is done in a Spanish outdoor oven of stone.

Photograph from Margaret M. Higgins

COCONUT MEAT, DEFTLY HUSKED AND CUT, DRIES IN THE SUN

Copra is Guam's export. Chamorros are adept in pulling off the heavy husk, over a hardwood stake driven into the ground, then halving the nut and slicing out the meat. Speed contests, similar to corn-shucking competitions in the Middle West of the United States, are frequent.

red, green, and yellow always in evidence and available when flowers are scarce.

The brilliant red hibiscus we have in profusion at all times of the year.

The driver of a cartload of lumber or bamboo wastes no time looking for a piece of red calico for a danger signal on the tail of his load. Instead, he ties a gay bouquet of red hibiscus to the projecting logs or poles and goes on his way.

Guam is a naval station. The chief income of the island is the money which is spent here for the upkeep of the U. S. Government activities. During the fiscal year 1937 the Federal funds expended in Guam totaled $959,895. During the same year the total island revenues, accruing to the Naval Government of Guam and used here to maintain those activities which pertain to the local government, were $311,072.75.

Many of the benefits enjoyed by the people have been paid for and are maintained from Federal funds and not from local revenues. These items include the principal roads, water system, electricity, telephones, sewage system in Agaña, and the Naval Hospital and Health Department.

Aside from small, privately endowed Susana Hospital, the Naval Hospital is the only one in Guam, and Navy medical officers are the only doctors. This well-equipped institution, which affords free medical and surgical care for the Chamorro people, is operated with funds from the Bureau of Medicine and Surgery, Navy Department, and from a special $20,000 appropriation by Congress for the care of "Lepers and Special Patients."

WORM TREATMENT GIVEN IN SCHOOLS

Besides the usual provision for the care of service personnel, the hospital has two large native charity wards, one for men and the other for women and children. There is also an outpatient clinic that does a rushing business, especially on Monday mornings when mass worm treatment is administered.

All the natives suffer from intestinal parasites, many from hookworm disease, and for some years it has been customary to give routine worm treatment in all native schools, and to administer it to all applicants at the outpatient clinic.

Guam has no malaria, not much dengue fever, and but occasional mild outbreaks

of typhoid. A large percentage of the population suffers from tuberculosis. Gangosa and leprosy are not so prevalent as in former years, but dysentery, yaws, and hookworm are always with us.

Americans can be justly proud of what the Naval Hospital and the Health Department have been able to accomplish in Guam. Since the American occupation the population has doubled and continues to increase at the rate of about one thousand a year.

DEATH IS A GREAT OCCASION

Old Pedro died yesterday. For several days his relatives and friends from other villages have been gathering in Agaña, and his house, in the next block to ours, has been the scene of more than the usual activity during the last 48 hours. Yesterday morning I saw one of his sons in the back yard, busily engaged with a saw and hammer, some boards, and a can of black paint.

Pedro had said good-by to his children and grandchildren, had received the final comforts of his religion, and lay on a straw mat on the floor of his small house awaiting the end, while his daughters and the women of the neighborhood put huge kettles of rice on to boil, and made plans to feed the friends who crowded into the house and overflowed into the street.

Pedro was not to die alone and forgotten. An individual's popularity in Guam is measured by the number of friends who come to be with him when he is ill, and who remain until after the funeral.

I suppose there are few places left where it costs so little to die as it does in Guam. The preparation of a body for burial is taken care of by friends or family, and coffins are, if possible, made at home. The more affluent families purchase these items from a local sawmill, but the average man expects nothing more than to make up a coffin of the right size from any lumber at hand. Lacking suitable material, one borrows from a neighbor.

Lumber is scarce and expensive in Guam. Every board or packing box that comes to the island is valuable. Very often a coffin is needed in haste, for the health laws require burial within 24 hours, and people are put to no end of concern to find material from which to make coffins.

Thus it was that, driving through one of the outlying villages one afternoon, we encountered a solemn procession wending its way to the little cemetery, the bearers carrying on their shoulders a long box nailed together from short boards, several of which bore the stenciled notice, "Kirin Beer."

Guam offers a rich field for archeologists. The island is peppered with prehistoric burial sites, marked by *latte*, or monument stones, which usually appear in double rows, the columns originally surmounted by round stone capitals, some of which weigh several tons (page 114).

Most of these sites remain untouched. The fact that the Naval Government does not permit unauthorized excavation or removal will preserve the artifacts intact until more trained investigators may find their way out here.

The people are naturally gifted in anything that pertains to theatrical production or costuming. Very few Chamorros have ever seen a stage production of any kind. They get all their modern ideas from motion pictures and from magazines.

NATIVE INGENUITY REMARKABLE

When the native schools closed last year and the teachers were preparing for the exercises that, in every school on the island, mark the annual closing and, alike to children, parents, and teachers, are the event of the year, I received a message from a young native teacher. She asked if I had anywhere about the house a picture of goldenrod. The elaborate production to be staged by her children called for a great deal of goldenrod.

I was unable to find a picture of that flower among the few books we brought to Guam, nor was I able to obtain such a thing in the station library. Now, it is difficult to describe accurately to another person a flower he has not the faintest chance of seeing, and describe it well enough so that it can be reproduced in paper. However, with the poor description I was able to provide and a still poorer pencil sketch, this young Chamorro teacher put her youngsters to the difficult task of manufacturing crepe-paper goldenrod.

As a tribute to her ingenuity and generalship, I can only say that when I attended her school entertainment and viewed the field of goldenrod that occupied more than half of a good-sized stage, my first reaction was a sneeze! Goldenrod does that to me at home.

The Chamorros like movies, especially western pictures with lots of shooting. As

Photograph by Dr. Spencer L. Higgins

CHAMORRO MUSICIANS RECLINE TO PLAY THE WAILING "BELIMBAU-TUYAN"

A half-coconut shell, attached to the center of the string board, rests on the player's stomach and a coconut grater pillows his head. As he pulls his bow across the single string, he provides a plaintive accompaniment to the *chamorrita*. This melody, to which many different words are sung, is the real folk song of Guam.

a contrast to this, Shirley Temple pictures draw larger crowds at the two local cinemas than the productions of any other single star. Even the great-grandmothers who never leave their homes except to go to church turn out in large numbers to see Shirley. Every little native girl wants to look like Shirley Temple, and mothers sacrifice any likely-looking child to the permanent-wave machine in hope of turning out a copy of their favorite screen heroine.

Yes, Guam has a beauty parlor. It has also several taxicab companies, a dime store, a restaurant, a good drugstore, numerous bars, lunchrooms, and pool halls. There is a post of the American Legion, and both the Elks and Masons have local organizations and very good clubhouses, located in Agaña. Every village has one or two small shops, but the only stores catering to the needs of the foreign population are in Agaña.

At the time of writing, the American service colony, consisting of officers and men, some of whom have their families here, Navy nurses, personnel of the Pacific Cable Company, Pan American Airways, and one or two other organizations, numbers 883.

There are also approximately 70 Americans, mostly former service men, who make Guam their home, having retired here in years past and married native wives. Some 15 Spanish, 40 Japanese, and a few Germans, Danes, and Filipinos, together with 12 Basque missionaries of the Capuchin order, make up the non-native portion of the population.

The natives have practically all the rights of American citizens, with very few obligations. While the Governor is the lawgiving authority and can issue executive orders with the full effect of law, the penal code of the island is based on the California codes, with certain necessary adaptations.

Since 1899 American naval officers, appointed as governors of Guam by the President of the United States, have succeeded each other at approximately two-year intervals, each one doing, or trying to do, what he has deemed most important and best for Guam.

MEN-BIRDS SOAR ON BOILING AIR

By Frederick G. Vosburgh

ONE chilly February afternoon, a pioneer American glider pilot, Jack O'Meara, cut loose from a towing airplane over New York City and headed his ghostly ship down the East Side.

He was trying to show that a man could ride on the warm breath of a city.

Every furnace, every person, every taxicab exhaust, is giving off its share of heat, and the heated air is rising—so reasoned O'Meara and his glider-conscious friends at the Glenn Curtiss airport on Long Island.

Manhattan, completely water girt, should be a chimney of ascending air on which the skillful pilot could soar at will.

This was the theory. Now for the test.

ALOFT—ON THE BREATH OF A CITY

With no sound but the sighing of the wind in its wings, the motorless plane glided southward along the eastern margin of Manhattan's masonry canyons. Commerce Department officials at Washington had warned O'Meara against wandering too near the heart of the city. They didn't want him colliding with a skyscraper or cracking up on somebody's roof.

By the time it neared the Chrysler Building, the glider had sunk considerably from its original 3,800-foot altitude—and O'Meara's heart had sunk with it. The flight seemed a failure.

Banking sharply, he headed across the East River toward the airport some five miles away.

How could he ever hope to make it? The ship was losing altitude alarmingly and it looked like a certain crack-up, either in the river or among the houses and factories on the Long Island side.

