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THE NATIONAL GEOGRAPHIC MAGAZINE

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New 10-Color Historical Map of the United States

Sixty-four Pages of Illustrations in Color

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THE NATIONAL GEOGRAPHIC MAGAZINE

Following the Trail of Lewis and Clark

In a Station Wagon Loaded to the Axles, an American Family Traces the Nation's Oldest Path to the Pacific

By RALPH GRAY *

With Illustrations from Photographs by the Author

"EXPLORE the Missouri river, & such principal stream of it, as . . . may offer the most direct . . . communication across this continent . . . ."

Penned by Thomas Jefferson at the White House 150 years ago this June, those instructions launched the Lewis and Clark Expedition—the exploration that opened American eyes to the marvels of a vast western domain.

New Sights Along Pioneer Trail

Reading and rereading Jefferson's words, I grew eager to see for myself "the soil & face of the country," much of which Lewis and Clark were the first white men to behold.

I thought, too, of my three children. What better way to show them the wealth and splendor of their native land than to trace the trail of those earliest adventurers? How their eyes would pop at the sights Lewis and Clark reported: Indians, great rivers, mountains, waterfalls. At the same time they would see the changes wrought by generations of Americans—farms and ranches, dams, busy cities, dynamic industries.

My hopes sprang to life one June day in Washington, D. C., when my wife and I, with about equal parts of help and hindrance from our youngsters, packed our station wagon with camp gear, toys, cameras, and clothing. On top we lashed the canoe *Trout,* a veteran National Geographic traveler.

"Daddy says we'll canoe at some places to make it seem more like real exploring," 12-year-old Judith explained to her younger sister, Mary Ellen. "Lewis and Clark traveled mostly on rivers."

The red 18-foot craft attracted friendly gibes as we traveled toward mid-continent.

"You're going in the wrong direction for boating," one man called as we crossed the Alleghenies. "Fish are scarce on the Plains."

In a corner of the station wagon I installed a compact library featuring a set of the Lewis and Clark journals. These journals were our guidebooks—a ready-made itinerary.

Opening volume one, I learned that the explorers camped at Wood River, Illinois, in the fall of 1803 before pushing off for the faraway Pacific. (For the route of the Lewis and Clark Expedition, see the National Geographic Society's Historical Map of the United States, a supplement to this issue.)

Wood River Now Flows Backward

Three days out of Washington, we stood at Wood River landing, 15 miles upstream from St. Louis, watching the mighty Mississippi slide by (page 717). I looked across for the mouth of the Missouri. The journals said it should be there, but it was nowhere in sight.

"Can geography itself have changed in the 150 years since Lewis and Clark camped here?" I asked Dr. G. F. Ordeman, refinery manager of Standard Oil's Wood River plant.

"Indeed it has," he replied. "The Missis-

* See also, in the NATIONAL GEOGRAPHIC MAGAZINE, "Vacation Tour Through Lincoln Land," by Ralph Gray, February, 1952. That article, adjudged an "outstanding achievement in bringing about a better understanding of the American way of life," won the author the George Washington Honor Medal and a cash prize from Freedoms Foundation, Valley Forge, Pennsylvania. Mr. Gray is chief of the National Geographic Society's School Service.

Lewis and Clark's Buckskin-clad Stalwarts Portage Heavy Dugouts Around Celilo Falls

On the Oregon side of the Columbia all hands work at circling the 20-foot drop. Meriwether Lewis and William Clark (center) direct the job. Sacagawea (right), Indian woman who accompanied the expedition, stands with her husband, Charbonneau. This mural by Frank Swartz decorates the rotunda of Oregon's capitol at Salem.

After army clothing wore out, the explorers and their men dressed in animal skins. Crossing the Plains, they lived mostly on the bounty of the land.

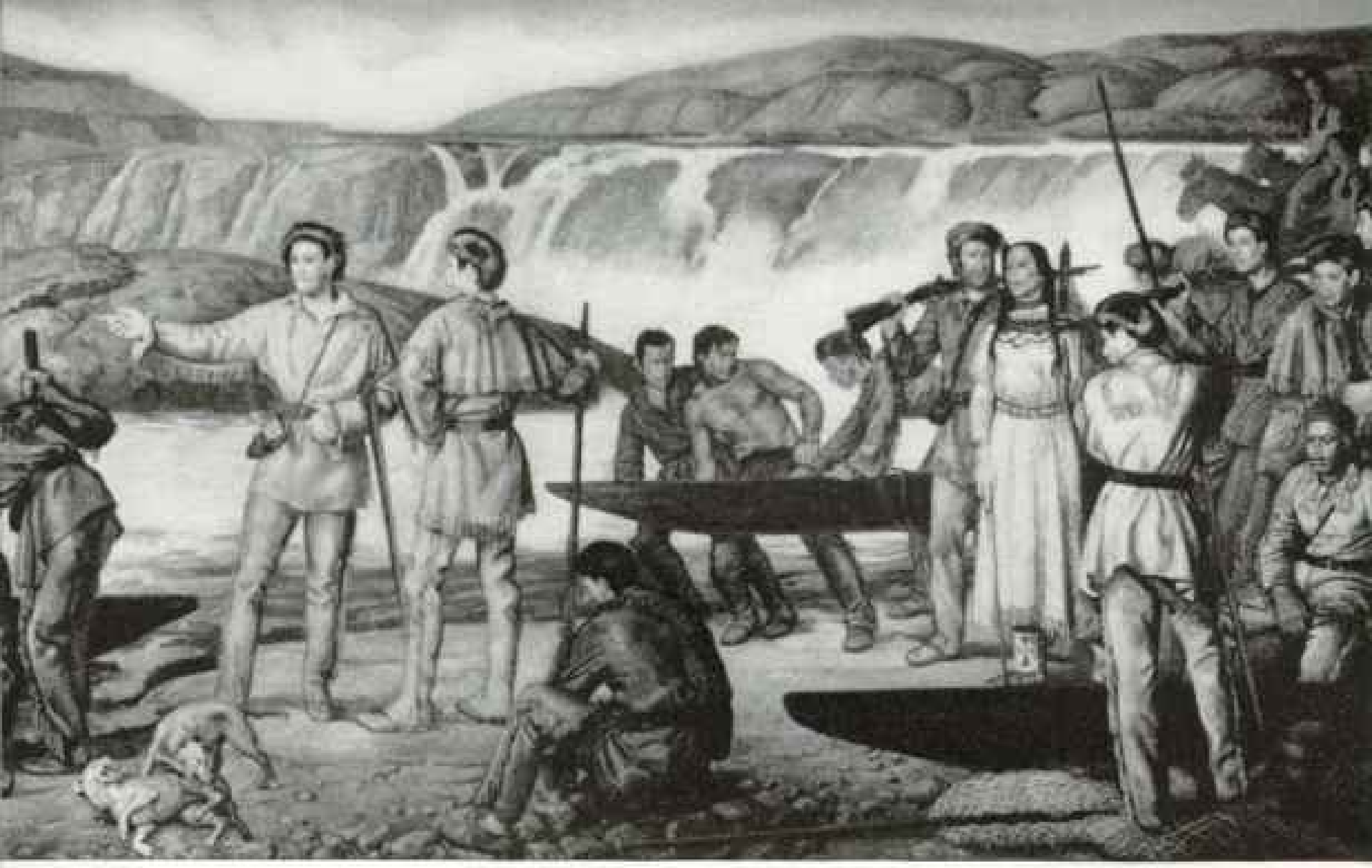
At Celilo Falls, Clark wrote in his journal: "We purchased 8 Small fat dogs for the party to eate; the natives not being fond of Selling their good fish, compells us to make use of Dog meat for food, the flesh of which the most of the party have become fond of. . . ."

Here the Lewis and Clark party neared the end of its westward journey. The author and his family, starting near St. Louis, Missouri, a century and a half later, retraced the Lewis and Clark trail.

Celilo, Now as Then, Is a Fine Spot for Catching Salmon

Today fishing rights at the falls belong solely to the Celilo Indians, who wield nets from precarious perches (below). Backwater from a dam being built at The Dalles soon will cover this spot.

Ray Atkeson



sippi has shifted eastward, and the Missouri mouth has jumped three or four miles south.

"Wood River, the stream that gave its name to Lewis and Clark's pioneer camp, now flows backward! It was blocked in 1917 two miles above its mouth. We made the last half mile a canal to lead Mississippi water to our refinery. Processing gasoline requires a lot of cooling water, you know."

In the Footprints of History

From Wood River our "expedition"—my wife, our children, and I—logged 10,000 miles in three months following the Lewis and Clark trail. The first three miles took us along a barely passable track that brought us opposite the present mouth of the Missouri. Judith, Mary Ellen, and Will raced to the water's edge.

"From this meeting of waters," I told them, "Lewis and Clark set out." Then in simple words I tried to tell this great American adventure story—how the explorers paved the way for the Nation's growth from an Atlantic community to a great power spread across a continent.*

This on-the-spot history lesson held the youngsters' attention. Ten-year-old Mary Ellen perched pensively on a driftwood log, dangling her feet in the swift, silent Mississippi. Even 6-year-old Will was comparatively stationary.

"That water you're trying to fall into," I said, "formed the western boundary of the United States in 1803."

In May of that year President Thomas Jefferson bought the huge Louisiana Territory from Napoleon. (See pages 751 and 752, and inset, "Growth of Our Country," on the new Historical Map of the United States.)

One hundred and fifty years ago this June Meriwether Lewis scratched out a letter to William Clark, his redheaded comrade of the Indian wars. He described a project that Jefferson and he had dreamed of for years.

The President wanted 29-year-old Captain Lewis, his private secretary, to choose a co-captain and lead a small Army detachment up the Missouri to its unknown source, cross the fearsome Rockies, and descend the almost legendary Columbia to the Pacific.

Clark Welcomes "Imense Undertaking"

Lewis wondered, in his letter, if Clark could be induced to participate in such a trip's "fatiegues, it's dangers and it's honors."

William was the youngest brother of George Rogers Clark, the patriot of the Revolution who won the territory that became Ohio, Indiana, Illinois, Michigan, and Wisconsin.

Young Clark jumped at the chance. He wrote: "This is an imense undertaking fraited with numerous dificulties, but my friend I can assure you that no man lives with whom I would prefer to undertake and share the Dificulties of such a trip than yourself."†

In those days each man was his own master, even in spelling.

* See "Trailing History Down the Big Muddy," by Lewis R. Freeman, NATIONAL GEOGRAPHIC MAGAZINE, July, 1928.

† Historical quotations, with a few exceptions, are from *Original Journals of the Lewis and Clark Expedition, 1804–1806*, edited by Reuben Gold Thwaites.

710

A Nebraska Farm Stands Fast Against the Missouri River's 1952 Flood

Pictured at their crest near South Sioux City, the waters cover fields and lap at house, outbuildings, and parked machinery. Silty, debris-laden flow has polluted the well pumped by the windmill.

711

Wide World

Milling Cattle Seek Refuge Behind an Emergency Dike on a Barnyard Island

The farmer stayed behind to care for his threatened livestock. Feed delivered by plane and amphibious vehicle helped save his bewildered animals. Some stand shank-deep at the feeding troughs (top).

By the end of 1803 he and the "robust helthy hardy young men" recruited for the Corps of Discovery were encamped beside the Mississippi. Lewis, making final preparations in St. Louis, would join them later.

New Find: Clark Papers in Attic Desk

The published journals are rather skimpy in their treatment of the months at Wood River. Now at last many original notes, penned by Clark in camp or keelboat, have turned up only this year. Lost to scholarship for 150 years, this treasure-trove of new information about those early days of the expedition was found among the papers of a little-known Civil War general, John H. Hammond. They had gathered dust in a St. Paul attic until 1953!

As I was writing this narrative of our trip, the electrifying news broke that the Minnesota Historical Society had uncovered 67 original William Clark manuscripts cached in a desk once owned by General Hammond.

Flying to St. Paul, I held the documents in my hands and easily recognized Clark's characteristic scrawl and the accurate draftsmanship of his maps (page 734).

"How the papers got there, we don't know," said Dr. Harold D. Cater, director of the Minnesota Historical Society. "There's no known connection between the families of Clark and Hammond. None of Hammond's heirs knew about the Clark papers, nor was there any family tradition of special interest in Lewis and Clark."

In 1803 the 1,000 or so inhabitants of St. Louis lived and worked by the riverside (pages 716 and 736). This section has been cleared of buildings recently to make way for a fitting memorial to Jefferson and national expansion. Parking lots, however, still cover much of this old gateway to the West.

After their trip, I learned, both Lewis and Clark settled in St. Louis. Clark's descendants still reside in the area.

In St. Louis I asked William G. Clark, Jr., great-great-grandson of the famed explorer, if I might photograph him with one of the Lewis and Clark objects displayed in the Missouri Historical Society museum.

"I've got something better than that," he told me. He produced a paper signed by "G. Washington" in "the 17th year of the independence of the United States" (1793), commissioning Clark a lieutenant (page 749).

Clark and his men set out from Wood River on the great adventure "at 4 oClock P.M., in the presence of many of the neighbouring inhabitents, and proceeded on under a jentle brease up the Missourie . . . ."

The day was May 14, 1804. The Corps of Discovery had embarked, not to return until September, 1806.

The expedition used a 55-foot keelboat carrying a square sail (page 719). When wind failed, the craft was poled like a Nile barge, rowed like a Greek galley, or towed from the bank like a Yangtze junk. Two pirogues—long, slim rowing boats—completed the flotilla.

The official party listed 31 men: Army volunteers from posts along the Ohio and Mississippi, Kentucky hunters, French watermen, a Negro servant belonging to Clark, and the two captains.

Supplies included flour, meal, pork, drugs, medical instruments, salt, extra clothing, tools, gunlocks, flints, powder, and ball. Fully twice as much space was taken up by trade items for the Indians—"tho' not as much as I think ness? for the multitude of Ind? thro which we must pass . . .," Clark commented.

Lewis and Clark's expenditures were limited by Congress to $2,500. The patriots budgeted this meager sum to such a nicety that, except for the pay of personnel and materials obtained from Government posts, it covered the entire expense of the expedition.

Traveling frugally with my family, I spent slightly more in three months on the Lewis and Clark trail than the original party expended in three years. (Considered as a single long journey, Lewis's trip to the Pacific had begun in Washington, D. C., in July, 1803, 10 months before the actual start up the Missouri.)

"We have something in common with our predecessors," said Jean, my wife. "They seemed to have as much trouble as we do getting away on time!"

Dinner and Toasts Delay Departure

At St. Charles, where Lewis joined his companions, a farewell dinner and toasts on May 21 delayed the captains until 3:30 p. m., when they finally pushed off "under three Cheers from the gentlemen on the bank." In what was left of the day, the party traveled one mile per cheer!

Next morning at 6 the expedition started in earnest. It covered 18 miles before making camp—nearly double the 10 miles a day which was to be their average during the struggle up the Missouri.

Their journals reveal Lewis and Clark both as warmly human men. Like legendary Damon and Pythias, they were true friends, despite sharply contrasting personalities.

Lewis was a real leader, courageous but prudent, a quiet man, a thinker and an idealist. He enjoyed lonely tramps through the forests and often wandered far inland, while his men pushed along the river. Bluff, genial Clark was practical, realistic, and friendly.

Jefferson appointed Lewis the leader, but

Lewis regarded Clark, four years his senior, as his equal in all respects.

Lewis carried out most of the scientific observations, while Clark served as the party's map maker and was the more skilled waterman. Before leaving the East, Lewis spent three intensive months schooling himself in various sciences, mastering celestial navigation, and planning the details of the trip.

Fall Nearly Ends Lewis's Career

Lewis's roaming instincts nearly brought disaster the second day out of St. Charles. He slipped while climbing along the edge of a 300-foot cliff on the south side of the river. Luckily, he caught himself 20 feet down.

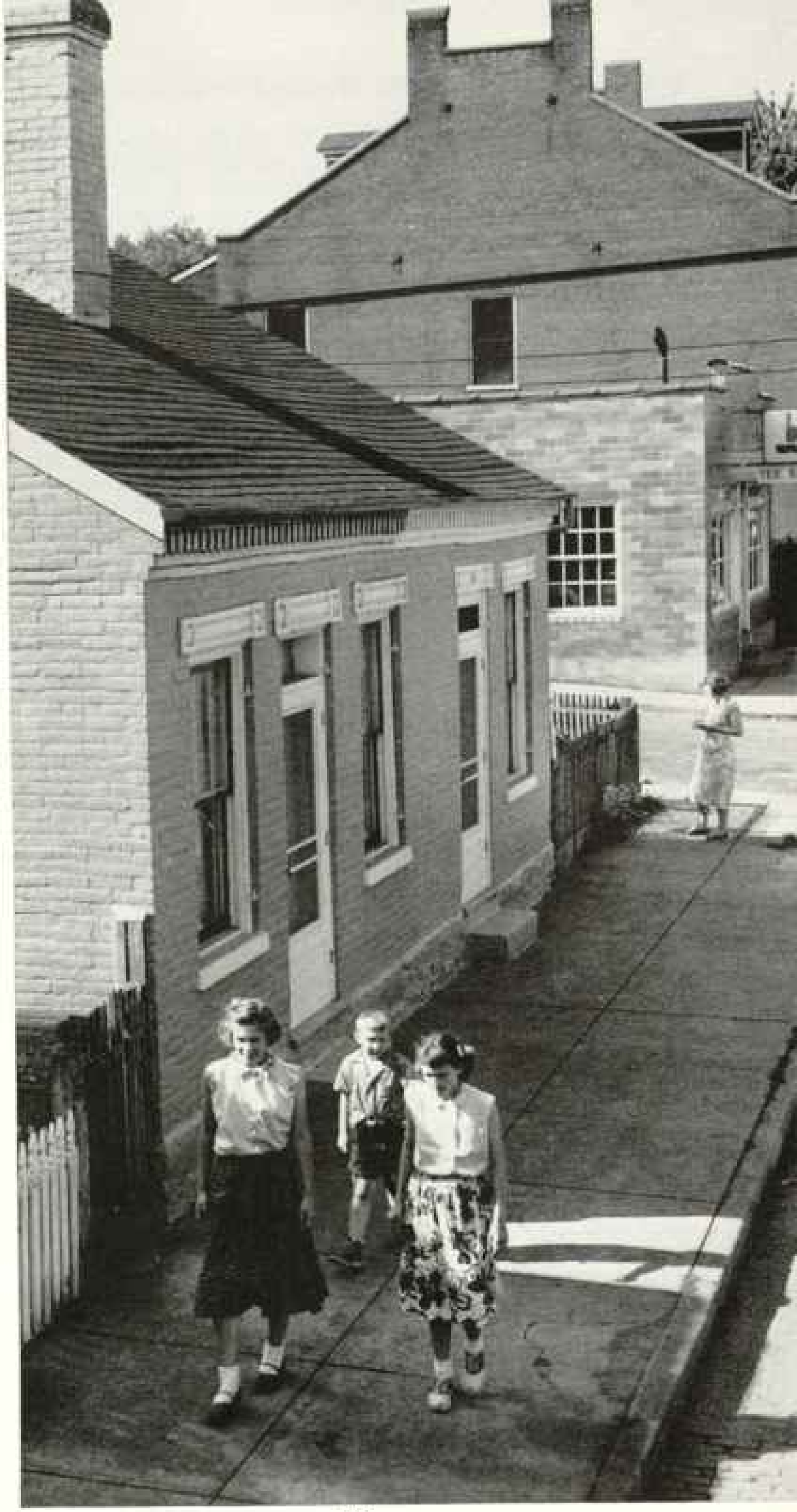
At the foot of the cliff, near present-day St. Albans, the rest of the party stopped in a cave called the Tavern. They studied the names of voyagers who sought shelter there, looked in wonder at Indian images painted on the walls, and measured the huge chamber.

This important Lewis and Clark landmark was lost for decades behind a river-built bank until Dr. Ralph P. Bieber, of Washington University in St. Louis, recently rediscovered it.

"How do you know this is the Tavern of the Lewis and Clark Expedition?" I asked Dr. Bieber as we stood on the floor of the cavern.

Dr. Bieber whipped out a tape measure. The cave stretched 120 feet wide, 40 feet deep, and 20 high—the exact dimensions reported in the journals.

A few miles upriver Lewis and Clark passed



713

Young Pathfinders Explore French-settled St. Charles

High-chimneyed brick homes give the Missouri town an Old World look. Though built flush with the sidewalk, they have gardens in the rear. Of hundreds of present-day Missouri River towns, St. Charles was the only one in existence when Lewis and Clark trekked west.

La Charette, a trading village of seven small houses—"the last white settlement on the river." I learned that a flood had long since washed away its site. St. Charles, Missouri, remains the only community on the westward Lewis and Clark trail that existed when the explorers passed (page 713).

The swirling milk-chocolate waters of "Big Muddy" led us in our turn west and north through woodsy Missouri, Mother of the West; wheat-growing Kansas; corn-belt Iowa and Nebraska; and the Dakotas, where farms give way to range.

We began to realize that a summer was none too long for covering the Lewis and Clark route. We were always in a hurry. Even our meals were rushed.

"When it comes to eating, you don't think of Duncan Hines," my wife reproached me. "You think of dunkin' doughnuts."

We stayed often in motels. The kids became as sharp-eyed at spotting "vacancy" signs as in locating Lewis and Clark markers.

North of Omaha, Nebraska, local historians led us to the place where they believe Lewis and Clark held their first council with the Indians. Such meetings were repeated countless times as the expedition moved into new tribal territories (page 720).

Death Struck but Once

At Sioux City, Iowa, we paid homage at the grave of the first American soldier to die west of the Mississippi. Sgt. Charles Floyd was "taken verry bad all at once with a Biliose Chorlick" [bilious colic] on August 19, 1804, and "Died with a great deal of Composure" the next afternoon. He was the only fatality of the entire expedition.

As we rolled across the Big Sioux River into South Dakota, a different world opened before us, as it had for Lewis and Clark. Here Joe Fields, one of the expedition's Kentucky hunters, killed the party's first American bison, commonly called the buffalo—the first some of them had seen (page 750).

Later, antelope were sighted. Called goats by the captains, they were then unknown to science. Clark described one as "Verry actively made, has only a pair of hoofs to each foot, his brains on the back of his head, his Norstrals large, his eyes like a Sheep."

The day after seeing the antelope, the party encountered its first prairie dogs. They "Set erect," the journals comment, and "make a Whistleing noise." The colony covered four acres. Lewis and Clark's men poured five barrels of water down one burrow to dislodge its owner.

The plains teemed with game; the men lived well. The land was as friendly as the river was hostile.

Lewis and Clark learned quickly, as do those who live along the Missouri today, that it is a "devil-river" constantly at war with humanity. Its current bore down upon them with unremitting force. Its mud banks dropped off, nearly swamping their canoes. Its eddies devoured sandbar islands as the men camped on them. Logs menaced the boats.

Blue Lakes from Brown Waters

The explorers covered 3,096 miles, by their own count, in their 15-month uphill push against the Missouri. Along paralleling modern highways we covered the same distance in a few weeks. The "Orange Crate" (Judith's nickname for the station wagon) took us through areas devastated by the flood of April, 1952—ruined croplands, new-cut channels, mud-soaked towns, wrecked and abandoned buildings (page 710).

We saw what the U. S. Army Engineers and the Bureau of Reclamation are doing to limit such disasters. The Engineers are building a series of earth-fill storage dams whose impounded waters will form an almost continuous chain of lakes from Yankton, South Dakota, to the Montana-North Dakota border.*

"They say the lake here will be blue," an unbelieving woman in Chamberlain, South Dakota, told me. "I've never seen Missouri water that wasn't brown."

These flood-control projects fit into a development program for the entire Missouri River Basin that will also produce power, provide irrigation, and stabilize downstream navigation.

As I stood with the children on heights overlooking the Oahe and Garrison projects, we saw a vast, dusty disarray of earth constantly churned by panting machines and diesel-powered Euclid trucks.

Fort Randall Dam, half-finished when we were there, made a more complete picture.

* See "Taming the Outlaw Missouri River," by Frederick Simpich, National Geographic Magazine, November, 1945.

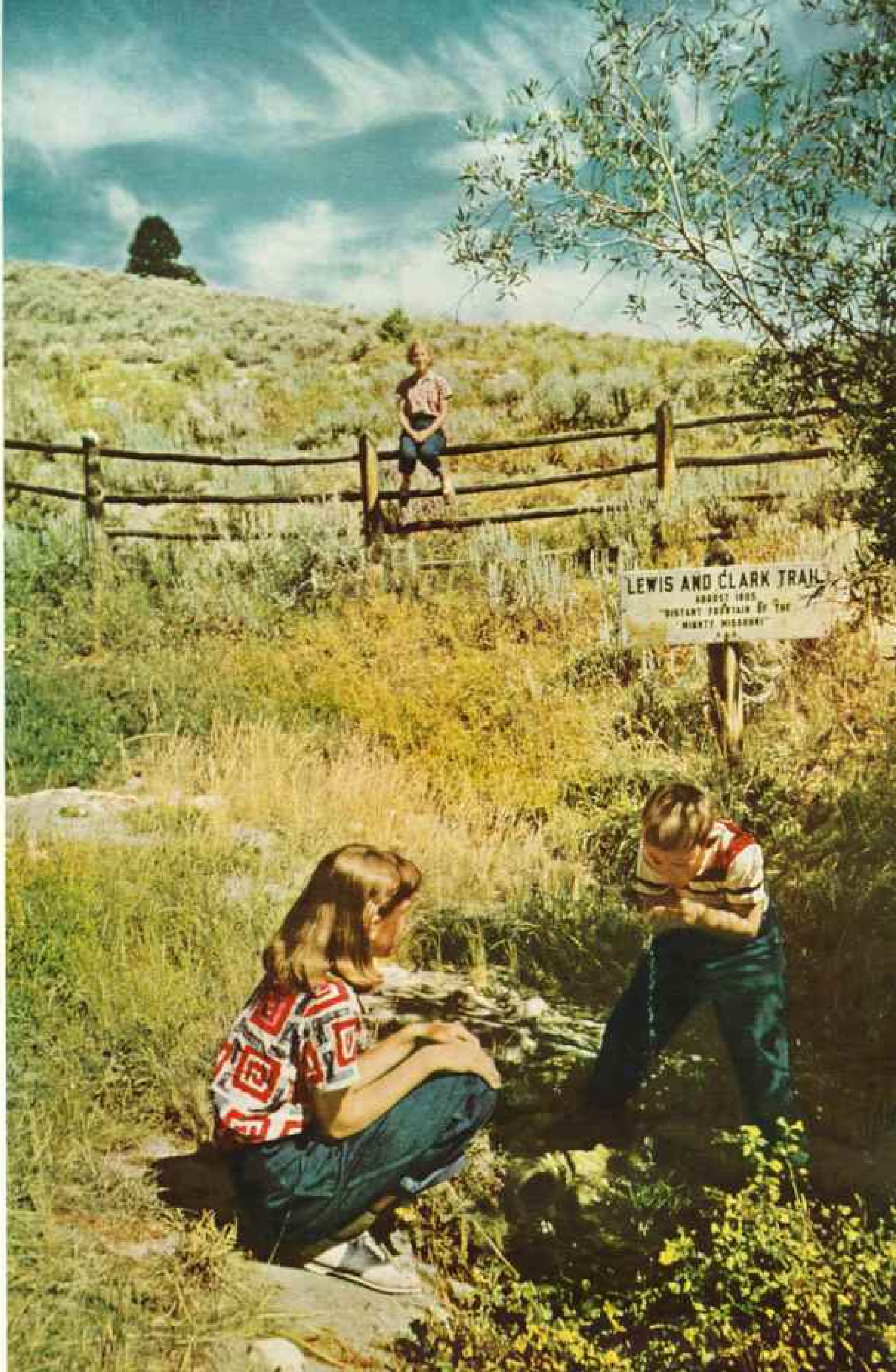
Kodachrome by Ralph Gray, National Geographic Staff

The Author's Children Drink at Lewis and Clark's High-water Mark →

On August 12, 1805, Meriwether Lewis reached this "most distant fountain of the waters of the Mighty Missouri in surch of which we have spent so many toilsome days and wristless nights. Judge . . . the pleasure I felt in all[a]lying my thirst with this pure and ice-cold water," wrote Lewis—scientist, diplomat, and explorer, but not a speller—in his journal.

From this point, high on the Montana slopes of the Continental Divide at Lemhi Pass (page 740), the pathfinders pushed into the Columbia watershed and penetrated to the Pacific.

The Gray family, camping beside the spring, found it still pure and ice cold.


LEWIS AND CLARK TRAIL

▲ **St. Louis, March 9, 1804: Meriwether Lewis and His Friends Witness Upper Louisiana's Transfer to the United States**

Thomas Jefferson purchased the Louisiana Territory on April 30, 1803, but communication was so slow that when Lewis and Clark arrived at St. Louis with their men the following November they found Spanish soldiers (left) still in control. This diorama is displayed in the Museum of National Expansion, St. Louis. Lewis, in white-plumed hat, stands at the left in the central group. Wax figures are only nine inches tall.

▼ The author found this Standard Oil Company towboat moored in the Mississippi at Wood River landing, Illinois. Here Lewis and Clark set up camp in the winter of 1803-04. Departing May 14, the party ascended the Missouri River and passed the bluff where Missouri later built its State Capitol at Jefferson City (right).

Kodachromes by Ralph Gray, National Geographic Staff

Between Council Bluffs, Iowa, and Omaha, Nebraska, the Missouri Coils Like a Brown Serpent

Flood struck at the cities in April, 1952, but a sand-bag army averted a disaster to Omaha's water-front buildings (in distance). The monument commemorates a council between Lewis and Clark and the Oto Indians (page 720).

Keelboats, Precursors of River Steamers, Advanced the Course of Empire Westward

These adaptable craft made headway with sails, towropes, oars, and poles. This one was built for use in the movie, "The Big Sky." Seen in Wyoming, it resembles the boat that carried the explorers halfway up the Missouri.

Kodachromes by Ralph Gray, National Geographic Staff, and Tom Kilduffs

© National Geographic Society

Young Pilgrim Files a Progress Report

Will Gray's note joins those of other trail followers on Spirit Mound in South Dakota. Indian legend populated this hill with belligerent "little people." Lewis and Clark correctly reported its 65-foot height.

Author Puffs an Indian Peace Pipe

On or near this bluff at Fort Calhoun, Nebraska, the explorers held the first of many Indian palavers. They said they had come from "the great Chief of the 17 great nations [States] of America."

Fort Berthold, a Fur Post, Yields Archeological Secrets

After Lewis and Clark showed the way, trappers and fur traders made the Missouri River a busy highway. Beaver hats adorning gentlemen in London, Paris, and Washington came from animals caught in the lonely and dangerous spaces of the American West. To protect their travel routes, fur companies erected forts along the Missouri. Such a post was Fort Berthold, North Dakota, built in 1858.

The Army garrisoned the outpost from 1865 to 1867. It withstood many attacks by wandering Sioux. Though damaged by fire, it stood until the 1890's.

Bearded Dr. G. Hubert Smith of the Smithsonian Institution, Washington, D. C., here discusses the Berthold dig with Dr. Gordon C. Baldwin of the National Park Service. Their work is urgent, for the site will be inundated when Army Engineers complete Garrison Dam. The Missouri River, hidden by the distant trees, will rise to form the largest reservoir in the world in area.

➤An assistant whisks away dirt from stumps of the fort's palisade.

Kodachromes by Ralph Crane, National Geographic Staff

Earth Lodges Rising from the North Dakota Prairie Call to Mind a Forgotten Indian Life. Bismarck's Skyscraper Capitol Breaks the Horizon

Earth-covered dwellings made snug havens for Missouri River tribes. In such a home lived Sacagawea, the Shoshoni girl-mother who joined the Lewis and Clark Expedition (page 725). The author's children visit restored lodges with Alberta St. Clair, a Shoshoni princess, now a coed at the University of Wyoming.

Camping Chores Occupy Three Young Coursers of Old Trails at Like-a-fishhook Village, North Dakota

Named for a Missouri River bend, Like-a-fishhook was inhabited by earth-lodge people until the 1890's. Their saucerlike, unrestored house sites still dimple the plain. A team from the State Historical Society of North Dakota, excavating the area, has brought to light axheads, shoe soles, and patent-medicine bottles.

Kodachrome by Ralph Gray, National Geographic Staff

Alberta St. Clair and Judith Gray Test Missouri Waters Near Craig, Montana

Camping here in 1805, Lewis "saw a large herd of Bighorned anamals on the immencely high and nearly perpendicular clift . . . they . . . bounded from rock to rock . . . where it appeared to me that no quadruped could have stood."

Sacagawea Showed the Way West to Generations of Women to Come

Throughout 20 months and 5,000 miles, the stanch Shoshoni girl shared the trials of the trail with the 31 men of the expedition. Despite the child on her back, she loyally performed her portion of camp and trail duties. In addition, she helped stave off starvation in the mountains by finding edible roots. Her mere presence prevented attacks by Indians, for "a woman with a party of men is a token of peace," as Clark noted.

Sacagawea's statue, by Leonard Crunelle, stands on the grounds of North Dakota's State Capitol at Bismarck, 40 miles from the point where Lewis and Clark encountered her. The Shoshoni heroine was living in a village of Minnetarees who had kidnaped her four years earlier. Her child was born less than two months before she departed with the American expedition for the faraway Pacific. Her husband, Toussaint Charbonneau, a French trader, accompanied the party as an interpreter (page 741).

▼ A Flathead Indian father and two children rest after dancing for debarking train passengers at Three Forks, Montana. Their ancestors met Lewis and Clark in Montana's Bitterroot Valley.

Kodachromes by Ralph Gray, National Geographic Staff

Sanish, North Dakota, Huddled on the Prairie, Calmly Faces Doom by Flood

The valley enclosing the town meets the Missouri River just to the left. Garrison Dam, being built 90 miles downstream by the U. S. Army's Corps of Engineers, will one day inundate homes and grain elevators.

Kodachrome by Ralph Gray, National Geographic Staff

Lewis and Clark Were the First Explorers to Report the Wealth of the High Plains

The leaders' journals scotched wild tales of live mammoths and mountains "of solid rock salt" 180 miles long. They noted fertile lands, discovered lignite and sodium sulphate, but missed the oil underground.

↑ **Pompeys Pillar: Montana's Monument to Clark**

Returning from the Pacific, Clark climbed this 200-foot-high formation near Billings and carved his name in letters still legible. Historians believe he named the rock for Sacagawea's baby, Pomp, whom he called "my little dancing boy" (page 741). Inset: Judith Gray admires a lush stand of fireweed on Lolo Trail, Idaho.

← Bison by the tens of thousands thronged the Lewis and Clark route in 1805, but a century and a half later the author had to travel far afield to show his children a straggling herd.

↓ These bison, or buffaloes, graze on a spacious fenced range in Hot Springs State Park near Thermopolis, Wyoming.

Keen observers of fauna and flora, Lewis and Clark reported many species new to science. Pursuing grizzly bears, the men learned to hunt in pairs so that one could reload while the other fired. Once it took six men to fell a monster running "at them with open mouth."

"Indeed he had like to have defeated the whole party," wrote Clark.

Kodachromes by Ralph Gray, National Geographic Staff

Prickly Pear, Making Judith Wince, Pierced Expedition Moccasins

One night Clark extracted 17 cactus spines from his feet. "Musquetoes eye knats and prickley pear [are] equal to any three curses that ever poor Egypt laboured under," he confided to his journal. The highway approaches Loma, Montana, on the Lewis and Clark trail.

Lewis (Aft) and Clark Show Sacagawea the Site of Her Abduction

Here the Jefferson, Madison, and Gallatin Rivers unite to form the Missouri, longest river in North America. These Three Forks, Montana, men dress for their part in an annual Lewis and Clark pageant. Miss St. Clair impersonates Sacagawea (page 722).

The 160-foot-high earth fill jutted a mile from the north bluff to the riverbank. A monster dredge sucked chalk rubble from the bank and built a sill across the river. The finished sill will divert the river through a bypass. Then engineers will push the embankment across the old riverbed, completing the dam in 1957.

At Gavins Point Dam, near Yankton, we asked if we could drive down to river level, to see Calumet Bluff.

"Stay over to the right on that construction road, keep moving, and don't get in the way of those Eucs," a workman shouted.

In a fog of dust we crept down the long slope. A Euclid jounced past, carrying 14 cubic yards of dirt as if it were a shovelful. A continuous procession of these huge-wheeled monsters lurched to river level and dropped their burdens, anchoring the newborn dam to Calumet Bluff.

What a different scene when Lewis and Clark counciled here with the Sioux!

For days the captains had tried to arrange a meeting with the powerful tribe. Many times they "Set the Praries on fire as a signal for the Soues to Come to the River." At last several chiefs arrived at the Calumet Bluff camp. They warily counciled with the strangers. Near by, Lewis and Clark planted a strange banner. For the first time these Indians saw the American flag.

Indian Dances: "a Houp & Hollow"

Lewis and Clark were honest councilors and able diplomats. The warriors were more curious than hostile. The pipe of peace went around. Thirty Sioux braves danced for the party, moving Sgt. John Ordway to note that such Indian affairs "always began with a houp & hollow & ended with the Same."

In the journals I read that the Sioux were "a Stout bold looking people, (the young men handsom) & well made . . . the Warriers are Verry much deckerated with Paint Porcupine quils & feathers, large leagins and mockersons, all with buffalow roabs of Different Colours. the Squars wore Peticoats & a White Buffalow roabe with the black hare turned back over their necks and Sholders."

Upstream, near present-day Pierre, capital of South Dakota, I showed the children where the Teton Sioux gave Lewis and Clark some troublesome moments. The expedition barely got through without a fight.

Then we came to the domain of agricultural tribes, the Arikaras, Minnetarees, and Mandans, who lived in semipermanent earth-lodge villages along the Missouri. Most of them were in what is now North and South Dakota.*

Over modern highways that would have astounded our predecessors, we steered the Orange Crate toward Bismarck, capital of North Dakota. As I drove, my wife quoted from our traveling library.

"Lewis and Clark," she announced, "spent the winter of 1804-05 in the region northwest of Bismarck."

The Mandan Indians of the area, she told the children, were known by the explorers to be friendly to whites. Lewis and Clark had come 1,600 miles in five months. They built Fort Mandan and settled down for the winter.

"Do the Mandans still live in dirt huts like they used to?" Judith asked.

"No. Most 20th-century Indians live in houses. The earth lodge is all but forgotten. And soon those big dams you've been seeing will drown most of the old sites."

Scientists want to learn more about earth-lodge people before the waters come. I talked with Dr. Gordon C. Baldwin, National Park Service archeologist, about their work.

"The Smithsonian Institution helps the National Park Service supervise the salvage program," he told me. "The Bureau of Reclamation, Army Engineers, and local groups and universities also participate. We've brought to light hundreds of earth-lodge sites. Search has revealed other places of habitation ranging in date from several thousand years before Christ to the early white era."

Near Chamberlain my youngsters spotted a group of men digging in a field beside U. S. 16. We tumbled out of the car and watched. They were high-school and college archeology students, working for the Nebraska State Historical Society.

"Gee, someday I'd like to do something like that during the summer," said Mary Ellen.

Earth Lodges Restored Near Bismarck

The boys showed us a large ceremonial lodge and two earth dwellings they had uncovered. These were built by Arikaras about 1750. Hard-packed circular floors were exposed just a few feet from the highway. A tourist, curious about the activity, asked if the boys were preparing the foundation for a silo.

The children quickly learned to spot the dimples that indicate earth lodge sites (page 732). As a climax, in Fort Abraham Lincoln State Park near Bismarck, we saw five restored lodges rising like earthen bubbles under the green sod (page 722). One of them was completely furnished, with bunks around the edge, fire pit in the center, cache pits in the floor, and grinding basins for corn. A buffalo skull on a stick made a family altar.

It looked so homelike that Will asked, "Are you sure no one lives here?"

* See "Indians of Our Western Plains," by Matthew W. Stirling, NATIONAL GEOGRAPHIC MAGAZINE, July, 1944.

An Arikara Earth Lodge Floor Lies Bared, Dark Patches Beyond Mark Unexcavated Sites

Near Fort Thompson, South Dakota, University of Kansas archeologists measure an Indian home. Wetting the earth (foreground) brings out small features that would not show if dry. Holes around edge and larger ones near center held timbers that supported earthen walls and roof (page 721). Oblong cavities were cache pits for storing corn or personal articles. Students purchased white Spanish-American War helmets from a New York surplus store.

His mother reassured him. "But," she said, "it was in a house just like this that Sacagawea lived when she first saw Lewis and Clark."

"Oh, Sacagawea," Mary Ellen said. She stumbled over the difficult name. "We read a story about her in school."

"Yes, she traveled from here to the Pacific and back with Lewis and Clark. She carried her baby boy, born near here less than two months before she started."

"Why did she go with them?" Will asked.

For answer, I took him back to the Indian girl's childhood. Sacagawea was a Shoshoni living in the Rocky Mountains.* Raiding Minnetarees captured her in 1800, when she was about 12 years old, and carried her away to the Plains. There she remained a slave until Toussaint Charbonneau, a Canadian squaw man who knew many Indian tongues, bought and married her.

Through the unknown lands ahead, Lewis and Clark would need interpreters. They hired Charbonneau. His squaw, included in the deal, proved indispensable; she was important to the captains because of her tribe.

The explorers knew that at the Missouri source they would have to abandon their boats. The Shoshonis were the only people in that area from whom they might buy

* Among other spellings of the Shoshoni woman's name is "Sacajawea."

horses for the trip across the "Shining Mountains." Providence had sent them an ambassadress.

Modern Sacagawea Joins by Air

Like our predecessors, my family and I were joined by a Shoshoni princess. Lewis and Clark's Sacagawea came to them across the icy Missouri in a tublike boat of buffalo skins. Her modern counterpart—Miss Alberta St. Clair—came to us out of the sky at Bismarck in a two-motored airliner.

Knowing the common heritage of Alberta and Sacagawea, I had asked her to join our pilgrimage. Had she been a princess of Cathay, my children could not have been more thrilled.

"My friends call me Tiny," she told us, "from my Indian name, Danditze, which means 'Little One.'" In camp the next night she proudly modeled two deerskin dresses, one decorated with elks' teeth and the other beautifully beaded. Both are heirlooms.

The children fought to sit next to Alberta in the station wagon. Will asked if she went to school.

"Yes, I'm a senior at the University of Wyoming. But when I was in the first grade like you, I went to school on the reservation."

Alberta gabbed happily with the girls about movies and popular songs. For three weeks she was one of the family.

We left Bismarck in a caravan led by Russell Reid, superintendent of the State Historical Society of North Dakota, and drove across vast, windy plains. Gusts threatened to blow the canoe off the car, but we safely reached Fort Berthold Indian Reservation.

During a blustery afternoon shower we came to a village site called Like-a-fishhook. There, beside the Missouri, on a broad grassland which Garrison Dam will flood, we set up camp next to the tents of the historical society (page 723).

The Expedition Leaves Fort Mandan

Lewis and Clark left Fort Mandan after their winter layover on April 7, 1805, at 4 p.m. (another late start!). The captains were jubilant.

It was still a water-borne party. The keelboat, loaded with letters, dispatches, and specimens of Plains life—dead and alive—for the scrutiny of President Jefferson, had been sent down the Missouri to St. Louis. Thirty-one men and Sacagawea set out to wrestle six small canoes and the two pirogues—one red and one white—up the dwindling river.

"This little fleet," mused Lewis, "altho' not quite so rispectable as those of Columbus or Capt. Cook, were still viewed by us with as much pleasure as those deservedly famed adventurers ever beheld theirs; and I dare say with quite as much anxiety for their safety and preservation. we were now about to penetrate a country at least two thousand miles in width, on which the foot of civilized man had never trodden; the good or evil it had in store for us was for experiment yet to determine, and these little vessells contained every article by which we were to expect to subsist or defend ourselves."

A month later, at a point which we reached in two easy days, Lewis's worst fears were nearly realized. The white pirogue, laden with the expedition's most valuable baggage, turned nearly "topsaturva" during a sudden squall. From the bank, Lewis and Clark watched helplessly.

Sacagawea, her baby strapped to her back as usual, calmly clung to the stern of the boat with one hand and retrieved with the other nearly everything of value as it floated by. Her husband, the helmsman at the moment, froze with fear. Cruzatte, the bowman, had to threaten him with shooting before he would grasp the helm and right the vessel.

Grizzly "Reather Intimedates Us All"

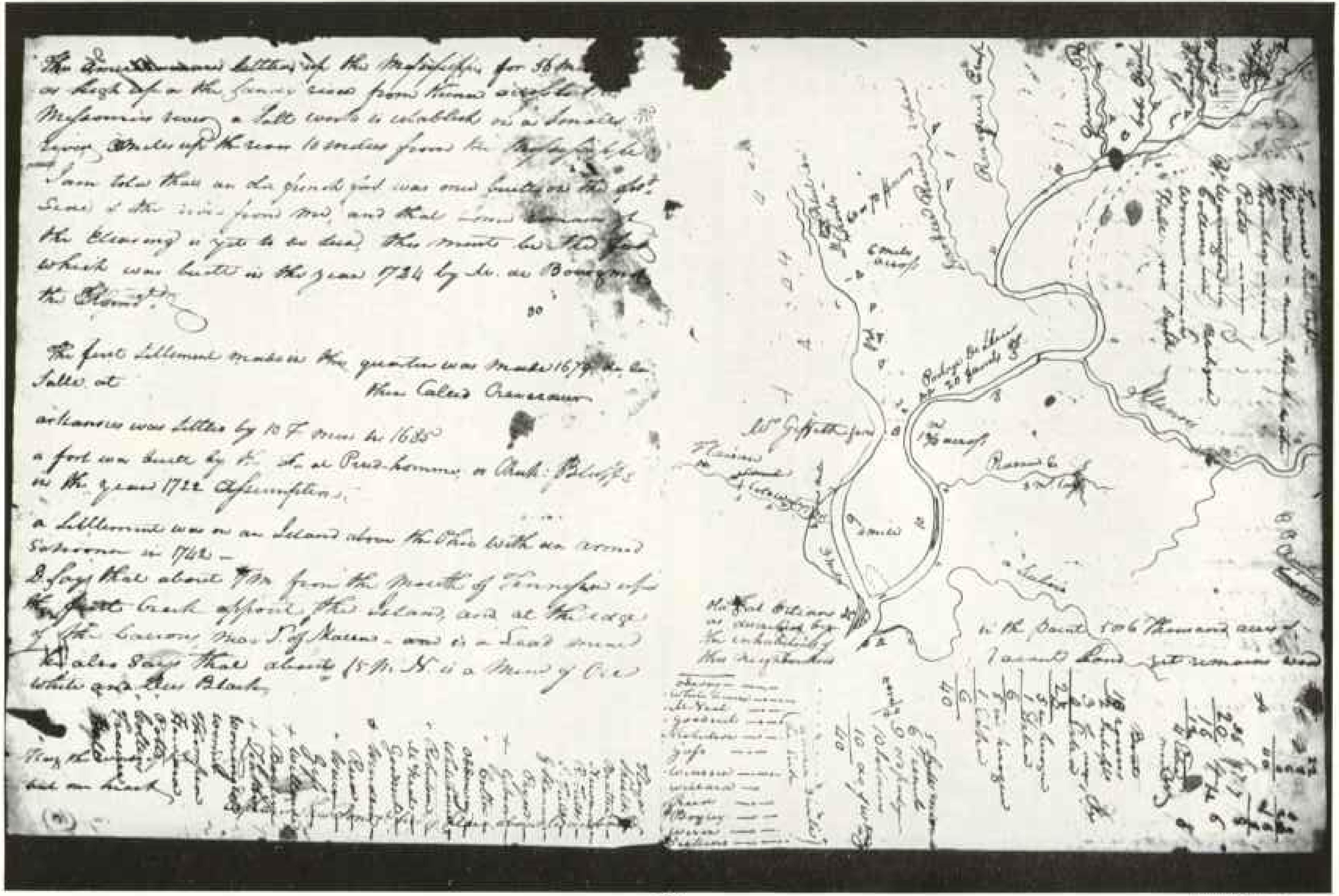
I could not miss the excitement of the journals as they described the party's approach to the Rockies. The fearsome grizzly bear was encountered and described for the first time by whites. ". . . these bear being so hard to die reather intimedates us all; I must confess that I do not like the gentlemen and had reather fight two Indians than one bear."

The men also made the acquaintance of cactus. The spines of the prickly pear easily penetrated their moccasins. Clark one night plucked 17 thorns from his feet. My children, warned by this, walked with extreme care on the plains (page 730).

The pioneers gazed in wonder at a great riverbed running in from the south without a drop of water in it. Draining an arid region, it flowed only in spring or after heavy rains. Now the tremendous lake behind Fort Peck Dam permanently fills Big Dry Creek. We all piled into the motor launch *Sacajawea* and cruised some 250 feet above submerged banks where the expedition's rivermen once towed their boats with elk-hide ropes.

On May 26, from high hills on the north, Lewis "beheld the Rocky Mountains for the first time . . . ."

With the coming of spring the young captains' thoughts turned to girls they had left behind. Clark named Judith River for Julia Hancock, a Virginia damsel whom he called Judy and later married. Lewis christened


The first settlement made in the quarter was made 1679 by la Salle at
then called Crevecoeur
arkansas was settled by N F men in 1685
a fort was built by the ... at Prud-homme or Chick: Bluffs
in the year 1722 Assumption
a settlement was on an Island above the Ohio with an armed
... in 1742 –
Pass Bayou
New Orleans as described by the inhabitants of this neighborhood

Clark's Manuscript Reveals a Crabbed Hand, Skillful Draftsmanship

A dusty attic in St. Paul, Minnesota, yielded this and 66 other original Lewis and Clark journal pages earlier this year. The Minnesota Historical Society made the find and termed it "the greatest discovery of its kind in decades."

The newly found manuscripts begin with December 13, 1803, seven weeks before the earliest expedition notation in the Thwaites edition of the journals.

This ink-blotched sheet is crowded with notes of general history on the left and with a map of the vicinity of the Wood River camp of 1803-04. The Mississippi flows from the upper right. The Illinois (right) and Missouri (left) join it. Tiny Wood River is labeled "Dubois," its French name. The tent symbol at its mouth marks the party's first camp. In the margins are listed the men of the expedition.

Meandering Rivers Mesh Waters at Three Forks, Montana

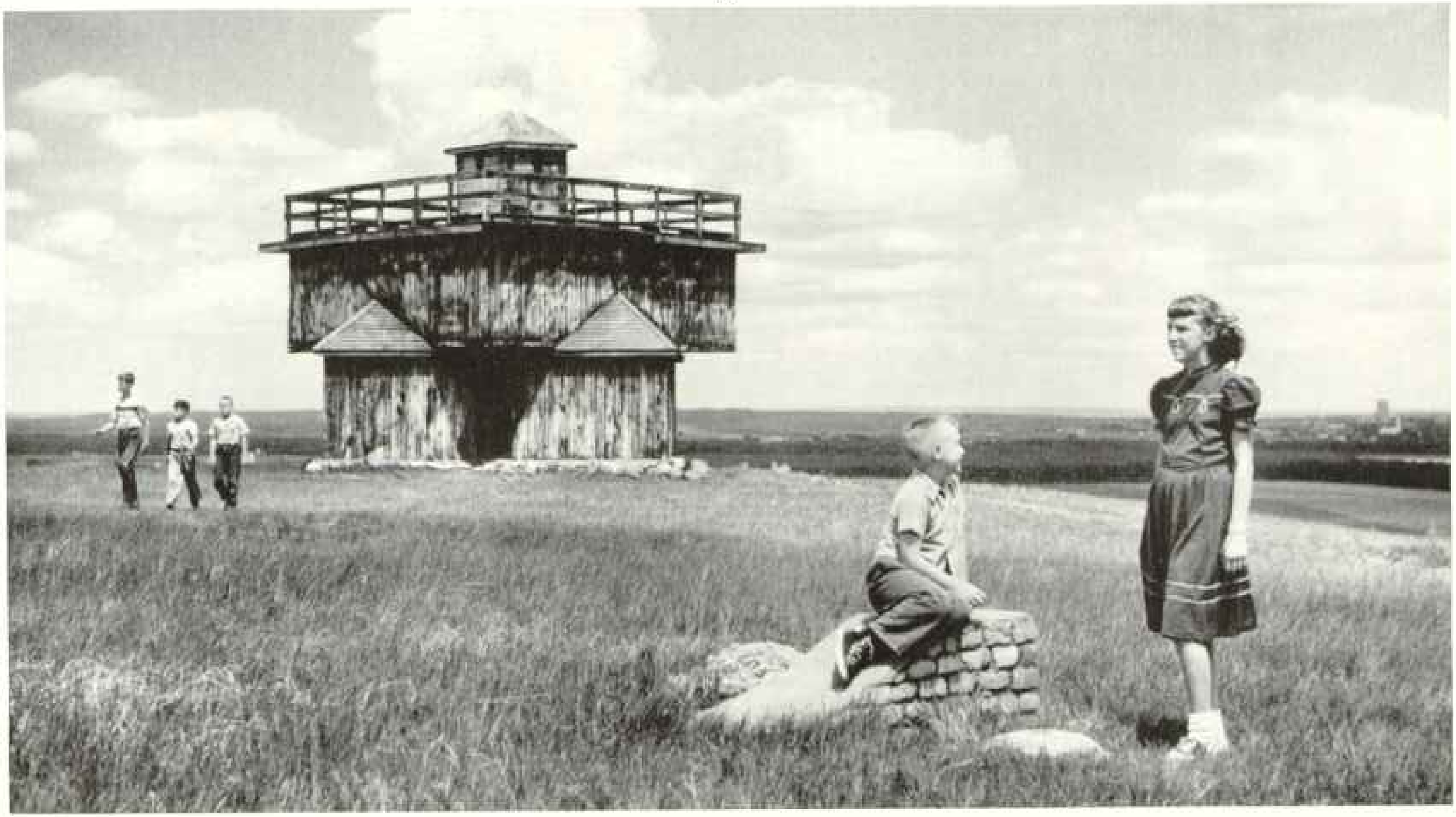
The Missouri begins 2,466 miles above its mouth, at the cliff in center background. The Jefferson and Madison rivers twist about tree-studded islands and join in the foreground. Their combined waters are soon augmented by the Gallatin—the third of the forks—flowing beyond the highway at the right.

William Clark was the first white man to see this "essential point in the geography of this western part of the Continent"—July 25, 1805.

✦ Missouri's Cities and Farms Raise Living Monuments Along the Lewis and Clark Trail

When the adventurers visited St. Louis (upper picture) in 1803, the Mississippi River city occupied only the cleared area in the center. Today these acres form the Jefferson National Expansion Memorial, dedicated to America's westward movement. Lower picture: Wheat fields and grain elevators frame Kansas City's skyscrapers, hazy in the distance. William Clark in 1806 climbed bluffs where the city now stands and noted the site's "many advantages for a trading house. . . ."

✦ A restored blockhouse in Fort Abraham Lincoln State Park commands the North Dakota prairie near Bismarck. Gen. George A. Custer and his Seventh Cavalry rode from here in 1876 to the Little Bighorn and death at the hands of the Sioux.



Marias River in honor of Maria Wood, a pretty cousin.

The men thought Marias River the course they should take. The captains, in perfect agreement as usual, held that the true Missouri was the southern fork. Lewis's discovery of the Great Falls of the Missouri a few days later settled the matter; Indians had told them the Missouri thundered out of the mountains in a series of falls.

Great Falls Robbed of Water

We followed the trail to these "truly magnificent and sublimely grand" falls. "From the commencement of time [they had] been concealed from the view of civilized man," wrote their discoverer. Today the water, shunted through turbines, provides power for Great Falls, Montana. The cascades in summer often are mere trickles.*

Four separate cataracts and many rapids drop a total of 500 feet in 11 miles. Enraptured by the sight, Lewis tramped alone beside them. Next day he shot a buffalo for his evening meal. While watching it die he was suddenly charged from behind by a large grizzly bear.

His gun empty, Lewis fled across a treeless plain beside the river. The bear gained fast. The man splashed into the water to chest depth, turned and faced his adversary with his espontoon, a kind of spear which was then standard issue to soldiers.

At the water's edge, the animal "sudonly wheeled . . . declined the combat . . . and retreated . . . the cause of his allarm . . . misterious and unaccountable."

Nowhere did the expedition find wildlife more abundant than on the Missouri's upper reaches. But to show my children the wondrous animals so often mentioned in the journals, I had to detour to protected ranges where today's small herds dodge extinction. We saw bears—brown, cinnamon, and black—and elk in Yellowstone National Park; buffalo in two Wyoming preserves (page 729); antelope near Townsend, Montana; prairie dogs at Devils Tower National Monument; bighorn sheep in the Black Hills.

Clark marked out an 18-mile route for portaging around Great Falls. From the only large cottonwood tree in the vicinity the men made wheels 22 inches in diameter. A mast from a pirogue was cut up to provide axles for two carts.

The portage consumed an entire month. On July 15, after caching everything that could be left behind, the expedition pushed upriver in eight canoes. Large boats could no longer be used; so two new cottonwood dugouts joined the fleet.

In this region, where mountains press roads next to riverbanks, we were able to follow the trail closely by car. We entered Montana's Lewis and Clark County and launched *Trout*, our own canoe, in the swift-flowing Missouri beside U. S. 91.† We paddled about in the vicinity of the expedition's July 17th camp (page 724).

North of Helena a motorboat skimmed us through the "Gates of the Rocky Mountains." Here a small dam has created a lakelike reach where the journals describe 5¾ miles of gloomy cliffs rising nearly 1,200 feet from the water's edge. The explorers had to travel after dark to reach a spot roomy enough for a camp. In the canyon Lewis found nowhere to "rest the soal of his foot."

East of Montana's capital we watched men and machines at work on the Bureau of Reclamation's Canyon Ferry Dam. Near this new 225-foot-high concrete barrier across the Missouri, Sacagawea gave the cheering news that the three forks were not far away.

Clark, walking ahead, discovered the point where three rivers unite to form the Missouri, 2,466 miles above its mouth. The captains named these streams Jefferson, Madison, and Gallatin for the President and two of his cabinet members.

In the one-street town of Three Forks, Montana, we took rooms in Sacajawea Inn. Driving six miles to the river's three forks, we saw where the tributary streams wander in from a mountain-ringed valley, mesh their meandering waters under a great rock cliff, and create the Missouri (page 735).

Lewis Kills an Indian

What I saw at this birthplace of the Missouri brought me to a startled halt. Eight Indians were creeping up on four white men asleep on the ground. The redskins rushed. The attacked men jumped up, guns and knives in hand. Protecting their horses, the whites killed two Indians.

We had stumbled on a reenactment of the only fatal encounter between the expedition and redskins. The fight, in which Reuben Fields knifed one Indian and Lewis shot another, was being rehearsed for the Three Forks pageant, based on episodes of the Lewis and Clark saga. Next evening, watching it from bleachers, we looked down on a drama whose stage was the site where many of the incidents took place (page 730).

Pageant day, the anniversary of the ex-

* See "Montana, Shining Mountain Treasureland," by Leo A. Borah, NATIONAL GEOGRAPHIC MAGAZINE, June, 1950.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Labrador Canoe Adventure," by Andrew Brown and Ralph Gray, July, 1951; "Down the Susquehanna by Canoe," July, 1950, and "Down the Potomac by Canoe," August, 1948, both by Ralph Gray.

Kodachrome by Ralph Gray, National Geographic Staff

The Explorers Sank Canoes and Took to Horse at the Beaverhead's Forks in Montana

Up to this point the captains had counted 3,096 grueling water miles. Here Lewis, walking ahead, left a note telling Clark to await him while he went on to buy Indian horses. He returned with a mounted tribe of hungry and capricious Shoshonis, only to find Clark had not arrived. Since the "yellow gentlemen" feared a trap, Lewis gave the chief his gun and said "he might shoot me" if "enimies" appeared. After an uneasy night Clark showed up, and Sacagawea recognized the chief as her brother. On their return trip the explorers recovered their canoes.

Lemhi Pass: Here Meriwether Lewis on August 12, 1805, Became the First White American to Stand on the Continental Divide

This lonely road follows the historic route across the Bitterroot Range from Montana to Idaho. Leaving the last trickle of Missouri water, Lewis pushed down the Pacific slope "to a handsome bold runing Creek of Clear water. Here I first tasted the water of the great Columbia."

Proud Shoshonis Honor Sacagawea in This Cemetery

Sacagawea's memory lives on in Wind River Indian Reservation, Wyoming. Old-time Shoshonis said that an aged woman who died there in 1884 was the girl who traveled to the Pacific and back with Lewis and Clark. That woman lies in the central grave.

Others contend that Sacagawea died six years after the expedition, while returning from a visit to St. Louis.

Beyond reasonable doubt, Sacagawea and Charbonneau in 1810 did travel to "Red Head's Town," as Indians called St. Louis, after Clark's flaming hair. They carried their son Baptiste (cenotaph on left), the Pomp of the expedition, to their white friend to be educated, but, becoming "weary of a civilized life," soon started for home.

Prince Paul of Württemberg, visiting the West, took a fancy to Baptiste. The two traveled together in Europe and returned in 1829. Later Baptiste guided white parties.

Bazil (marker on right) was Sacagawea's adopted son, according to Indian tradition.

Kodachromes by Ralph Gray, National Geographic Staff

↑ **"The Soil Appears to Improve as We Advance." Washington State's Wheat Country Was Opened by the Expedition; Near Dayton**

↓ Wild mountain hay goes into stacks to winter-feed a Montana rancher's Herefords and palominos near Lemhi Pass. Through this meadow flows Trail Creek. Here one expedition member gave thanks to God that he had lived to "bestride the mighty and heretofore deemed endless Missouri."

Kodachrome by Ralph Gray, National Geographic Staff

↑ Emerging from Lolo Wilderness Near Greer, the Explorers Struck Idaho's Clearwater River

Every spring loggers fill the river with timber and run it to the mills at Lewiston. Tom Kiskila, a former logger, canoed the author through the Clearwater's canyon. They started at Canoe Camp, a few miles below, where Lewis and Clark built dugouts for their final lap to the Pacific.

↓ Wind Makes Light of Skirts High Above the Columbia River Gorge

After navigating the Snake River, the expedition entered the "Great River of the West" and eventually passed Rowena Crest, this Oregon outlook on the Columbia River Highway. Above and below this placid stretch, falls and rapids harassed the explorers.

Kodachromes by Ralph Gray, National Geographic Staff

"*Ocian in View!* O! the Joy," Wrote Clark on Seeing the Pacific

At Ecola Point, Oregon, the author's family reached trail's end and Clark's "grandest and most pleasing prospects." Clark, Sacagawea, and others walked onto the sands to view a stranded 105-foot whale. Cannon Beach sparkles in the distance.

The Gray Girls Improvise a Travois on the Site of Fort Clatsop

On this sheltered spot near Astoria, Oregon, the expedition wintered in 1805-06. Lewis triumphantly wrote: "We have found the practicable and navigable passage across the Continent of North America." Returning, the explorers arrived in St. Louis, September 23, 1806.

plorers' arrival in this area, was a big event in Three Forks. Flathead Indians danced (page 725). There was a parade in the morning and a rodeo in the afternoon.

Harley Fitzhugh, the rodeo master, operates a saddlery shop which Will and I visited. Will never let a chance pass for talking with real range riders. He saw enough high-heel boots, ten-gallon hats, and silver-spangled chaps on our trip to last a lifetime.

In Three Forks a restaurant cashier gave me four silver dollars in change. As I hefted the unaccustomed weight in my hand, I overheard her remark, "Another Easterner!"

We hit the trail again, moving west up the Jefferson River to *its* forks, where the two captains decided the stream now called the Beaverhead was the correct route. We stopped beside a formation called Beaverhead Rock, which Sacagawea had recognized as a landmark on the trail to her people.

Lewis and Clark were frantic to meet the Shoshonis. Nearly half their second summer was gone, and they had no horses for crossing the mountains. The Indians were keeping out of sight, thinking this strange invasion a trick of their Blackfeet enemies.

Food became scarce. In those days most game avoided the mountains and lived on the grassy plains. The rivers grew smaller and swifter. The men were exhausted from constant struggles with the canoes.

Lewis went ahead with only three men, hoping to show his friendly intentions. Leaving a note for a rendezvous at the Beaverhead's forks, Lewis and his patrol walked west up Horse Prairie Creek. They became the first white Americans to stand on the Continental Divide: August 12, 1805.

Pushing down the opposite slope, the discoverer enjoyed his first taste of Pacific-bound water.

In the valley beyond, Lewis at last found his Shoshonis.* He gave beads and gifts to a few squaws. Then Chief Cameahwait and 60 armed warriors advanced toward him.

White Men Tired of Shoshoni Hug

The white man fearlessly put down his rifle and walked ahead, holding the American flag. Cameahwait, reassured, "very affectionately" threw his arm over Lewis's shoulder and pressed his cheek against the stranger's.

Other Indians followed suit; Lewis and his men "wer all carresed and besmeared with their grease and paint till . . . heartily tired of the national hug."

Fine horses were all about. Now began the ticklish maneuver of getting the Indians across the Divide to the meeting place with Clark. One minute the impulsive redskins were for it; the next they feared a trap. Lewis cajoled them into a "cheerfull and gay" mood, whereas "two hours ago they looked as sirly as so many imps of satturn."

The entire village followed Lewis back across the mountain. He spent an anxious night waiting for Clark and his party to reach the forks, but by noon, August 17, 1805, the expedition was reunited. All its members experienced the Shoshoni hug of friendship.

Sacagawea's first sight of the Indians sent her into a dance of joy. She sucked her fingers, a sign that among these people she had been suckled as a baby. A squaw came forward. Sacagawea recognized a playmate who had been captured with her by the Minnetarees and later escaped.

Sacagawea Finds Her Brother

A council was arranged. Sacagawea translated. She saw Chief Cameahwait for the first time and, according to one account, burst into tears. She ran to the Indian, threw her blanket over him, and embraced him over and over. Truth is stranger than fiction: Cameahwait was Sacagawea's brother.

Though visibly moved by the reunion with her people, Sacagawea had found a greater loyalty. She unhesitatingly chose to keep on with Lewis and Clark. The latter, especially, became fond of the "little squar"; he called her "Janey" and referred to her papoose, whom he called Pomp, as "my little dancing boy." "Pomp" was Shoshoni for "first-born male." According to historians, Clark named Pompeys Pillar, the remarkable formation on the Yellowstone River, for the baby (page 728).

Bartering for horses began. Eventually the explorers acquired 29. The men cached their hated canoes against their return by sinking them with rocks in the river. Joyfully they started across the mountains.

Lewis celebrated his 31st birthday at this triumphant point by moodily reflecting that he "had as yet done but little, very little, indeed, to further the hapiness of the human race, or to advance the information of the succeeding generation."

Before starting over the Continental Divide, my family and I drove our Shoshoni passenger to her home on the Wind River Reservation in Wyoming.

A tribal council was in progress in a huge wooden hall when we arrived at Fort Washakie, agency headquarters. Parked outside was an acre of late-model automobiles—Pontiacs, Buicks, and Lincolns among them. Today's Shoshonis are as well mounted as those Lewis and Clark found.

* See "Indians of the Far West," by Matthew W. Stirling, NATIONAL GEOGRAPHIC MAGAZINE, February, 1948.

Within a mile of her home Alberta showed us the reputed grave of Sacagawea (page 741). Then we bade the Wyoming princess goodbye and turned back to Montana and the Lewis and Clark trail. The children and I paddled over the spot where the buckskin-clad explorers sank their dugout canoes (page 739).

At Armstead we left Montana's major highway system and drove west on narrowing roads through Horse Prairie Valley and Trail Creek Valley. We camped that night in Lemhi Pass on the great Bitterroot Range, beside the spring which Lewis and Clark regarded as the uttermost source of the Missouri (page 715).

Crossing the Great Divide

Next morning we stood on the very crest of the Great Divide (page 740) and marveled at the maze of mountains surrounding us.

Between Lemhi Pass and the Pacific Lewis and Clark were outside the limits of the United States of that time. Their exploration of the Oregon country helped solidify America's claim to a no man's land that later became Idaho, Washington, and Oregon.

The rugged terrain along the Salmon River forced the expedition to detour north and struggle across the Bitterroots again. Near present-day Missoula, Montana, the captains and their weary men recuperated in a camp they called "Traveller's Rest."

Pushing on westward, the explorers climbed the Bitterroot Range for the third time and entered Lolo wilderness. Indians told them that a faint trail led to the navigable Clearwater, but warned that others had "suffered excessively with hunger . . . being obliged to subsist for many days on berries alone as there was no game in that part of the mountains which were broken rockey and so thickly covered with timber that they could scarcely pass."

This section was the most difficult of the entire trail. September snow covered the slopes and threatened to freeze moccasined feet. As the Indians predicted, there was no game. Flour and other foodstuffs gave out. The men killed a colt and ate it. Crayfish, bear's oil, and candles were consumed. Indian dog became a staple of diet in the lower lands.

This wild Idaho upland has seen little change since Lewis and Clark's day. We discovered that forcing passage through the stubbornly resisting forests and crags still was an adventure in the 20th century.

We followed the Lolo Trail, a one-way forest road that alternately tunnels through groves of evergreens and skirts the brink of yawning chasms. One stretch, between Powell Ranger Station and Pierce, Idaho, presents 100 miles without a gas pump, a home, a forester's station, or any vestige of civilization except the rough roadbed.

So much of the route is up and down that usually we were in second or low gear; we averaged 10 miles an hour. After five miles the rocky going ruined one tire. We churned the additional 95 miles without a spare.

We made it, but early next morning, after traveling only 13 miles on a hard-surfaced highway, another tire blew out from the beating it had taken.

A new highway, being built along the Lochsa River, will one day make such adventurous motoring unnecessary.

Dropping into the gorge of the Clearwater River, we followed that beautiful stream to Canoe Camp (page 744). There Lewis and Clark's men, nearly starved, sick, and now as tired of land travel as they had been of river voyaging, built five dugout canoes for the last lap to the Pacific.

As their strength returned, they formed squares and danced to the lively strains of a fiddle. Curious Nez Percé Indians gathered around and watched the caller "boss other mans how to do funny dance and sing songs, and all laugh"—still a pretty good description of a square dance.

Throughout the trip, the men often danced. Another amusement was watching the reaction of each new group of Indians when they spotted York, Clark's Negro servant. At least once, a redskin wet a finger and tried to rub the blackness off. York often demonstrated his tremendous strength and allowed the amazed Indians to believe he was a wild animal caught and tamed by Clark. It was "big medicine."

By October 7 the dugouts were ready. Lewis and Clark pushed off down the river, famous today for its spring log drive.*

Canoeing in the Explorers' Wake

I, too, canoed the swift Clearwater—from Canoe Camp almost to the explorers' second night stop below. In *Trout's* stern rode Tom Kiiskila of Orofino, Idaho, one of the region's most experienced loggers and rivermen.

Without difficulty we shot the many rapids mentioned in the journals, but stopped short of one at Spalding, Idaho. There a Lewis and Clark dugout struck a rock and sank.

As we paddled, Tom told me about working as a double for Buddy Baer in the movie, "The Big Sky." He learned how to handle a keelboat of the type Lewis and Clark used on the Missouri (page 719). Alberta's Shoshoni menfolk were extras in the same movie.

At Spalding we visited the Indian museum

* See "Idaho Loggers Battle a River," by Ross Hall and J. M. Rottier, National Geographic Magazine, July, 1951.

William G. Clark, Jr., Displays His Great-great-grandfather's First Army Commission

The yellowed document, signed "G. Washington" on March 19, 1793, is here reproduced for the first time. It has been handed down through generations of the Clark family in St. Louis. It made the famed explorer a lieutenant in the Fourth Sub Legion and sent him to Ohio territory to fight Indians under Gen. "Mad Anthony" Wayne. A decade later, having resigned from the Army, Clark again was commissioned a lieutenant in preparation for his westward journey. Throughout the trip, however, Clark was called captain.