But O'Meara's glide carried him across, and the warm air from a cluster of smokestacks gave him a temporary boost.

Then all at once the flyer felt himself rising. A strong upward current was carrying him skyward—to two thousand, three thousand, four thousand feet. He had struck the warm breath of the mighty city, not over Manhattan itself but over Long Island, across the East River, where this enormous heat-created, or "thermal," current had been blown by the west wind.

High aloft, the light-hearted O'Meara exulted. The theory was vindicated, and it was an easy glide now to the home airport.

Before coming in to a perfect landing, he dipped and bobbed in triumph.

Riding thermals was a novelty then, more than seven years ago.

HUNDREDS OF MILES WITHOUT MOTORS

Today the flights of many such audacious soarers have so increased knowledge of the air and its currents that sailplanes, as high-performance gliders are known, have been flown several hundred miles and others have reached altitudes of more than two miles above their take-off point.

Much of the remarkable progress in soaring has come about since 1929, when the National Geographic Magazine published the first extensive article in America on flying without an engine.*

At that time motorless flying was confined chiefly to Germany, where an air-minded nation had turned to gliders and sailplanes when denied power-driven planes under the Versailles Treaty.

Pilots placed chief dependence on simple "slope winds," the inverted waterfall of air produced when a breeze hits a hill and shoots upward.

Now the sport of soaring is world-wide, and the harnessing of various types of air currents, even those that accompany thunderstorms, has resulted in hitherto unheard-of achievements.

Engineless planes have actually flown farther and higher than the best power-driven planes had flown up to about 1911.

NEW WORLD RECORDS

A Russian, Victor Rastorgoueff, last year flew a world's record straight line distance of 405 miles. The average speed of his motorless ship was more than 48 miles per hour.

Another Russian pilot, V. M. Iltchenko, covered 253 miles carrying a passenger.

Kurt Schmidt, a German, soared over the sand dunes of East Prussia for a day and a half—36 hours and 35 minutes.

Another German, Heinrich Dittmar, sailed into the clouds above Campo dos Affonsos, Brazil, and rode the turbulent gusts of an incipient thunderstorm to a height of 14,190 feet above the point where

* See "On the Wings of the Wind," by Howard Siepen, in the National Geographic Magazine for June, 1929.

Photograph by Hans Groenhoff

JUST BIG ENOUGH FOR PILOT PLUS PARACHUTE IS THE COCKPIT OF A SAILPLANE

Wise soarers wear the silken life preserver, for turbulence sometimes encountered in clouds could tear off a wing (page 133). Here Richard C. du Pont, president of the Soaring Society of America and winner of the 1937 national championship, makes ready for a takeoff at Elmira in his German-built Minimoa. One helper puts the transparent cockpit cover in place; the other attaches the tow-rope to a hook under the ship's bullet nose (page 130).

a towing airplane released him—a climb of more than two and a half miles by air power alone. Even with two men aboard, a German ship has risen 10,840 feet.

Women, too, have made outstanding flights (p. 139). A Polish girl last year soared all day and all night, coming down with a record of 24 hours and 14 minutes. Hanna Reitsch, of Germany, has made a round trip of 155 miles and a "goal flight" of 218 miles. Setting out to fly from the soaring center on the Wasserkuppe to Hamburg, she did so, "on the nose."

In the United States, with no government subsidy, the number of glider pilots is comparatively small. Interest is growing, however, and there are a few splendid pilots.

Only this spring, on April 19, Lewin Barringer of Philadelphia rode the thermal currents of the Southwest to a new American record, making a goal flight of 212 miles from Wichita Falls, Texas, to Tulsa, Oklahoma, and incidentally reaching an altitude of 6,500 feet (page 129).

On May 8, John Robinson of San Diego unofficially climbed about 10,000 feet.

Richard C. du Pont, the American champion, set a national distance record of 158 miles and an altitude mark of 6,233 feet as long ago as 1934; and a duration flight of 21 hours 34 minutes has been made at Honolulu, Hawaiian Islands, by Lieut. William A. Cocke, Jr.

KEEPING A SAILPLANE ALOFT

A sight of one of these silent-winged flyers makes the man in the street wonder whether the law of gravitation has been mysteriously repealed.

"That fellow weighs 150 pounds," he muses, "and that sailplane, light as it is, must weigh at least another 350. That's 500 pounds up there in the sky, without any motor to drive it along and give the

Photograph by Acme

"WHAT'S KEEPING HIM UP?" PEOPLE WONDER AS A SAILPLANE PILOT SOARS OVER NEW YORK CITY

The people are—at least they are helping. From every person, every panting taxicab, every roof and sizzling pavement, the heated air is rising. Upon that mighty thermal current a graceful glider rides. Towed aloft by a powered plane, Peter Riedel, German soarer, in this sleek Rhönsperber, cut capers over Manhattan for several hours on a hot afternoon in June, 1937. More than six years earlier an American, Jack O'Meara, made a pioneering flight on the city's warm breath in winter (page 123).

wings lifting power. Why in the name of Newton doesn't the thing come down?"

Actually it *is* gliding downward. But the air current in which it is descending is rising faster than the plane is sinking. Consequently the sailplane rises. A good analogy is that of a man walking slowly down an upward-moving escalator, or down a stepladder in a rising elevator.

All around us on sunshiny days the air is invisibly boiling, warmed by the earth's central heating plant more than ninety million miles away. From surfaces that best absorb the sun's heat—from plowed fields and the streets and roofs of towns—the air, being heated, is broken away and pushed up in a succession of huge, invisible bubbles, by the adjacent cooler, and therefore heavier, air.

To these convection, or "thermal" currents, if the wind be strong and the country hilly, other powerful drafts are added—the "slope winds," or "deflection currents." Often the thermals are blown against hillsides, so that the two kinds of currents are mingled in gusty confusion.

STREAMLINED "BIRD" HAS 50-FOOT SPAN

Airplane travelers do not like such a day. The air is "bumpy." But the turkey vultures like it, and the other soaring birds, including that featherless soarer, man.

The owner of a modern high-performance glider, or sailplane, casts an eye at the wheeling vultures and regards their presence as an excellent sign. Birds of death and ill omen they may be to others, but to him they are merely signs of good soaring.

On overcast and windless days, he knows, turkey buzzards, like himself, are grounded, unable to do any extensive flying without

Photograph by Arthur B. Schultz

NEITHER SHIP NOR PILOT WAS SCRATCHED!

When a glider landed in a tree top at Betsie Point, near Frankfort, Michigan, last September 5, its ground speed was practically zero because of a 25-30-mile head wind. It settled gently as a leaf, and the pilot, unhurt, climbed down the tree.

the help of upward currents of air. But this is a soaring day, a day for wings.

Briefly he consults the weather man: "Fresh westerlies creating deflection currents; thermal conditions good, probably best about noon."

Strapping himself into the sleek, bullet-like cockpit of his sailplane, he becomes a bird himself—a streamlined bird with a 50-foot span of varnished plywood-and-fabric or light metal wings.

But, unlike a bird, he needs a boost before he can climb and soar. Towed by an automobile or pulled by a winch (page 130)—there are at least eight other ways of launching a sailplane—he shoots into the air from the brow of a hill, rides the slope wind to a thousand feet or so and is off, catching the first thermal and climbing into the clouds on unseen fountains of air.

ALLEGHENIES OFFER CHANCES FOR RECORD BREAKING

Mainstays of the sail-flyer in hilly country are still the ordinary slope winds, and on these the duration records have generally been established.

With a sailplane of low sinking velocity, a good pilot can shuttle back and forth in the upcurrent of wind over a mountain almost indefinitely, as long as the wind holds out. As one prominent pilot put it to me, "It's like glorified flagpole sitting."

The real test comes when the soarer leaves the friendly ridge and starts going places. Then he calls into use every available current known to sail-flying and practical meteorology. He must know the air as the old clipper ship captains knew the sea. He must know his geography, too, for every sizable bump on the landscape may be a potential help.

Not too far from the famous soaring center on Harris Hill, Elmira, New York, lie the long northeast-to-southwest ridges of the Alleghenies, forming a natural skyway that may ultimately enable American sailplane pilots to capture the world's long-distance record. These ridges have long been a flyway for migrating hawks, which stream southward in numbers every fall on the updrafts formed as the prevailing westerly wind strikes the mountain barrier.

But even in the best slope-soaring country there are stretches where deflection currents entirely desert the sailplane pilot, either because of a break in the mountain wall, such as the Delaware Water Gap, or

Photograph by Hans Groenhoff

PICKETING FOR HIGHER WINDS, NOT HIGHER WAGES

Pilots at Elmira call a strike against the whimsical weather which prevailed during last year's National Soaring Contest. The air was often stagnant, with little wind and weak thermals, but several flights of more than a hundred miles were made.

because the wind has died down for a time or taken to blowing in the wrong direction.

Then indeed he must know his thermals, those fugitive updrafts about which the soaring fraternity has recently learned so much.