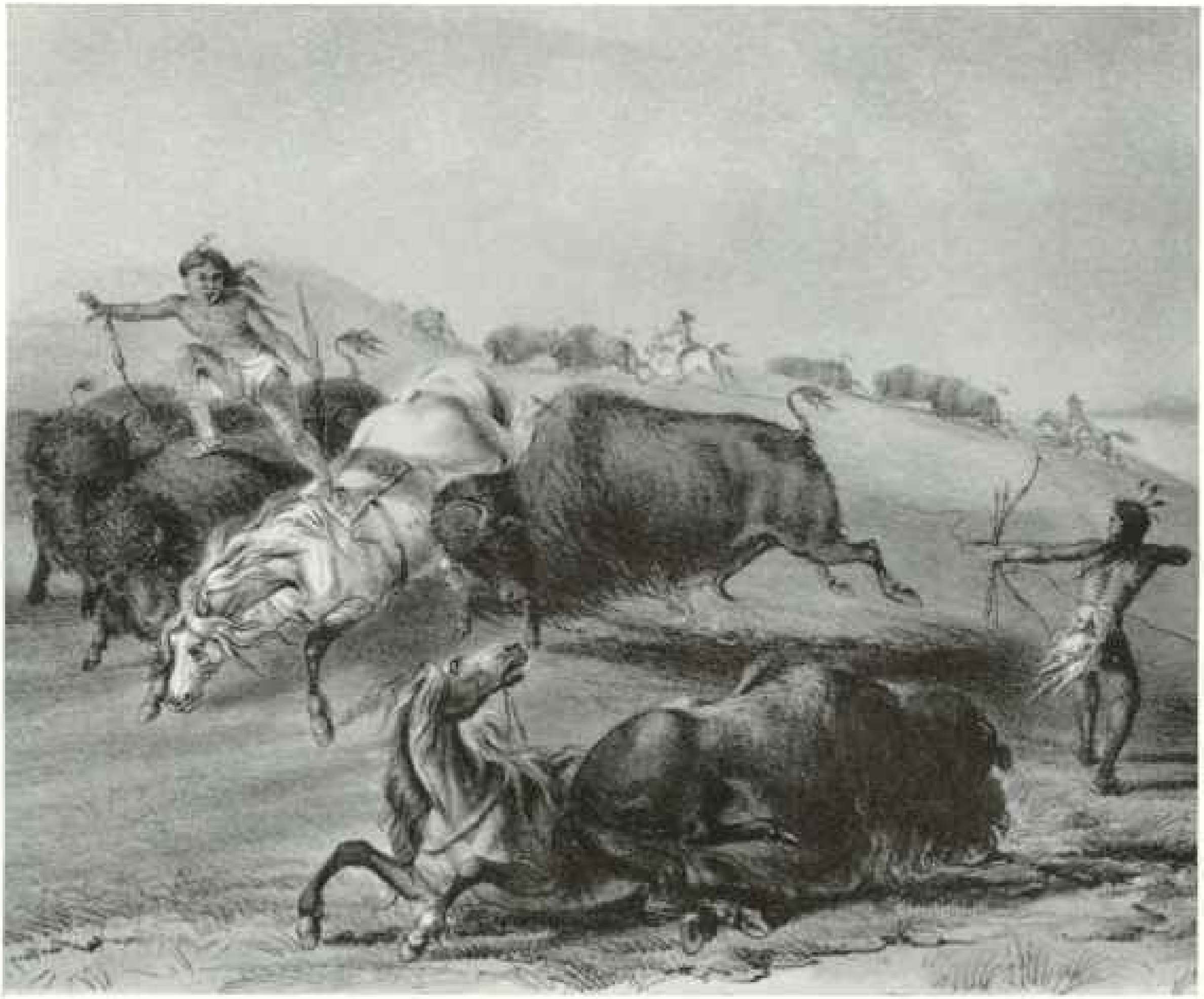
and saw a dugout canoe claimed by Nez Percés to be one of Lewis and Clark's.

Lewiston, Idaho, and Clarkston, Washington, twin cities named for the explorers, straddle the Snake River where the Clearwater joins it. From there to its union with the Columbia, the Snake traverses southern reaches of the treeless Palouse, that enormous wheat field in the sky (page 742). Harvest was completed when we drove through. The yellow stubble stretched to infinity.

Westward-running waters of the Snake and the mighty Columbia sped Lewis and Clark toward their goal. From Indians they bartered salmon, roots, and dogs. Clark noted that the presence of Sacagawea "reconsiles all the Indians, as to our friendly intentions a woman with a party of men is a token of peace."

The explorers had little to say about the natural beauty of the Columbia River gorge which so delighted us—colored cliffs overhung with lacy waterfalls, great trees, conical mountain peaks shimmering in the distance (page 745). All their energy and interest strained toward one goal—the glittering Pacific. How much farther, they asked themselves in their anxiety, did this great stream flow?

Some rapids they ran in the canoes; others they portaged (page 708). The Indians became "assumeing and disagreeable." They drove hard bargains. Experienced from deal-



Library of Congress

Horses Stumble and a Brave Rides Circus Style in a Breakneck Buffalo Chase

Lewis and Clark saw "immence hirds" of the animals that provided food, clothing, shelter, and fuel for Plains Indians. Near Great Falls, Lewis wrote, "I sincerely belcil that there were not less than 10 thousand buffalow within a circle of 2 miles." At Fort Mandan he joined red men "Killing the Buffalow on Horseback with arrows which they done with great dexterity...." This conception of the hunt was drawn by George Catlin, Pennsylvania artist and ethnologist, who lived among the Indians in the 1830's.

ings with whites from ocean vessels, they knew the value of their goods. Also, they were incorrigible thieves. The crowning insult came when Clark passed the peace pipe around one group in council and it never came back to him.

On November 2, 1805, the journals noted the tide rose about nine inches. The journey which Meriwether Lewis began beside the Potomac estuary at the "President's House" in Washington, D. C., now had taken him from Atlantic to Pacific tidewaters. He was the first American to cross the continent.

Hardships Before Joy

But the end was not yet. The great Columbia estuary, reaching inland toward present-day Portland, Oregon, presented its explorers with the bafflements of big water and bad weather. Hardships compounded for them before they attained the Pacific proper, where the bad news broke upon them that fortune had sent no ship to carry them easily home. They would have to return overland.

Near present-day Astoria, Oregon, they found a sheltered spot and built Fort Clatsop for their winter quarters (page 746). From there they later walked overland to the site of today's resort—Seaside, Oregon—and made salt from sea water.

Through rain and wind the intrepid men pushed on. One wretched November day the fog cleared. The Columbia straightened and widened into a great bay. William Clark expressed the elation of the entire group:

"Ocian in view! O! the joy."

For us, the skies not only cleared as we came to the Pacific. The sun burst out and bathed the spectacular Oregon coast in golden light (page 746). "From sea to shining sea," we had traced the footprints of the men who made the phrase possible.

New National Geographic Map Marks the 150th Anniversary of the Louisiana Purchase

By Evelyn Petersen and Wellman Chamberlin

"THIS is the noblest work of our whole lives," said Robert R. Livingston as he signed the Louisiana Purchase treaty of cession on May 2, 1803.

"From this day," he continued prophetically, "the United States take their place among the powers of the first rank."

In honor of the 150th anniversary of that most momentous real-estate deal in history, the National Geographic Society presents its members all over the world with a large 10-color Historical Map of the United States.

More than 2,185,000 copies of this map, a special supplement to the June National Geographic Magazine, have rolled from the big lithographic presses. Its preparation was the largest—and pleasantest—project ever undertaken by The Society's cartographers in their 55 years of mapping the earth.

Here, compressed into 912 notes on one handsome, highly readable sheet of paper 41 by 26½ inches, is the story of how our Nation has grown to a strength, prominence, and glory which even the outermost reaches of Livingston's imagination could hardly have encompassed.

Smaller maps in color, largely reconstructed from centuries-old charts of enduring historical value, supplement this graphic picture of the growth of a nation (pages 756-769).

Named for a Man Who Never Saw It

As members unfold the large 10-color map and run their eyes south to the Mississippi River Delta, they will find the first reference to the Louisiana Territory: a note citing the arrival of the explorer La Salle in 1682. He gave the whole central area of what is now the United States the name "Louisiana," for his King, and claimed it for France.

The French, however, suffered heavy financial losses in trying to colonize the area and happily ceded it to Spain in 1762. Later, in 1800, Spain passed it back to France again in the Treaty of San Ildefonso. Though the treaty was secret, rumors of it trickled to America.

To find out if these reports were true became a primary task of Robert Livingston, whom President Jefferson dispatched as his Minister to Paris. As the first Chancellor of New York State, Livingston had sworn in President Washington. He now had the mission of protecting his country's interest in the mouth of the Mississippi. The matter was vital, for through New Orleans passed the produce of three-eighths of the new Nation's territory.*

Livingston reached France just in time to see Napoleon's brother-in-law Leclerc set sail for Santo Domingo to quell the native revolt there. He also learned that it was true Napoleon had acquired Louisiana and intended to occupy it.

This news so alarmed Jefferson that he threatened war. "The day that France takes possession of New Orleans," he wrote Livingston, "we must marry ourselves to the British fleet and nation."

Jefferson spoke differently a few months later, however, when the Spanish Intendant at New Orleans closed the port to Americans. The western States went wild and demanded war. But the long, gangling President restrained them. "Peace," as he said later, "is our passion."

To prove it he selected James Monroe, who was especially popular with the West, to join Livingston in Paris and try to buy New Orleans and the Floridas. At the least, the two envoys were instructed, they were to secure the use of a port.

Napoleon Changes His Mind

At the same time Monroe was appointed, Napoleon learned in Paris that Leclerc had followed almost his entire army to the grave in Santo Domingo. Having lost the valuable island, the heart of his colonial system, Napoleon now saw Louisiana as a liability. To add to his troubles, he also faced war with England; and he needed money.

The Monday following Easter, April 10, 1803, found Livingston still hard at work on the French and still unaware of Napoleon's change of mind. He went again, as was his habit, to ask Talleyrand if France would sell New Orleans and West Florida.

This time, however, when he put the usual question he got the shock of his life. For the usually taciturn Talleyrand turned and asked: "What will you give for the whole?"

Two days later, after Monroe had arrived, he and Livingston were entertaining at dinner when they spied Count François Barbé-Marbois, Napoleon's finance minister, through the window, strolling in the garden. They invited him to join them for coffee. Later that night, when they were alone, Barbé-

* See "New Orleans: Jambalaya on the Levee," by Harnett T. Kane, National Geographic Magazine, February, 1953.

National Geographic Photographer Volkmar Wentzel

A Cartographer Studies the Most Important Map of Early United States History

Charles E. Riddiford, who styles the National Geographic Society's maps, pores over the Library of Congress's 1755 Mitchell chart of the British and French dominions in North America. His problem: to reduce and reproduce the old map with the aid of modern color printing while retaining its antique flavor and showing geography as known at the time. Result: the "America Emerges" map on pages 758-759.

Marbois and Livingston all but settled the Louisiana Purchase.

Livingston was so jubilant that before he went to bed he sat down and scratched off a long dispatch to Secretary of State Madison. It was now three o'clock, he wrote, but it was "so very important that you should be apprised that a negotiation is actually opened, even before Mr. Monroe has been presented. . . . We shall do all we can to cheapen the purchase; but my present sentiment is that we shall buy."

Livingston and Monroe had neither the authority nor the money needed to close such a deal. The French, for their part, did not define the exact borders of the purchase in either sales talk or contract; in fact, they had not even taken possession of the land.

Nevertheless, on May 2, Monroe recorded in his memoranda, "we actually signed the treaty . . . in the French language." The papers in English were signed later, and all were back-dated to April 30, the day the Americans' final offer had been presented to Napoleon.

For $15,000,000 Livingston and Monroe had taken on a piece of land which doubled the size of the Nation and which within 100 years was worth 500 times that price.

Cost Less Than One Destroyer

One of earth's richest storehouses of foodstuffs, fuel, and power, the area eventually was carved into six whole States—Arkansas, Missouri, Iowa, Nebraska, Oklahoma, Kansas—and parts of 11 others: North and South Dakota, Montana, Wyoming, Colorado, New Mexico, Minnesota, Mississippi, Alabama, Texas, and Louisiana (see inset on supplement map).

Though $15,000,000 would not buy one destroyer today, the sum was more than double the $7,000,000 it cost to run the entire government in 1800, including support of the Army and Navy. Congress, however, quickly approved the purchase at a special session.

There were some protests in America, but

none so dramatic as those within Napoleon's own family. When the Emperor's brothers, Lucien and Joseph, stormed in to upbraid him, they found him in a bath scented with eau de cologne. The angrier the three Bonapartes became, the louder they shouted.

Shower of Perfume, Flood of Gumbo

Finally Napoleon rose in the tub and threw himself back with a splash, showering his brothers with the perfumed water. The Bonapartes laughed, but the valet fell to the floor in a faint.

Before the United States could take over their new land, the French first had to complete the cession from Spain. Thus, on November 30, 1803, the French took command from the Spanish in New Orleans, after which they strained to out-fete each other with banquets that started with a selection of 24 kinds of gumbo and sagged on through 50 courses.

The transfer from the French to the Americans 20 days later went as smoothly as the first, except that the Stars and Stripes got stuck on its way up the mast. When the flag reached the top, however, it waved triumphantly, and the Place d'Armes reverberated with the thunder of cannon.

Long before the Stars and Stripes flew over the new territory, President Jefferson had interested Capt. Meriwether Lewis, his private secretary, in an expedition to explore the unknown land west from the Mississippi, up the Missouri, and down the Columbia to the Pacific. That journey is described in Ralph Gray's article, "Following the Trail of Lewis and Clark," starting on page 707 of this issue.

Members themselves can retravel the trail, just as Mr. Gray did, with the help of their new map and the National Geographic Society's 1951 map of the United States. The 1951 map shows more than 11,000 place names, all of which obviously could not be squeezed into the new historical map. The two maps team perfectly because they are drawn on the same scale.*

In addition to the path of Lewis and Clark, nine other routes of exploration and the four major emigrant trails to the West have also been traced on the map. Members will find them listed along the right border, with the symbols used for showing their routes.†

Motorists Speed Over Explorers' Routes

Since a good portion of each route can now be traversed by highway, and since major highways are shown on the map, members can pick vacation routes to suit their tastes in explorers. A ride on Route 66 across the Mojave Desert, for example, closely approximates the route of fur trapper Jedediah Smith, the first American known to have crossed overland into California. On his return he also became the first white man to cross the high Sierras and the Nevada-Utah desert.

A motorist who skims over that desert today might find it hard to believe that in the vicinity of modern Route 50 Jedediah nearly stumbled to his death only 126 years ago. Burning with thirst, he dreamed of brooks and cooling cascades. But he struggled on with his little group.

At night one of his men, Robert Evans, lay down to die. The rest of the desperate party could do nothing but leave him and stagger on, hoping to find water.

Three miles beyond they did find it. Smith drank his fill, then dipped a kettle into the spring and ran back to Evans. He found him barely able to mumble and hurriedly lifted the kettle to his friend's swollen lips.

Evans drank and drank, never stopping till he had drunk the last drop of four quarts of water. Then he looked up at Jedediah and asked him why he hadn't brought more.

Many historians have overlooked Jedediah Smith because his journals were destroyed in fires. Records of most of the other trail blazers have been better preserved. But explorers and writers can turn out book after fascinating book without ever plotting an exact course of travel.

In areas where the precise route is not indicated by the explorer's own accounts, The Society's cartographers have used the best possible judgment in the light of the most scholarly and reliable investigations.

A Giant Historical Project

To draw these routes and write the 912 historical notes, 17 members of the cartographic staff have worked in total 7,764 hours. Chief cartographer James M. Darley and the co-author, staff cartographer Wellman Chamberlin, pored over history books for 10 months.

To the cartographers the most amusing historical fact they found—and duly recorded in a note in the lower right inset at Killingworth, Connecticut—was the one about Abel

* Members may obtain additional copies of these maps of the United States (and of all standard maps published by The Society) by writing to the National Geographic Society, Washington 6, D. C. Prices in the United States and elsewhere, 50¢ each on paper; $1 on fabric; Index, 25¢. Greatly enlarged editions (67 x 43½ inches) of both the Historical Map of the United States and the 1951 map, The United States of America, are also available on heavy chart paper; price, $2 each. All remittances payable in U. S. funds. Postpaid.

† Members who desire more information on exploration in the Southwest than could be given in this map should consult their copies of the National Geographic Society map, Southwestern United States, a supplement to the June, 1940, National Geographic Magazine and now out of print.

Buell, who doubled in cartography and counterfeiting. Buell, who engraved the first map of America after the Treaty of Paris in 1783, also altered 5-shilling notes—for which he served time in jail.

To accommodate the multitude of place names and notes in the crowded East, the eastern seaboard has been enlarged in two insets. One covers the area north from Philadelphia and the other the section south to Albemarle Sound. Though the scale of the main map is a generous 78.9 miles to the inch, these two insets enlarge the areas 3½ times.

Colors and Dates Record Expansion

A third inset shows how the United States grew from the original Colonies to its present size. Each addition is differently colored so that the story can be grasped at a glance. State borders, marked off with dotted lines, include within them the date when the State entered the Union.

One purchase mentioned on the map but not in the inset is the acquisition of Manhattan Island. Peter Minuit, as everyone knows, bought the beautiful wooded island from the Canarsie Indians for about $24 worth of trinkets. But, as in the case of the Louisiana Purchase, the sellers really didn't own the land. The true owners, the Manhatoes, later had to be paid.

People commonly fix the start of American history at the time of Columbus's landing at San Salvador in 1492. But several of the map's notes antedate the one on Columbus. California's Sierra redwoods *(Sequoia gigantea)*, for example, are noted as the "world's oldest living things." A note on the fossil remains of the "Minnesota Man" at Pelican Rapids says they are 20,000 years old, and the Kensington Runestone in the same State may be evidence of a 14th-century visit by Norsemen.

From these vague beginnings the notes move through time, down to a reference to the boyhood home of President Eisenhower (Abilene, Kansas). At Fulton, Missouri, there is a memo on Prime Minister Churchill's "Iron Curtain" speech. And in Kentucky are the birthplaces of the Presidents of the Union and the Confederacy, Abraham Lincoln and Jefferson Davis. They were born only eight months and 100 miles apart.

The first atom-bomb test is noted near the Civil War battlefield of Valverde, New Mexico. Through this State passed the Goodnight-Loving Trail. No lover's lane, it was a cattle trail blazed by Charles Goodnight and Oliver Loving.

In the pages following (756-769), six famous old maps, plus two modern maps of historic interest, help round out the picture of the making of America. Most have been redrawn by Charles E. Riddiford and William Palmstrom, staff cartographers (pages 752 and 755).

Though they relettered place names to make them easier to read, the cartographers faithfully reproduced the spellings as they originally appeared. This explains obvious spelling errors like "Wabache River" (for Wabash River) and "River Missisipi" on the Mitchell map (pages 758-759).

All but two of the maps are presented in four colors. For maximum clarity they have been printed by line reproduction rather than halftone.

This requires much more time and effort. Color separations for halftone are done in minutes by camera. But for line they are done patiently and meticulously by hand, a separate drawing for each color. The result is the same clarity of color found on the large supplement map, which is lithographed.

Considering that it was drawn about 1600, the first map looks surprisingly like the North America that we know today. It is part of a world map, unsigned and undated but called the Molineaux-Wright chart after two English map makers who did most of the work reflected in it. Edward Wright is believed to have compiled it from an earlier globe by Emeric Molineaux with the assistance of geographers John Davis and Richard Hakluyt.

National Geographic map makers chose it to show the extent of knowledge about the New World at that time, and also to plot on it the routes of the explorers who had gathered that knowledge (pages 756, 757).

Columbus Missed U. S. Mainland

Columbus, the first to stumble on the New World in his search for the Indies, did not touch the United States. John Cabot actually was the first to behold our eastern shores, unless Norsemen preceded him by 500 years.

The Mitchell map, second in the series, is a kind of birth certificate for the United States (pages 758-759). The master map on which both British and Americans planned their maneuvers in the Revolutionary War, it also was the map on which their peace negotiators defined the boundaries of the original United States. It remained the best map of the new Nation until it was succeeded by the Arrowsmith map (page 769).

Capt. John Smith, who saved the infant Jamestown colony in Virginia, also made the "mother map" of that area, the original one to which all subsequent maps owe something of their lineage (pages 760, 761).

The stories about John Smith and Pocahontas have so overshadowed the accounts

National Geographic Photographer Volkmar Wentzel

A Sharp Pen and an Artist's Eye Devise a Map's Ornamental Scroll

William Palmstrom, of The Society's cartographic staff, made final drawings for some of the historical maps in the next 14 pages. Here he finishes the cartouche, or tablet, for "America Emerges." He patterns his drawing after the John Mitchell design (left foreground) to keep it in character with the original (page 752). Mitchell's "North America" remained the best until the Arrowsmith map of 1795 (page 769).

of his map making that it may surprise some people to know that Smith also created a valuable map of New England, the first good map of that area in English (see "Founders of New England," beginning on page 803 of this issue). His map appears on page 764 opposite a National Geographic map on page 765 showing the five landings of the Pilgrims. The Plymouth landing was not the first, but the fifth.

Swift Growth Made Map Obsolete

The map of "The North-West-Coast of North America" (pages 762-763) was drawn in 1840. Like the first map, "The Discovery of North America," it tells a story of search. Explorers still were pushing west, but now they were seeking land routes to the Pacific.

Less than 10 years after this map was made it was obsolete. By then emigrants were streaming along all the major trails, making heroic, often tragic, history on every mile they conquered. Within the decade the young nation burgeoned almost to its full modern size, acquiring even more land than it had gained by the Louisiana Purchase.

Alaska, called "Seward's Icebox" in 1867 when the United States bought it from Russia, has long since come to be regarded as a treasure chest. Mapped on a modern base, it is reproduced across two pages (766-767).

Last in the series is the Arrowsmith map, which replaced the Mitchell map as the most reliable picture of the country in 1795. On it The Society's cartographers have appropriately traced the major journeys of the most widely traveled American of that day: George Washington (page 769). So much of the new information which gave this map its prominence was personally gleaned by Washington that he can be called not only our Nation's First Citizen but also its First Geographer.*

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

THE DISCOVERY OF NORTH AMERICA

Spain
France
Portugal
England

GRONLANDE

MARE INCOGNITA

Davis 1585 (England)

Frobisher 1576 (England)

Gaspar Corte Real 1501 (Portugal)

Trinidad

ESTOTILAND

Sebastian Cabot may have been in Hudson Bay 1508. (England)

Gaspar Corte Real 1501 (Portugal)

CANADA

St. Lawrence Bay

Cartier 1534 (France)

The Lake of Tadoussac the bounds whereof are unknowne

John Cabot 1497 (England)

Cape Santa Maria

Cabot 1498 (England)

VIRGINIA

OCEANUS ATLANTICUS

Route of Hernando de Soto 1539–43 (Spain)

Narvaez 1528 (Spain)

Cabeza de Vaca 1528–36 (Spain)

Ponce de Leon 1512

Bahama

Las Bermudas

Cape of Fear Gordillo 1521 (Spain)

Verrazano 1524 (France)

Columbus 1492 (Spain)

San Salvador

Mayaguana

The Gulfe of Mexico

TROPICUS CANCRI

Cuba

Hispaniola

Columbus 1502

Cape Gratias a Dios

Dominica

Columbus 1498

Hojeda and Vespucci 1499 (Spain)

Darien

Balboa 1513 (Spain)

Sir Francis Drake to New Albion 1579 (England)

GUIANA

EQUATOR

America in the Discovery Age: the Molineaux-Wright Chart

ALTHOUGH many of its features appear oddly distorted in the light of modern knowledge, the Molineaux-Wright chart (opposite page), published in England about 1600, was one of the most important maps of all time. It summed up what Europeans knew by then about the New World.

Named for Emeric Molineaux and Edward Wright, the most probable authors, the chart was the first to use Wright's definitive revision of the Mercator map projection, cornerstone of modern navigation. The National Geographic Society's cartographers have redrawn the map so that it can be easily read and have traced on it the routes of the explorers who added new lines to the face of the globe.

Scholars believe Shakespeare had the Molineaux-Wright map in mind when he wrote in *Twelfth Night:* "He does smile his face into more lines than is in the new map, with the augmentation of the Indies."

Seeking Asia, They Found America

The New World was discovered somewhat in the manner of a sleepwalker who, venturing out of bed, stubs his toe and confronts an obstacle alien to his dream world. The explorers dreamed of finding an easy water route to China and India—and the spices, silks, and gems that caravaneers had carried overland for centuries before. But what they found instead was America.

Christopher Columbus, if the traditional tale is true, reached Portugal, the center of oceanic discovery, by a lucky chance. He was washed ashore after a sea fight in 1476. Then he married into maps. According to his son, Columbus's widowed mother-in-law gave him her husband's library of charts. Again fortune smiled when Ferdinand and Isabella of Spain agreed to sponsor his discovery voyage after thrice rejecting it.

In the half-light of dawn, August 3, 1492, Columbus set sail from Palos de la Frontera, Spain. Ten weeks passed before a lookout cried *"Tierra! Tierra!"* Going ashore in the Bahamas, the Admiral embraced the earth and named the land San Salvador.

On his third voyage he discovered the mouth of the Orinoco and wrote to his royal sponsors, "I am convinced that this is mainland, very large, unknown heretofore. . . ."

In 1497 John Cabot persuaded Bristol merchants to underwrite an adventure to the Orient. Sailing west, he appears to have coasted Nova Scotia from Cape Breton Island to Cape Sable, perhaps reaching Maine. On his return he sighted Newfoundland.

For the Portuguese, Gaspar Corte Real touched Greenland (1500) and Newfoundland (1501), places believed to have been known to Norsemen like Leif Ericson 500 years earlier.

Giovanni da Verrazano, a Florentine captain, was the first (1524) to visit New York Harbor and describe the Atlantic shore of the future United States, but some historians discredited his account. In 1909, just as Italian Americans were preparing to erect a statue to him, vindicating proof turned up in Rome: a previously unpublished version of Verrazano's letter to King Francis I of France. The explorer reported that, seeking Cathay, he had seen a new world "larger than our Europe and Africa and almost Asia."

Although many people refused to believe Verrazano, cartographers long accepted the counterfeit of Nicolò Zeno, a Venetian, who published a map labeled the work of an ancestor. Mythical Freisland, here shown southeast of Gronlande (Greenland), existed only in Zeno's imagination.

"Cold Estotiland," which Milton referred to in *Paradise Lost*, appears to have been an equally fabulous "discovery" by Dutch fishermen before Columbus's voyages.

Europeans took a long time to give up the notion of finding a westward passage to the Indies. Blocked to the south, they nosed into the subarctic for a Northwest Passage.

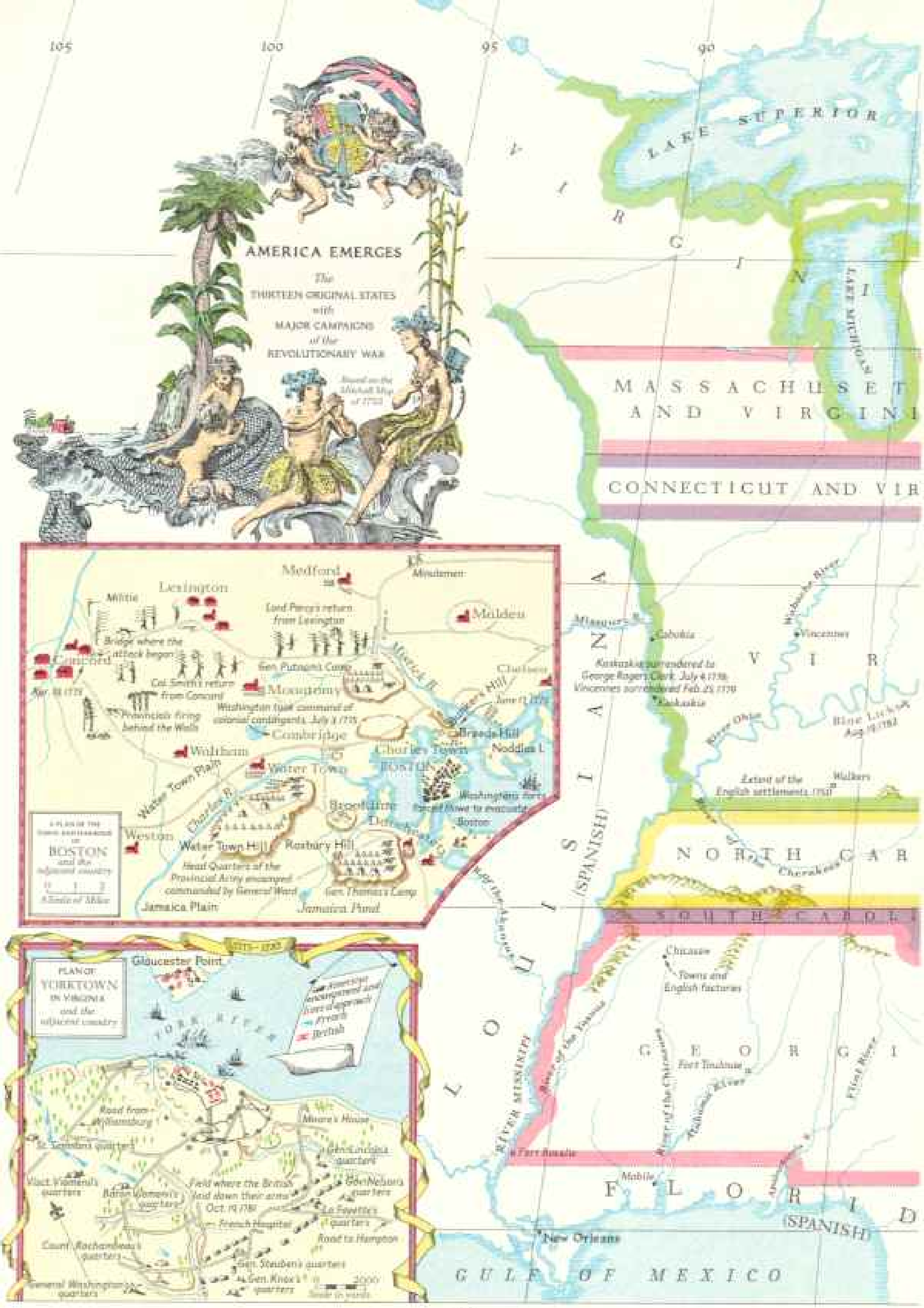
Jacques Cartier in 1534 sailed into the Gulf of St. Lawrence and claimed half a continent for France. Returning the next year, he explored the St. Lawrence River to the Lachine (China) Rapids and also christened Mount Royal, from which Montreal takes its name. He learned of the fresh-water sea, Lake Huron, shown here as the Lake of Tadousac.

Frobisher Found Fool's Gold

Sir Martin Frobisher's search for a Northwest Passage in 1576 resulted in a gold rush. After discovering Baffin Island's Frobisher Bay, the explorer returned to London with rock which was falsely analyzed as gold-filled. Subsequent expeditions proved his bay no passage to the Orient, his fool's gold good only for mending roads.

Spaniards, looking to the south, became the discoverers of real gold. Hernando Cortes, conquering Mexico, looted a fortune in gold and emeralds from Montezuma. The same year Alonso de Pineda skirted the Gulf of Mexico's north coast. Pánfilo de Narváez saw the mouth of the Mississippi, but did not live to tell the story. Cabeza de Vaca, one of the survivors of the Narváez party, wandered on to Mexico City.

Then came Hernando de Soto with his band of horsemen, brilliantly bedecked, armed to conquer a king. They marched inland from Florida. For years they dragged through jungles, forests, and swamps, looking for riches. The treasure they found was the Mississippi River.



758

Using a Map Like This, Peace Negotiators Shaped a New Nation in 1783

John Mitchell's chart, upon which this map is based, was published in London in 1755. It was used for the Paris Treaty, which delineated frontiers of the new United States. Insets show Revolutionary War theaters.

Half a Dozen Seaboard States Claimed Lands to the Mississippi

Some royal land grants stretched ocean to ocean, and original States sought vast extensions. Here Massachusetts leaps across New York and the Great Lakes. Virginia in 1781 made the first offer to relinquish claims.

Capt. John Smith's Map of Virginia

As a young man, John Smith ran away from an apprenticeship in a merchant's office in England and joined a fight in Flanders. When peace ended that adventure, he went home and camped in a pasture with his horse, guns, and a copy of Machiavelli's *Art of War*.

To fight against Turkey, young Smith joined the Austrians. Knocked out in battle, he was abandoned as one of the slain. The Turks, finding Smith alive, sold him to a vainglorious pasha who, to make an impression, labeled Smith a Bohemian noble, subdued by the pasha's own victorious arms, and shipped him to a Constantinople lady named Tragabigzanda.

Escapes in Slavery's Collar

Though he confessed his humble rank, the Englishman apparently impressed the Turkish lady, for she freed him and sent him to her brother. The latter enslaved Smith again and treated him so brutally that the youth slew his master with a flail. Still wearing slavery's iron collar, he escaped to Russia.

A mere 24 years old, Smith went home to an England afire with colonizing fever. Buying stock in the Virginia Company, he sailed with 140-odd others in December, 1606, for Virginia, then a vast area between French Canada and Spanish Florida (map, page 756).

Accused of a conspiracy on shipboard, Smith was under arrest when the colonists, in April, 1607, reached the "Chesapeack" (as he spelled it). Opening of sealed orders revealed he had been appointed to the governing council, but he was not allowed to take his seat until two months later.

Nine days after the settlers founded "Jamestowne" (May 13), Captain Smith set out to find a strait to the Pacific, the "East India Sea." Instead he discovered the "Powhatan" (James) River falls at the future Richmond, Virginia.

On his return Smith found the settlers facing hostile Indians and waning food supplies. Soon they were forced to cut their daily ration to a pint of worm-eaten grain boiled in water, plus an occasional bit of fish. Wrote one colonist: "Our drinke was water; our lodgings, castles in the air."

Captain Smith taught them to build houses and defenses. He also got them corn, fowl, and fish by trading with the Indians. Time and time again he risked his own life to save the lives of the colonists.

Smith was searching for the source of the "Chickahamania" River when he fell into the hands of Chief Powhatan's Indian warriors. For a month they exhibited the white man from village to village.

The captain received Powhatan's judgment—death—at Werowocomoco, the chief's headquarters on the "Pamaunk" (York) River. His executioners were raising their clubs to crush his bowed head when up sprang 13-year-old Pocahontas, the chief's daughter, and averted the blow by laying her head upon Smith's.

Pocahontas claimed the prisoner as her property, as was her right, and had him adopted into the tribe. Later she risked her life several times by secretly delivering corn to the colonists. Years after, when Pocahontas had married John Rolfe and moved to England, Captain Smith wrote a book in her praise and sent it to Queen Anne. Pocahontas had one son, Thomas, from whom many of Virginia's fine families have descended. One of the descendants, Mrs. Edith Bolling Galt, married President Woodrow Wilson in 1915.

Ever a bachelor, Smith noted that Powhatan "hath as many women as he will." Some of the chief's wives appear in the map's left corner.

Smith's map was drawn following an expedition up the Chesapeake. Leading a party of 14 men, including map makers, he explored Maryland's Eastern Shore and, crossing the bay, journeyed up the "Patawomeck" to the vicinity of Great Falls. Entering the "Toppahanock" (Rappahannock), the explorers named "Stingra Ile" for a sting ray that wounded Smith. Modern Stingray Point carries on the name.

Dated 1606, the map was sent to England, where it was engraved by William Hole, first Englishman to reproduce musical scores from engraved plates. For 30 years the chart ranked as the "mother map" of Virginia. This reproduction, re-edited for legibility, copies the tenth and final edition.