A THERMAL CURRENT MADE VISIBLE

These thermals are a story in themselves. As I write I can literally *see* an example of a thermal, or heat-created, air current. Today is cold and the steam radiator by the window is very hot. Above it the heated air is rising. In a patch of sunshine against a near-by wall I can see the shadows of this heated air, vigorously boiling upward.

I tear a few shreds from a dustcloth in my desk, hold them over the radiator, and up they go, to the ceiling.

Outside, on sunshiny days, the same thing is happening, with sun-heated roofs, streets, and cornfields active as radiators and with soaring birds and sailplanes as dustcloth wisps.

If the sail-flyer could actually see these currents, they could doubtless be used to much better advantage and soaring might even become a practical means of transportation. Perhaps the future will bring development of a thermal current detector, possibly in the form of goggles, which will take some of the guesswork out of soaring.

As it is, the pilot must watch the birds —they have an uncanny knack of finding the up-drafts, as if they actually felt them out with sensitive wing-tip fingers. He must watch the terrain for areas which absorb the sun's heat best. Above all, he must watch the clouds, for a cumulus mass may mark the top of a good thermal current or itself provide valuable lifting power.

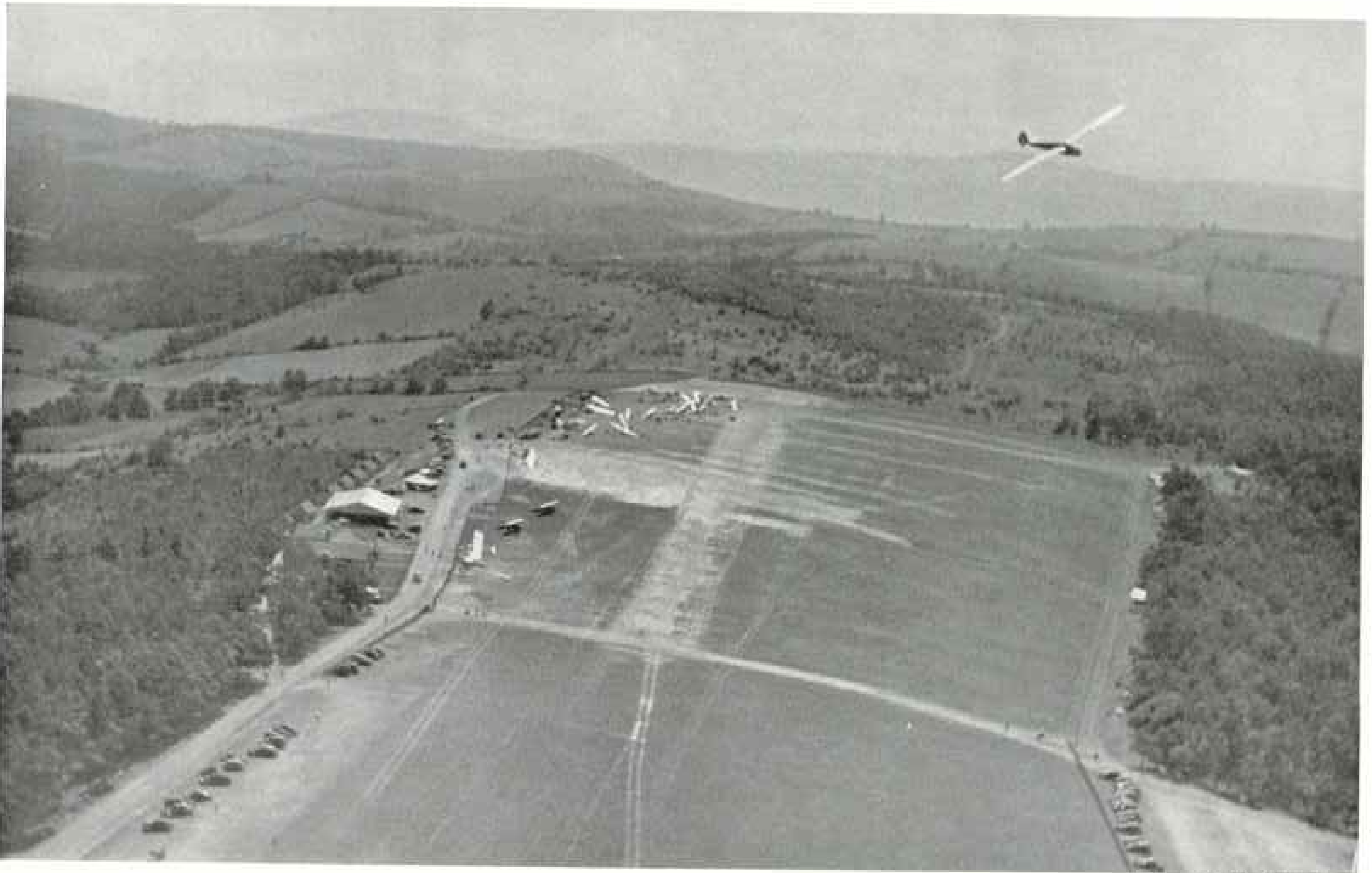
GUIDED BY BUTTERFLIES

The resourceful soarer misses no clue. There are cases, for example, in which pilots have gotten guidance from butterflies.

"If you see a lot of butterflies up four or five thousand feet," they reason, "you can be pretty certain they were carried there by a current of rising air."

Such feathered soarers as the eagles, hawks, and vultures are deeply respected by their wooden-winged emulators.

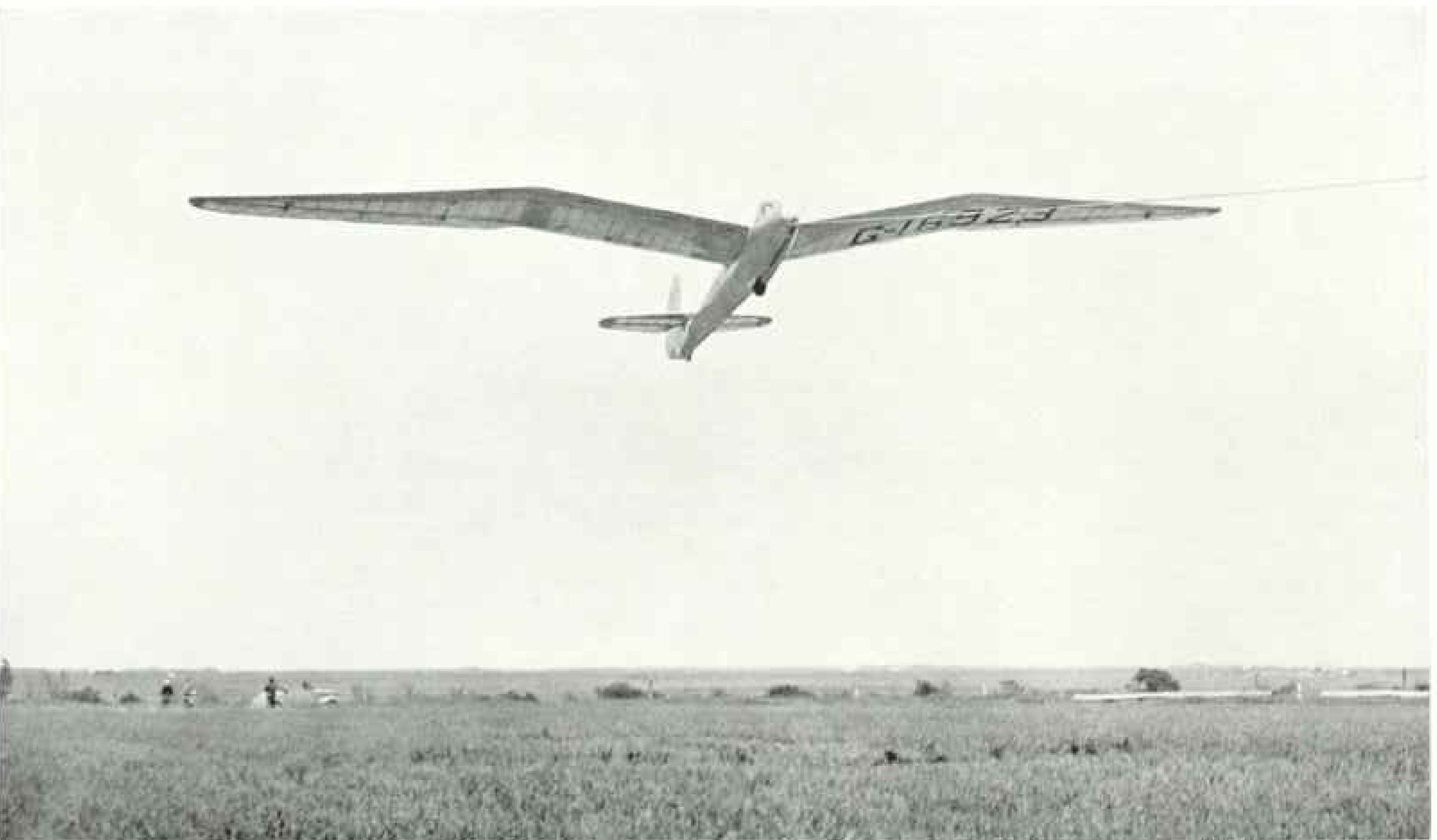
"I've seen a vulture catch a thermal only



Photograph by Hans Groenhoff

CENTER OF SOARING IN THE UNITED STATES IS HARRIS HILL, NEAR ELMIRA, NEW YORK

Here at the Warren E. Eaton Gliding Fields the national championships are being held from June 25 to July 10. New York City, long the goal of soarers at Elmira, is 170 miles to the southeast, downwind. Considerably nearer are the ridges of the Alleghenies, which offer a possible "flyway" southward (page 126). Circling above in last year's contest is a Ross-Stephens RS-1, an outstanding American sailplane piloted by its designer, Harland Ross.



Photograph by David Combs

OFF ON THE LONGEST SAILPLANE FLIGHT YET MADE IN AMERICA

Lewin Barringer, of Philadelphia, flying Richard du Pont's German-built Minimoa, takes the air at the Wichita Falls, Texas, airport on April 19, 1938, on his record-breaking 212-mile "goal flight" to Tulsa, Oklahoma. The take-off from a level airport, without benefit of hills, was made by winch tow (page 130). "The first hour was a real struggle to stay up and once I was down to 500 feet," says Barringer, who is general manager of the Soaring Society of America. "Just in time, heading over a large, dry, plowed field, I caught a good thermal and climbed it to cloud base at 3,500 feet. From then on the thermals were stronger and more frequent as I progressed northeast and then due north with the wind." Once, entering a cloud, he flew by his instruments to 6,500 feet, but soon dived out because of the turbulence. Later, flying cross-wind to his announced goal of Tulsa, he passed up chances for a possible distance of 300 miles downwind into Kansas.

Photograph by Fred T. Loomis

IN A MOMENT THAT SLENDER THREAD WILL FALL TO EARTH AND THE SAILPLANE WILL BE OFF, FREE AS AIR

This truck-borne winch developed by Paul du Pont, a cousin of the American champion, launched Lewin Barringer on his new American distance record flight of 212 miles in the Southwest this spring (page 129). As the rope winds swiftly around the drum, a sailplane here is pulled into the air at Harris Hill, Elmira (page 134).

Photograph by Hans Groenhoff

AS IF DEFYING THE LIGHTNING, A SAILPLANE AT HARRIS HILL, ELMIRA, NEW YORK, TAKES OFF UNDER BLACK THUNDERCLOUDS

Pilot Peter Riedel's weather-wise eyes have noted that the storm, though it looks forbidding, has actually passed over the hill and in its wake are coming good thermal soaring conditions, with formation of cumulus clouds. So, towed by a speeding automobile, the German expert shoots skyward in the 1937 National Soaring Contest. He amassed the largest number of points, although, as a foreigner, he was not eligible for the national championship. Flying in actual thunderclouds is dangerous, but daring pilots have tried it and lived (page 140).

AP Photograph from Pictures, Inc.

WITH GLIDERS AS CARS AND AN AIRPLANE AS LOCOMOTIVE, A "SKY TRAIN" HEADS FROM NEW YORK FOR PHILADELPHIA AND POINTS SOUTH

On this experimental flight in 1934, a three-glider train, strung out behind the towing airplane (upper right), carried mail from New York's Floyd Bennett Field to Philadelphia, Baltimore, and Washington. As each city was reached, a glider was released and landed safely by its pilot.

thirty or forty feet from the ground and go up until nearly out of sight without once flapping its wings," said one seasoned pilot, admiringly.

The soaring pilot gets an excellent chance to study the birds' flight habits, one silent flyer observing another and picking up hints on flying technique.

"Once," Lewin Barringer told me, "I was even able to climb up past that wonderful soarer, the turkey buzzard. However, he soon showed that his far superior maneuverability and flying technique more than make up for his greater sinking speed."

"We've exploded the popular belief that whenever you see a lot of vultures circling they're flying over something that's dead or dying," the same observant pilot remarked.

"In some cases, of course, this is doubtless the reason. But often the thing that brings them together is the existence of an extra-good soaring condition. One bird has spotted a vigorous thermal and the others have gathered around to ride it, too.

"I've soared with vultures and hawks four or five thousand feet up where they couldn't possibly be looking for food, even though they have remarkable eyesight.

"From my own observations at fairly close range, I'd say they spend as much time in lazily riding the currents as they do in looking for their next meal."

Most consistent allies of the expert soarer, however, are the clouds themselves. The churning, vaporous heart of a cumulus cloud, or the gusty turbulence of a thunderhead, often carries an aerial hitchhiker far; and no altitude records are likely to be broken by a soarer who has not yet mastered the art of flying blind.

CLOUD-HOPPING CALLS FOR NERVE

This cloud-hopping is anything but an exact science. Yet skilled soarers usually select the same attractive-looking cloud.

In last year's national championship, Richard du Pont, twenty miles from the Elmira starting point, plunged into a dense cumulus cloud and flew by his instruments for a while, buoyed up by swirling, shifting currents.

As he came out, another plane loomed ahead, and the two ships, each traveling about fifty miles an hour, narrowly missed crashing head on.

It was Barringer, friend and rival contestant, who had sighted the same mass and had just been about to plunge into it, little thinking that this one cloud among thousands would be already occupied.

A little later du Pont headed into another cloud, and suddenly a shape whizzed out of the mist, this time the German contender, Peter Riedel (pages 125 and 131).

The poet who wrote "lonely as a cloud" is sadly out of date!

Cumulus clouds — white, billowy, rounded, but flat on the bottom—are the kind that sometimes develop into thunderstorms, and their insides boil with a tempestuousness that the poet, peering up, would hardly suspect. Particularly violent is their mood when the cumulus masses become thunderheads, turning dark with shining white edges.

Some idea of what it feels like to ride such a cloud was given by Heinrich Dittmar of Germany, holder of the world's altitude record, in describing a sailplane flight over Rio de Janeiro.

Towed aloft by an airplane, he cast off at 1,150 feet, found an upcurrent, and entered a towering mass of cumulus cloud.

"As I knew, from many previous flights, of the turbulence inside clouds," he wrote afterward, "I drew my safety straps somewhat tighter, so as not to be lifted out of the seat by powerful gusts. One quick look at the snap-hooks of the parachute, and then into the cloud.

"Hardly was I inside the cloud when I was greeted by the first violent gusts, and the farther I flew into it the more the machine became the plaything of the up-and-downward-moving air currents.

"The variometer, which shows the rising or falling speed, hit the end of the scale; the speed indicator went up to 150 kilometers (93 miles) an hour, only to return to zero at the next moment; a frightful jolt, and I am hanging in the safety straps, but I cannot make out what position the machine has got into.

"To avoid its breaking up, I try to keep the speed as low as possible, but I succeed only with great difficulty. The compass is continually turning around, the turn indicator sticks to the right, and the inclinometer also does what it likes. In addition, dirt from the skid flies up into my eyes. But the altimeter goes up and up; that is the chief thing."

On this flight Dittmar set a new international record of 12,630 feet above the point of release from the towing plane—a record, incidentally, which he himself shattered shortly afterward.

The chief danger, as the German indicated, is that the plane will get going so fast that its momentum, when checked, will tear off the wings.

Du Pont, riding thunderheads in winning the national championship at Elmira last year, once found himself traveling over a hundred miles per hour, but was successful in pulling out of the dive, thanks to skillful handling and the strength of his German-built plywood plane.

DOWN A 100-MILE "CLOUD STREET"

Occasionally "cloud streets" are formed—long, regular rows of cumulus clouds. Usually the air is rising on one side of the "street" and descending on the other. It is only necessary to get on the right side and keep going, without spending time in circling for altitude.

Such a condition enabled du Pont to establish the former American record. Taking the air above Harris Hill at Elmira in the national contest of 1934, he found a long lane of lift-providing clouds stretching away to the southeast.