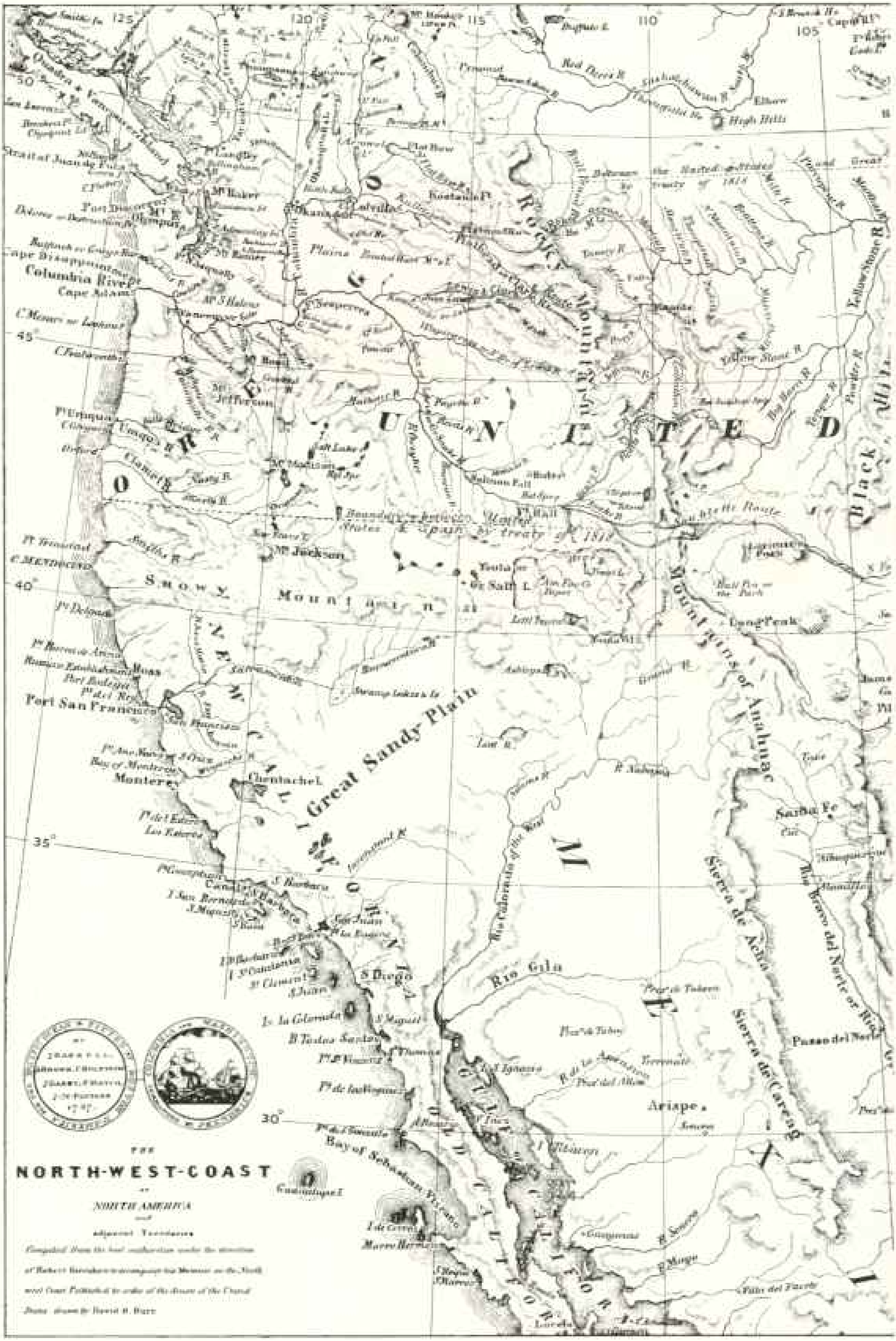
Smith, Injured, Goes Home

Shortly after finishing his map, Smith became president of the Jamestown council. Then a gunpowder explosion burnt him so severely that he returned to England.

Without Smith the colony fell apart. Some 60 desperate survivors had set sail for England when they met Lord De La Warr, first Governor of Virginia, off "Poynt comfort." The happy sight of reinforcements and fresh supplies sent them back.

Captain Smith never saw Jamestown again, but he did visit New England, and there he made another map (page 764).


VIRGINIA
POWHATAN
MONACANS
MANN AHOACKS
Powhatan
Massawomeck
Massaw omecks
Tauxenent
Pissasack
James Towne
PEACK
BAY
Cape Henry
Cape Charles
Poynt comfort
Accowmack
Smyths Iles
Chickahokin
Peregrines mount
THE
VIRGINIAN SEA


THE
NORTH-WEST-COAST
OF
NORTH AMERICA
and
adjacent Territories
125
120
115
110
105
50
45
40
35
30
Strait of Juan de Fuca
Mt. Baker
Port Discovery
Mt. Olympus
Mt. Rainier
Cape Disappointment
Columbia River
Cape Adams
Mt. S. Helens
C. Foulweather
Mt. Jefferson
Umqua R.
Clamet R.
Salt Lake
Mt. Jackson
C. MENDOCINO
Snowy Mountains
Boundary between United States & Spain by treaty of 1819
Ft. Hall
Teuta or Gt. Salt L.
Port San Francisco
Monterey
Chentachel
Great Sandy Plain
S. Barbara
S. Diego
Rio Gila
Rio Colorado of the West
Mountains of Anahuac
Sierra de Acha
Sierra de Carena
Santa Fe
Rio Bravo del Norte or Rio Grande
Paso del Norte
Arispe
Bay of Sebastian Vizcaino
Guadalupe I.
Yellow Stone R.
Big Horn R.
Black Hills
Rocky Mountains
Long's Peak
High Hills
Red Deer R.
Saskatchewan R.
U N I T E D
O R E G O N
N E W C A L I F O R N I A
M E X I C O
Gulf of California

The Opening of the American West: Burr's 1840 Map

ONLY a little more than a century ago, when David H. Burr drew this map for the United States Senate Committee on the Oregon Territory, he was not always sure what he was doing, so vague was the knowledge of some rivers, mountains, and deserts.

The fur trappers—bearded, shaggy mountain men—blazed many a trail through the Rockies, but few left written records. They were busy enough. They fought grizzly bears with knives, matched the Indians' wilderness skills, and bragged and roistered at their annual jamborees. Searching for beaver pelts, they trod hidden valleys and attained the headwaters of mighty rivers.

One of these men was Jedediah Smith, the first known American to lead a party overland into Mexican California. Called the pathfinder of pathfinders, Smith in 1826 crossed the Mojave Desert. On his return he made the first crossing of the high Sierra Nevada (probably near the headwaters of the Stanislaus) and then crossed the Basin Region to Bear Lake (Trout Lake).

Most historians have overlooked Smith because his journals were lost, but map maker Burr must have known his works because he drew in Smiths River and the Inconstant (the Mojave), both in California, and the Adams (the Virgin), a Colorado River tributary.

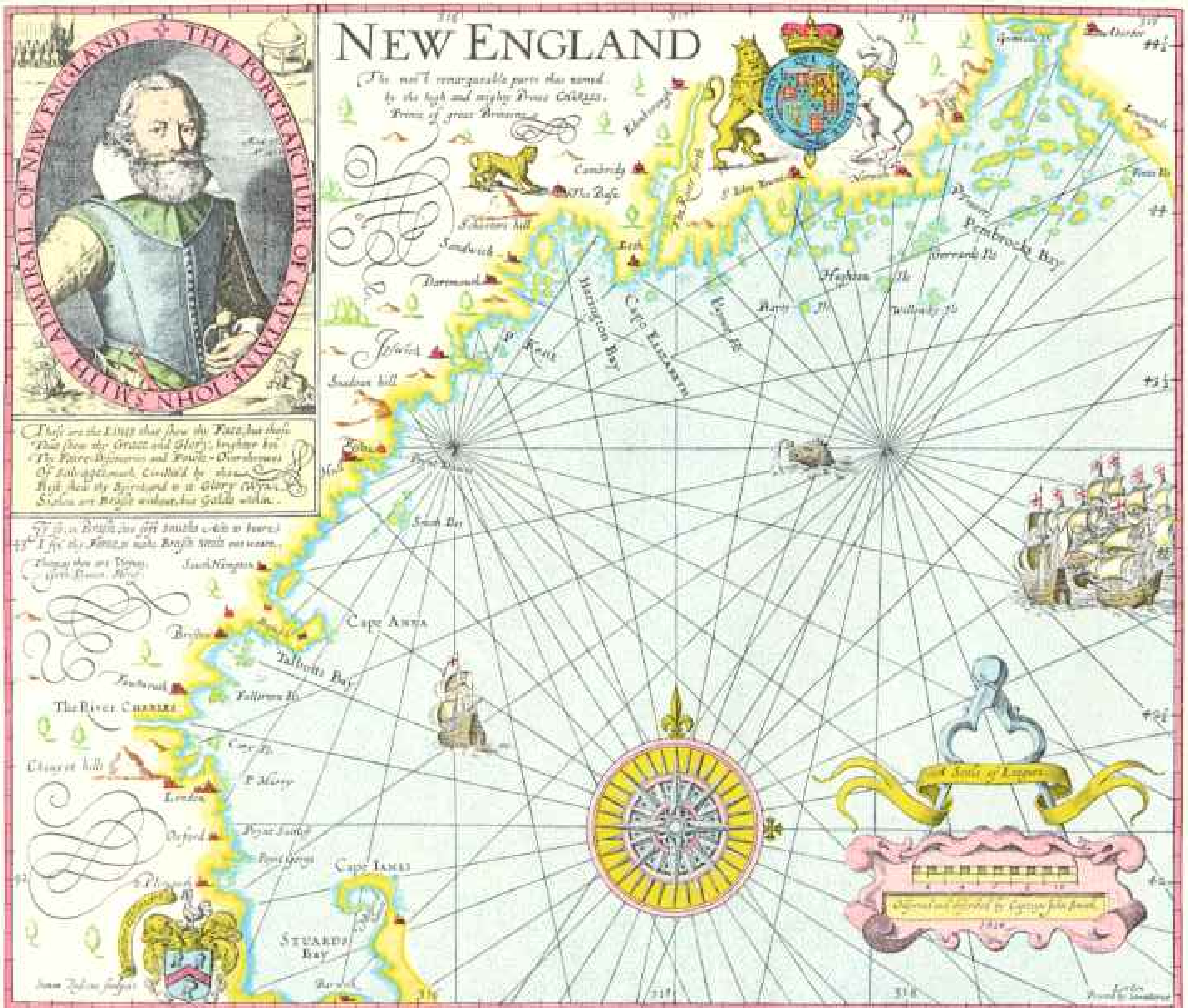
Burr ignored the pioneer work of Joseph R. Walker, who crossed the Sierras in 1833, discovered the Yosemite Valley, and brought back the first description of the Sierra redwoods. He similarly slighted Walker Pass and Walker Lake.

Nation Was Swiftly Expanding Westward

When Burr's map was drawn, Great Britain and the United States were at odds over the Oregon frontier. The covered-wagon pioneers, who started streaming into the Northwest in 1842, clamored for a boundary settlement favorable to the United States. James Polk campaigned for the Presidency in 1844 crying "Fifty-four forty or fight!"—a degree of latitude that would have pushed American claims to the Alaska boundary; but later, when the British refused to budge, Polk compromised on the 49th parallel.

Meanwhile, Texas, having won its independence from Mexico in 1836, joined the United States by annexation in 1845, an act which helped touch off war with Mexico. The United States' quick victory added all of California, Utah, and Nevada, most of Arizona, and parts of New Mexico, Colorado, and Wyoming in 1848.

Thus, eight years after Burr drew his map, the Nation had grown almost to its present size. Only the Gadsden Purchase (named for the American negotiator) remained to be added in 1853. Southern sympathizers hoped to build the first transcontinental railroad across the Purchase, a small strip of Arizona and New Mexico. Eventually the Southern Pacific accomplished the project, but only after the Central Pacific, building eastward, and the Union Pacific, heading west, had met at Promontory Point, Utah. There on May 10, 1869, the union of Atlantic and Pacific was sealed with a golden spike.


NEW ENGLAND
The most remarqueable parts thus named by the high and mighty Prince Charles, Prince of great Britaine.
THE PORTRAICTUER OF CAPTAYNE JOHN SMITH ADMIRALL OF NEW ENGLAND
These are the Lines that shew thy Face; but those
That shew thy Grace and Glory, brighter bee:
Thy Faire-Discoveries and Fowle-Overthrowes
Of Salvages, much Civilliz'd by thee
Best shew thy Spirit; and to it Glory Wyn;
So, thou art Brasse without, but Golde within.
If so, in Brasse, (too soft smiths Acts to beare)
I fix thy Fame, to make Brasse steele out weare.
Cape Anna
Talbotts Bay
The River Charles
Cape Iames
Stuards Bay
Cape Elizabeth
Harington Bay
Pembrocke Bay
Cheuyot hills
London
Oxford
Plimouth
Bristow
South Hampton
Dartmouth
Sandwich
Cambridg
Sudley hill
Ipswich
S. Iohns Towne
Norwich
Aberden
Edenborough
The Base
Barwick
Point Iames
Point Elizabeth
Point George
P. Mary
Cape Ile
Fullertons Iles
Smith Iles
Point Murrey
Kent Iles
Hoghton Iles
Barty Iles
Willowby Iles
Dunbarton
Haryoton Ile
Southam hill
Stannards Ile
St. Georges Ile
Leith
Dumbarton
Snadoun hill
Haughton Ile
Pembrock Bay
Scale of Leagues
Observed and described by Captayne John Smith 1614
Simon Pasæus sculpsit
London Printed by Iames Reeue
44½
44
43½
43
42½
42

Captain Smith's New England . . . and the Pilgrims' Cape Cod

LONDON merchants who financed John Smith's second trip to America (1614) directed him to kill whales, collect furs, and find copper and gold mines.

The captain stayed 80 days. Though he gathered only a small cargo, he collected the knowledge needed to draw a map (above), and he gave a name to the area: New England (see page 803 of this issue).

Most of his sailors went fishing, but Smith went surveying. "We ranged the Coast both East and West much further," he wrote. Half a dozen earlier maps of the region he found so divergent that "they did mee no more good, then so much waste paper, though they cost me more." The captain drew his map in the style of the medieval portolan (or harbor-finding) charts, which used a grid of radiating lines of direction instead of "squares" of latitude and longitude.

"Barbarous Names" Changed to English

Smith later asked 15-year-old Prince Charles to change the Indians' "barbarous names for such English, as posteritie might say Prince Charles was their Godfather." "Accominticus" became "Boston," and "Accomack," "Plimouth." And the royal hand substituted "Cape Anna" for "Cape Tragabigzanda," named for the Turkish woman who befriended Smith when he was a slave (page 760).

Of the Smith map's place names, only Plymouth, Cape Anna (Ann), South Hampton, and the Charles River endure on their original sites. His "Boston" is now York, Maine, and his "London" is Cohasset, Massachusetts.

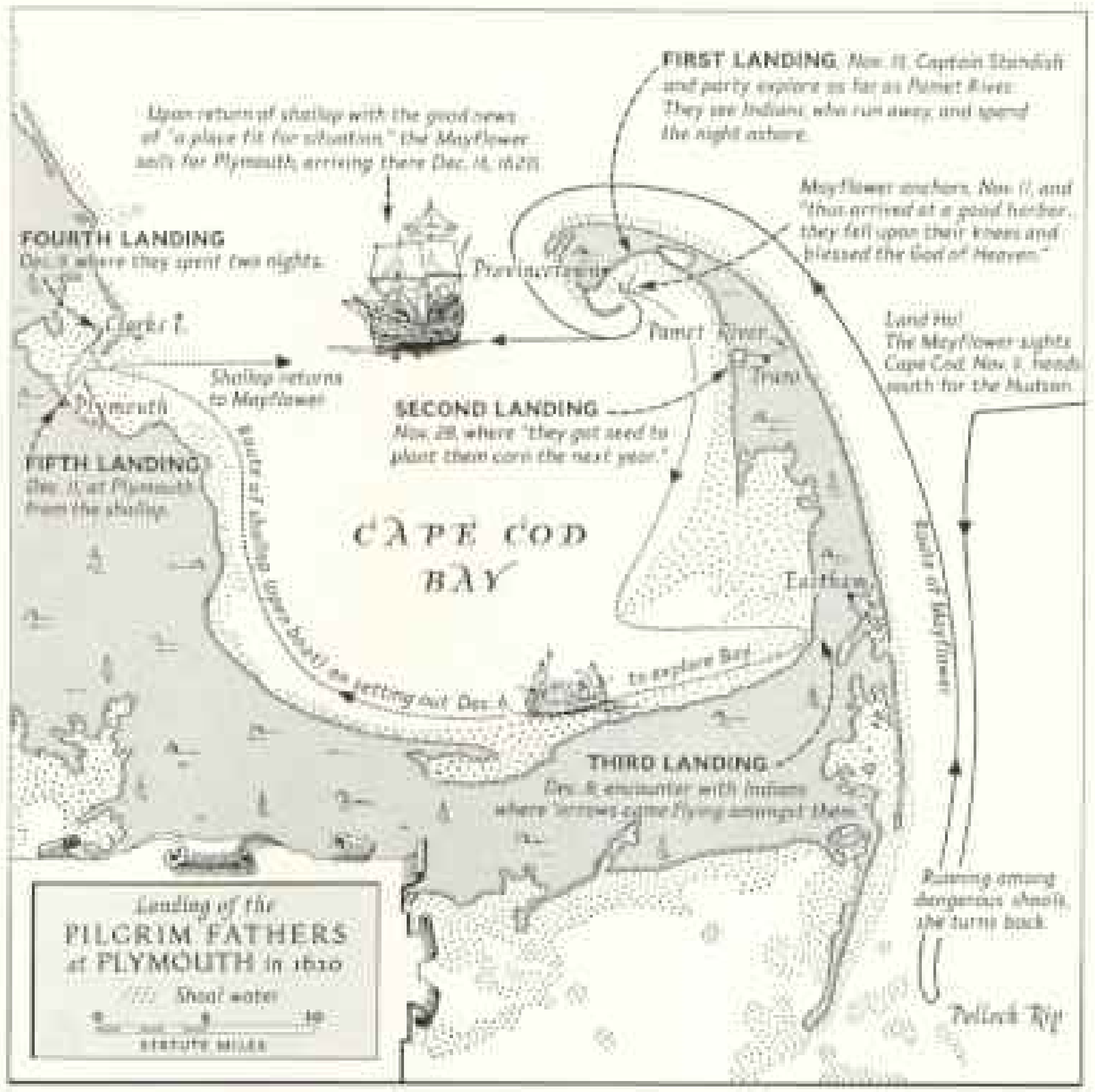
The captain was attempting a third voyage to America in 1615 when he was captured by French pirates. Locked in the gun room of their ship, he wrote *A Description of New England*, in which his map originally appeared. One stormy night he escaped in a small boat.

Never Saw His "Children" Again

Smith thereafter promoted American colonization with a press agent's zeal. He offered his services to the *Mayflower* colonists, but the frugal Pilgrims rejected him in favor of "my books and maps," which they felt "were much better cheape to teach them, than my selfe."

Captain Smith died at 51 years without having seen America again. But he must have dreamed of settling between Ipswich and "Cape Iames" (Cape Cod), for "I would rather live here," he once said, "then anywhere."

Of both Virginia and New England, he said: "I may call them my children; for they haue bin my wife, my hawks, my hounds, my cards, my dice, and in totall my best content, as indifferent to my heart as my left hand to my right."



The Pilgrims, casting anchor in Provincetown harbor November 11, 1620, found a country of such "wild and savage heiw" that a group set out in the *Mayflower's* shallop, a small boat, to comb Cape Cod Bay for a more hospitable place. This map, drawn by the National Geographic Society's cartographers, traces the shallop's route to Plymouth, "a place fit for situation." Plymouth thus became the Pilgrims' fifth, not their first, landing. There is no proof that they set foot ashore on Plymouth Rock. They may have landed anywhere between the Rock and four miles north. There were no Pilgrim women at this landing; they were waiting on the *Mayflower*. And there were no Indians.

CHUCKCHEE SEA
U.S.S.R.
U.S.
Chukotski Poluostrov
Anadyrski Zaliv
Mys Schmidt (North Cape)
The exploration of Wrangel Island that of James Cook, 1802-3 confirming separation of the continents
Mys Vankarem
Mys Navarin
Mys Barykova
Mys Dezhneva (East Cape)
Sighted by Bering 1728. Remnants of once continuous land uniting America and Asia
Bering Strait
Diomede Is.
Mys Chaplina
Monday
Sunday
Date Line
Capt. James Cook reached this point in 1778
Icy Cape
Reached and named by Capt. F. W. Beechy, 1826
Point Barrow
Wainwright
Point Lay
Cape Lisburne
Point Hope
DeLong Mountains
Baird Mountains
Brooks
Kivalina
Noatak
Kotzebue Sound
Kotzebue
Noorvik
Will Rogers killed with Wiley Post in airplane crash 1935
ARCTIC CIRCLE
Cape Prince of Wales
Teller
Seward Peninsula
Founded in 1892 as reindeer station with import of herd from Siberia by Sheldon Jackson, American missionary
Frederick Schwatka, in 1883 first white man to explore length of river
King I.
Nome
Gold found on beach 1899 started second rush to North
Bluff
Golovin
Norton Sound
St. Lawrence Island
Discovered and named by Bering Aug. 10 1728
Gambell
Northeast Cape
Last shots of Civil War fired in Alaskan waters at Union whalers, June 22, 1865 by Confederate Cruiser Shenandoah
First steamboat ascended Yukon 1869. River navigable to Whitehorse June through October
Stuart Island
Unalakleet
Explored and mapped in 1778 by Captain James Cook
St. Michael
Built by Russians 1833
Nulato
Galena
Ruby
Kaltag
ALASKA
BERING SEA
Hall Island
St. Matthew Island
Cape Romanzof
Hooper Bay
Mountain Village
Marshall
Anvik
Holy Cross
Russian Mission
Kuskokwim Mountains
McGrath
Ophir
Flat
Crooked Creek
Aniak
Akiak
Bethel
Sleetmute
Stony River
Mt. Gerdine
Taylor Mts.
Nelson Island
Hazen Bay
Mekoryuk
Cape Mohican
Nunivak Island
Etolin Strait
Kuskokwim Bay
Quinhagak
Entered by Capt. James Cook seeking northwest passage in 1778
Platinum
Cape Newenham
Hagemeister Island
Walrus Islands
Dillingham
Naknek
King Salmon
Iliamna
Iliamna Lake
MT. KATMAI NATIONAL MONUMENT
Mt. Katmai
Bristol Bay
Father Hubbard termed 1931 eruption "prelude to hell"
Egegik
Becharof Lake
Ugashik
Alaska Peninsula
Aniakchak Crater
Veniaminof Volcano
Chignik
Perryville
Mitrofania I.
Sutwik I.
Semidi Islands
Chirikof I.
Named for Capt. K. W. Perry who brought survivors of Katmai destruction here
Perry Shelter
Named by Bering for sailor who died here. Herbs gathered ashore by Naturalist Steller saved expedition from scurvy
Shumagin Islands
Nagai I.
Unga
Sand Point
Cold Bay
Deer I.
Sanak Islands
Shishaldin Volcano
Unimak
Unimak Pass
Akutan
Akun
Unalaska
Dutch Harbor
Bogoslof
Appeared in 1796 continues active volcano
Mt. Vsevidof
Umnak
Chuginadak
Fox Islands
ALEUTIAN ISLANDS
St. Paul
Otter Island
Walrus Island
Pribilof Islands
St. George
Discovered by Pribilof 1786-7 searching for retreat of seal herds. Fur seal protected by 1911 international agreement
Cook Inlet
Seldovia
Augustine I.
Barren Is.
Shuyak I.
Afognak I.
Shelikof Strait
Kodiak
Kodiak Island
Trinity Islands
Umnak
Mt. Vsevidof
Carlisle
Chuginadak
Herbert
Yunaska
Amukta
Amukta Pass
Seguam
Seguam Pass
Atka
Amlia
After Aleut revolt in 1762 against Russian bestialities 3000 were killed to break spirit
The name Alaska derives from Aleut word "al-ay-ek-shie" meaning mainland
Attu
Chichagof
Semichi Islands
Shemya
Near Islands
Agattu
Buldir
Kiska
Segula
Little Sitkin
Semisopochnoi
Rat
Tahoma Reef
Rat Islands
Amchitka
Amatignak
Ulak
Gareloi
Tanaga
Kanaga
Great Sitkin
Adak
Kagalaska
Andreanof Islands

Alaska, Seward's Icebox, Became a Treasure Chest

In the 1860's, Tsarist Russia, considering Alaska a financial and strategic liability, offered the possession to the United States. Secretary of State William H. Seward snapped at the $7,200,000 bargain, but the Senate ratified the purchase with reluctance. Wits called the deal Seward's Folly and the new possession his "icebox."

Since those times the Territory has yielded more than two billion dollars in fisheries products; metals have added almost another billion. In one recent year the fur catch alone sold for more than Alaska's purchase price. Some valuable forests never echo to the shout "Timber!"

Though rich in resources, Alaska remains underpopulated. Fewer than 165,000 people occupy a land twice as big as Texas, the home of 7,700,000.

At the beginning of the 18th century the North Pacific lay shrouded in a mystery that kept geographers guessing whether Asia and America were joined or separated. To answer the question, Tsar Peter the Great sent Danish-born Vitus Bering eastward to Kamchatka with orders to explore the waters off its coast. In 1728 Bering sailed through the fogbound strait that was to bear his name and proved that Asia and America were separate. On his second expedition, 13 years later, the voyager sighted the American mainland and charted Mount St. Elias, but never set foot ashore. Russia's claim to Alaska rested on Bering's discoveries. He died in 1741 on lonely Bering Island.

Once extremely isolated, the Territory now lies only a few hours by airliner from Seattle, a mere 19 flying hours from New York.

George Washington's Travels, Traced on the Arrowsmith Map

THAT so many cities and towns can say "George Washington slept here" is not surprising, for the Father of his Country was the most widely traveled American official of his age. The real wonder is that he survived the perils of his many journeys.

If Washington in his declining years had traced his trips on paper, he might have used the Aaron Arrowsmith map of 1795, the best picture of the United States at that time. Here the National Geographic Society's cartographers have redrawn the Arrowsmith map to improve its legibility and added the routes of Washington's most important travels.

Slept on "Fodder or Bairskin"

Sixteen-year-old George began his travels in 1748 with the first of several surveying trips along the Potomac and its tributaries.

Eating in frontier homes, the young surveyor observed that "there was neither a Cloth upon ye Table nor a knife to eat with." Often he slept "before the fire upon a Little Hay Straw Fodder or bairskin." One night his straw bed caught fire.

Later, when Virginia's Governor Dinwiddie needed an agent to deliver the royal colony's demand that the French quit encroaching on its claims in the Ohio Basin (pages 758-759), he selected 21-year-old Washington as the ablest diplomat and frontiersman for the job. Nearly 500 miles of trackless forests and unpredictable Indians lay between the young man and his goal.

Little could Washington guess that the message he carried would touch off war between England and France and lead to his own country's fight for freedom.

At Logs Town, a French trading post (the present Legionville, Pennsylvania), Washington met the Oneida chief, Half King, so called because he could be overruled by the Six Nations. The Virginian persuaded Half King to desert his French allies for the British.

Joined by Half King and a few warriors, Washington marched to French headquarters at Fort Le Boeuf, now Waterford. There he delivered the Governor's demand that the French depart and received their firm refusal.

While Washington eyed the future enemy's war materiel, the courteous but crafty French commander wooed Half King. As Washington noted, the Frenchman exerted "every artifice which he could invent to set our own Indians at Variance with us."

When Virginians and Indians rode out of the fort, some Frenchmen followed in canoes, offering firewater; but, as Christopher Gist, Washington's guide, observed, "we had the pleasure of seeing the French overset, and the brandy and wine floating in the creek."

Washington had another narrow escape when an Indian guide treacherously fired at him from 15 paces. Rather than slay the man, the Virginian got rid of him by a ruse and, though fatigued, marched all night to throw the assassin off the trail.

To cross the "Allegeny" River, which they expected to find frozen, the Colonials were forced to build a raft. "We were Half Way over," their leader wrote, [when] "we were jammed in the Ice . . . we expected every Moment our Raft to sink, and ourselves to perish. Jerked . . . into ten Feet [of] Water . . . I fortunately saved myself by catching hold of one of the Raft Logs."

Washington next became a lieutenant colonel in the Virginia militia and headed into wilderness and battle. Building Fort Necessity as a counter to France's new Fort Duquesne (now Pittsburgh), Washington and 400 green troops stood siege by 900 French regulars and Indians. They surrendered fort and cannon on July 3, 1754, but marched out the next morning as free men.

Washington made his next campaign as aide-de-camp to General Braddock, who in 1755 set out on his disastrous expedition against Fort Duquesne. On the march north the Virginian caught such a violent fever that he abandoned horse for covered wagon. "Dr. James's Powders," which Braddock prescribed and Washington praised as "the most excellent medicine in the World," left him recovered in two weeks.

Four Bullet Holes in His Tunic

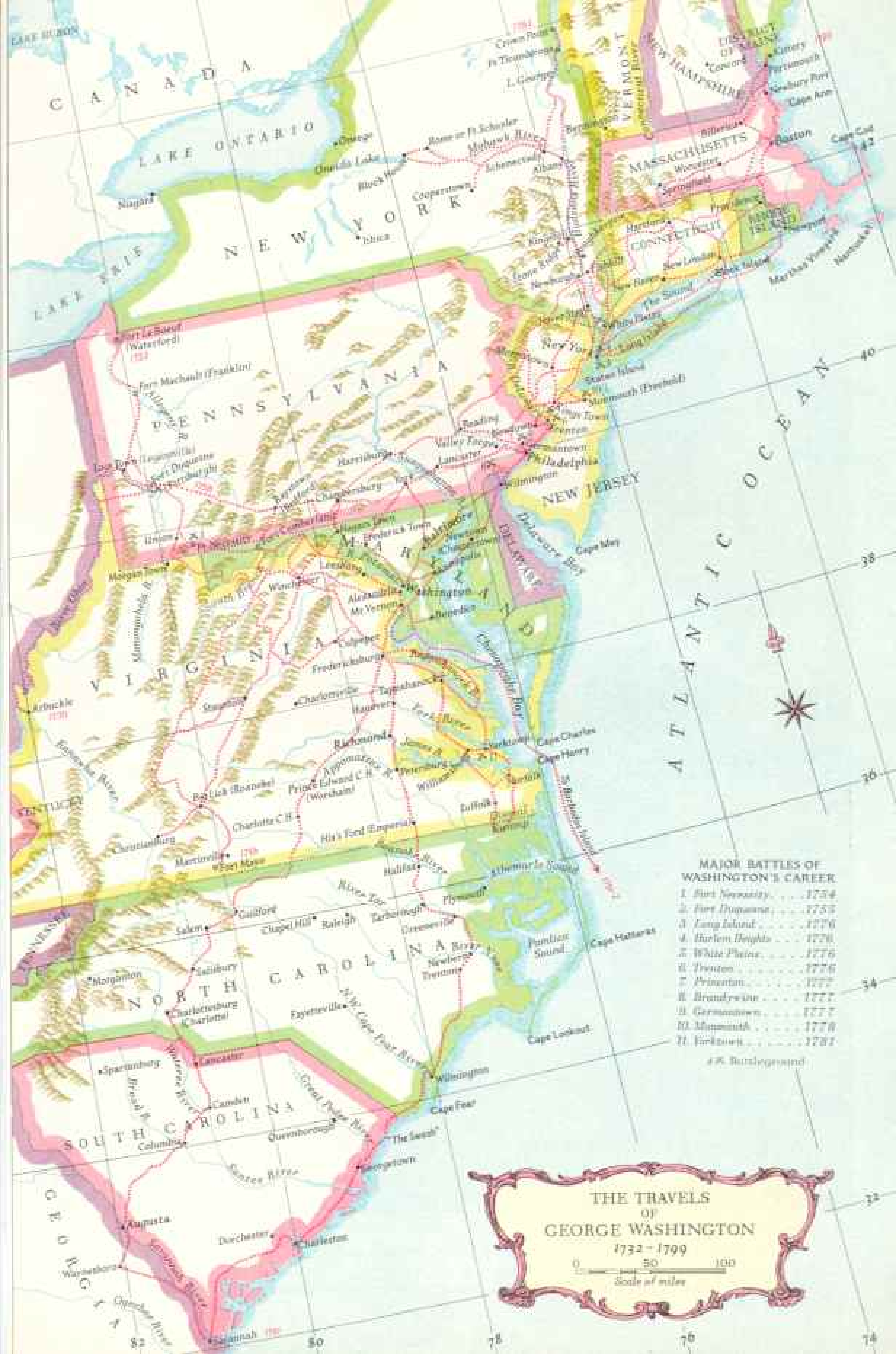
"Very low and weak," Washington joined Braddock the day before the British rout near Fort Duquesne. There, he wrote, "We have been beaten, most shamefully beaten, by a handful of Men." Although death was leveling his companions on every side, Washington escaped with four bullet holes in his coat.

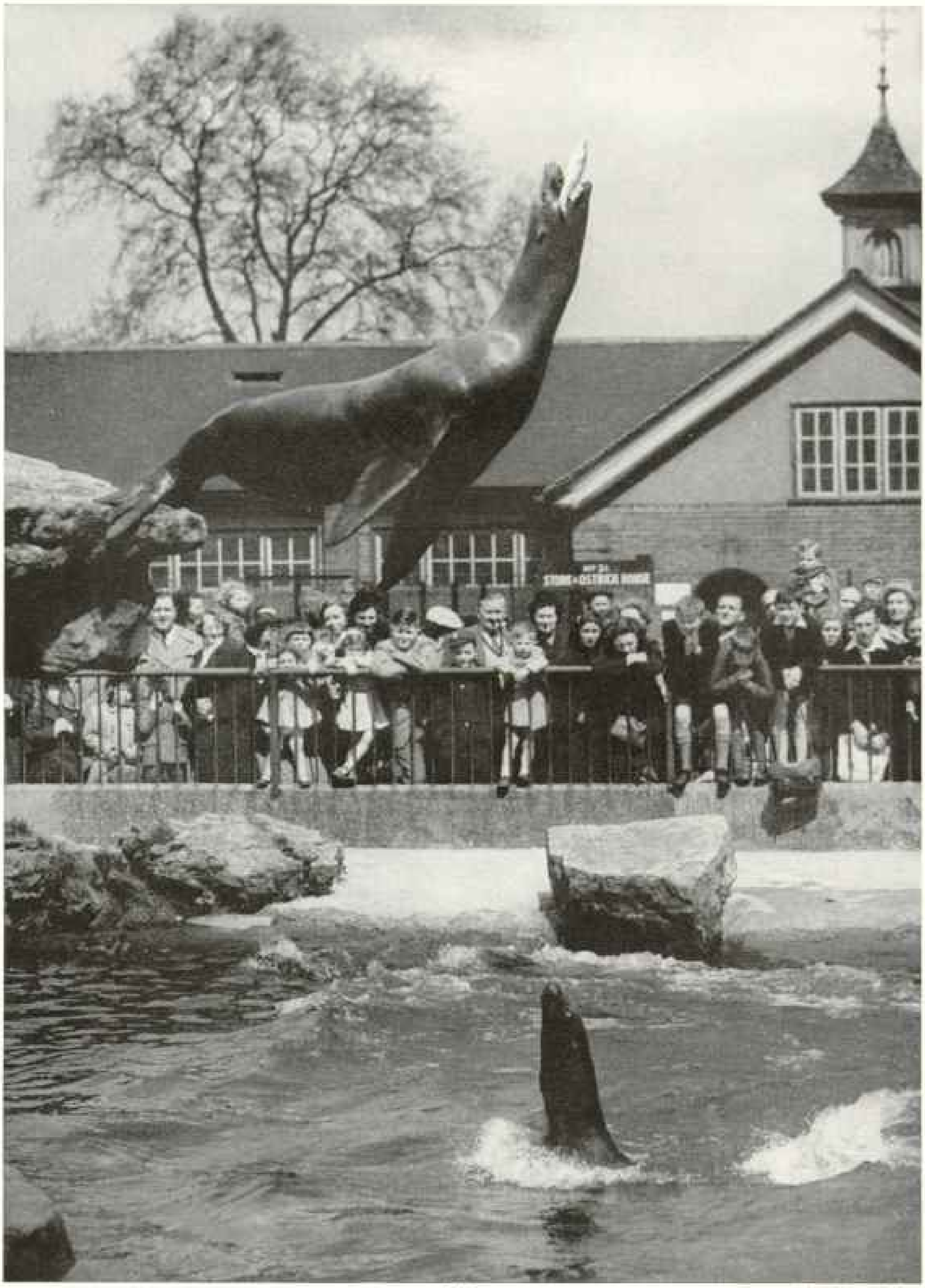
Brilliant in defeat, Washington led the survivors out of the French trap. He buried Braddock, who succumbed to wounds, beneath an open road to conceal the grave.

Named Commander in Chief of the Revolutionary forces in 1775, General Washington traveled with his army for the next eight years (map insets, pages 758-759). Victory achieved, he went home to become a private citizen and "move gently down the stream of life, until I sleep with my Fathers." But soon he pushed west again to tend to his properties and to look for easy links between navigable waters of the Atlantic and Ohio River slopes.

Elected President, Washington in 1789 made a triumphal swing as far north as Kittery, Maine. Two years later he toured the South to Savannah, Georgia.

Death, which he eluded so often, ended his travels in 1799.