He carried neither compass nor parachute, but he promptly seized the opportunity and started off for New York, 170 miles away. "Easy Street" petered out before he reached his goal, but he landed in

Photograph from European

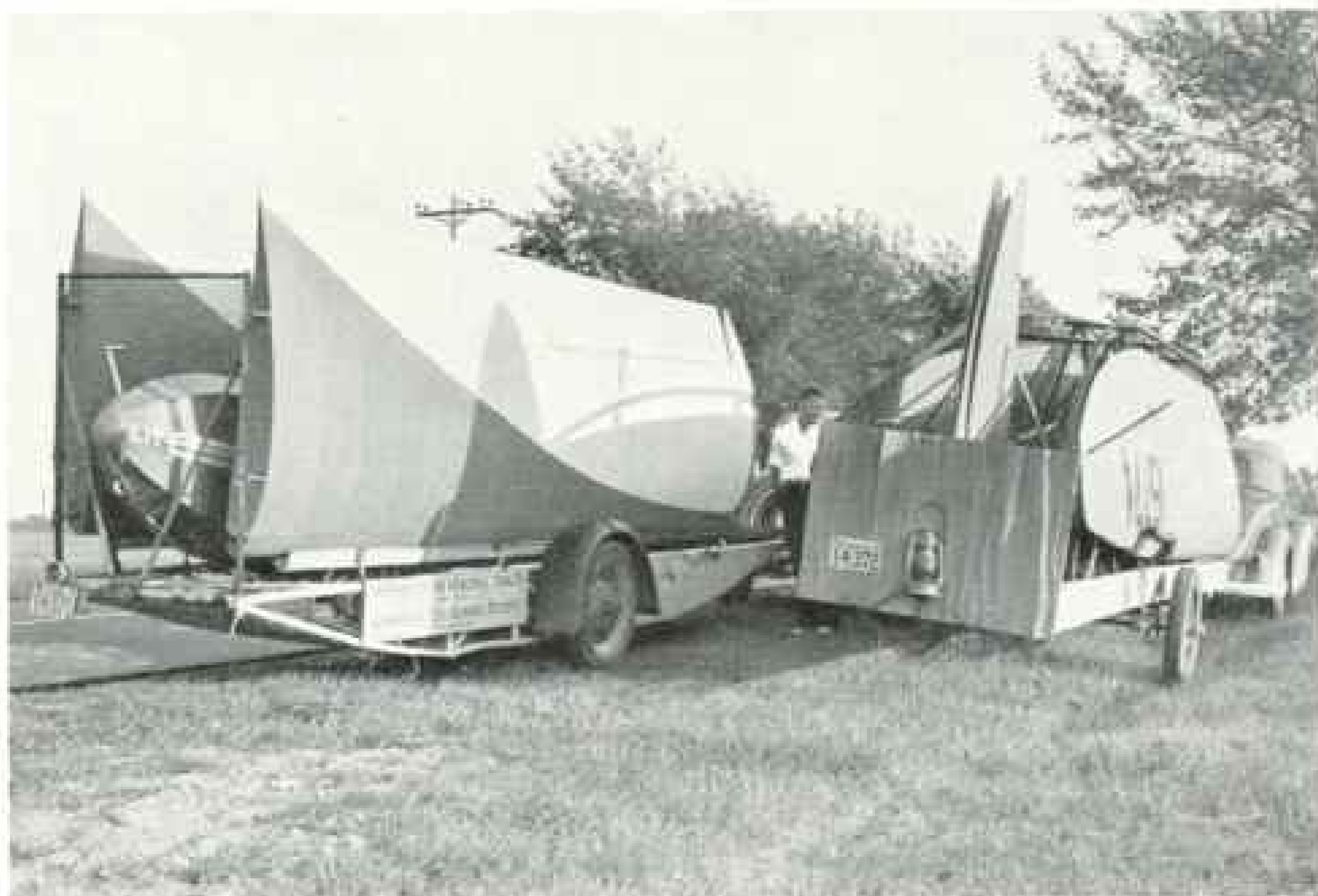
MAN-POWER, AND ALSO WOMAN-POWER, SHOOTS A GLIDER INTO THE AIR

The old-fashioned "muscle method" is still used, but chiefly in Europe; Americans seem to prefer labor-saving devices (page 130). At this glider school for women in Germany, husky girls lend a hand at the rubber shock-cord. Commands are given first to walk, then to run, whereupon a rope holding the sailplane's tail is cut and the craft is snapped into the air, slingshot fashion.

© Fox

A TWO-PLACE SHIP SPREADS ITS HOMEMADE WINGS IN A BACK YARD IN GLIDER-MINDED BRITAIN

Members of a gliding club had quantities of enthusiasm, but only one glider and a limited treasury. So they drew plans, bought materials, and built themselves a two-seater in the back garden of a member at North Walsham, Norfolk. The English long-distance gliding record was boosted this spring from 104 to 206 miles.



Photograph by Arthur R. Schultz

WINGS DEIGN TO RIDE THE ROAD

Gliders are so built that they can easily be "knocked down" and taken to and from contests on long trailers, such as these beside a road in Michigan. Another way is to bring the glider by air, towed by a powered plane (page 132). The young man pictured was killed later in a glider accident.

a New Jersey field with a distance mark of 158 miles which stood as the American record for nearly four years.

Working closely with meteorologists on the ground, the sailplane flyers give as well as take. In return for weather maps and forecasts they provide many an odd bit of information about the ways of this all-pervading element, the air.

For example, sailplane pilots, using thermal currents more and more, found that one plane sometimes would be rising at 15 feet or so a second, while two other planes, one directly above and the other below, were getting no lift at all.

The result was confirmation of the theory that the warm air rises in a succession of enormous bubblelike masses. The middle plane happened to be in the bubble; the others were above or below it.

SHAKING A BUBBLE LOOSE

Most astounding to me, however, is this further fact: That apparently it is possible under certain conditions for mere man to shake one of these bubbles loose!

A modern sailplane flight in competition is never over until the ship is actually on the ground, and stubborn pilots, fighting to the last for a breath of breeze that would keep them in the air, discovered something.

They found that if a man dived his ship at high speed, 70 or so, above a promising source of thermal currents such as a cornfield, banked sharply when only one or two hundred feet from the ground, and spiraled upward in tight climbing turns, a surprising thing sometimes happened. A sudden thermal current caught the ship and carried it up, up, up, to the neighborhood of the clouds again. The swirling sweep of the 50-foot wingspread, traveling at 70 miles an hour and suddenly twisting upward in corkscrew fashion, had apparently dislodged a thermal bubble which had been trembling on the verge of rising!

When the first report of this came from a pilot in Germany, most American soarers were skeptical. But they tried it and found it often worked. Richard du Pont told me he has successfully used this maneuver several times. Meteorologists say it is entirely credible. One might use the analogy of a drop of water trembling on the lip of a

faucet: If the drop is almost ready to fall anyway, a surprisingly light tap on the faucet will dislodge it.

"I WAS SO HAPPY I SCREAMED"

There is nothing mild or weak about a real thermal. Chester Decker, 1936 national champion, described one he picked up near Glory Hill, some ten miles southeast of Elmira.

"It hit the ship with such force," he related, "that the wings bowed fearfully, then up I went in a steep spiral from 1,200 to 5,000 feet with my variometer showing a steady climb of five meters (about 16 feet) per second. Thrill of thrills—reserved only for soaring pilots, and one that is intensified rather than tempered with experience!

"I relaxed. The sky was suddenly full of good clouds; the ground was a mile away straight under me. I was so happy I screamed.

"The clouds were lined up like conveniently located service stations and we jumped from one to another for 30 miles, diving continually to prevent being drawn into them. This was cloud-hopping at its best, and a thrill I'll never forget if I live to be a hundred."

Photograph by H. Steiner and C. Heiniger from Black Star

IN SWITZERLAND GLIDERS ARE EVEN HAULED UP THE STEEP, ICY SIDES OF THE JUNGFRAU

This one is some 11,300 feet high and still going higher, with the aid of an electric windlass and a sledge. Taking off from a snowy stretch on the shoulders of the mountain, soaring pilots ride treacherous air currents among the Alpine peaks.

BREEZES BLOWING STRAIGHT UP

Over the big steel mills at Bethlehem, Pennsylvania, Decker found a thermal from the smelting furnaces which helped him to stretch his flight to a total of 146 miles.

Thermal currents, often of awe-inspiring force, may even be encountered after dark. Once the late Warren Eaton and Barringer were flying their sailplanes from the new Big Meadows field in the Virginia Blue Ridge when toward evening they both hit a thermal. They were about to come down, as it was rapidly growing dark, but when they tried to do so they found they could not. The air was rising too fast, moving upward swiftly and inexorably over a wide expanse of wooded mountain.

"It was the most hair-raising experience I ever had," Eaton said afterward. "We had to dive at 85 miles an hour to get

Photograph by Carl W. Thompson, Jr.

BUZZARD'S-EYE VIEW OF A GLIDER PILOT 500 FEET IN THE AIR

At New Castle, Delaware, Carl W. Thompson, Jr., wanted to see himself as others never see him, riding high in silent, solitary flight. So he attached a box camera to one wing, had himself whisked aloft, and tripped the shutter by pulling a string with his left hand. The ship, a primary training glider, has more in common with the early experimental planes of the Wright brothers than with the modern streamlined glider or sailplane (pages 124, 129, and 131).

down through it. It was pitch dark when we finally were able to land by the light of automobile headlights."

This was an "evening thermal" of unusual force. It amounted to a brisk breeze blowing straight up in the air instead of from side to side, as the sailplane's instruments showed the vertical velocity of the current to be about 10 to 15 miles per hour.

Evening thermals are usually encountered over areas which store up much heat during the day, such as expanses of forest or water, a type of country exactly the opposite from that which yields the best thermals in daylight hours. With the coming of night, thermal conditions go into reverse.

By shifting to these evening currents when the daytime thermals die, the shrewd soarer can greatly prolong his flight. At Elmira it is frequently after dark before all the men-birds come home to roost.

DARING PILOTS RIDE A "LINE SQUALL"

Exceptional opportunities for record-breaking are afforded by a "cold front," or "line squall," a weather condition in which a cold air mass is pushing forward and under a warm air mass along a line often hundreds of miles in extent.

"A well-pronounced cold front consists of a tremendous thunderstorm roll extending hundreds of miles and traveling with a speed of 25 to 40 miles per hour," says Dr. Karl Lange, of the Blue Hill Observatory, Harvard University, chief weather adviser to American soaring pilots.

"The conception of the meteorologist that the cold air pushes the warm air up, thus creating an enormous upcurrent field, has been of much benefit to soaring. And, in return, soaring flights in such conditions have helped explain to the meteorologist the

detailed happenings inside a line squall.

"We know now that you find a very smooth region of upcurrents of a depth of a mile or so all along the front edge of a cold front. You can soar there going with the front and flying along the towering thunderheads.

"We know, too, that flying a little farther back—into the region of clouds, heavy precipitation, and hail formation, violent turbulence and downcurrents, not to mention lightning—is just short of suicide."

On July 29, 1935, one of these cold fronts came down from the Arctic by way of Iceland and marched eastward across Germany. Directly in its path was the Wasserkuppe, German soaring center, and above it three sailplanes were circling.

Photograph by Alfred Eisenstaedt from Pix

WOMEN, TOO, ARE TASTING THE THRILL OF SILENT FLIGHT

Strapped to her seat in a durably built primary training glider, the determined looking young woman is about to be catapulted into space for a glide from the top of a hill to the bottom (page 134). Later, at this gliding school for girls at Trebbin, Prussia, she will be graduated to intermediate gliders and sailplanes, in which she can not only glide but soar. A Polish girl has stayed aloft in a motorless plane for more than 24 hours (page 134). On May 15, 1938, Hanna Reitsch, of Germany, made a round-trip flight of 155 miles.

All at once the three pilots sat up and took notice. No longer were the upcurrents fleeting and weak. Some strong new force was seizing their ships and bearing them vigorously upward. All about them was rising air.

Turning eastward, they rode before the storm, and mile after mile it carried them, finally depositing all three in the same field near Brno, Czechoslovakia. Landing safely, they found themselves in joint possession of a new world's record of 313 miles.

In returning to their German starting point by airplane tow, however, Rudolph Oeltzschner, one of the record-breakers, was killed, whereupon his companions insisted that his memory be perpetuated by listing the record in his name alone. This was done and it was generally supposed that the mark would stand indefinitely.

It is typical of the rapid progress of soaring, however, that this "unbreakable" rec-

ord has since been broken by the Russian, Rastorgoueff, not once but several times.

Riding a cold front or a thunderstorm is dangerous business. The trick is to stay just ahead of it. There is frightful danger if a pilot lets himself be sucked into the midst of it, for the inside of a hard thunderstorm is a raging combination of about the most violent things in Nature: fearsome gusts, pelting hail, fierce bolts of lightning.

One sailplane, flown by the Austrian soarer, Kronfeld, landed safely, though riddled with hail as if it had been exposed to machine-gun fire. Others have had their wings torn off. The adventurous pilots have survived, however, to give a clearer idea of the structure of a thunderstorm.

Rising air currents mark its forward edge, for a thunderstorm has, in smaller degree, much the same effect as a cold front. These upcurrents are often terrifically strong.

"Once in flying a power plane over western New Jersey I got in the front part of a thunderstorm," one pilot recalled. "Before I knew it I had gained 4,000 feet.

"I shut my engine off and dived at 100 miles per hour—and I was still going up!"

The back part of the storm, on the other hand, is a zone of fearful downcurrents and terrific turbulence.

HOW HAILSTONES ARE FORMED

Hail, familiar phenomenon of summer storms, is concrete evidence of the violent gusts which are tearing the heavens apart, for those turbulent upward and downward blasts are the forces which make hailstones.

A drop of rain starts to fall, when suddenly it is caught by an upward gust and carried far aloft. In the cold upper regions it becomes ice, and once more it heads for the earth. Again it is snatched high into the sky and another coating of ice is added.

In rare cases this continues until the hailstones reach the size of baseballs, and one can imagine the force of currents strong enough to support them until they fall.

Sailplane and glider pilots, wholly dependent upon air currents for their motive power, acquire a keen knowledge of their element and a healthy respect for certain types of meteorological conditions.

Later, as pilots of powered planes, they find their knowledge of currents useful. Barringer, flying a party of archeologists in Iran (Persia), used slope winds to help lift his airplane over a 13,000-foot range.

A simple primary training glider differs from a sailplane as a slow, easygoing saddle nag differs from a lithe, nervous Arab steed. The primary glider (pages 138-9) can merely glide; it cannot soar.

Considerably more efficient is the intermediate or utility glider, which is partially streamlined and can soar on occasion.

MAN'S MOST GRACEFUL VEHICLE

But the thoroughbred of them all is the sailplane, one of the most graceful things ever produced by the hand of man. There is no "cleaner," more efficient aircraft in existence than a high-performance sailplane. You can see the joints where the plywood comes together, but you cannot feel them—and neither can the wind.

Lightness of weight is far from being the most important factor in building a sailplane. In Germany an experimental plane was built which had a wingspread of 34 feet, yet weighed only 125 pounds. Its construction required 11,000 man-hours of work. Yet it was a failure for cross-country flying because it was not fast enough. It was actually too light.

To add momentum and hence speed, one German soarer habitually ballasted his sailplane with 160 pounds of water which he dropped toward night when the updrafts were growing weaker.

Every sailplane is a flying laboratory of aerodynamic and meteorological study. On a pad strapped to one knee, pilots jot notes about the currents encountered.

The art of birdlike flying has come far since the half-minute flights of Lilienthal in Germany in the 1890's, or even since 1911, when the redoubtable Orville Wright achieved his then amazing feat of keeping a glider up 9 minutes 45 seconds on a North Carolina sand-dune slope wind.

Today a skilled pilot in a well-built sailplane can go soaring from a perfectly flat airport, if the thermals are strong and the launching rope long enough to send him up five hundred to a thousand feet.

Many feel that the thermals of the sunny Southwest offer exceptional chances for long-distance soaring, and Barringer's fine flight seems to bear them out (page 129).

Either there or in the Alleghenies south of Elmira—or somewhere else in this increasingly air-minded land—an American may some day set a new world's record for soaring flight. But far more important is steady progress in learning the moods and ways of that tenuous stuff which gives us our weather, our breath itself, and support for our man-made wings—our Mother Air.

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Immediately after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

The Society coöperated with Dr. William Beebe in a deep-sea exploration of undersea life off Bermuda, during which a world record depth of 3,028 feet was attained August 15, 1934, enabling observations of hitherto unknown submarine creatures.

The Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole, and contributed $100,000 to Admiral Byrd's Antarctic Expeditions.

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.

The Society's notable expeditions to New Mexico 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 have solved secrets that have puzzled historians for three hundred years. The Society is sponsoring an ornithological survey of Venezuela.

On November 11, 1935, in a flight sponsored jointly by the National Geographic Society and the U. S. Army Air Corps, the world's largest balloon, *Explorer II*, ascended to an officially recognized altitude record of 72,395 feet. Capt. Albert W. Stevens and Capt. Orvil A. Anderson took aloft in the gondola nearly a ton of scientific instruments, and obtained results of extraordinary value.