THE TRAVELS
OF
GEORGE WASHINGTON
1732–1799
0 50 100
Scale of miles
MAJOR BATTLES OF
WASHINGTON'S CAREER
1. Fort Necessity 1754
2. Fort Duquesne 1758
3. Long Island 1776
4. Harlem Heights . . . 1776
5. White Plains 1776
6. Trenton 1776
7. Princeton 1777
8. Brandywine 1777
9. Germantown 1777
10. Monmouth 1778
11. Yorktown 1781
CANADA
LAKE HURON
LAKE ONTARIO
LAKE ERIE
NEW YORK
PENNSYLVANIA
NEW JERSEY
DELAWARE
MARYLAND
VIRGINIA
KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
VERMONT
NEW HAMPSHIRE
DISTRICT OF MAINE
MASSACHUSETTS
CONNECTICUT
RHODE ISLAND
ATLANTIC OCEAN
Crown Point
Ft. Ticonderoga
L. George
Oswego
Oneida Lake
Rome or Ft. Schuyler
Mohawk River
Schenectady
Albany
Niagara
Cooperstown
Ithica
Bennington
Concord
Kittery
Portsmouth
Newbury Port
Cape Ann
Billerica
Boston
Cape Cod
Worcester
Springfield
Providence
Hartford
Newport
New London
New Haven
Kingston
Fishkill
Newburgh
Stone Ridge
The Sound
White Plains
Long Island
New York
Morristown
Staten Island
Monmouth (Freehold)
Trenton
Reading
Valley Forge
Germantown
Philadelphia
Lancaster
Harrisburg
York
Wilmington
Fort Le Boeuf
(Waterford)
Fort Machault (Franklin)
Fort Duquesne
Pittsburgh
Chambersburg
Bedford
Cumberland
Union
Ft. Necessity
Morgan Town
Hagers Town
Frederick Town
Baltimore
Chestertown
Annapolis
Leesburg
Winchester
Alexandria
Washington
Mt. Vernon
Benedict
Delaware Bay
Cape May
Chesapeake Bay
Culpeper
Fredericksburg
Staunton
Charlottesville
Tappahannock
Hanover
York River
Richmond
James R.
Petersburg
Williamsburg
Yorktown
Cape Charles
Cape Henry
Norfolk
Suffolk
Arbuckle
Kanawha River
Big Lick (Roanoke)
Prince Edward C.H.
(Worsham)
Appomattox R.
Charlotte C.H.
Christiansburg
Martinsville
Fort Mayo
Hix's Ford (Emporia)
Halifax
River Tar
Tarborough
Plymouth
Albemarle Sound
Guilford
Salem
Chapel Hill
Raleigh
Greeneville
Newbern
Trenton
Pamlico Sound
Cape Hatteras
Cape Lookout
Morganton
Salisbury
Charlottesburg
(Charlotte)
Fayetteville
Wilmington
Cape Fear
Spartanburg
Lancaster
Camden
Columbia
Queensborough
The Swash
Georgetown
Santee River
Augusta
Dorchester
Charleston
Waynesboro
Savannah
40
38
36
34
32
82
80
78
76
74



770

A Leaping Sea Lion Fields a Herring. His Friend in the Water Hopes for an Error

Feeding time brings a crowd to the pool in London's Regent's Park zoo. Keepers toss fish in the air, and sea lions soon learn that extra dividends reward the ones that climb the rocky ledge (left) for a flying leap.

London's Zoo of Zoos

Nature-loving Londoners Make Pets of the Animals at Regent's Park, 125-year-old Zoo, and Its Country Branch, Whipsnade

By Thomas Garner James

ONE thing that startles visitors to London is the social status that animals enjoy there. Best estimates indicate that there is at least one pet for every man, woman, and child in the city.

Cats alone are estimated at five million. And to this figure must be added the dogs, birds, fish, ponies, rabbits, tortoises, monkeys, hamsters, and other far more novel beasts which are privileged members of many a London household.

The most famous and favored of London's pets, however, do not share anyone's household. They have their own 34-acre estate in Regent's Park, since 1828 the preserve of the Zoological Society of London. There are 7,000 of them, including the birds, beasts, and the 3,000 fish, and they are probably the most thoroughly observed, admired, adored, and talked about animals alive. They are, for better or for worse, *everyone's* pets—or, at least, the pets of everyone who can squeeze in.

On a fine holiday afternoon 50,000 visitors may crowd into the London Zoo. In a year two million pay admission, about as many people as go to all of London's famous (and mostly free) art galleries and museums combined.

Fellows Fraternize with Inmates

It was my privilege to meet the zoo's leading citizens on a more exclusive basis. I was introduced to them on Sunday morning, when the Zoological Society of London reserves its Regent's Park home for a sort of weekly private party. It is then that the zoo's 7,000 or so permanent guests, furred, feathered, and finned, receive, as intimately as anyone could desire, the 7,000 or so Fellows of the Zoological Society, the voting, dues-paying members who run the Society and elect its officers.

Not all the Fellows, of course, come every Sunday. My host, David Strang, was one who does. An artist-engraver by weekday vocation, Mr. Strang confessed to me as we finished lunch in the Fellows' Restaurant: "I failed to come once, years ago, when I was too ill to get out of bed." He hadn't missed since.

While he spoke he was wrapping in a napkin the rind of the melon he had just eaten for dessert. His other guest, 13-year-old Jane Kerr, was doing the same; so of course I did too.

Later Jane transferred the tidbits from the napkins to the cavernous mouth of Lorna, the zoo's black African rhinoceros, and while she did so we scratched a certain place behind Lorna's right ear. Rumbling happily, Lorna squatted back on her piglike tail and haunches like a clumsy puppy—both tons of her.

As an African, Lorna came equipped with two horns instead of the single one possessed by her Indian cousins. Rhino horns, which grow from the skin not the skeleton, are normally worn away in zoo life by constant rubbing on the enclosure walls, as in the case of the zoo's Indian rhino, Mohan (page 781).

Merely a Cobra Killer

We began our morning rounds with Tiki and Chummy, two tiny capuchin monkeys from South America. Next, Mr. Strang called into his gentle arms a quick-moving meerkat, an African species of mongoose.

"This is Merely," he said, "merely a meerkat, one of three that arrived at the zoo together. I named them Merely, Nearly, and Quite; but on his house they have spelled his name 'Mearly,' which *nearly* misses the point, don't you think?

"Merely is everyone's friend," Mr. Strang went on, cuddling the neat little body against his tweed jacket, "everyone, that is, except a snake in the grass."

A mongoose, he explained, is not immune to snake venom, as some people think. Like Rudyard Kipling's Rikki-tikki-tavi, it risks its life in destroying its ancient enemy, the cobra, pitting nothing but dexterity, sharp teeth, and courage against the poisonous fangs.

Next on the list came Prince, a cheetah, the most fastidiously handsome animal I have ever seen (page 786). Prince is so tame that his comfortable quarters are usually filled with Sunday admirers. Fleetest of animals, the cheetah, or hunting leopard, can hit 70 miles an hour or more in dashes after the gazelles of its native deserts.

After Prince and lunch and Lorna, and before the public gates were opened to admit the Sunday-afternoon queues, Jane and I were embraced, literally, by some young pythons and boas slithering across our shoulders.

A 25-pound, 10-foot python, I admit, would make a good masseur if one's nerves were in top shape. His tail anchors itself with a clove hitch around one arm, say, while the rest of him slides steadily and powerfully over one's tingling chest muscles.

My python seemed to enjoy our exercise almost as much as the grinning keepers, while

National Geographic Photographer Volkmar Wentzel

A Londoner Raised Rota in His Yard, Moved Him to the Zoo During the Blitz

This lion was only a cub when George Thomson, a Fellow of the Zoological Society of London, took him home. In 1940, when bombs began to fall, Mr. Thomson moved his pet to London's zoo. In 1945 he gave the beast to Winston Churchill, who sagaciously left him where he was. Rota has sired some 30 cubs.

the boa on Jane's shoulder looked me in the eye as if to see how I liked the experience. I silently tried to assure my reptilian friend that there was nothing for either of us to get excited about (page 783).

Thousands of Amateur Animal Tamers

The London Zoo's animals, in short, don't act quite like ordinary beasts. But then, neither do Londoners act quite like ordinary zoo crowds.

"Look at the people coming through those gates," said Mr. Strang. "Almost any one of them is an experienced animal tamer."

By the time I myself had been "tamed" by many a visit to Regent's Park, I had to agree that Mr. Strang was right.

The feel of the place is evident any sunny summer afternoon in the Children's Zoo, a special pets' corner. Here llamas, goats, wallabies, ponies, donkeys, rabbits, woolly lambs, parrots, pigs, poultry, pigeons, and even a reindeer and a baby elephant—all cared for by pretty hostesses—roam freely to kiss and to be kissed by tiny visitors (page 777).

This special Children's Zoo was opened in 1935 to bring together zoo babies and London babies even more intimately than the larger enclosures would allow. Like many other Regent's Park "firsts," it has since been copied at zoos around the world.

Here on an August bank holiday I watched a llama, trapped within a ring of squealing children, condescending to a Cockney burden

National Geographic Photographer Volkmar Wentzel

So-So Gulps Her "Tea" While Susan Holds Out Her Cup for a Refill

The chimpanzees' tea party, a major attraction at Regent's Park (page 774), has been widely copied by other zoos. Young chimps, with little training, learn to eat porridge with a spoon, drink milk from cups, and politely pass fruit (page 785). Rarely is one so ill-mannered as to upturn his bowl and wear it as a hat.

of love—until the ultimate sticky-handed caress drove her to forget her zoo manners and spit accurately and impartially at all the genus *Homo* in sight.

The spray had no deterrent effect on my zoo mates, however. My last sight of the llama's resigned face, disappearing beneath the advancing sea of stroking hands, seemed to sum up all that London animals have sacrificed for the sake of taming the Londoner.

Thoughtfully, the Children's Zoo has provided low child-proof fences over which the pets can escape. The thicker skinned among the pets hold their own against the petters. I watched two goats climbing a stout lady's well-defended ramparts to the apples bursting out of her shopping bag, while a third happily chewed a small girl's hair ribbon. A fourth sampled my incautiously opened notebook.

This hilarious corner for children, where old clothes are advisable, carries to conclusion the logic of the zoo as a whole. As G. W. Graves, head keeper of the Rodent House and a member of the National Geographic Society, told me: "We put people cheek by jowl with animals here that most zoos would fear to let near strangers."

While he was speaking, a kinkajou named Goldie was sitting on my head eating grapes and dribbling grape juice down my ear. On the Broad Walk beyond, the riding elephant was sharing an old gentleman's proffered lunch basket, and next door a two-year-old baby

was reaching up to put a peanut into the open maw of Marmaduke, the 700-pound tortoise.

"We soon get to know which people are too wild to be trusted with our animals," Graves said. "But if you try to shut the tame ones off from rubbing noses with their favorite creatures, you might as well close the zoo."

First Aid for Nipped Fingers

All the really dangerous exhibits are zoned and labeled. Even so, the zoo's first-aid booth handles an average of more than a hundred cases a day, minor cautionary nips and knockdowns being considered part of the learning process as people and beasts get to know each other.

Naturally, the keepers themselves seldom suffer "occupational injuries." They know—and are known by—their pets far too well.

"Some people have had a tooth knocked out doing this," said head keeper A. J. Woods of the Bird House as he placed a cherry between his lips and turned his face up toward Baby, an Indian great hornbill (page 786).

The huge black-white-and-buff bird, with a beak almost a foot long, snatched the fruit from his mouth; but, at a word, reluctantly replaced it.

"The dangerous bit is when she changes her mind just after she's given it back," Woods said. "That beak can do a lot of damage, accidental like.

"But Baby and I are good friends. We both came to the zoo in 1923; and I think she likes me."

He tossed the cherry in the air for Baby to field. "She hasn't missed a catch yet." He threw several more, left and right, up and down; the reaching beak was as dependable as Joe DiMaggio's glove.

Pickpocket with Four Hands

"I've been living with monkeys so long I think the way they think," panted head keeper Laurie Smith of the Monkey House, "but I just can't move fast enough."

A moment before, Smith had wrestled another visitor's breast-pocket handkerchief back from Mr. Jiggs, a red-haired orangutan (page 785).

"I could see that kerchief was going to catch his fancy; but he can pick a pocket quicker than either you or I can stop him," continued Smith a bit breathlessly. "You have to remember that they've got four hands."

Mr. Jiggs had not varied his pensive, Buster Keatonish expression one iota.

"He likes to think of himself as a ladies' man," Smith grinned. We had already seen that nothing pleased Mr. Jiggs more than to have his picture taken out on the lawn, arms around any pretty girl he could persuade to pose with him. But whenever he started to walk the young lady back toward his cage, a keeper was always there to intervene. No wonder Mr. Jiggs looked pensive.

Guy, a 6-year-old, 150-pound gorilla, had also gone a round with Smith that morning, uttering low gorilla chuckles as he and his friend rolled over and over across the floor.

"He has a ticklish spot on the back of his neck, and if I lay one finger there, he's almost helpless," Smith explained. "But in another few weeks at the rate he's growing, Guy is going to be far too big for me or anyone else to wrestle with."

"But what would you do if you were really caught?" we asked.

Steel "Snake" for Defense

"If I want to make him release me, I always can," said Smith. "I don't like to frighten him, so I won't get too close. But watch this."

He took from a handy shelf a foot-long piece of black steel spring. It wriggled in his hand like something alive, and the young gorilla instantly retreated toward the far corner.

"He thinks it's a snake," Smith explained. "He's never seen one, of course, but the jungle instinct is there." *

As we turned to go, four simian voices rose in protest. "They know I haven't yet given them their elevenses," said Smith. He turned a key in a door and was suddenly buried under leaping chimpanzees.

Brother Compo and sisters So-So, Susan, and Sally rapidly disentwined themselves when Smith asked where their cups were. Then they lined up contentedly, mugs in hairy hands, as he poured them out their morning milk.

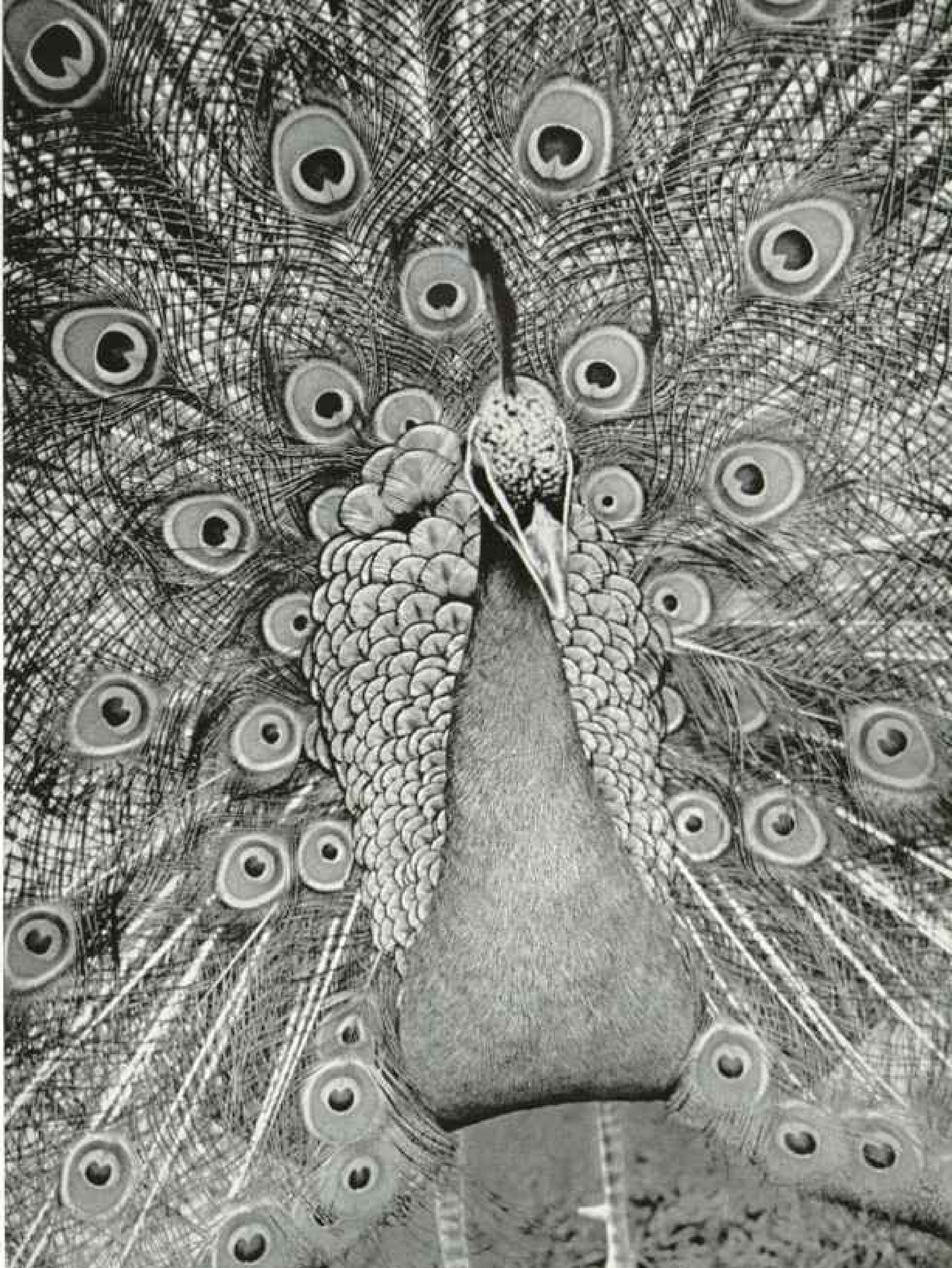
"You don't have to *teach* them any tricks," said Smith. "They know too many of their own already. Watch this." He held out his key ring, which had a dozen keys. So-So took but a moment to select the one that would unlock her cage door.

Since arriving from Sierra Leone in 1948, Sally, So-So, Susan, and Compo have solemnly burlesqued England's teatime manner, entertaining an audience totaling a million or so at some 500 of the zoo's famed chimpanzee tea parties (page 773).

But even chimpanzee children eventually grow up. On a wintry evening late last year in the BBC's Lime Grove studios, I watched three of this beguiling foursome give their final public tea party before the television cameras.

Susan was indisposed; but brother Compo

* See, in the National Geographic Magazine: "Man's Closest Counterparts (Apes)," August 1940, and "Monkey Folk," May, 1938, both by William M. Mann.



W. Busch

Scores of Eyes Stare Out from a Whipsnade Peacock's Tapestry of Feathers

led sisters Sally and So-So to their proper chairs and acted generally as any brother should, except for snatching a banana from So-So's plate when her back was turned.

Sally, unfortunately, spilled her milk. Knowing she had been naughty, she placed both hands on top of her head and rocked back and forth in confessed disgrace while So-So helped keeper Smith wipe up the damage. But no one was so impolite as to stand on the table or try to make a party hat out of an empty plate *this* time. All in all, it was a very successful "tea," with Compo waving a final goodbye to the televiewers from the arm of a zoo official.

"What is difficult for us to explain to young children," the same official told me later, "is that the dear little Susan they have watched growing up has now reached an age where she is more than a match in swiftness and strength for any five grown men.

"There is some special potency about chimpanzee muscle that makes it, weight for weight, many times more powerful than human muscle; and, like some of us humans, the older a chimp grows, the more crotchety he or she sometimes gets. When they are nearing seven years old, as these chimpanzees are, we just don't think it fair to them to take any chances with their newly adult temper."

Whipsnade Gives Animals Elbowroom

In addition to the Regent's Park menagerie, the Zoological Society also owns and administers a country branch at Whipsnade, 30 miles north of London. Here it keeps another 2,000 animals on show in conditions that contrast sharply with those at Regent's Park.

"You could drop all the 34-acre London gardens into one of our zebra paddocks," Whipsnade's superintendent, E. H. Tong, pointed out.

Whipsnade Zoological Park, draped over more than 500 acres of the billowing land wave of Dunstable Downs, was planned as an intermediate step between an urban menagerie and a natural preserve like South Africa's great Kruger National Park.*

In atmosphere, Whipsnade rather resembles an English gentleman's country estate—except for the camels, zebras, bison, elephants, and giraffes circulating among the deer and peacocks (pages 775 and 780-783).

The site of Whipsnade, too, is particularly pleasant even for the English countryside. It is best, I think, on a windy day when gliders and their human pilots take off from the steep slopes of the high downs. They soar in the standing-wave updraft like silent vultures wheeling to and fro over the tigers, gazelles, lions, and wallabies.

Whipsnade, once farmland, was acquired by the Zoological Society of London beginning in 1926. On its 700-foot crest wolves, bears, and wild birds find sanctuary in a dark pine and fir grove. From the ridgetop the western slope drops 300 feet to the Icknield Way, the Bronze Age track of ancient fur-clad Britons that runs from the northeast section of Wiltshire into Norfolk County.

The Zoological Society's late Secretary, Sir Peter Chalmers Mitchell, and its then superintendent, Dr. Geoffrey Vevers, found hundreds of flint tools when developing the Whipsnade site—reminders of the days when man in Britain lived on terrifyingly equal terms with the now extinct woolly rhinoceros and mammoth.

Great White Lion Plays with Clouds

At the suggestion of a Society Fellow fond of the great white horses (some of them believed to be prehistoric) cut elsewhere in Britain's chalk downs, Mitchell ordered to be carved on the western slope of the Whipsnade downs a white lion 160 yards long. It was laid out to a true-perspective design by artist R. B. Brook-Greaves.

Seen now from the Icknield Way, the 100-yard-tall lion plays with cloud shadows on the slope while his real-life counterparts sniff the breezes in their ridgetop pits.

A feature of Whipsnade's natural charm is the way several species share a single paddock. Fallow deer and flamingos may hold one field, for example, with cranes and camels in another. Concealed moats are replacing fences wherever possible, so that few barriers are visible.

Native birds and mammals are welcome to join the animal brotherhood at Whipsnade except where they might endanger valuable exotic exhibits. Thus the sunken lions' dell, where great carnivores laze and play like kittens, may also see a wild rabbit or two. The lions seem to consider the rabbits beneath their notice. The bunnies, on the other hand, know better than to tempt the tiger family next door.

Rare Sheep Keep Grass Cut

Roost-robbing foxes are frustrated not only by the perimeter fence but also by the llama, deer, or antelope herds sometimes kept purposely in the same enclosure with the more valuable birds.

Flocks of Soay sheep and rare four-horned Jacob's sheep move from paddock to paddock, serving the very practical purpose of grazing down the long grass which might otherwise harbor injurious parasites.

* See "Roaming Africa's Unfenced Zoos," by W. Robert Moore, NATIONAL GEOGRAPHIC MAGAZINE, March, 1950.

International News Photos

Goat Bends a Languid Ear to a Cockatoo's Gossiping Tongue

In the Children's Zoo, a special section of Regent's Park reserved for young people, tamer animals wander at will (page 772). Here Sally, a 35-year-old cockatoo, has left her perch to chat with Toggs, a hybrid goat.

"You notice that the wire overhang on our fence faces outward rather than inward," said Whipsnade overseer Phil Bates as we joined in his daily tour of inspection. "We changed it around like that when we found that more animals were trying to break in than out.

Moor Hen Moves In with Vipers

"Native and migratory birds are as free as the wind, naturally. We are pleased to have them join us for a spell until they get restless again.

"Perhaps we hadn't fully realized what a sanctuary for bird life we had become until the summer of 1950. That year a wild moor hen built her nest and raised her family of chicks right in the middle of our reptilary, sitting there on her clutch undisturbed among the indifferent vipers.

"You might say that the only 'escapes' we've had, really, were some flightless pheasants, which were surprised and bewildered one day when the wind picked them up off the downs just as it lifts the glidermen.

"If you were an animal pensioner on the Whipsnade ration roll, would you want to leave?"

We stopped to say hello to Dixie, the 50-year-old, mouth-organ-playing Indian elephant.

"Dixie and her keeper came here together from a circus the year we opened," said Bates. "They're now Whipsnade's oldest inhabitants." Then he smiled, "Except for myself, that is. I was farming here at Whip-

snade, you see, before the Zoological Society took over. You might say I'm still a farmer, one who has just learned to prefer waterfowl and Kodiak bears to pigs and chickens."

If any farmer could be too well liked by his animal charges, Bates is perhaps the man. When Whipsnade was shorthanded during World War II, he was almost killed by a chimpanzee that had grown suddenly jealous of the attention he was paying another.

As we walked along, birds and beasts alike recognized Bates from a distance and moved up to the barrier to nibble at an apple or to beg a puppy biscuit from his bulging pockets. A young nilgai, or Indian antelope, Bambi, grabbed and held on to his coattails with her muzzle.

"Bambi is one of the many Whipsnade bottle babies I've had to rear by hand," Phil explained. "It's hopeless now for me to try to convince her that I'm not her mother."

Whipsnade has become, to some extent, a zoo breeding ground. With more privacy and fewer visitors than Regent's Park, animal courtship thrives. Surely among a Briton's most rewarding experiences is to hold a pair of field glasses on a May morning to watch a new gnu or gentle giraffe child, a bright-eyed baby wallaby peeping from its mother's pouch, or perhaps a tawny tiger cub learning what an English spring is like.

Zoo Began with a Private Collection

In 1826, a little more than 100 years before the lions and kangaroos invaded Whipsnade, the Zoological Society of London held its first meeting. Its president and one of its prime movers was Sir Thomas Stamford Raffles, colonial administrator, founder of Singapore, and amateur zoologist. Another promoter was Sir Humphry Davy, famous chemist, who invented a miner's safety lamp in which metal gauze absorbed the flame's heat.

It was Sir Stamford's own Malaysian collection that started the zoo off, though the best of his shipments from Singapore was lost at sea. The menagerie at Regent's Park, with its "collection of living animals," opened its gates to the public in 1828, and the following year the Zoological Society was granted its royal charter.

The charter empowered it to import "new and curious subjects of the Animal Kingdom," but also specified that the Society was to promote scientific studies of breeding, acclimatization, and other aspects of animal physiology.

Today the Zoological Society owns the largest collection of "new and curious subjects" in the world. Its scientific meetings and dinners, begun in the 1830's, are still held each month. The Society's learned papers, monographs, and reports fill long shelves in libraries around the world.

But at the meetings, though the members may be deep in a discussion of parasitology or genetics, they are not at all surprised if a keeper leads a tame Komodo dragon lizard into the conclave, or if a young elephant is marched down the aisle of the book-lined lecture hall to show her excellent condition.

"Living Laboratory" for Scientists

The alliance between the Society's animals and its scientists is a highly practical one.

"Whenever the fact finder wants to," a zoo official explained to me, "he can check his library research against the 'living laboratory' of the menagerie simply by stepping out of the door. He could spend a lifetime in Africa or traveling about the wilds before he could ever see in the flesh more than a fraction of the various living forms of birds or apes, for example, that the Society has gathered here."

The animals, of course, contribute in another important way to the scientific research; they finance it. The truly unique fact about the patrician Zoological Society of London is that it gets along without any Government financial support whatsoever; it has met its 125 years of heavy expenses almost entirely from daily gate receipts. While paying its own way, the Society has served as model for hundreds of state-supported zoos and aquaria around the world and has rung up a list of scientific "firsts" long as a giraffe's neck.

Self-support gives the animals' and keepers' "public relations" a fundamental importance hardly true of other scientific institutions. The zoo's natural-history lessons must be popular week in and week out, as measured by the public's jingling coins, or the whole concept of the Society fails.

Wild Animals Need Friends

The animals, of course, get their benefits in return. Already discoveries about the care and feeding of some species have extended their average life span in the zoo to several times what it would be in the wild.

"We think of it this way," said the Society's director, Dr. L. Harrison Matthews. "The British Commonwealth of Nations includes many of the world's remaining wild-animal habitats, and this heritage carries with it a real responsibility.

"An animal these days needs all the friends it can get. The Zoological Society's job for the next century and a quarter—as it has been for the last—is simply to gather those friends together in the pleasure of sharing a voluntary acceptance of responsibility for animal welfare."

 Kodachrome by National Geographic Photographers B. Anthony Stewart and David S. Boyer

London Zoo Giraffes Sniff a Visitor's Basket

Giraffes have been putting cricks in zoo-goers' necks since the first specimens arrived in 1836.

Feeding the animals is approved in most parts of the 34-acre park, but giraffes have delicate stomachs and visitors' tidbits make them sick. At mealtimes the keeper feeds them a proper diet: plenty of greens hung high to simulate treetops where they normally browse.

Fearless Children Mount Tame Beasts While Parents Hover on the Sidelines. The Great Jumbo Walked in the Zoo Parade

Each sunny afternoon in summertime, zoo-visiting children get a chance to ride the animals. Elephants are most popular, camels next. Jumbo, the world's most famous elephant, was a zoo favorite at Regent's Park until he was sold to P. T. Barnum in 1882 over Londoners' protests. Before any animal is allowed to carry a child, it must be dependably tame and thoroughly familiar with the parade course. These children ride at Whipsnade, the zoo's country estate 30 miles north of London. Two riderless elephants and a llama join the parade. The Bactrian camel bringing up the rear is one of a large herd bred on Whipsnade's 500 acres (page 782).

Mighty Mohan, with Patience Rare for a Rhino, Lets a Visitor Straddle His Armored Back. Keeper Rewards Him with Fresh Peas

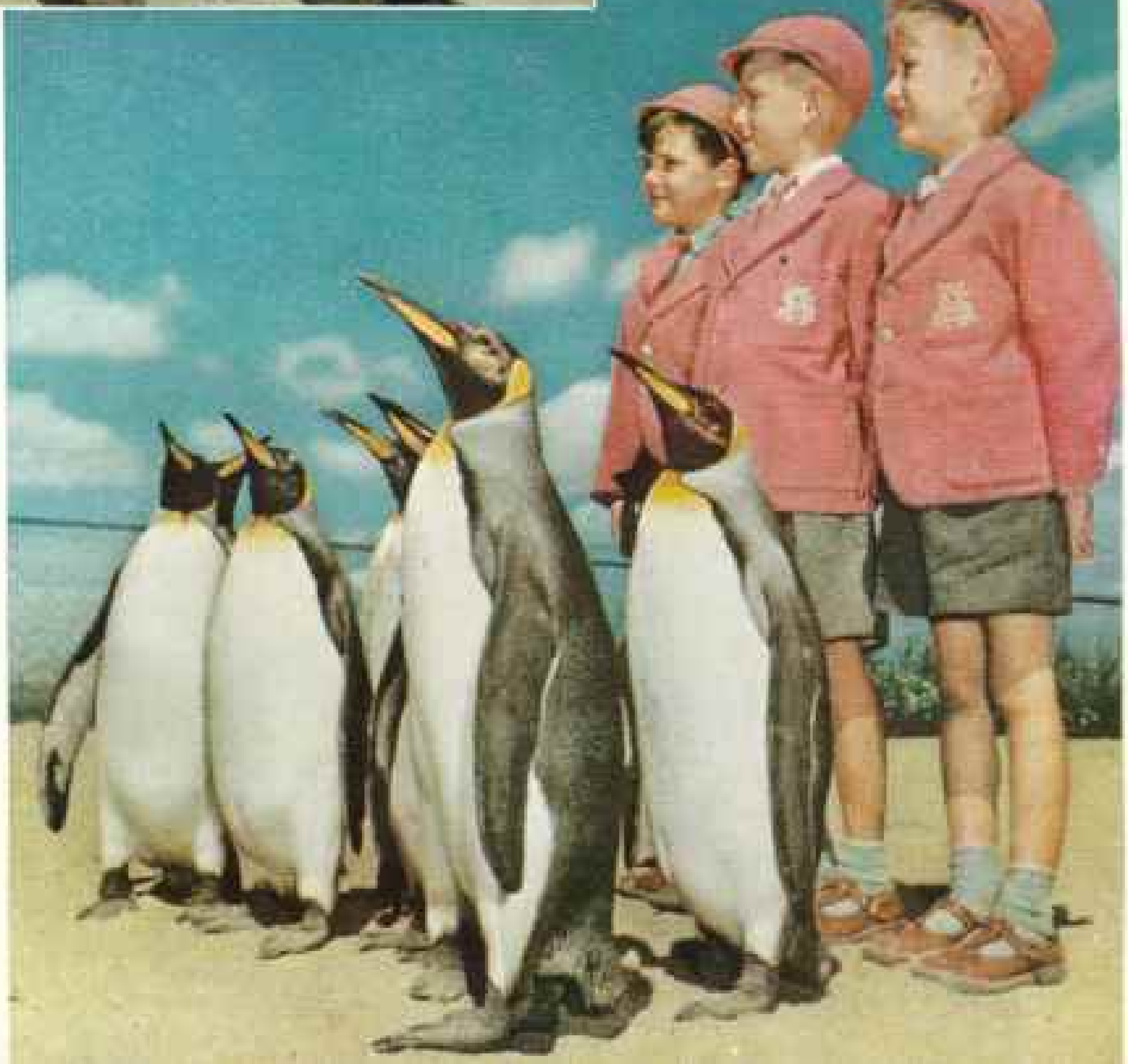
Kodachromes by National Geographic Photographers B. Anthony Stewart and David S. Boyer

Bactrian's Back Holds Seats for Three

London Zoo uses Bactrian (two-hump) camels for children's rides because, unlike their one-hump dromedary cousins, they don't need elaborate saddles. On a busy afternoon one camel may give rides to as many as 400 children.

Wild Bactrians came originally from central Asia, but they have been domesticated for centuries. The zoo raises its own. Breeding is done at the nearly fence-free Whipsnade, where camels, zebras, bison, giraffes, and other non-carnivores can roam fairly freely. The zoo opened Whipsnade in 1931 as a rest home for animals that needed relief from crowds; it is now a zoo in its own right.

Bactrians bear their young early in spring. When two zoo favorites, Wally and Peggy, had a calf last year, they disappeared temporarily from the children's parade; Peggy wouldn't leave the baby, and Wally wouldn't leave Peggy. Later in the summer they were persuaded to go back to work, with Lucky, the baby, trudging behind.



King Penguins Dress Alike, as Do the Boys

The zoo permits its better-behaved animals, like penguins, to play with children; the children, too, must be polite. This policy usually leads to mutual admiration, only occasionally to nipped fingers or plucked feathers.

Before these 30-pound king penguins were ready to play with boys from near-by Aylesford House School, they had first to get used to England's climate, far warmer than their home near the Antarctic Circle, and to zoo food.

The frigid South Georgia waters where they were captured swarm with crustaceans, the penguins' normal diet. They ate the zoo's proffered herring and whiting only when the fish were stuffed into their bills.

Kodachromes by National Geographic Photographers B. Anthony Stewart and David S. Boyer

Zoo's Slowest Ride: Giant Tortoise Races at a Snail's Pace

Weighing up to 400 pounds, these giant tortoises from the Galápagos are strictly dry-land reptiles. They pass summers at Whipsnade, winters at the zoo. As steeds they proved disappointing. This one refused to budge until one rider got off and prodded him.

Children and Python Both Learn: Squeeze Gently!

Boys and girls quickly overcome fear of snakes, and some even try to kidnap smaller varieties from the outdoor reptile quarters by hiding them under shirts. This gentle 10-foot Indian python has never tried to squeeze hard enough to harm its playmates.

It's a Holdup! Dumbo Won't Let the Food Truck Move Until She Collects Toll

Dumbo, flown from Assam, India, in 1949, was one of the first baby elephants to arrive by air. Since that year planes have been widely used to transport zoo animals. Dumbo soon learned to count on the truck for a snack.

Smart Orangutan Swabs His Den

Not to be outdone by the chimp (right) is Mr. Jiggs, a six-year-old orang capable of mopping his own quarters. What he really enjoys is walking hand in hand with visitors.

Baby Chimp Takes a Sip of Medicine

For nearly a decade Mrs. Dorothy Pinto-Leite, a Fellow of the London Zoological Society, has taken care of the baby monkeys. She nurses the sick, helps newcomers get used to cage life, and teaches them zoo etiquette. Here she administers tonic to Fifi, a young chimpanzee from Nigeria.

Chimpanzees are generally regarded as the smartest of the apes. They can master simple arithmetic, apparently recognize photographs of themselves, and learn table manners, including use of cup and saucer, knife and fork.

Kodachromes by National Geographic Photographers Volkmar Wentzel, B. Anthony Stewart, and David S. Boyer

Kodachromes by National Geographic Photographers B. Anthony Stewart and David S. Boyer

Hornbill Removes the Cherry but Usually Leaves the Teeth

When breeding, the male Indian great hornbill uses its massive beak to plaster its mate and eggs inside a hollow tree, feeding them through a hole in the mud wall until the young are two months old. This female, 30 years in the zoo, is still known as Baby.

Friendly Cheetah Licks Ice Cream from a Visitor's Teaspoon

Cheetahs, fastest of cats, can spurt 70 miles an hour. In India they are trained and used for hunting. Prince, a zoo resident since 1946, has appeared in movies and television. When stroked by visitors, he purrs like any house cat, but more so!

Stately Homes of Old Virginia

James River Plantations, Now Busy Working Farms, Link the Nation's Past to the Living Present

By Albert W. Atwood

FROM a boxwood-fringed lawn topping a gentle rise, we gazed through the trees toward a steely glimmer that was the James River, a quarter of a mile to the south. Behind us rose the noble Georgian façade of Berkeley, ancestral home of two Presidents and one of Tidewater Virginia's most famous mansions (page 791).