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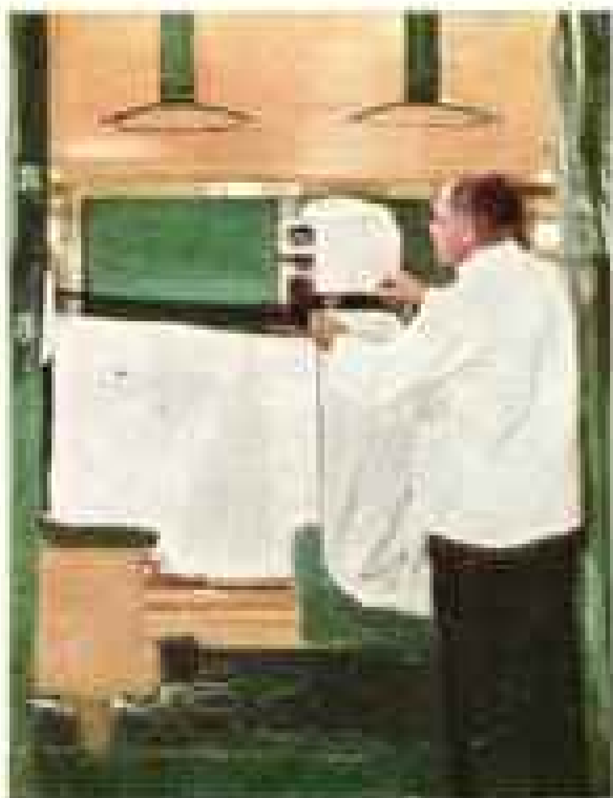

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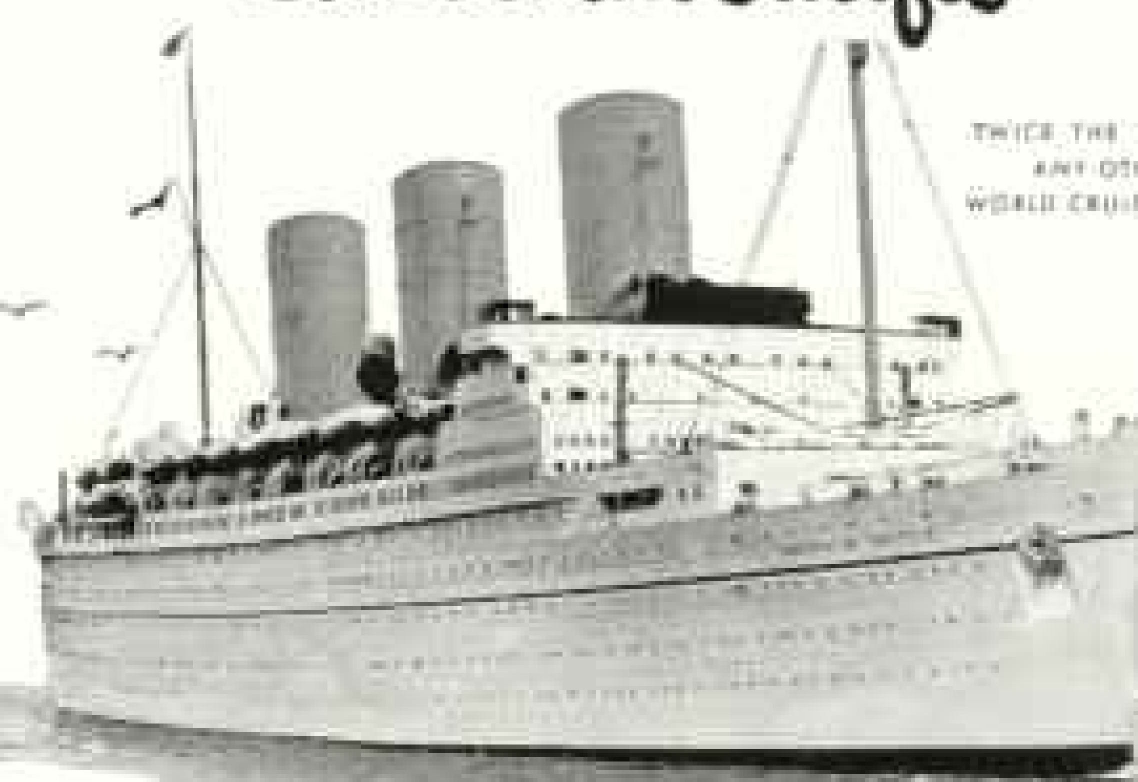

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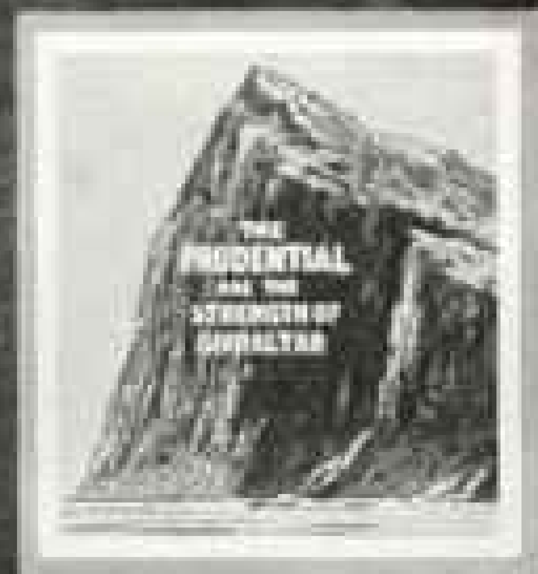

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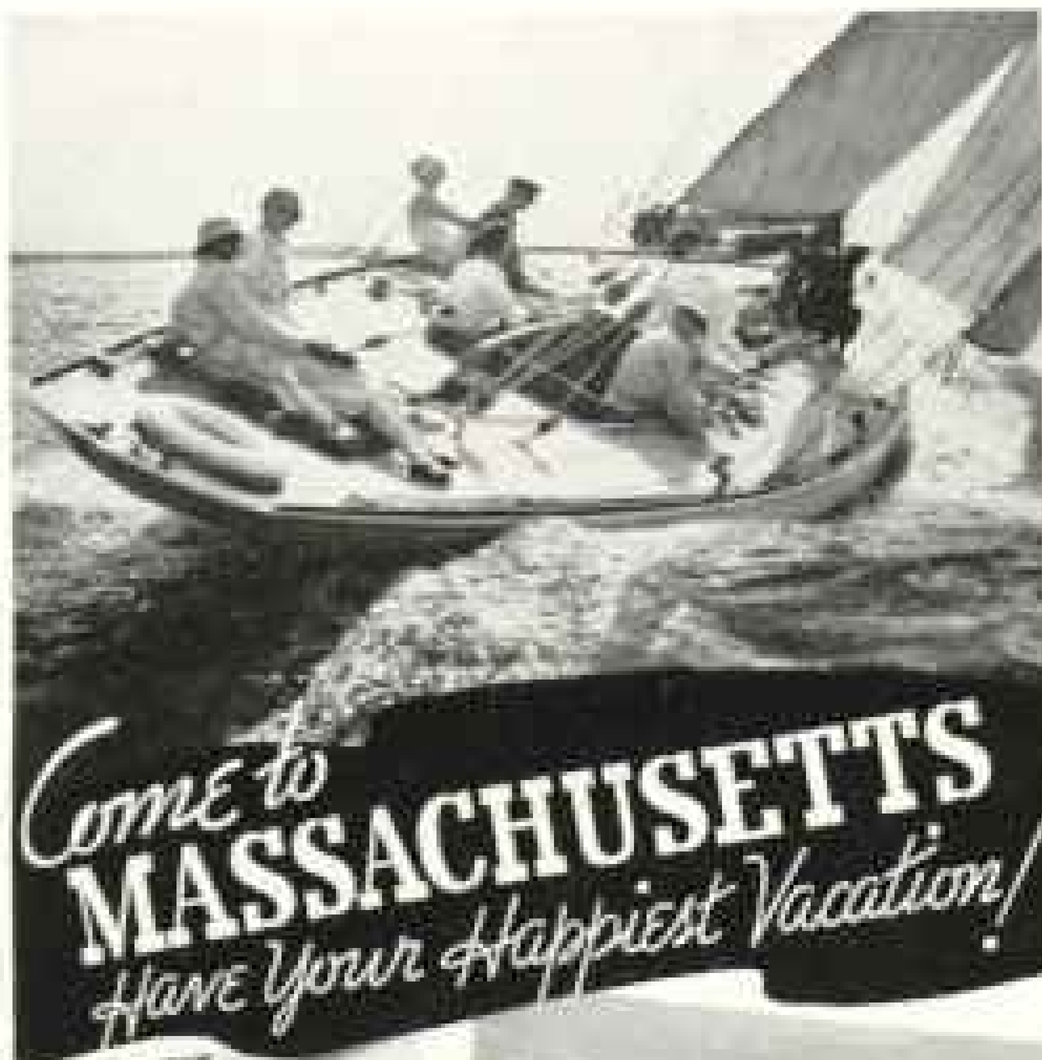

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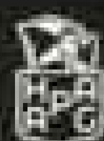

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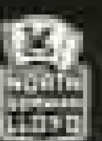