"We have nearly 8,000 visitors a year," said Malcolm Jamieson, who owns Berkeley today.

"What questions do people ask?" I inquired. "What interests them most?"

"'Plantation' is a magic word," he replied. "Everybody has heard of the old Virginia plantations, but few visitors know much about them. You can hardly think of a question they haven't asked me. Especially they want to know whether the plantations operate as they did 200 years ago; if not, how they compare with those of the 18th century."

"They always want to know when the house was built," another plantation owner told me. "The age and architectural period seem to interest everybody. Often they ask who the architect was, a question few owners can answer.

"Visitors insist on knowing whether the house had any connection with historic personages or events. 'Did Thomas Jefferson or Robert E. Lee really visit here?'

"Everyone is interested in the boxwood, and some question us closely about unusual shrubs or trees not normally found in their own States.

"They want to know about the outbuildings, known here as 'dependencies.' 'Which was the kitchen and which the schoolhouse?'

"And always they ask, 'Where did you come from? How long have you been here? Are you from the North or South? Do you farm the property, or is it just a home?' They want to compare us with the men and women who lived in this house in colonial times."

Near Jamestown and Williamsburg

To join these thousands of spring and summer visitors who find so much to arouse their curiosity and interest in the old plantations, I had driven south to the James River region between Richmond and the sea. A landmark of this area is Jamestown, the first permanent English settlement in the American Colonies.

Williamsburg, which I made my headquarters, was not only the planters' colonial capital but for 80 years the political and cultural center of what was then the largest, most populous, and in some respects the most influential of the Colonies.*

Twenty-six years ago John D. Rockefeller, Jr., began to restore Williamsburg. Since then 6,000,000 people have visited the little city. Many of them have learned there of the close tie between the plantation system and the early leadership of our Nation.

Standing beside the James River, I was reminded of a sentence in a letter which Thomas Lee Shippen, a student at William and Mary College in Williamsburg, wrote his parents in 1783:

"The River flows beautifully along, carrying with it, or rather giving birth to Commerce Riches & Happiness."

When Rivers Were the Only Roads

The river still "flows beautifully along," giving the plantations much of their rare charm. But in the wilderness of 300 years ago the Tidewater rivers provided something far more important—access to the outside world. Without the rivers, the only highways, trade would have been impossible.†

Ocean-going vessels loaded bulky hogsheads of tobacco at each planter's private landing at the foot of his garden. With this valuable freight the ships sailed directly for London and Bristol.

Large tracts of land and much labor were needed to raise tobacco. The wilderness supplied the land; indentured servants from England and slaves from Africa performed the labor.

In England, land was the source and symbol of aristocracy. The same tradition was transplanted to Virginia, where great tracts gave the settlers wealth, power, and social position.

Remote and isolated, the plantations developed as self-contained units; each was a town in itself, a society in miniature. As Thomas Jefferson pointed out, Virginia had no towns of consequence because trade was brought to the doors.

Each mansion, like an Old World manor

* See "Restoration of Colonial Williamsburg," by W. A. R. Goodwin, National Geographic Magazine, April, 1937.

† See "Tidewater Virginia, Where History Lives," by Albert W. Atwood, National Geographic Magazine, May, 1942.

Westover Stands Unmarred by the Passing Centuries

Spacious plantation homes, solidly built by descendants of America's first settlers, line the banks of Virginia's James River. Some of the mansions date from colonial times. Thousands yearly visit them as shrines.

Westover, says the author, "is perhaps the most impressive single symbol of Virginia's colonial grandeur." It was built about 1730 by wealthy William Byrd II, a forebear of Admiral Richard E. Byrd, the explorer, and his brother, United States Senator Harry F. Byrd.

Old tunnels and a hidden room lie beneath the manor house. At night, so the story goes, the ghost of beautiful Evelyn Byrd, William's daughter, emerges and walks Westover's halls. Disappointed in love, she died at 30 and was buried on the grounds (page 799).

Here Garden Week guests of Mrs. Bruce Crane Fisher, the present owner, enter the house, while others relax on the lawn.

National Geographic Photographers Robert F. Sisson and John E. Fletcher

Virginia House: Its Materials Came from Warwick Priory

England's first Earl of Warwick and his son built Warwick Priory in the 12th century for an order of canons. The establishment flourished until the dissolution of the monasteries by Henry VIII. Thomas Hawkins, a court favorite, acquired the property and remodeled it as a home about 1568.

Many owners succeeded Hawkins. Finally, in 1925, wrecking crews leveled the historic pile. Its stones and beams were carefully salvaged and sold to the late Alexander Weddell. He obtained many of the priory's doors, panels, and staircases from antique dealers, to whom they had been sold. Later he used the venerable materials in building this gabled Tudor-style mansion in Richmond. Today it is owned by the Virginia Historical Society (page 798).

One of the weathered sandstone blocks (upper right) bears the coat of arms of Queen Elizabeth I. It was cut to commemorate her visit to Thomas Hawkins's home in 1572 (page 801).

National Geographic Photographers Robert F. Sisson, John E. Fletcher, and Donald McBain

house, had its outbuildings: kitchen, smokehouse, dairy, washhouse, coach house, stable, schoolhouse, and slave quarters. Servants and slaves learned all the necessary trades.

Plantation owners formed an aristocracy, a ruling class. Governor Alexander Spotswood of Virginia once complained to a superior in England that there was no one qualified to fill three vacancies on his council except members of a family which, with their relatives, already dominated it.

The planters developed a love of luxury and magnificence, copying their houses in part after the Governor's Palace and other fine buildings in Williamsburg. There were wastrels, gamblers, and ne'er-do-wells among the planters, but for the most part they were hard-working men of ingenuity, courage, integrity, and idealism. Their plantation duties were heavy and exacting.

Training Ground for Leaders

Planters believed in cultivating not only their lands but their minds. They acquired—and read—good libraries. Some employed tutors for their children; others sent sons and daughters to England to school, lest they "become barbaric in the wilderness."

The plantations served as excellent schools for training in public affairs. Each generation of youth learned not only to command but also to become adept at practical administration and the handling of men.

Young planters unquestioningly accepted civic duties; most of their public service was without recompense. First they became vestrymen, the vestry then being a local unit of government as well as the ruling board of a church; or they sat on the county court. Later they went to Williamsburg as Burgesses or, if influential, as Councilors.

Thus dynasties grew up which gave leaders to the Colonies when they became a nation. It was a proud, vigorous, brilliant, and public-spirited society, producing men of the stamp of George Washington and Thomas Jefferson.

My first visit was to Shirley, on the east bank of the James. This is one of the least changed and restored of the mansions. Shirley is open to visitors the year round (except Sundays), but it would be hard to find another distinguished old house so devoid of showplace atmosphere. Its haunting charm, once sensed, is never forgotten.

Shirley has been owned by the Carter family for about two and a quarter centuries and probably has operated as a farm even longer.

Young Hill Carter, the present owner, is of the ninth generation of Carters. He farms 800 acres, raising cattle, sheep, hogs, hay, and soybeans. Like his ancestors, he is a vestryman and also a county supervisor.

"Once you've lived by the river," he said, "you won't live anywhere else."

The best-known feature of the house is the "hanging" stairway, a 3-story spiral of carved walnut that mounts—apparently without support—in a flowing, sweeping manner that gives the feeling of motion.

Cradle Rocked Infant Lee

Near the foot of the famous stairway is a cradle which, I was told, once held the infant Robert E. Lee. Lee was born in the family home, Stratford, but the Confederate leader's mother took her young children to Shirley, her girlhood home, as often as possible.

Charles Willson Peale's famous portrait of George Washington on the battlefield of Princeton formerly hung in the hallway. Mrs. James Harrison Oliver, former owner of the house and cousin of the present owner, sold it to John D. Rockefeller, Jr., and it now graces the colonial Capitol in Williamsburg.

A story good-humoredly passed around among the first families of Virginia tells of a visitor who once commiserated with Mrs. Oliver, a Carter before her marriage, for being obliged to sell the valuable portrait.

"It really didn't matter," she replied. "After all, General Washington wasn't a member of the family."

In a house as old and noteworthy as this, fire is the worst hazard. A blaze started in 1944, but so much apparatus came from Richmond and near-by places that no serious damage was done. Douglas Southall Freeman, the distinguished biographer and former newspaper editor, alerted the countryside by radio.

The estate dates from 1613 and was owned by Thomas West, third Lord De La Warr, and his three brothers. Its name commemorates Lady De La Warr, daughter of Sir Thomas Shirley (Sherley).

The house, loftiest on the river, is square-built to the world. Most of the paneling, doors, transoms, furniture, silverware, and portraits are original.

Builder's Grandson Our 9th President

A few miles from Shirley stands Berkeley, historic home of the Harrison family.

Berkeley was built in 1726, six years before the birth of George Washington, as attested in the brickwork by the date and initials of the builder, Benjamin Harrison, and his wife, Anne Carter.

This early Virginian's son and namesake signed the Declaration of Independence, served as Governor of Virginia, and sired a son, William Henry Harrison, who became the ninth President. A later Benjamin Harrison, Ohio-born great-great-grandson of Berkeley's

Berkeley, Ancestral Home of Two Presidents, Opens Its Gate to Garden Week Visitors

A member of Virginia's distinguished Harrison family built Berkeley in 1726. William Henry Harrison, our ninth President, was born in the Georgian-style mansion. His grandson, Ohio-born Benjamin Harrison, became the 23d President. Among their ancestors at Berkeley were an attorney general of colonial Virginia and a signer of the Declaration of Independence. Malcolm Jamieson, the present owner, has carefully restored house and grounds.

Berkeley, open daily throughout the year, stands above the James River near Charles City, Virginia. Boxwood lines the path leading to a landward door. The sign invites visitors to a luncheon at near-by Westover Church.

Garden Pilgrims Stroll Toward the Columned Entrance of Upper Brandon, Stately Product of Ante Bellum Virginia

William Byrd Harrison built the center section in 1820. The wings were added about 1890. An observation platform tops the roof.

Upper Brandon's Breezy Hall Spells Charm and Comfort

Virginia's early colonists staked out vast estates along the James. Waxing rich from tobacco, their descendants built handsome mansions fronting the river. Each of these remote homes developed a little village of dependencies, shops and slave quarters where artisans fashioned life's necessities.

Sprawling Upper Brandon plantation in Prince George County was once a part of neighboring Brandon (page 795). The latter preserves its village identity with a post office that serves both estates.

Mr. and Mrs. Harry C. Thompson, who purchased Upper Brandon in 1948, repainted the interior but left the mansion virtually unchanged (opposite).

Here Martha Clarke Robertson, granddaughter of the owners, romps with guests while her mother (standing right) watches. Close examination of the staircase railing would reveal saber cuts inflicted by Union troops in the Civil War. Paneled wainscoting is original. Hand-carved woodwork decorates a doorway (background left) and archway pillars (left and right).

Kodachromes by National Geographic Photographers Robert F. Sisson, John E. Fletcher, and Donald McBain

  Kodachromes by National Geographic Photographers Robert F. Sisson, John E. Fletcher, and Donald McBain

Brandon's Walls Knew the Gossip of Colonial Dames; Modern Belles Talk of Fashion

Shooters Hill, built in 1936, stands seven miles west of Richmond on an estate that once belonged to neighboring Tuckahoe plantation, a 17th-century patent. Architect Duncan Lee designed the house in 18th-century style with an eye to 20th-century living. Here party-bound young ladies descend the graceful spiral staircase.

Keswick Shares Its Colonial Heritage with the Public

Charles Clarke acquired Keswick estate early in the 18th century. A son built the two-story frame house about 1730. It stands on the south side of the James in Powhatan County west of Richmond.

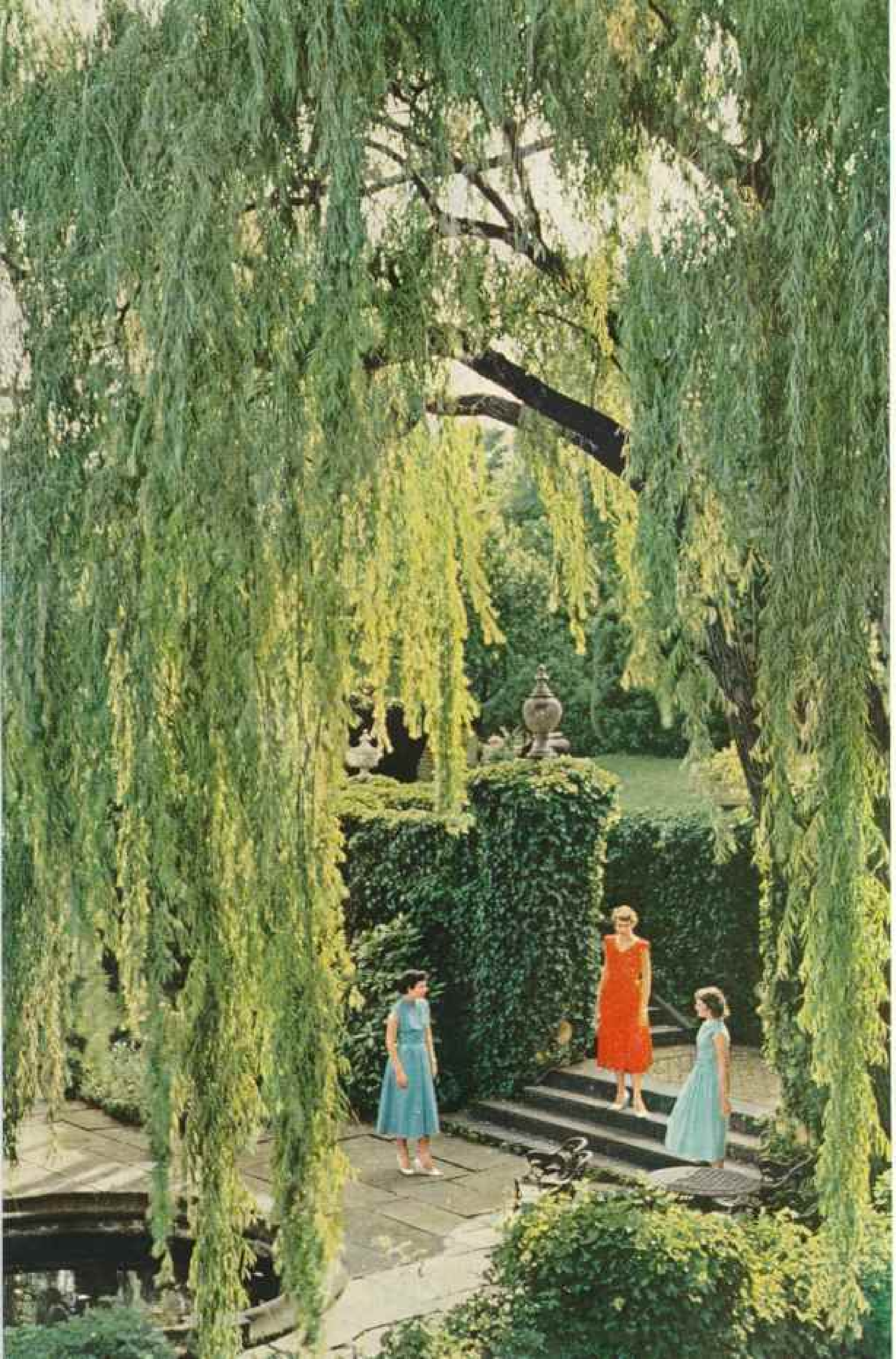
Several of Keswick's outbuildings date from 1742. One is a two-story brick dwelling, the original Clarke home. Iron bars, built for protection against Indians, still enclose the windows.

Mr. and Mrs. John W. Russell, the present owners, open Keswick to the public during Virginia's annual Garden Week, the last in April. Boxwood adjoins house and drive.

Riverview Garden Flaunts Its Blooms

Handsome Riverview (background) was built in 1860 near Charles City, Virginia. General McClellan used the mansion as a signal headquarters in his advance on Richmond.

Mr. and Mrs. Arthur J. Sackett, Riverview's owners, believe the serpentine wall is more than a century old. It encloses a formal garden. Azaleas bloom along the wall. Dwarf boxwood bordering the path shields nodding tulips.



builder, became the 23d President, serving from 1889 to 1893.

Fishing methods used today off Berkeley differ little from those used by the Indians, according to its present owner, although sturgeon no longer spawn on the flats.

"The shad still run in the spring," said Mr. Jamieson. "For two or three months several rowboats, two men to a boat, work from the fishhouse at Berkeley. Working at night, when the tides are right, the boats drag their drift nets, each net lighted by torches. From the house this is an attractive sight. Trucks take the shad to Richmond."

Mr. Jamieson raises beef cattle and sheep and grows boxwood on a large acreage. He showed me one field containing 15 or 16 thousand of the diminutive trees.

Berkeley, known as Harrison's Landing during the Civil War, was an important embarkation point for the Army of the Potomac.

President Lincoln visited Gen. George B. McClellan at the landing, and the General handed the President the so-called "Harrison's Landing Letter," an important document outlining to Lincoln the General's ideas, political and military, for prosecution of the Civil War.

After the Harrison family gave up ownership of the plantation more than a century ago, it passed to a succession of owners. Its handsome old brick was painted over and its graceful symmetry hidden by a large porch.

Mr. Jamieson has carefully restored the house. Paint was removed, and visitors may see how colonial masons tooled the mortar lines between the bricks to provide a play of light and shadow on the joints and brick edges. These artisans also took pains to use mortar of a color which would enhance that of the brick. Both house and garden are open to visitors the year round (page 791).

Westover, an Architectural Gem

Two miles from Berkeley is Westover, described as the "emerald clasp of the golden necklace of the James." It is perhaps the most impressive single symbol of Virginia's colonial grandeur (page 788).

The river frontage is superb; magnificent trees dot the spacious lawn between mansion and river. In the renowned boxwood garden is the grave of the mansion's builder, William Byrd II. The wrought-iron gates swing from pillars surmounted by massive balls upon which perch life-size eagles with wings half spread as if poised for flight.

Of all the colonial houses I have visited, Westover seems most to exude mystery, with its hidden room under the house, its subterranean passages, and its ghost stories, especially those that concern Evelyn, unmarried daughter of William.

"Evelyn was supposed to have made a compact with her friend, Elizabeth Harrison of Berkeley, to come back after death, but in a way not to frighten her," Mrs. Bruce Crane Fisher, present owner of Westover, told me with a smile. "Strangely enough, the four or five persons who claim to have seen her in our time have all commented that they were not frightened.

"One of the maids has reported to me that she has seen the figure of a woman, once walking in the garden and again in a near-by cottage at night.

"A previous owner declared his fright at seeing a man in ruffles and wig."

Virginia Remote as the Moon

Byrd, one of the wealthiest and most powerful of the land-owning grandees, was tremendously active. He not only looked after vast estates and held public office; he almost invariably read Greek and Hebrew in the original before breakfast.

On a visit to England, William Byrd II courted a young lady, the "Sabina" of his letters. To her father he wrote: "The estate I have tho it lye so far off as Virginia, is very considerable I have there about 43,000 acres of land 220 Negros at work upon it." His hopes were dashed when Sabina quoted her father's response that "an Estate out of this Island [England]" seemed "little better than an Estate in the moon."

Grounds and gardens at Westover can be seen daily. The house, occupied by Mrs. Fisher and her children, is open only during Historic Garden Week, at the end of April.

One of the great houses near Williamsburg is Carter's Grove, four miles to the southeast. Framed by giant tulip poplars, the house stands at the top of a magnificent series of terraces, or falling gardens, looking down across woodland and meadow to the shining river.

From the highest terrace I looked away to a distant pasture where a large herd of cows grazed. Clearly, Carter's Grove was not merely a showplace or palace.

Cattle ranching, Virginia boasts, began not in Texas but in the Old Dominion, and Carter's Grove, like so many other historic plan-

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Ektachromes by National Geographic Photographers Robert F. Sisson, John E. Fletcher, and Donald McBain

A Weeping Willow Frames Visitors in the Garden of Virginia House

Built of materials salvaged from England's Warwick Priory, Virginia House stands above the James in Richmond. Once a private home, it is now owned by the Virginia Historical Society. Mansion and terraced grounds comprise one of the Old Dominion's showplaces (pages 789 and 801).

tations, is a working farm. Two women—a daughter of Mrs. Archibald McCrea, the owner, and a friend—give all their time to raising livestock and crops.

The glory of Carter's Grove is the beauty of its great hall and the elegance of the series of formal paneled rooms extending the full length of main building and wings. Elaborate paneling was fashioned from the oak, walnut, and pine surrounding the house.

Where Girls Said "No"

Legend has it that George Washington proposed to Mary Cary and Thomas Jefferson to Rebecca Burwell in one of the parlors. Since each answered "No," the scene of the rejection is now dubbed the "Refusal Room."

Mrs. McCrea, when asked about it, said, "I tell pretty young ladies when they enter the room not to allow their favorite young men to come with them!"

Rebecca, a niece and ward of the original owner, apparently did refuse the youthful Jefferson. He called her "Belinda" and many other fancy names. Washington admired Mary Cary, but the evidence is that he liked her married sister, Sally, even more.

Carter's Grove was built between 1751 and 1753 by Carter Burwell, grandson of Robert "King" Carter, aristocrat and landowner extraordinary. Through intermarriage the Carters became "cousin" to most other plantation-owning families.

Since 1927 Mrs. McCrea has put her heart and soul into preserving Carter's Grove. "I am nothing but a reflection of it," she told me. "It must not die."

Carter's Grove can be seen by the public only on certain occasions when Mrs. McCrea opens it for charity. But 5,000 servicemen were entertained there during World War II.

One poetic visitor described the house in the guest book as "beloved bride of Time, whose understanding, gentle hand caresses what it touches. Love is here, and strength and dignity and quiet worth."

From Jamestown a ferry bore me across the broad estuary of the James, as beautiful in early-morning light as in the sunset's glow.

A few miles north of Surry is Four Mile Tree, one of Virginia's few remaining 17th-century plantation houses. Like others of that pioneer era, it is small and unpretentious in contrast with the more numerous 18th-century mansions. The estate, now owned by C. E. Carter, evidently was named for a tree which was an early boundary marker.

Beyond Surry, on the way to Richmond, I turned off to Brandon and Upper Brandon, two of the largest river plantations. Once they were a single establishment.

Lying in a great bend of the James, the two plantations have a river frontage of 12¼ miles and with adjoining plantations form a huge unofficial game preserve.

Harry C. Thompson, Upper Brandon's owner, told me that 8,000 to 10,000 Canada geese winter on this stretch of the James. Mrs. Thompson drove us to see the 1,200-acre duck-hunting marsh. On the way we passed several of the 20 traps set to catch deer alive for shipment to game-deficient areas.

As many as 123 deer have been seen feeding in a single winter grainfield in Brandon. Quail, opossums, raccoons, and a few wild turkeys also roam the estate.

The garden at Brandon is one of the most remarkable and beautiful in Virginia. Giant hardwoods, oversize boxwood, old-fashioned shrubs, a 300-year-old pecan tree, and the unchanged formality of design, all testify to many generations of protection and cultivation.

Design Credited to Jefferson

The oldest of the buildings at Brandon was originally erected as a blockhouse to fight off Indians. Relatives of the Harrisons of Berkeley owned the plantation for 200 years until 1926, when it was bought by the late Robert W. Daniel.

The design of the central portion of the house is attributed to Thomas Jefferson, a friend of the Harrisons. Jefferson, of course, was deeply interested in architecture and liked to help his friends with their buildings.*

When Mr. Daniel restored the house, a gold wedding ring fell to the floor of a parlor as workmen removed plaster. Jewelers dated the ring as of the early 1700's, but no one knows its story. Was it cast off by a disillusioned bride or was it treasured by an aged spinster as a symbol of an unfulfilled hope?

Whatever the explanation, the room from whose chandelier the ring now hangs is supposed to be haunted by the ghost of the former owner.

Brandon's many rooms are bright and luxurious (page 795). One of the dependencies is now used as a lounge and playroom; behind it lies a modern swimming pool.

"No estate like this can be justified as a showplace only," Mrs. Daniel, the owner, remarked to me. "Once there was a racing stable here; in those days, pleasure was the owner's purpose. Now, though it continues to give pleasure, Brandon is a working farm."

Of 5,000 acres, 2,200 are planted in corn, oats, wheat, barley, alfalfa, and clover. Dairy and beef cattle are raised. One of the earliest American farms, Brandon now is operated according to modern farm techniques.

* See "Mr. Jefferson's Charlottesville," by Anne Revis, National Geographic Magazine, May, 1950.

National Geographic Photographers Robert F. Sisson and John E. Fletcher

England's Good Queen Bess Once Climbed These Stairs, Now a Part of Virginia House

Carved oak staircase and paneling, like other materials in Virginia House, came from Warwick Priory. Queen Elizabeth trod the steps on a visit to the priory in 1572 (page 789). Armor (left) dates from the 17th century.

Mrs. Daniel finds it a full-time job just to supervise operations.

"It is strange," she said, "how many of these places up and down the river fall into the hands of women. Mrs. Harrison ran Brandon for 60 years."

The Brandon garden and grounds are open daily and Sunday; the house during Garden Week.

At Upper Brandon, Mrs. Thompson received me in suitably rough outdoor clothes. An unsophisticated visitor once remarked to her: "I reckon you call this one of those southern mansions?"

"Yes, if you want to," Mrs. Thompson replied.

"I reckon *you* don't live here," concluded the visitor.

Upper Brandon is heavily timbered with beech, willow oak, and magnolia. Its trees, spaciousness, and magnificent river frontage make it a rare place (pages 792 and 793).

The house farthest west on my tour was Tuckahoe, boyhood home of Thomas Jefferson. Tuckahoe, about eight miles west of Richmond, is one of the oldest of the James River plantations and one of the least changed, although very likely it was built at least 20 years before Richmond was founded.

The house was probably erected by Thomas Randolph, son of William Randolph of Turkey Island, and was owned and occupied for more than 100 years by a branch of the Randolph family. Jefferson's mother was a Randolph.

Considerably run down after nearly 70 years out of the family, Tuckahoe was purchased in 1898 by members of the prominent Coolidge family of Boston, direct descendants of Thomas Jefferson. In 1935 it was bought by Mr. and Mrs. N. Addison Baker.

"One of my most prized family possessions," a member of the Coolidge family said, "is the Greek grammar that Thomas used in school at Tuckahoe."

The little building in which Jefferson studied his lessons from age five to nine still stands. The traditional plantation scheme of dependencies and servants' quarters has survived almost intact at Tuckahoe.

H Shape Promotes Hospitality

Although Tuckahoe contains fine interior woodwork, it is, in the main, a plain, simple structure compared with the stately elegance of Carter's Grove, Westover, and Brandon. It has, nevertheless, a quaint, ingenuous charm of its own, for here the feeling is of the 17th as well as of the 18th century.

An unusual feature is the H-shape construction, two entirely separate and complete houses connected by a great hall, or saloon (not salon), originally a ballroom.

As early as 1779, guests commented on how the construction lent itself to hospitality —one wing for family and the other for guests. Another famous example of H construction is the Lee homestead, Stratford.

The boxwood maze at Tuckahoe contains such a wealth of old-fashioned dwarf boxwood that, if planted in a continuous row, it would extend for one and a half miles.

Although Mrs. Baker generously admits architects, students, and others especially interested in Tuckahoe, house and gardens are open to the public only in Garden Week.

Keswick, another plantation west of Richmond, still preserves circular slave quarters, where bunks for the bachelor slaves hung from the interior brick periphery (page 796).

Old Homes Moved to New Sites

On Richmond's western edge is an attractive modern residential development, Windsor Farms, where many fine homes stand on the wooded bluffs above the James. Among the new residences, curiously enough, are several very old homes of architectural and historic interest. They were moved, or rebuilt from materials moved, from other parts of Virginia and from England. Destruction threatened these houses on their original sites or encroaching industry rendered them forlorn. An outstanding example is Virginia House. (See pages 789, 798, and 801.)

Overlooking the James River from a high bluff west of Windsor Farms is Burleigh, a reproduction of a Virginia house of the Queen Anne period. It is owned by Mr. and Mrs. Wirt Peebles Marks, Jr., and is furnished throughout with fine American antiques of the Queen Anne and Chippendale periods.

Between bluff and river runs the historic James River and Kanawha Canal, an important artery of traffic during the post-Revolutionary period. The canal towpath, which once felt the plodding hoofs of oxen, now serves as the right of way for the Chesapeake and Ohio Railway, carrying freight to Newport News for export.

To visit and describe all the time-mellowed and restored plantations up and down the James River, much less all the 250 homes and gardens which are open in Garden Week, is naturally impossible. Yet nearly every one has its own distinctive appeal.

Since 1929, Garden Week admission fees have been used to restore authentic form and beauty to grounds and gardens of historic homes and shrines throughout the State.

In persuading so many owners to open their homes and gardens to the public during the last week in April, the Garden Club of Virginia has helped to teach many a lesson in patriotism.

Founders of New England

Centuries after the Pilgrims and Puritans, an Englishman Seeks Forgotten Shrines in His Homeland and Theirs

By Sir Evelyn Wrench

With Illustrations by National Geographic Photographer B. Anthony Stewart

As my wife and I drove along a drowsy east-coast road, we passed a signpost directing wayfarers to New York and Boston. When we reached New York, its two streets were deserted. The residents must have been in their fields or indoors preparing a midday meal. The only sign of life was a solitary black cat.

We were not in the United States, but in historic Lincolnshire, England's grain-producing "breadbasket." As we drove on to Boston, one village after another reminded us of namesakes in New England. The countryside itself was not much different from landscapes I remembered in Massachusetts.

More than 300 years after Pilgrims and Puritans set sail for a New World wilderness, I was following their faint time-drifted footprints in the country they left behind.*

Capt. John Smith Named New England

"This Virgins sister called New England" was how the redoubtable and irrepressible Capt. John Smith referred to the territory which so attracted him when he sailed along its coast in 1614. He adds that it was named New England at his "humble suit by our most gracious Prince Charles" (subsequently Charles I).

In the minds of most of us, Smith's name is usually associated with Virginia rather than with New England; yet the future of this more northerly region occupied his thoughts during the last decades of his life (pages 760, 765).†

A New England historian has written that in no part of England did he feel so much at home as in our eastern counties of Suffolk, Essex, and Norfolk. That observation has been confirmed by countless Americans, including United States airmen stationed at the bomber bases in eastern England.

The full significance to Americans of this quiet countryside which looks out across the North Sea to Flanders is a matter of more than surface resemblance. Here, hallowed by centuries of occupancy, are villages named Hingham, Framlingham, and Dedham, and ancient Norwich (pages 819, 821, and 829). In the parish registers and mossy cemeteries of slumbering English towns one finds names with a familiar American ring: Bradford, Brewster, Winthrop, Eliot (map, page 805).

Englishmen, usually eager to enshrine the names and graves of their memorable dead, have but recently turned their attention to these one-time strongholds of Puritanism. Even today, few markers commemorate the fact that it was from eastern England that many of New England's founders came.

Perhaps the growing knowledge that Massachusetts was not wholly unlike their familiar surroundings helped prompt these courageous men and women to carry English speech and English ways across the Atlantic in their search for religious tolerance.

The landing at Plymouth in 1620, marking the beginning of successful colonization in New England, stands also at the end of a long period of discovery. By the time the *Mayflower* sailed from Plymouth quay with its 102 hopeful Pilgrims, the groundwork had been established for the unique role of the English in the founding of New England.

One is sometimes tempted to believe that Columbus had the equivalent of a 20th-century public relations man working in his behalf, so completely have his voyages overshadowed those of his contemporaries. Actually, Columbus did not see the mainland of North America until 1502, on his fourth voyage. Apart from the uncorroborated landings of Norsemen in the 11th century, the first to set eyes on the North American mainland were men of the Bristol ship *Mathew* in 1497, led by the Genoese navigator, John Cabot. He may have gone as far south as Maine (pages 756 and 757).

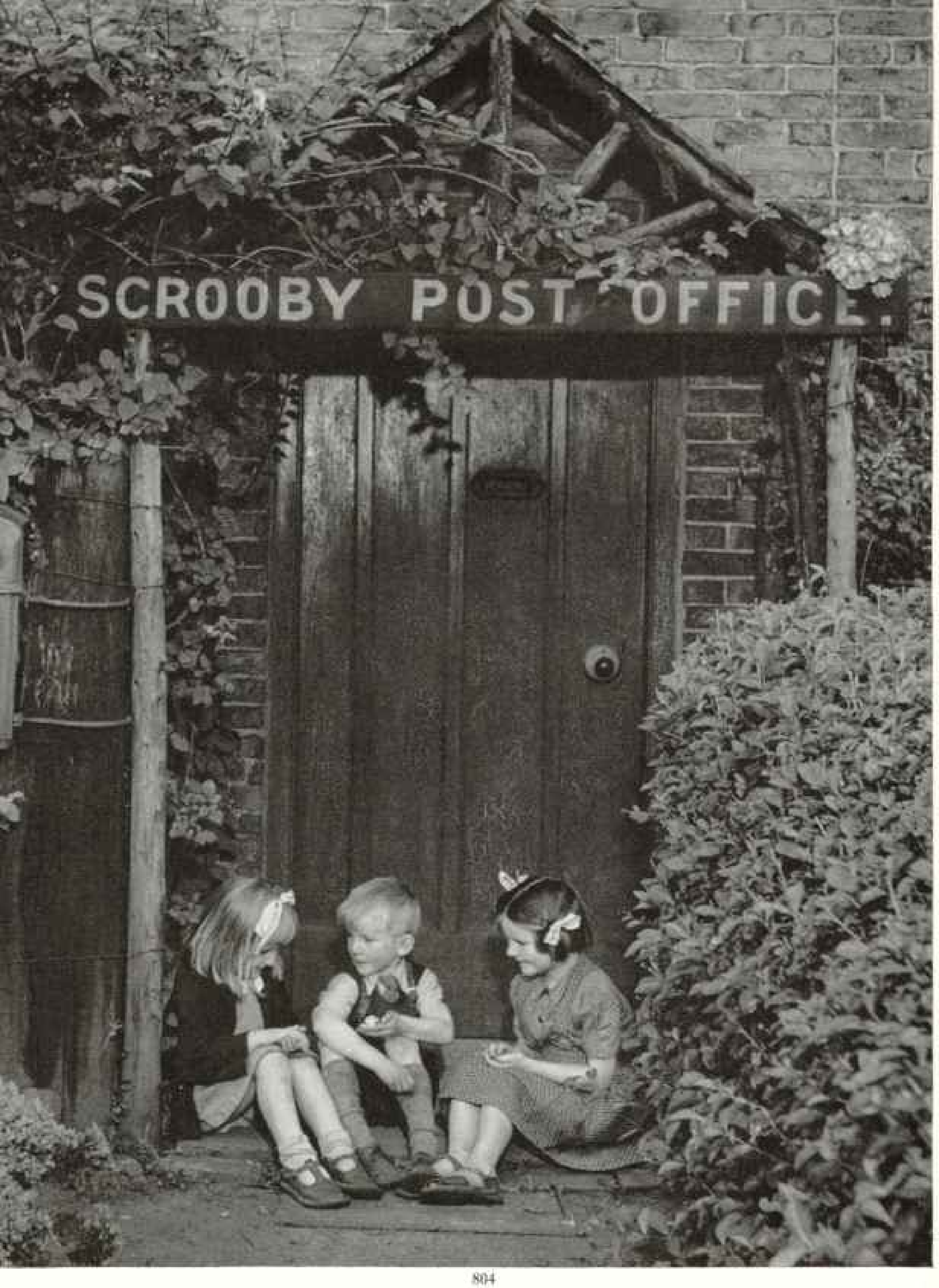
Explorers Caught Codfish in Baskets

As Cabot sailed along the shore of Newfoundland, he found codfish so plentiful that they could be scooped up in baskets. Upon his return to England he informed his Bristol employers that he had reached the country of the Grand Khan, for, like Columbus, Cabot believed the world to be much smaller than it actually is and assumed that the next continent to the west must be Asia.

There are those who claim that the name "America" itself was not derived from that of

* See, in the National Geographic Magazine: "Land of the Pilgrims' Pride," by George W. Long, August, 1947; and "Pilgrims Still Stop at Plymouth (England)," by Maynard Owen Williams, July, 1938.

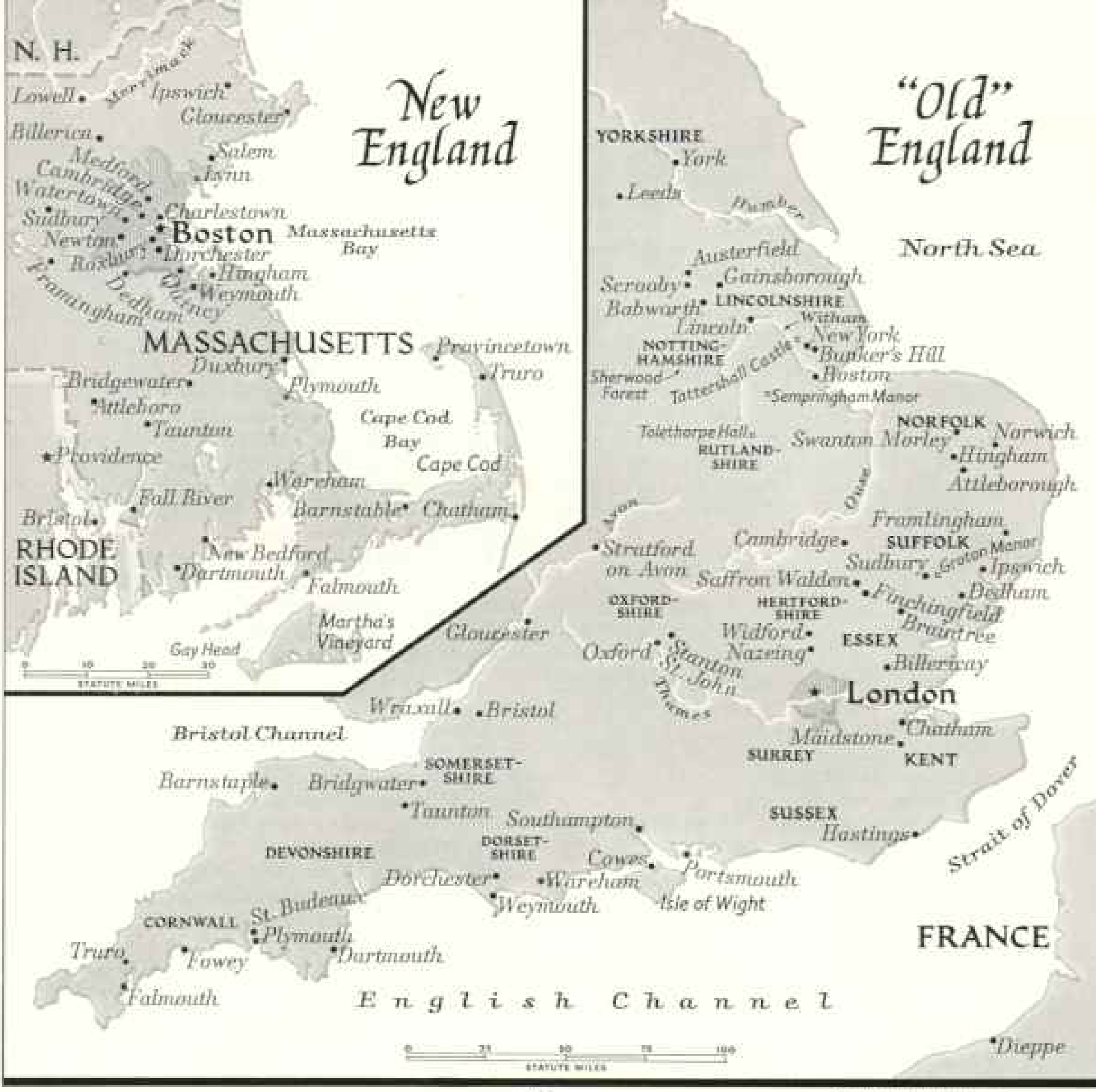
† See "Founders of Virginia," by Sir Evelyn Wrench, National Geographic Magazine, April, 1948.



804

William Brewster, a Leader of the *Mayflower* Pilgrims, Served as Scrooby Postmaster

In this "meane Towtlet," in England's Pilgrim Land, Elder Brewster developed Puritan beliefs which led him to the New World (pages 815, 818). His descendants included Henry Wadsworth Longfellow and Zachary Taylor.



805

Drawn by Irvin E. Alleman

Drowsy Towns in the Mother Country Share Names with Bustling New England Upstarts

Homesick settlers gave familiar names to their colonial villages. Barnstaple became Barnstable, Framlingham became Framingham; but Boston, Plymouth, and scores of other names came over unchanged.

the Italian navigator Amerigo Vespucci, but rather from the Englishman Richard Amerycke, Sheriff of Bristol. In his capacity as Bristol customs official he paid Cabot the pension of £20 granted him by Henry VII for his discovery of the mainland of North America. What could be more natural, Bristol folk ask, than that Cabot, seeking a name for his landfall, should have thought of his powerful sheriff friend? Of course the weight of evidence is heavily to the contrary.

Between Cabot's discovery and the landing at Plymouth, more than 40 voyages were made to the New England coast. Most of them gave Englishmen their first sight of the New World. The crewmen of one, captained by George Waymouth and partly financed by Shakespeare's friend Henry Wriothesley, Earl of Southampton, kidnaped five "Salvages" in 1605 from the Maine coast.

These Indians were not the first to be lured aboard vessels and taken to England as "evidence" of New World discoveries. A voyage in 1502 returned to Bristol with "three men brought out of an Iland forre beyonde Irelond, the which were clothed in Beestes skynnes and ate raw fflessh and were rude in their demeanure as Beestes."

Walked 3,000 Miles for Help

The first Englishman to traverse New England on foot, so far as I am aware, was one David Ingram. In 1568 Ingram completed one of the most remarkable walks in history.

Together with about a hundred others, he was dumped ashore near present-day Tampico, on the Gulf of Mexico. With two companions, he made his way by land to a point near present-day Saint John, in New Brunswick, Canada, where he was found by a French trader.

Unfortunately, Ingram's account of the journey, written years later, exceeded even the bounds of 16th-century credulity. Today historians accept as fact the main elements of his narrative, but discount such passages as a description of elephants "twise as big as an Horse . . . [with] two teeth or hornes of a foote long growing straight foorth by their nosethrilles" which he claimed to have encountered.

Pilgrims Brought No Fishhooks

James I, during whose reign the first successful New England colony was established, had a streak of shrewd common sense. When the application of the Pilgrim Fathers to settle in the New World was placed before him, the King asked very sensibly:

"What profits may arise in the parts to which they intend to go?"

"Fishing," was the reply.

"So God have my soul, 'tis an honest trade! 'Twas the Apostles' own calling."

The Pilgrims, if they ever recalled the King's words, probably regretted that they did not pay more attention. Apparently they landed at Plymouth without fishing tackle.

The same thrift which prompted the Plymouth colonists to forego the luxury of hooks and lines made itself felt in their one contact with Capt. John Smith. He had offered himself as pilot for their trip to New England. The offer was turned down "to save charges," wrote Smith somewhat acidly (page 765).

Boosters Who Never Crossed the Sea

Curiously, several of the men most influential in the early affairs of New England never crossed the Atlantic.

Robert Browne was one of these all-but-forgotten actors in the Pilgrim drama. The founder of the Brownists, he became a fiery advocate of the right to worship without interference from the State. Had these Separatist views of his not been circulated, the *Mayflower* might never have sailed.

Browne's unpopular preachments landed him in prison repeatedly. He was freed several times through the influence of William Cecil, Lord Burghley, a distant relation.

Robert Browne was born at Tolethorpe Hall, in tiny Rutlandshire, almost at the center of England. On one of our visits to the homes and graves of New England's founders, my wife and I took tea with the present occupant of Tolethorpe, who has lived there for 20 years.

We found the austerity of postwar Britain at work in this quiet corner of England, too. Owing to the impossibility of getting domestic help, our hostess was faced with the prospect of leaving her old home. Temporarily she was keeping things going with the help of a "nanny" who had been with the family for a quarter of a century

To run an old-fashioned English home practically unaided is a heartbreaking task. A social revolution has taken place in our country during the last two decades; it is sad to visit so many historic old homes and find that the families to which they belonged are now unable to live in them.

In our wanderings we found only two or three houses still occupied by descendants of New England's founders. For the most part they stand empty, or house institutions or Government departments.

Progress Threatens College "Backs"

No one familiar with American history can stroll along the "Backs" of the Colleges of Cambridge—apparently threatened recently by a Ministry of Transport proposal to turn Queen's Road into a main highway—without being strangely moved.

Here we are at the very birthplace of New England, where the ancient mother begat her lusty child. Robert Browne took his degree here at Corpus Christi College in 1572 and went forth to proclaim the belief that man should get into direct contact with his Maker without human intervention.

If the temporal history of New England began with the explorations of Cabot and Capt. John Smith, its spiritual counterpart can be traced to Cambridge and Robert Browne, the "founder of Congregationalism."

Later comers, too, carried Cambridge learning from England. John Robinson, beloved pastor of the Pilgrims during their first "exile" in Holland, studied at Corpus Christi, and Roger Williams, founder of Rhode Island, at Pembroke College.

Emmanuel College holds a particular place of honor in our record. Queen Elizabeth, alive to the latest gossip, remarked to Sir Walter Mildmay, its founder:

"So . . . you have erected a Puritan foundation?"

"No, Madam," replied Sir Walter, "but I have set an acorn which, when it becomes an oak, God alone knows what will be the fruit thereof."

Canny Queen Bess had gone to the heart of the matter. Emmanuel College became a major instrument in the spread of Puritan doctrine.

Kodachrome by National Geographic Photographer B. Anthony Stewart

From This Quay the *Mayflower* Carried Plymouth's Name to Two Dozen Daughter Towns

A *Mayflower* Model Hangs in Church at Boston, England

Boston, Lincolnshire, in the 13th century rivaled London as England's leading port. Today it is a quiet fishing and shipping town of 29,000, far outgrown by its Massachusetts namesake. The name Boston (from Botolph's Town) honors St. Botolph, a Saxon monk.

Cells still in the city's Guildhall imprisoned leaders of the *Mayflower* Pilgrims when they were captured in an early attempt to flee the country. A tablet in the church tower (opposite) lists five British Bostonians who became governors of Massachusetts.

Cotton Chapel, a part of the church, is named for John Cotton, vicar of St. Botolph's (1612-33), who became new Boston's spiritual leader. The chapel has been restored by American Bostonians.

An Air Force pilgrim from the United States signs the Mayor's guest book in old Boston. His visit was one of many arranged by the English-Speaking Union.

Kodachromes by National Geographic Photographer B. Anthony Stewart

Boston's Noble Lantern Tower Witnessed a Pilgrim Attempt to Escape to Holland

Betrayed by their ship captain, the Pilgrims were imprisoned. Freed, they reached Amsterdam the following year, 1608. The 15th-century tower, 272 feet high, is called Boston Stump because of its blunt look from afar. Its lantern once held a beacon to guide ships. Low tide on the River Witham strands fishing boats.

Queen Elizabeth, Riding Sidesaddle, Reviews Her Guardsmen Trooping the Colour

With pageantry typical of this coronation year, Elizabeth celebrated her first official birthday as England's Queen. The time-honored ceremony began with a procession from Buckingham Palace to the Horse Guards Parade. Elizabeth was the first queen ever to ride in it on horseback. Her insignia identify the Queen as Colonel-in-Chief of the Scots Guards. Under her namesake, Elizabeth I, Englishmen founded Roanoke Island's Lost Colony in 1587.

Kodachrome by National Geographic Photographer B. Anthony Stewart

Her Majesty's Household Cavalry and Foot Guards March with Clocklike Precision

So complex is Trooping the Colour that standing orders take 24 pages to outline the positions and commands. Traditionally taking part are the Household Cavalry, including Life Guards (white plumes) and Royal Horse Guards; and the Foot Guards regiments—Grenadier, Coldstream, Scots, Irish, and Welsh. Guardsmen rehearse for weeks to ensure a smooth performance on the Queen's official birthday in June (her real birthday is April 21).

Bobby Protects His Eardrums from Crier's Bell and Bellow

Town criers from England, Wales, and Scotland gather each year for a national championship contest. Competitors are judged on uniforms as well as volume and clarity. Here one tries the test proclamation: "Oyez! Oyez! Oyez! To all loyal subjects of Her Majesty the Queen here assembled . . ."

Criers Flex Their Leather Lungs, Strain Throats and Tongues

Common long ago, criers are now found in Britain mainly in resort towns, where they proclaim local events, distribute handbills, and attend municipal functions. The 1952 criers' contest was held in Hastings, Sussex. Winner was Ben Johnson (second row right, with medals), who journeyed from Fowey, Cornwall.

Kodachromes by National Geographic Photographer B. Anthony Stewart

London's Coronation Route Leads Along Whitehall from Westminster Abbey

The Abbey (lower left) points to Westminster Hall (right), one of the Houses of Parliament. Parliament Square is green with grass. Beyond, Whitehall curves past Treasury, War Office, and Admiralty to Charing Cross.

Rural Craftsmen Practice Old Skills: A Cottage Gets a Roof, Dobbin a Shoe

Roof thatching went to New England with the earliest colonists. A Bristol record dated 1626 shows that one John Morgan placed himself as apprentice to a New England carpenter. For seven years' work he was promised 25 acres of land in the New World. Here an apprentice thatcher learns to trim new straw on a Herefordshire cottage. When his training is complete, he may become one of nearly 900 master thatchers in England and Wales. Properly laid, the thatch will last 15 to 25 years. Below: A Hereford apprentice blacksmith fits a horseshoe.

One of the best-known graduates of Emmanuel—a fruit of Sir Walter Mildmay's Puritan oak—was John Harvard, founder of Harvard College.

Emmanuel sent many pioneers to New England: Thomas Hooker, a founder of Hartford, Connecticut; Thomas Shepard, pastor of Cambridge, Massachusetts, apparently a friend of John Harvard; William Blaxton (Blackstone), first European to live where Boston now stands; Nathaniel Ward, author of *The Simple Cobler of Aggawam in America* and framer of the first code of laws in New England; Simon Bradstreet, who sailed with Winthrop; and many others.

My wife and I spent some happy spring days visiting the Colleges at Cambridge. The friendly porter at Emmanuel, wearing a top hat—a welcome sight to an old Etonian, for even at my conservative alma mater the "topper" is no longer compulsory—took us under his wing. He showed us the rooms named in honor of John Harvard.

We looked out on lawns alight with dancing daffodils. Fruit trees were blossoming, and we thought of Browning's words about the delights of being in England in April. An American and an English officer, both in uniform, wandered past us on a sightseeing tour.

Stratford Has New England Link

Stratford on Avon, 80 miles west of Cambridge, with its memorials to England's greatest dramatist, also has a connection with New England (page 833). Not far from the house in which Shakespeare was born is the half-timbered home of John Harvard's mother, Katherine Rogers. Presented to Harvard University in 1909 as a rendezvous for American visitors, the building is dated 1596. Appropriately, students of the American university are admitted free of charge. One of the treasures preserved in the house is Jefferson Davis's walking stick!

Next in our Pilgrim quest we moved a hundred miles northwest of Cambridge, to the Scrooby district. Here, clustered around the northernmost tip of Nottinghamshire, are the hamlets in which William Brewster and William Bradford (born at Austerfield across the Yorkshire border) developed the views which led them to set out for America in 1620. These were the boyhood haunts of the men who founded the first successful New England colony—the Pilgrim Fathers who sailed in the *Mayflower* to Plymouth (page 818).

Instead of starting at Scrooby village, I preferred going direct to the little church of Babworth on its wooded hilltop a few miles to the southeast. It was to Babworth Church that William Bradford and the Brewsters—William, Mary, and little Jonathan—used to walk from Scrooby and near-by Austerfield. Here they listened to the "grave & reverend preacher," Richard Clyfton, by whom they were so deeply stirred.

Clyfton is one of the few early Separatists whose appearance we can picture. He is described as a "good and fatherly old man, having a great white beard." He was then only fifty!

Though his teachings profoundly influenced the Pilgrim congregations of the Scrooby district in their growing determination to escape from persecution, Richard Clyfton was another of the founders of New England who never crossed the Atlantic. He died in 1616, during the self-imposed exile of his flock in Holland.

Search for an Elusive Key

The approach to Babworth is all that one's entry into Pilgrim Land should be. We left the main road and followed a path to the hilltop across a field of waving wheat.

On the locked door of the little church was a notice: "The key can be obtained from Babworth post office," from which we had just come.

Back we went, down a lane to the ivy-clad "village," which consists of two houses. The postmistress denied all knowledge of the key and said we should apply to the church custodian, who lived in the cottage on the other side of the road. Our banging on his doors aroused no one.

Two wayfarers suggested that we re-climb the hill and apply at the manor house. This time we were more fortunate. We pulled an old-fashioned bell in the back yard. Its clang reverberated through the building, to the apparent amusement of a friendly jackdaw perched near by.

We got our key and made our way again to the church—to find no tablet or marker whatever to inform the visitor that this forgotten corner of Nottinghamshire had played so important a role in the Pilgrim story.

Scrooby Is Heart of Pilgrim Land

Scrooby, like Babworth, accepts its fame with indifference. It was here that William Brewster succeeded his father as "postmaster," a job that also entailed supplying horses to travelers on the Great North Road (page 804).

All of Scrooby speaks to us of Brewster, who lived "in good esteem amongst his friends and ye gentlemen of those parts, especially the godly & religious."

Before leaving the heart of Pilgrim Land we stopped to see the old church at Austerfield, three miles away, where the record of William Bradford's baptism is preserved.

Gainsborough, our last call, is closely con-

nected with the Pilgrim story. Its congregation migrated to Holland ahead of the Scrooby group. It was to Gainsborough's market that young farmer Bradford took his cheeses and wool for sale, and William Brewster probably came there on market days to buy horses for his "post" work.

From Gainsborough we went south again, through Lincoln, to two namesakes of great American cities. We hoped to retrace along this route the first flight of the Scrooby congregation in its efforts to escape the "harryings" of King James.

We found Lincoln's soaring Gothic cathedral once again in possession of its copy of the Magna Carta—the finest of the four in existence (page 834). This is the document of freedom which so many Americans saw at the New York World's Fair in 1939-40. During the war the priceless rectangle of parchment was safeguarded in the Library of Congress in Washington, D. C.

It was in Lincoln during World War I that the first modern armored vehicles—dubbed "tanks"—were made secretly for trial on the Western Front.

New York to Boston: 8 Miles

From Lincoln my wife and I drove through New York's deserted main street and eight miles farther to Boston (page 826). It was from old Boston, on England's North Sea coast, that the congregation of Scrooby made its first attempt to escape to Holland and religious freedom.

Old Boston—the name is derived from "Botolph's Town"—has other links with the New World. In St. Botolph's Church a tablet reminds visiting Americans that five men connected with the town subsequently became governors of Massachusetts: Richard Bellingham, Thomas Dudley, Simon Bradstreet, John Leverett, and Francis Bernard (808, 809).

Another bond between the two Bostons is the fact that John Cotton was vicar here for many years before he crossed the Atlantic to become the "patriarch of New England."

In recognition of their debt, generous New England friends of old Boston in 1931 paid for the restoration of the tower of St. Botolph's Church—Boston Stump—and the recasting of its bells.

In the Guildhall we saw the trap door in the floor through which Elder Brewster and his companions emerged into the courtroom from cells below. They had been imprisoned for their first attempt to escape from England, in 1607. They had secretly boarded a vessel chartered to take them to Holland, but its captain betrayed them to the authorities. Lacking exit permits, they were promptly put in prison (page 832).

Fortunately for the history of Massachusetts, the Boston authorities eventually released their charges. In the spring of 1608, after great difficulties, the Scrooby congregation succeeded in reaching Amsterdam in a Dutch vessel.

The Scrooby Pilgrims spent twelve years in Holland. Then, partly for fear that their children might become confused in the welter of sects which throve on Dutch tolerance, they determined to seek a new home in the wilderness of America.

By the time the little group was finally aboard the *Mayflower* at Plymouth, England, with the permission of their King (if not with his blessing), the Pilgrims numbered 102 (page 807). Some of the newcomers were Londoners; others—among them John Alden—came from the eastern counties which were later to send so many colonists to New England.

The little Pilgrim band survived its first winter of terrible hardships to become the first permanent New England colony. But there were other hardy Englishmen not far behind them. During the next 10 years several small groups of settlers reached the coast before the arrival, in 1630, of the first really large-scale migration under John Winthrop.

Like Winthrop's 700 pioneers, who made up the Massachusetts Bay Colony, many of the smaller groups were Puritans, impelled out of England at least in part by religious dissensions.

Oddly enough, when the Pilgrims had secured their foothold at Plymouth under the guidance of the elders of Scrooby, they denied to others the very rights for which they had crossed the Atlantic. In their part of Massachusetts there was little room for anyone who would not conform to the nonconformity of the Separatists. Even the Puritans were outsiders.

Pilgrims Outraged by Merrymount

This strictness makes all the more remarkable the goings-on at Merrymount, 30 miles away.

In 1625 Thomas Morton—lawyer, of Clifford's Inn, London, and reputedly an Oxford graduate—settled at Mount Wollaston (now Quincy), Massachusetts. Later, when most of his fellows moved to Virginia, Morton took the leadership of the colony and renamed it "Ma-re Mount"—Mountain by the Sea. The strait-laced Pilgrims, with reason, chose to understand the name as "Merie Mount."

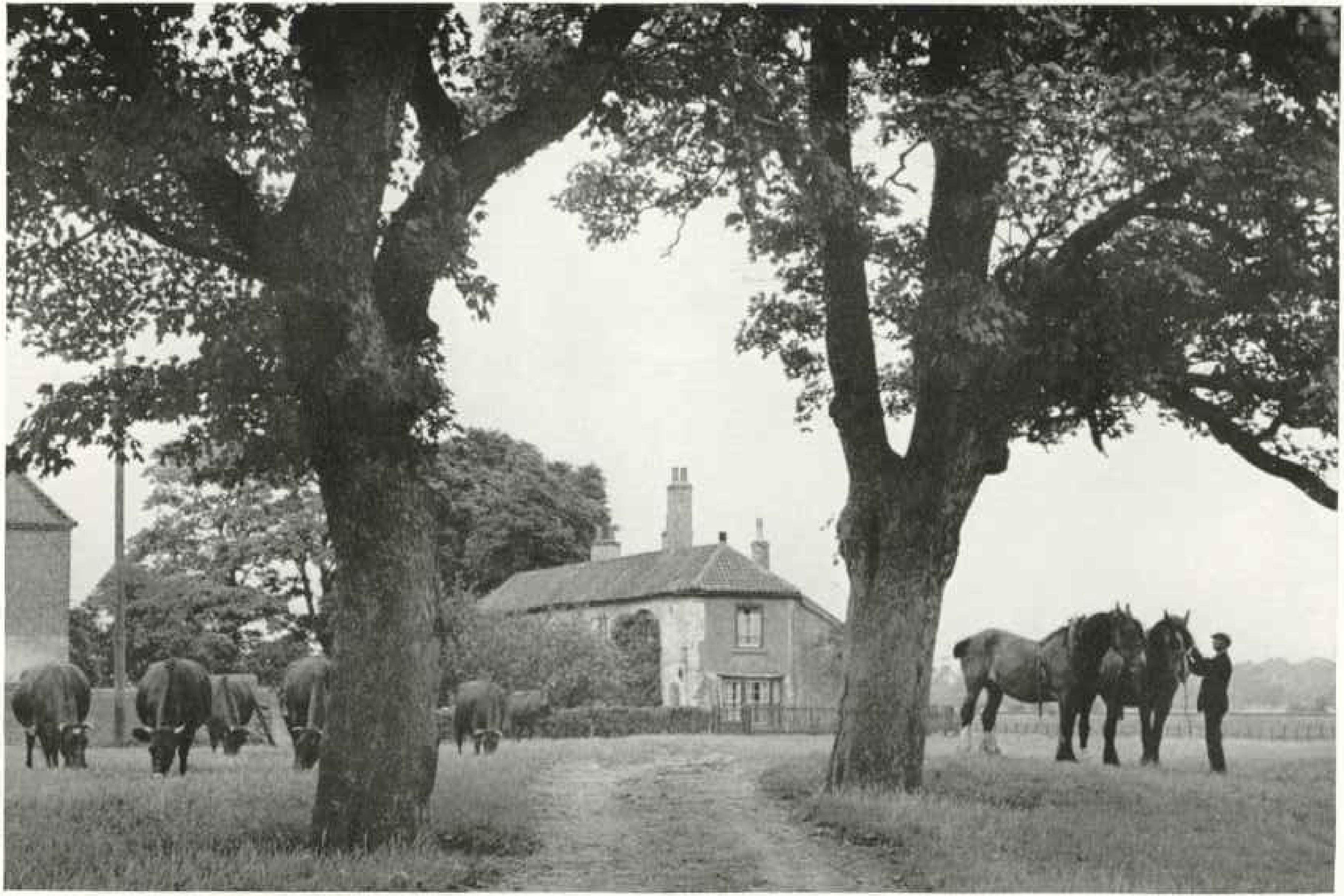
Morton had not come to New England for the sake of his soul. He had no quarrel with the Church of England. He was devoted to sport, and life in the open appealed to him.

At Merrymount, Morton erected an 80-

817

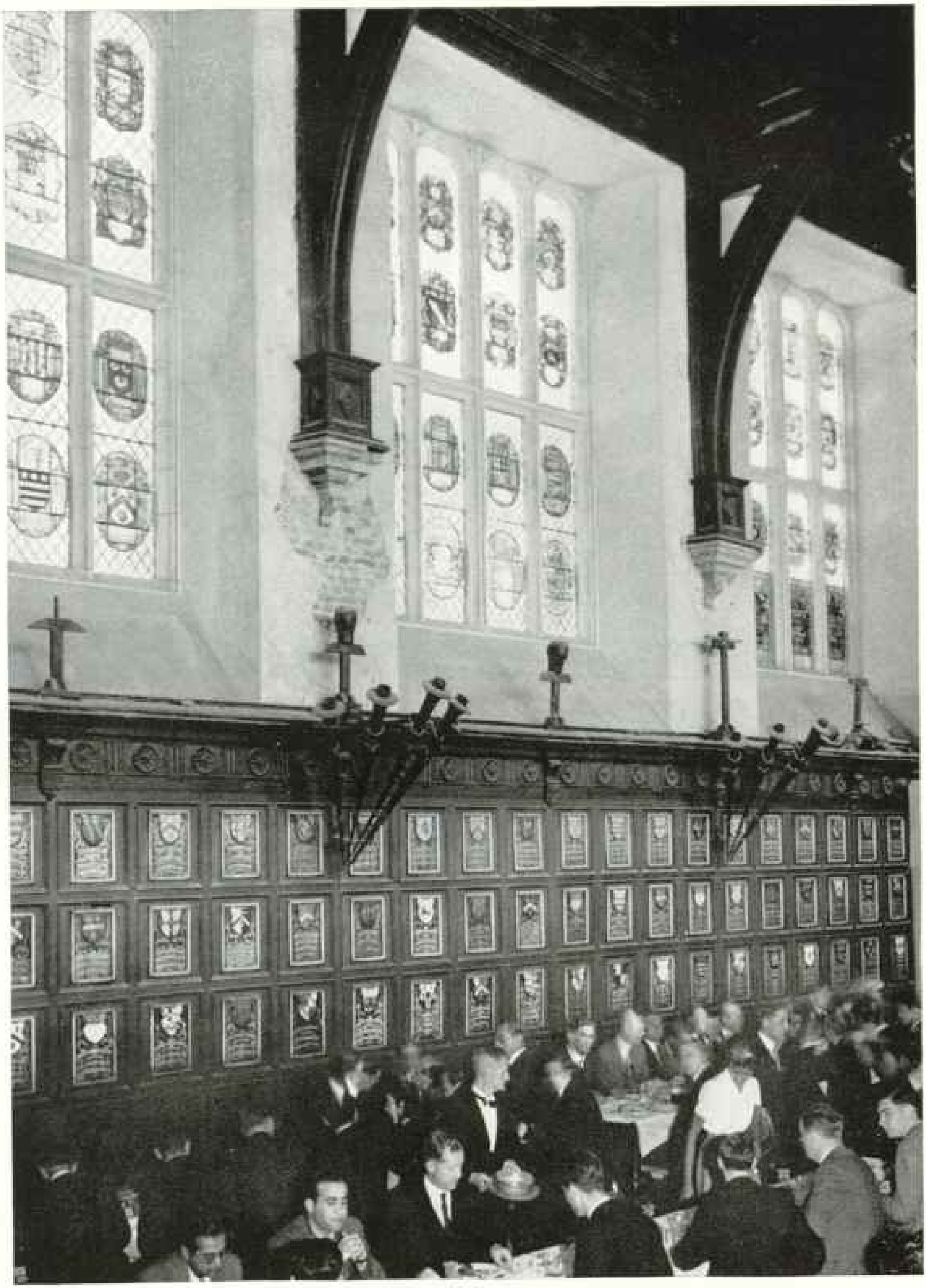
Some Essex Towns Have Changed Little Since Puritans Walked Their Streets

The aromatic saffron crocus, once raised here for flavoring, gave Saffron Walden its name. Seventeenth-century dress would look as much at home in this unspoiled town as that of these housewives.



Walls of This Nottinghamshire Farmhouse Incorporate Remnants of Scrooby's Old Manor, Onetime Home of William Brewster

Puritan leader John Winthrop wrote to his wife Margaret, as she prepared to join him in Massachusetts, asking her to bring "axes of severall sorts" from the smith of Braintree, England. Here Braintree's modern-day smith, G. H. Bateman (left), repairs an old axhead. The Winchester bushel (right), now kept in the chancel of St. Andrew's Church in Hingham, once was chained in the market place as a standard measure for merchants and farmers.



820

Middle Temple Hall, London, Resounded to Shakespeare's Lines in 1602

The Bard's own company is believed to have acted *Twelfth Night* in this building. Lawyer John Winthrop, Puritan leader, undoubtedly dined here beneath the coats of arms of Temple members.

foot Maypole, around which he and his companions, "inviting the Indean women, for their consorts, dancing and frisking togither," according to the grumbling Pilgrims, indulged in "ye beastly practises of ye madd Bacchinalians." A friend of Ben Jonson and doubtless a devoted customer of London's rollicking Mermaid Tavern, Morton saw no reason to give up the gay life just because his neighbors were sober-sided.

"Captaine Shrimpe" Takes Command

The Pilgrim Fathers might have turned a blind eye had Morton and his cronies confined their attention to Indian girls and "quaffing & drinking both wine & strong waters in great exsess." But Morton also used questionable methods to make money. He sold firearms to the Indians in return for choice furs worth far more than the "common" beaver used as currency in the province.

821

Abe Lincoln's Ancestors Came from Hingham, Norfolk

Robert Lincoln, the President's earliest known forebear, died in Hingham about 1543. More than 200 from that vicinity emigrated to the Massachusetts Bay Colony. They included Samuel Lincoln, who came to Salem in 1637. Bust and plaque in Hingham's church honor the Emancipator.

Selling the Indians firearms and teaching them how to use them struck at the very existence of Plymouth Colony. In 1628 Myles Standish was sent, with eight men, to put an end to Morton's activities.

In the ensuing "battle of Merrymount"—in which the only casualty occurred when one of Morton's men "rane his owne nose upon ye pointe of a sword"—Morton was captured and later shipped off to England.

This whole sequence of events must have provided deep satisfaction for Standish, who thus had his revenge for the derisive nickname, "Captaine Shrimpe," given him by the irreverent Morton.

"Mine host of Ma-re Mount" turned up again in New England, apparently unchastened. Trade in firearms and "strong waters" was resumed.

Finally John Endecott, local governor of the Salem settlement, took action. The Maypole was felled. Morton's house was burned before his eyes, and he was sent packing again to England.

Morton's story ends on a pathetic note. After a period at home working for Sir Ferdinando Gorges, "the founder of Maine," Morton drifted back to New Plymouth where for a few weeks he lived "meanely at four shillings per week and contente to drinke water."

In adversity his love of sport persisted. He excited the wrath of Myles Standish "by wandering gun in hand over the Duxbury marshes."

Broken in health and half-crazed, Morton spent his remaining years in Maine.

Even this scapegrace among New England's founders contributed his bit. Morton's book, *New English Canaan, or New Canaan, Containing an Abstract of New England* (1637), in which he mercilessly pilloried the "Saincts" of Plymouth, was hailed by a contemporary as "the truest description of New

England, as it then was, that ever I saw."

Morton acquired another monument when the contemporary American composer Howard Hanson based an opera on Nathaniel Hawthorne's short story, *The Maypole of Merry Mount*. The opera, *Merry Mount*, was presented six times at New York City's Metropolitan Opera House in the 1933-34 season.

Sir Ferdinando Gorges, Morton's sometime friend, is a mystery man of early New England history. Surprisingly little is known of his private life, although we are familiar with his public career. Of Norman descent, the Gorges family lived at Wraxall, Somersetshire.

Sir Ferdinando never went farther across the Atlantic than the Azores. For 40 years, however, his preoccupation was with the colonization of America. His interest was whetted by such incidents as the adoption into his own family of three of the captive Indians brought from Maine by Waymouth in 1605. The civility of these "Salvages," Gorges wrote, was "farre from the rudenesse of our common people."

In the last years of Elizabeth's reign Ferdinando involved himself in the Essex Plot against the Queen and was lucky to get off with his life. In prison he had ample time to think out his plans for colonial development.

Gorges wanted to found just such a colony as one would expect of an Elizabethan courtier. Unlike the Pilgrims, Sir Ferdinando was a supporter of the Crown and the Established Church. He had elaborate plans for a great city in Maine, to be called Gorgeana. There was to be a mayor and a board of councilors. The government was to be modeled on the England of the Stuarts.

War Scuttled "Dream City" Plans

After years of disappointments and failures, Gorges received a charter in April, 1639. At that time more than 70 years of age, he proposed to go to the New World to preside in person over his province.

Perhaps it was just as well for the internal peace of the colonies that the Civil War broke out in England. King Charles and his supporters, among them Sir Ferdinando, had other fish to fry, and there was no time for furthering grandiose schemes for New England colonization. Had a royal government been established in Maine, Gorges's rule "of the Lord Proprietor, for the Lord Proprietor, and by the Lord Proprietor" might easily have led to stormy relations with the neighboring Colony of Massachusetts.

The only place in my wanderings where I found a memorial to Sir Ferdinando is the Church of St. Budeaux, four miles northwest of Plymouth, where a tablet was erected, appropriately enough, by the citizens of Maine. Though his pretentious colonization schemes came to nothing, New England remembers Gorges with gratitude for the voyages of exploration he promoted.

At first, schemes for large-scale colonization of Massachusetts fared little better than did Sir Ferdinando's ambitious plan for Maine. In 1626 the Dorchester Adventurers, a group of Puritans with an eye for business, gave up their idea of establishing settlements of English fisherfolk on the New England coast. The Dorchester investors learned to their sorrow that "rarely any Fisher-men will worke at Land, neither are Husband-men fit for Fisher-men but with long use and experience."

The Great Bay Colony Gets Its Start

Fortunately, one among the Adventurers had not joined for profit. This was the Reverend John White, rector of Dorchester. Distressed by growing unemployment in England, White saw in the colonies a possibility for relief. Moreover, he hoped that new areas of North America might be opened to Protestant evangelizing, as a counterweight to the Jesuits of Canada.

"Being grieved in his spirit that so good a work should be suffered to fall to the ground," White promised a new land grant and fresh support if the handful of colonists remaining would cling to their foothold.

The rector of Dorchester appealed to powerful friends in his effort to find new backers for the faltering colony. By 1629 there were both money and a charter, issued in the name of the "Governor and Company of the Massachusetts Bay in New England." Historian Samuel Eliot Morison notes that this very document, taken to New England in 1630 by Winthrop, served for more than 50 years as the constitution of the Massachusetts Bay Colony.

White grew up in Stanton St. John, Oxfordshire, a few miles from Oxford University. The stone house in which he was born in 1575 still looks across the steep main street of the village to a 13th-century parish church in which his baptismal record is preserved.

He was one of those who bade godspeed to Winthrop's expedition when it set out for Massachusetts Bay in 1630. But like Gorges he never emigrated to the wilderness to which he had so long devoted his energies.

Jobless Puritan Led Expedition

White died in 1648. Many years passed before a memorial tablet was placed by his grave under the south porch of St. Peter's Church in Dorchester, Dorsetshire. Only by degrees have we realized the extent of our indebtedness to the "patriarch of Dorchester."

It is not known why the leadership of the

Kodachrome by National Geographic Photographer B. Anthony Stewart

Children Listen to a Pilgrim Tale in Chantry House, Where *Mayflower* Voyagers Assembled

Billericay, Essex, contributed four of the original 102 passengers. Christopher Martin, the ship's treasurer, lived in Chantry House, now a café. Massachusetts' namesake town, Billerica, omits the "y."