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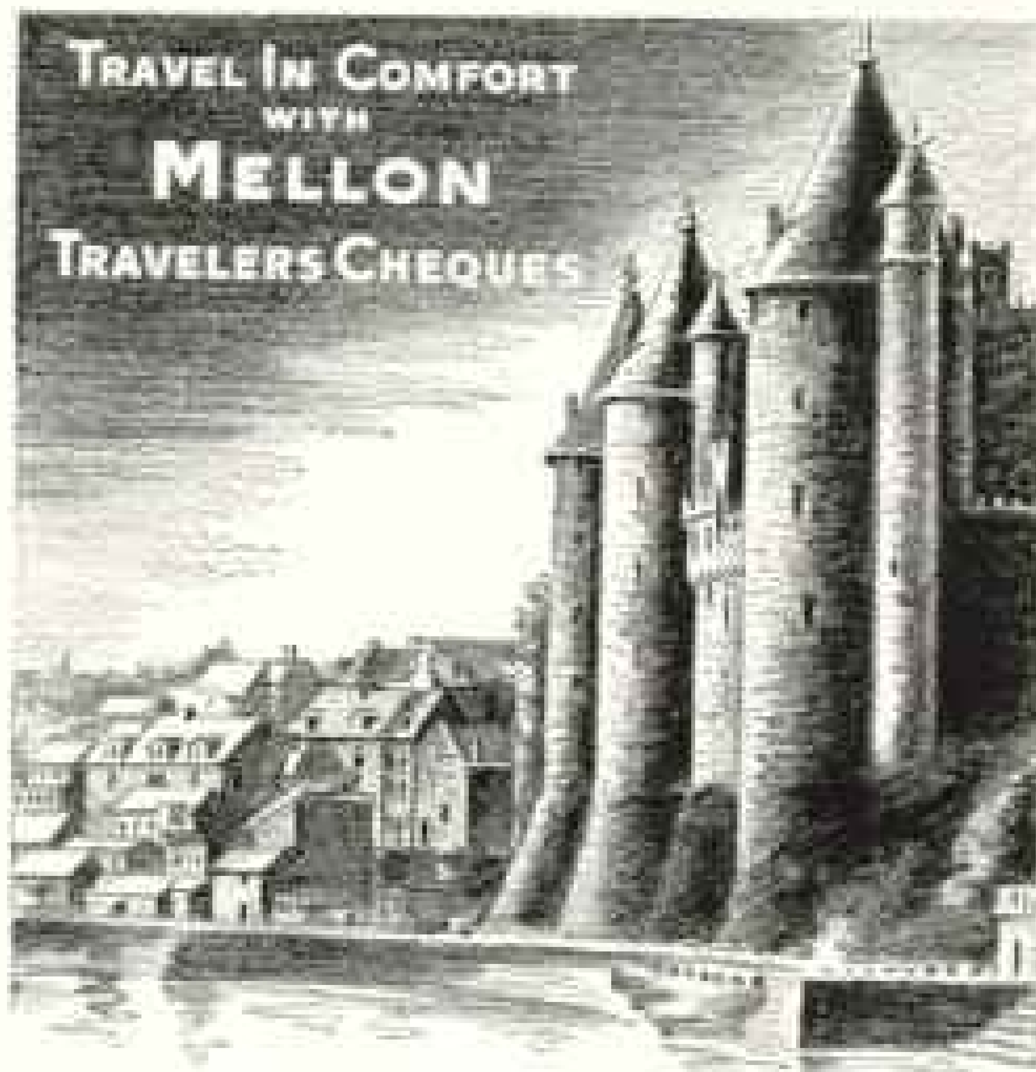

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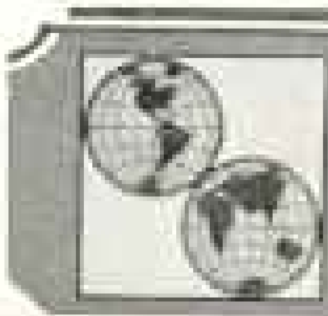

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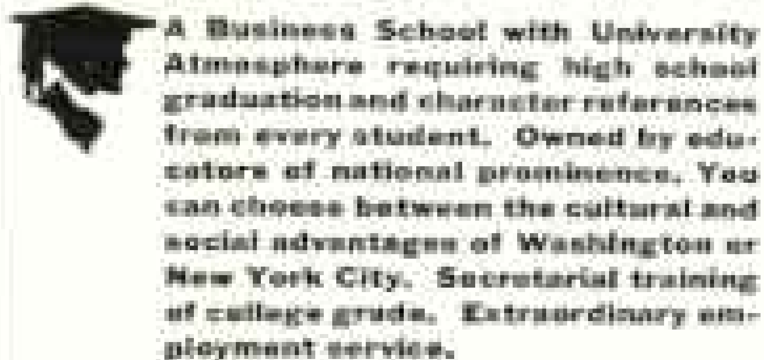

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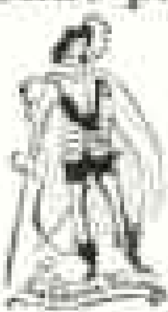

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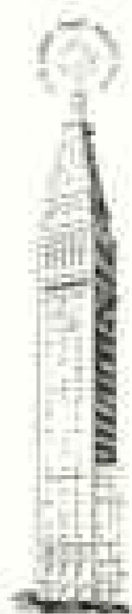
SOL . . . . THE SCORCHER

EXTREME heat is a real danger, if you expose yourself too long to the direct rays of the sun or if you are overactive in warm weather. Those with high blood pressure, heart or kidney trouble are in greater danger than those in sound health. Persons who work in foundries, engine rooms or other places where the temperature is excessive should be *especially on guard against* heat prostration.

Collapse usually comes suddenly and takes one of two forms—either heatstroke or heat exhaustion. They are radically different from each other in the effect upon the sufferer and in the immediate treatment needed.

In heatstroke the face is red or purple, skin dry and hot, temperature high; the patient is usually unconscious. In heat exhaustion, much the opposite effect is noticed. The face is pale, the skin moist and cold, temperature low; the stricken person is usually conscious. In either case call a doctor immediately. Pending his arrival, do what you can to help the patient. Always remember that the *hot* body should be *cooled* and the *cold* body *warmed*.



Heatstroke treatment—Lay patient on back in a shady place. Remove as much clothing as possible. Reduce temperature by sponging body with cold water. Apply ice bag or cold cloths (iced if possible) to head. Give no stimulants; but after the patient becomes conscious let him have all the cool water he will drink.

Heat Exhaustion treatment—Lay patient in reclining position. Loosen clothing. Keep warm with hot-water bottles, blankets, or other means. Give stimulants; tea, coffee, or aromatic spirits of ammonia (1 teaspoonful in ½ glass water).

Should a hot spell come, wear light, porous clothing. Avoid unnecessary exposure to sun or excessive heat, indoors or outdoors. Keep your head covered when in the scorching sun. Drink adequate amounts of cool water. Use a liberal amount of salt with food to replace the salt lost through perspiration. Observe healthful living habits—sufficient sleep, frequent baths, well-selected and usually light foods. Send for the Metropolitan leaflet "Heat Exhaustion and Sunstroke." Address Booklet Department 738-N.

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7-38

"Where shall we stay?"

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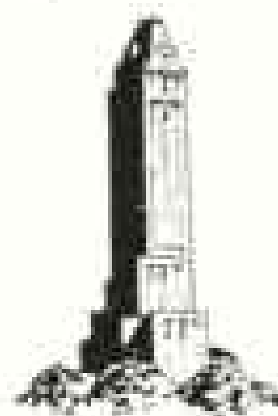

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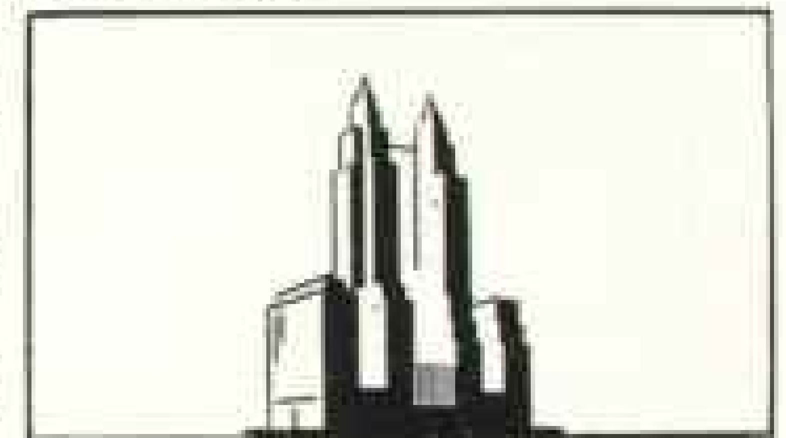

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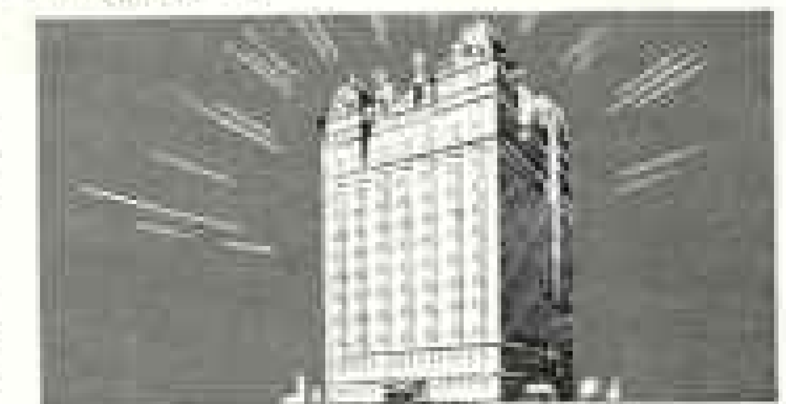

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"Where shall we stay?"

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