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Honourable Artillery Company Parades in Plumed Helmets and Breastplates

From Henry VIII's time through Montgomery's campaign in Africa, the Company has defended its country. It inspired the Massachusetts Boston's Ancient and Honorable Artillery Company (founded 1638). Background: St. Paul's Cathedral, London.

Silk for England's "Old School Tie" Comes from Sudbury's Looms

Sudbury has been weaving silk for almost 200 years. Prime Minister Chamberlain's umbrella silk came from its mills. These workers display bright colors made to order for clubs and colleges. Sudbury, Massachusetts, derives its name from this town in Suffolk.

Kodachromes by National Geographic Photographers B. Anthony Stewart and David S. Boyer

Jingling Bells and Fluttering Ribbons Mark the Lively Morris Dance at Maidstone

Old-time participants, who blacked their faces, were confused with the Moors; hence the name, Moorish (or morris) dance, according to one explanation. English Puritans banned such frivolity, together with the Maypole,

↑ Major Oak Survives in Sherwood Forest

This decaying monarch, known as Major Oak, epitomizes the decline of Sherwood Forest, home of the legendary Robin Hood. In medieval times the forest was part of a vast hunting ground reserved for England's kings. Coal mines and ammunition dumps (right) have encroached upon the area, so that today only parts of Sherwood's 20-by-8-mile range deserve the name forest. These cyclists pretend to hide in Major Oak, as some of the *Mayflower* Pilgrims may have done before fleeing England.

← B1192 Links New York and Boston, England

Skyscrapered New York, named for the Duke of York, bears little similarity to the Lincolnshire village of the same name, which has only two streets. Old Boston has a Bunker's Hill near by. The girl picnickers are typical of thousands of English city dwellers who each week end take to the country roads on bicycles.

Kodachromes by National Geographic Photographer B. Anthony Stewart

The Architect of a Sand Cathedral Collects Admirers' Pennies at Weymouth Beach

From this Dorsetshire port John Endecott and a band of some 60 pioneers sailed in 1628 in the *Abigail*. They settled at Naumkeag, later Salem. Endecott eventually became governor of the Massachusetts Bay Colony. Weymouth's Massachusetts namesake is the State's second oldest settlement. This sand structure is modeled after the Truro Cathedral in Cornwall. Vandals never bother the artist, but storm and beach ball sometimes ruin his creations.

Yale University Has Its Roots in These Welsh Hills

The rolling hills near Llangollen, Denbighshire, Wales, are sometimes called the Yale country. In 1718 a Welsh merchant named Elihu Yale was asked for funds to help build a new college in the Connecticut Colony. Yale, who had made a fortune in India, responded generously, sending goods worth £562.12s.0d., plus books. In gratitude the trustees named the college for him. Elihu Yale lies at near-by Wrexham; Yale alumni have restored parts of the church there as a memorial.

Sleepy Framlingham Lives in the Past

The baker's boy, delivering Granny's bread, has no traffic worries; heavy trucking bypasses the Suffolk town.

Life within these gabled row houses might seem uncomfortable to some, but the owners fondly cling to old-fashioned ways. They crowd their mantels with curios and take their baths in tin tubs. Central heating they ignore, relying on coal grates.

Mary Tudor once took refuge here from her troubles. A ruined castle dates from the reign of Edward I.

Framlingham, like many another English town, has its namesake across the Atlantic, but Framingham, Massachusetts, spells it without the "l."

Kodachrome by National Geographic Photographer B. Anthony Stewart

Kodachromes by National Geographic Photographers John E. Fletcher and B. Anthony Stewart

Salem Youth Dons the Somber Garb of Puritan Ancestors

Salem, Massachusetts, has reconstructed the pioneer village that was Salem in 1630. Summer visitors can get an inkling of the settlers' hardships from the crude bark-covered wigwams and sod-roofed dugouts.

Spouted Drinking Mugs at George Inn Kept Old-time Mustaches Dry

From this 17th-century lodging in Southwark, London, stagecoaches set out for Kent, Surrey, and Sussex. Dickens mentions it in *Little Dorrit*. John Harvard knew its predecessor; he inherited a tavern near by.

Massachusetts Bay venture was offered to John Winthrop. A combination of circumstances prompted Winthrop to accept. His family was Puritan, and he foresaw greater troubles than those which had driven the Pilgrims to exile in America.

"I am verily persuaded," he wrote in 1629, "God will bringe some heavye Affliction upon this lande, and that speedylye."

As a known Puritan, Winthrop lost his attorneyship at the Court of Wards and Liveries, by which he earned a comfortable income. There remained little promise for him in a Merrie England increasingly preoccupied with riotous living and "keeping up with the Joneses."

As his determination to move to America grew, Winthrop's efforts on behalf of the Massachusetts Bay Colony increased. He rode often to London for consultations on finance and organization; to Cambridge, citadel of the Puritan faith, with which he always had strong links; and to the friendly atmosphere of Sempringham Manor and 15th-century Tattershall Castle, the two residences of the Earl of Lincoln.

Few castles in our island are as closely connected with New England as Tattershall. Its massive brick tower, with walls 16 feet thick in places, dominates the landscape 11 miles northwest of Boston (page 836). Here, under the patronage of the Earl of Lincoln, the great exodus was discussed.

Two startling innovations grew out of these talks. One was that the sponsors should themselves emigrate to Massachusetts, and not send the bands of fisherfolk and adventurers that had proved the weak link before. The other idea, and it was a daring one for the time, was that the seat of government of the Massachusetts Bay Colony should be in Massachusetts!

Bay Colony Wins Self-Rule

On August 29, 1629, promoters of the Bay Colony met at a General Court of the Massachusetts Bay Company, probably at the home of Matthew Cradock, London investor. Deputy Governor Thomas Goffe put to the group a fateful decision, recorded thus:

"As many of you as desire to have the pattent and the government of the plantacion to be transferred to New England, soe as it may bee done legally, hold up your hands."

After a pause he added:

"So many as will not, hold upp your hands."

The chairman then spoke the momentous words, "The ayes have it."

The establishment of the Massachusetts Bay Colony as a semi-independent territory was assured.

Winthrop's remaining months in England were devoted to preparations for the migration. The Isle of Wight was to be the point of departure for these founders of Massachusetts, as it would later be for Maryland's forefathers. It was here, aboard the ship *Arbella*, that Winthrop began his famous journal—"the most precious chronicle of the Bay Colony"—which he carried on until his death.

To Mrs. Winthrop fell the difficult task of remaining at Groton Manor, in Suffolk, until it was sold. In a final letter to his "faithful and dear wife," composed "aboard the *Arbella*, rydinge at the Cowes march 28, 1630," Winthrop wrote that on "mundayes and frydayes, at 5: of the clocke at night, we shall meet in spiritt till we meet in person."

Emigrants Shared Ships with Livestock

The sailing of the Winthrop expedition in 1630 was completely unlike that of the little *Mayflower* a decade before, with its handful of apprehensive and all but penniless Pilgrims. Eleven well-found ships, carrying some 700 persons, set out for Massachusetts. In addition to their precious human cargo, the vessels carried cattle and horses; at least one brought a family dog to the New World.

Other ships followed, and by year's end the English-speaking population of Massachusetts was three times that of Plymouth. Under Winthrop's leadership the colonists established themselves in localities which became the towns of Boston, Charlestown, Medford, Watertown, Lynn, Roxbury, and Dorchester.

William Hubbard, early historian of the Colony, sums up John Winthrop's life as that of a man who "spent not only his whole estate . . . but his bodily strength and life, in the service of his country; not sparing, but always as the burning torch, spending."

Hubbard himself is of particular interest to members of the National Geographic Society. He was the direct ancestor of Gardiner Greene Hubbard, one of the founders of The Society and its first president from 1888 until his death in 1897.

One of the saddest incidents in the settlement of Massachusetts was the death of Lady Arbella Johnson and her young husband shortly after their arrival. It was Lady Arbella for whom Winthrop named the flagship of his fleet.

The Johnsons, together with the Saltonstall, Dudley, and Bradstreet families, were among the first to declare themselves in favor of emigrating to the New World. The early Bostonians were so fond of Johnson that for a long time afterward they would ask to be buried as near his grave as possible.

Another Puritan woman aboard the *Arbella* was Anne Bradstreet. Mistress Bradstreet must have been a remarkable woman. She

England's Boston: Restaurant Workers Clown Where Pilgrim Fathers Once Were Jailed

Many Bostonians emigrated to America; John Cotton, the town's vicar, became "patriarch of New England" (page 808). Scrooby's Pilgrims, caught trying to escape the tyranny of King James in 1607, were imprisoned behind these bars in old Boston's Guildhall.

was only 18 when she landed in the New World, but she successfully weathered the rude change from a life of luxury at home to one of hardship in a wilderness peopled by hostile savages.

Anne Bradstreet became the first New England poetess. Some of her verses may be read with as much pleasure today as they were 300 years ago. She conquered a frail body and "wasting consumption" to give to her new homeland eight children, all of whom grew to useful maturity.

As a girl Anne lived at Tattershall Castle, where she "had at one time eight tutors," who taught languages, music, and dancing.

At the age of 14 or 15 Anne wrote, "I found the follyes of youth take hold of me." Perhaps she was lovesick. Eight tutors in attendance, the majority no doubt males, may have been too great a test for even a Puritan maid. At 16 she married Simon Bradstreet, the son of a Puritan minister. Indeed, he may have been one of her tutors.

Unfortunately, the only book of Anne Bradstreet's poetry published during her lifetime—*The Tenth Muse Lately sprung up in America. By a Gentlewoman in those parts*—contains little that is worth remembering. Anne left many other poems, however. To Simon, the husband in whose "loving and grave companionship" she spent her life, Anne wrote:

If ever two were one, then surely we.
If ever man were loved by wife, then thee;
If ever wife was happy in a man,
Compare with me, ye women, if you can.

Sisters Under the Skin

During our visit to Scrooby, my wife and I were shown a letter which, like Anne Bradstreet's poems, brought us closer than anything else to the men and women who left England to settle in the American wilderness. It was written by Lydia Bates Fletcher, of Scrooby, just after her arrival in Massachusetts in 1632.

Lydia rejoiced that the settlers would shortly "have a Church in a settlement near

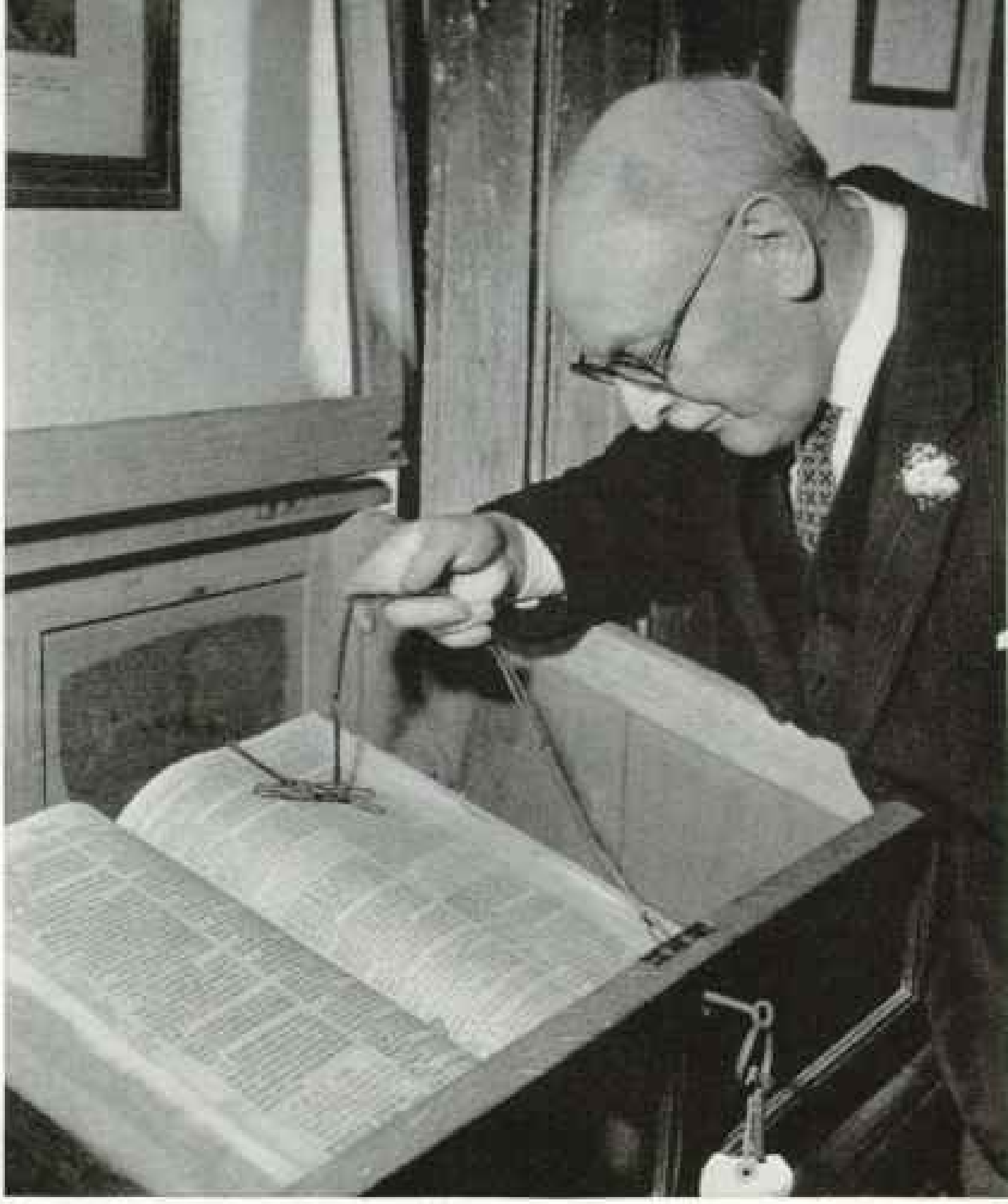
here—which is called Boston," and then went on to things dear even to a Puritan heart: food, her neighbors, and her clothes.

"At first," she wrote, "I could not eat the bread made from ye maise—but now I find it verry good. It makes a verry wholesome porridge . . . we have berries of divers kinds and beanes, and have planted some punkins . . .

"Elder Brewster is in good health, but his hair is white like ye snow. Love and Wrestling Brewster are both married, and are fine men."

Brewster's sons were not alone among the *Mayflower's* passengers in being oddly named. With Love (of God, presumably) and Wrestling, shortened to "Wrastle" (with the Devil) were Remember Allerton, Resolved White, Humility Cooper, and Desire Minter. Left behind in Holland were Fear and Patience Brewster.

Mistress Fletcher concluded her letter: "I think a woman should always look faire to her lord—so I pray that you will—if the chance cometh—send me my taffeta skirt"!



833

Chain and Locked Case Protect Stratford's Bible

Shakespeare lies buried in Holy Trinity Church, where this 1611 Bible is preserved. Near by stands the home of Katherine Rogers. New England's first college honors the name of her son, John Harvard (page 815).

That three-century-old bit of paper reminded me that the feminine founders of New England may not have been so distant from their modern sisters as we sometimes think.

Boston's First Three Residents

The namesake of that little Boston on England's North Sea coast to which Lydia Fletcher referred quickly became a focal point for New England life.

How many among the world's great cities can name their first three inhabitants? Boston can! All were members of the Church of England, and so remained apart from both Pilgrim and Puritan settlements: William Blaxton (Blackstone), hermit of Beacon Hill; Samuel Maverick, described in 1638 as "the only hospitable man in all the Countrey, giving entertainment to all Comers *gratis*"; and Thomas Walford, blacksmith, who lived in a "palissaded house."

When the Winthrop expedition arrived, Blaxton's little house was somewhere near the corner of Beacon and Spruce Streets in present-day Boston. There he lived as a recluse, happy with his precious library, his pigs and goats, his roses and vegetables. Around him on Beacon Hill he could gather wild strawberries, blueberries, and grapes. From his Indian friends he could obtain oysters, clams, and lobsters.

Blaxton's attachment to the Church of England—he had taken orders in it—made him unpopular with many of the Puritan newcomers. Probably the fact that he wore his "old canonical gown" did not improve matters. Moreover, he seemed to prefer the company of the Indians to that of his fellow Englishmen.

After the Puritan swarm had planted its towns across the Bay Colony—changing the name of Blaxton's own Shawmut to Boston—he must often have thought of the days when he had Beacon Hill to himself. Boston was "full of Girles and Boys sporting up and downe, with a continued concourse of people."

Lincoln Cathedral, Whose Gothic Towers Soar Above High Street, Guards One of England's Most Prized Possessions, the Magna Carta

Many Americans saw Lincoln's Magna Carta, finest of four existing copies, at the New York World's Fair. Thousands more saw it during World War II at Washington's Library of Congress (right). Today it is back in Lincoln, where World War I's first tanks were secretly manufactured (page 816).

Householders of Secluded Finchingfield, in England's Fertile Essex County, Await Their Morning Bus

A 16th-century writer described Essex County as "latte, fruteful, and full of profitable things." Despite this bounty, many Essex men left to become New England's founders. Finchingfield's square-towered church (right) was restored in memory of Daniel Shed, who went to New England in 1640.

Founders of Massachusetts Met Often Within the Massive Walls of Tattershall Castle

Sixteen feet of brick protected occupants of this "fortified dwelling" of the Earl of Lincoln, patron of the Massachusetts Bay Colony. Anne Bradstreet, first American poetess, spent her girlhood here (page 831).

Before long, Blaxton packed up, doubtless piling his possessions onto the back of his brindled bull, which he rode "for want of a horse." In his saddle bags, as he headed for the wilds of Rhode Island, were apples for the Indian children.

Blaxton's kindness to the Indian youngsters foreshadowed the devoted lifework of John Eliot, New England's "apostle to the Indians," who arrived from England in 1631.

The Bible in Algonquian

The great stumbling block to conversion of New England's "Salvages" had been language. John Eliot, serving as first settled minister of Roxbury, Massachusetts, set out to master the local Algonquian dialect. In 1646 he delivered an hour-and-a-quarter sermon to the braves of Nonantum village, in present-day Newton, which members of his audience said they understood. Eliot, like Blaxton before him, then passed out apples to the children.

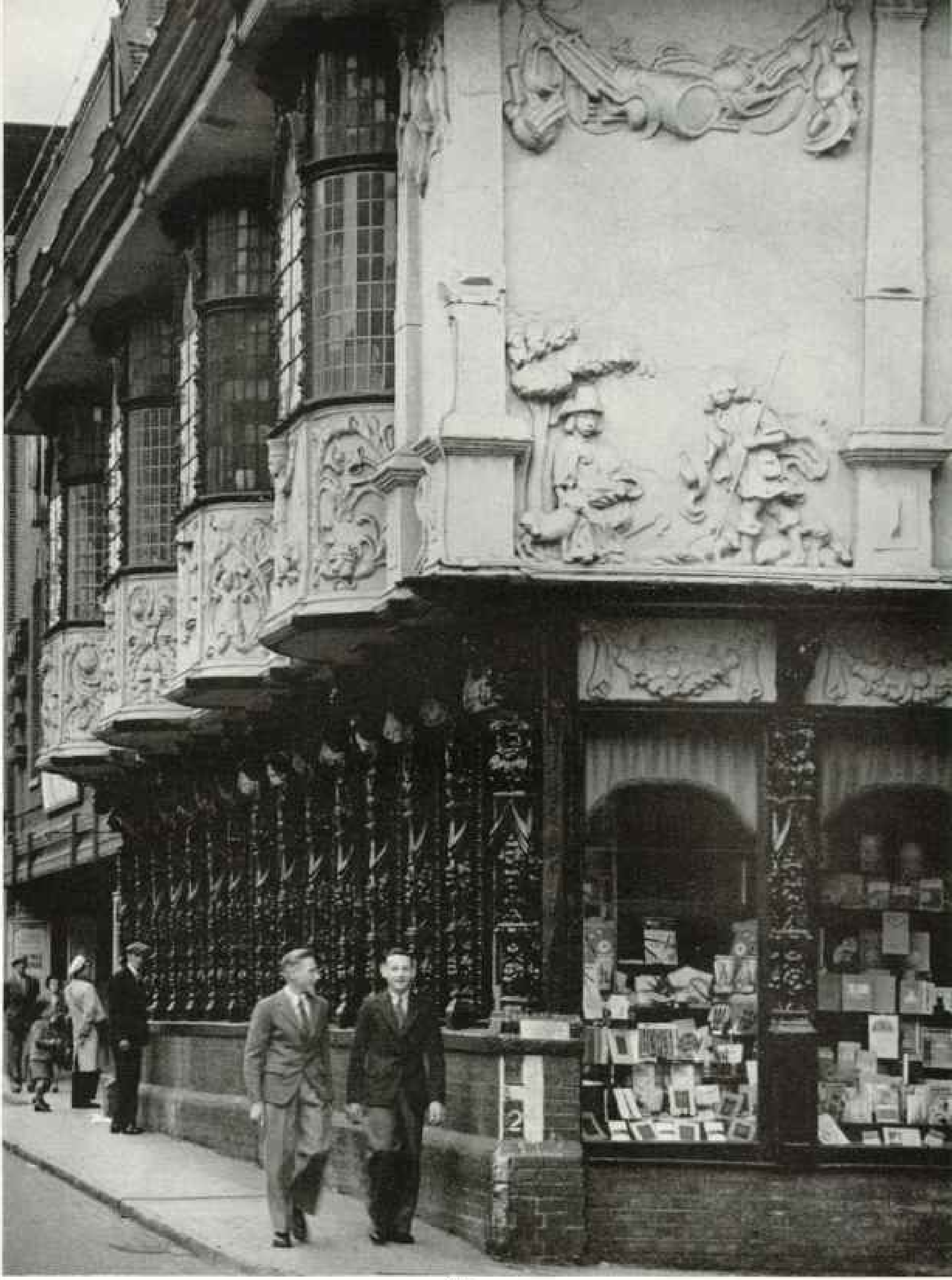
Eliot's crowning achievement had to wait for complete familiarity with the Indians' primitive tongue and a method of putting it on paper. His *Mamusse Wunnetupanatamwe Up-Biblum God*—literally, "the-whole holy his-bible God"—appeared in 1663. It was a 1,200-page translation into Algonquian of both Old and New Testaments, produced at Cambridge on the only printing press in the colonies.

Copies of Eliot's Indian Bible remained in use among older Indians at Gay Head, Martha's Vineyard, well into the 19th century. Today a first edition of it is among the rarest of American books. In 1947 a copy sold for $4,500.

Like so many who came to America before him, Eliot was born in Essex. I visited his birthplace in Nazeing, and the attractive church in Widford, across the border in Hertfordshire, where he was baptized. The little church with its red-tiled roof sits behind old brick walls flanked by bushes of deep-red roses which were in their glory in September.

Lincoln's Ancestor Settled in Hingham

John Eliot must have been a lovable old man. Conservative in his ways, he detested the wearing of wigs, which he regarded as "an abomination unseemlie in the sight of God." I like to think of him, even in his old age, retaining his quaint mode of speech. Cotton Mather records a bit for us: "I been't afraid, thank God, I been't afraid to die."



837

Ipswich's "Ancient House," Built in 1567, Has an Indian but No Australian!

Panels facing the street beneath bay windows of this bookshop represent four continents. An Indian with bow and arrow symbolizes America. Australia, unknown when the designs were fashioned, has no figure. Above the shop windows, shepherds guard their flock, perhaps in recognition of Suffolk County's wool industry.

English Sailors Enjoy a Busman's Holiday on the Balcony of a Thames-side Pub

The Prospect of Whitby inn, near London Docks, is a favorite with English seafarers. The *Mayflower*, but a few feet longer than a Thames sailing barge (center), took on supplies at London before the Atlantic trip.

As the years passed, the English influence spread to the wilderness beyond New England. For example, Hingham, in Norfolk, is not only a New England shrine, though it sent numerous parishioners to Massachusetts.

It was from Hingham that Samuel Lincoln, believed by historians to be the ancestor of the President, came to Salem in America in 1637; in a few months he moved to the settlement at Hingham. In old Hingham's 14th-century church is a bust of the Emancipator, placed there in 1919 (page 821).

Nine miles north of Hingham, England, is another locality connected with the Lincolns. In 1615 a certain yeoman farmer signed his will: "At the New Mansion of me, Richard Lincoln, in Swanton Morley."

In the little village of Swanton Morley is an old house, now the Angel Inn, where the will was signed. By its terms Richard Lincoln disinherited his eldest son. As a result, three of Richard's grandsons were forced by poverty to emigrate to the New World. Among them was Samuel Lincoln. History sometimes hangs indeed by a slender thread!

In the 13 years of the Great Migration (1630-1642), nearly 20,000 Englishmen settled in and around the Massachusetts Bay Colony. Representing every element of English life, they brought to New England a culture that was well rounded and complete. Little wonder that it took root so well in the Massachusetts soil.

Could he but visit today his old haunts along New England's coast, Capt. John Smith might not find things wholly unfamiliar. The names of half the towns in eastern Massachusetts would echo counterparts in England. English traits and English architecture would make him feel at home, as would certain similarities in the countrysides of eastern England and Massachusetts. The good captain might even detect traces of his own Lincolnshire accent in the speech of many a modern New Englander.

Here, in the lasting impact of English speech and English ways, is a living memorial to the founders of New England.

Nevada Learns to Live with the Atom

While Blasts Teach Civilians and Soldiers Survival in Atomic War, the Sagebrush State Takes the Spectacular Tests in Stride

By Samuel W. Matthews
National Geographic Magazine Staff

AGAINST night's last darkness on the Nevada desert, a faint green band of dawn framed jagged mountains to the east.

Suddenly a siren sounded, rising in urgency, higher and higher.

"It is now H minus two minutes," loud-speakers blared. "Kneel down in your trench. Look down. Brace yourself against the forward wall."

Two miles out across the flat, a bright white light shone from the top of a 300-foot tower. At that point, the 22d atomic explosion within the United States was a hundred-odd seconds away.

"I don't mind admitting it," the dark shape next to me said abruptly into the gloom. "I'm scared."

Sgt. Tom Radtke of Chicago, six years in the Regular Army, spoke for about 1,500 of us on hands and knees in our narrow burrows.

"Trembling Twenty," Closest Reporters

A few minutes before, the loud-speaker voice had said, "Good morning, gentlemen. Welcome to Yucca Flat, valley where the tall mushrooms grow . . . .

"The detonation you will witness today is about what the survivors of Hiroshima saw in 1945. It will be closer to you than any such detonation has ever been to Americans."

We had received many other briefings. I was one of 20 newspaper, radio, and magazine representatives accompanying 850 soldiers and approximately 600 officer-observers into entrenchments twice as close to the forthcoming blast as men ever had deliberately gone before. My name had been drawn from a hat for the chance to be there, two miles from an atomic explosion.

The "Trembling Twenty," we had been dubbed—"Men of Extinction."

By flickering light of flare pots, after only three hours' sleep, we had boarded a bus at 2 a.m. at the Sixth Army's Camp Desert Rock, 65 miles northwest of Las Vegas. Ahead lay a 25-mile ride into the heart of the U. S. Atomic Energy Commission's Nevada Proving Ground.

The convoy winked and twisted among moonlit hills, past the white expanse of Frenchman Flat, through Yucca Pass, to be stopped finally by military policemen with glowing electric batons.

We stumbled out into darkness speckled by bonfires among the brush, where waiting soldiers warmed themselves in the bitter cold night.

Loose powdery dust puffed beneath our feet. Canteens and helmets jingled as we walked.

Platoons and companies comprising the simulated atomic attack force spread along a double line of trenches half a mile in either direction from command and observer posts.

Many of the men in the trenches had come to Camp Desert Rock directly from Korean fighting.

Cpl. Frederick Jin, a Chinese American, had been in Korea for nearly a year. He laughed when I asked him which he preferred.

"I don't think any of us are sorry we're here," he said. "The Thing out there . . . I'd like to see it."

"Any one for Las Vegas?" some one joked.

"Seems pretty close here, doesn't it?" a soldier muttered.

"You should be in those houses, bub!" came an answer.

Test Houses Await Moment of Doom

Out to the right, lights marked two isolated frame houses built by Civil Defense planners within the predicted blast range of the "nuclear device" on the tower. One stood two-thirds of a mile from the explosion point (page 846), the other 1.4 miles away.

With "Milton Able I" Company, 3d Platoon, I took my place in a 5-foot-deep, 2-foot-wide slit cut into the desert floor. The sides were braced by tar paper, chicken wire, and timber. Sandbags lined the lips (page 842).

The siren howled just behind us. We knelt in the dust, heads down, muscles tense.

"H minus 30 seconds." The signals came through miles of wire from the Control Point, nerve center of a network of communication systems, automatic switches, and recording instruments all across Yucca Flat.*

"H minus 20 seconds." I took a deep breath. The "count down" of seconds began.

"Zero minus ten . . . nine . . . eight . . . seven . . . six . . . five . . . four . . . three . . . two . . . one—"

Half-night in the trench turned suddenly into blinding, pure-white noon. It was im-

* See Historical Map of the United States, a supplement to this issue.

840 National Geographic Photographer Volkmar Wentzel

Observers Listen to an Army Briefing on the "St. Pat" Atomic Blast

On the outdoor theater stage at Camp Desert Rock, Nevada, an officer points to Ground Zero (detonation site) on a sketch of the test area. From the trenches (L.D. for Line of Departure) where battalion combat teams lie in wait, black arrows show the troops' advance after the blast against an imaginary enemy (page 845). Most observers watched from News Nob, actually five miles behind the trenches.

possible not to blink. Grains of sand leaped into detail and vanished in the brightness, as if a giant searchlight had been switched on just at the back of my head.

Through closed eyelids the world turned orange and, a split second later, crimson. There was no sound; the flash had come and gone in utter silence. I opened my eyes and saw the sergeant huddled in a ball, his face lifted in startled wonder.

Ground Shakes, but No Sound—Yet

Earth rocked beneath us. A giant hand seemed to jar the trench from side to side, heaved it, shook it; then all was steady again.

Still no sound. How long?

Like a clap of thunder directly overhead, the shock wave came. Instantaneous, solid as a physical blow, the sound beat down. The trench seemed to jump convulsively.

A gale of dust and sand and brush roared across the opening above and was gone.

"You may stand and look," I heard beyond the roaring in my ears.

Thick brown dust covered the desert like churning fog. Beyond and above, the atomic fireball rose in the sky, a giant sphere of orange and black, tongues of fire amid billowing soot (page 844).

A column of gray tinged with tan lifted behind it. Then the fire dimmed, and, somewhere within the massive cloud, paint was spilled in pastel shades.

The spreading mushroom became bright pink. Purple shaded to lavender, orange turned dusty rose, and the hues folded and overlapped in great rolls and waves of cloud.

Higher and higher the cloud boiled against the bright blue-green of dawn. On the very summit ice crystals formed, cascading over the rim like pure-white surf in the sky.

The towering column silhouetted soldiers climbing from the trenches into the murk of dust. Odors of scorching filled the air, acrid and sharp. Along the ground it was impossible to see more than 100 feet.

Only above, huge and clear, towered the trademark cloud of atomic explosion, leaning with the wind toward the east, shearing from its stem—a dirty brownish cloud now topped by pink and gold where the sun hit it 40,000 feet above us.

Within 24 hours this cloud, carrying its invisible spitting radioactive particles, was to be tracked across Utah, Colorado, Kansas, Missouri, and into southern Ohio. Airborne and ground teams would follow it with delicate instruments, tracking "fall-out"—the descent of the "hot" particles back to earth.

On the proving ground, from helicopters

841

Alan Jarlson

Atomic Dawn, Many Times Noon's Brightness, Greets a Nevada Family 20 Miles Away

Nobody lives closer to the Yucca Flat test site than the Sheahans, who have watched a number of nuclear tests from their lonely Groom Mine property. Cleo the cat (left) let out a shrill meow and scurried for shelter after this blast. One Nevada atomic flash was seen as far away as Kalispell, Montana, 780 miles north.

842 U. S. Army, Official

GI's Dig In to Await Atomic Thunderclap

On the day of the test, 20 reporters, including the author, crouched with troops in such desert slits in the cold darkness of 5 a.m. Reinforced walls withstood the blast only two miles away, and most of the flash heat and dust passed harmlessly overhead.

and jeeps, other men already were measuring the radioactivity left by the flash of atomic disintegration (page 849).

The troops began to move ahead, following in the train of the monitors. Figures walked into the dust in scattered lines and vanished (page 845).

Full daylight came as we advanced cautiously through an area where equipment had been exposed to the blast. Tanks and armored cars stood lonely amid the brush and occasional yucca, or Joshua, trees. Many seemed unharmed.

But nearer the explosion—a mile or less from it—blackened sandbags and blistered paint on vehicles and weapons told of searing heat. White tapes guarded twisted scattered strips of metal that once had been part of an amphibious tank.

Desert Swept Clear of Vegetation

Here the landscape had a strange look. I realized suddenly that all vegetation had vanished—greasewood and creosote bush, cactus and yucca. Only bare desert remained.

Ahead, where the tower had been, a disk of black scarred the earth. In the first split second when the steel tower itself had vaporized, the fireball had left its grim tattoo.

Dust and smoke still hung over the Civil Defense area where the two white houses had stood. The wind-borne atomic mushroom had passed directly over them.

Through binoculars the nearer house could be seen dimly. Crumpled into matchwood, crushed into the desert, what remained was only wreckage, charred where it faced the blast (page 846).

At the second house, still cloaked in smoke, little damage had been expected. Yet there, too, a giant hand had clenched. Two hours later, technicians in protective coveralls taped tight around wrists and boot tops made a hurried 15-minute visit to House No. 2. Dangerously intense radioactivity in the area forbade a longer stay.

They found the dwelling's back broken. Floors sagged on splintered joists. Roof beams were buckled and rafters pulled from the ridgepole. Doors and windows, sashes and all, had been blown into the house.

Plaster store-window dummies,

clothed and placed throughout both houses, were found flung to the floor, chipped or crushed into powdery pieces by flying glass and debris. Only in experimental basement shelters were the mannequins unharmed (page 848).

Dramatic Lesson in Civil Defense

This dramatic destruction may serve a major purpose in safeguarding American homes. From data obtained on the atomic proving ground, Civil Defense engineers can better evaluate and prepare against the awful damage of an atomic attack.

Designs for better family and public shelters may be one result. The Army is proving that human beings, properly dug in and protected, can survive atomic blasts at quite close range.

Yet such demonstrations by the Department of Defense and the Federal Civil Defense Administration are secondary to the main purpose of the Atomic Energy Commission in Nevada. Its goal is to provide better weapons to ensure America's security against attack.

843 United Press

Cadillac's Dummy Driver Barely Escaped Crushing

Force of the bomb reached more than a mile to buckle the top of this car, one of 30 vehicles exposed to radiation and blast in the March 17 test. Val Peterson, Civil Defense Administrator, checks the damaged car.

The Nevada Proving Ground lies in one of the loneliest and most inhospitable regions of the country. The site was established only after careful study and widespread search for the best location.

When 1951 opened, America had fired only one atomic bomb within its own borders—the blast near Alamogordo, New Mexico, on July 16, 1945.

Two bombs had been dropped over Japan. Two were tested at Bikini Atoll in the Marshall Islands in 1946.* Two years later, Eniwetok Atoll became a permanent Pacific Proving Ground for atomic tests of weapons of advanced power and development.

But an atomic firing range closer to scientific laboratories within the United States was needed to avoid the cost and time of sending all test operations far out into the Pacific.

There are stages in development of a new weapon when only actual detonation can prove or disprove some new principle or design. Today's most powerful atomic bombs are never exploded in Nevada. Instead, the Atomic Energy Commission speaks of "nuclear devices" and "diagnostic shots." The Army talks of small-scale "tactical weapons," including the atomic artillery shell.

Four series of atomic tests have been conducted at the Nevada Proving Ground. The total number of explosions there by the end of the spring series of 1953 was expected to be close to 30. The Atomic Energy Commission, reassuring the Nation, has declared:

"No person has been exposed to a harmful amount of radiation from fall-out . . . No person has been injured by blast waves . . . Successive tests have not resulted in the accumu-

* See, in the National Geographic Magazine: "Farewell to Bikini," by Carl Markwith, July, 1946; and "Operation Crossroads" (Atomic Bomb Tests), 10 illustrations by Charles Bittinger and Joint Task Force I, April, 1947.

The Atomic Mushroom Leaps in Fiery Fury from Yucca Flat

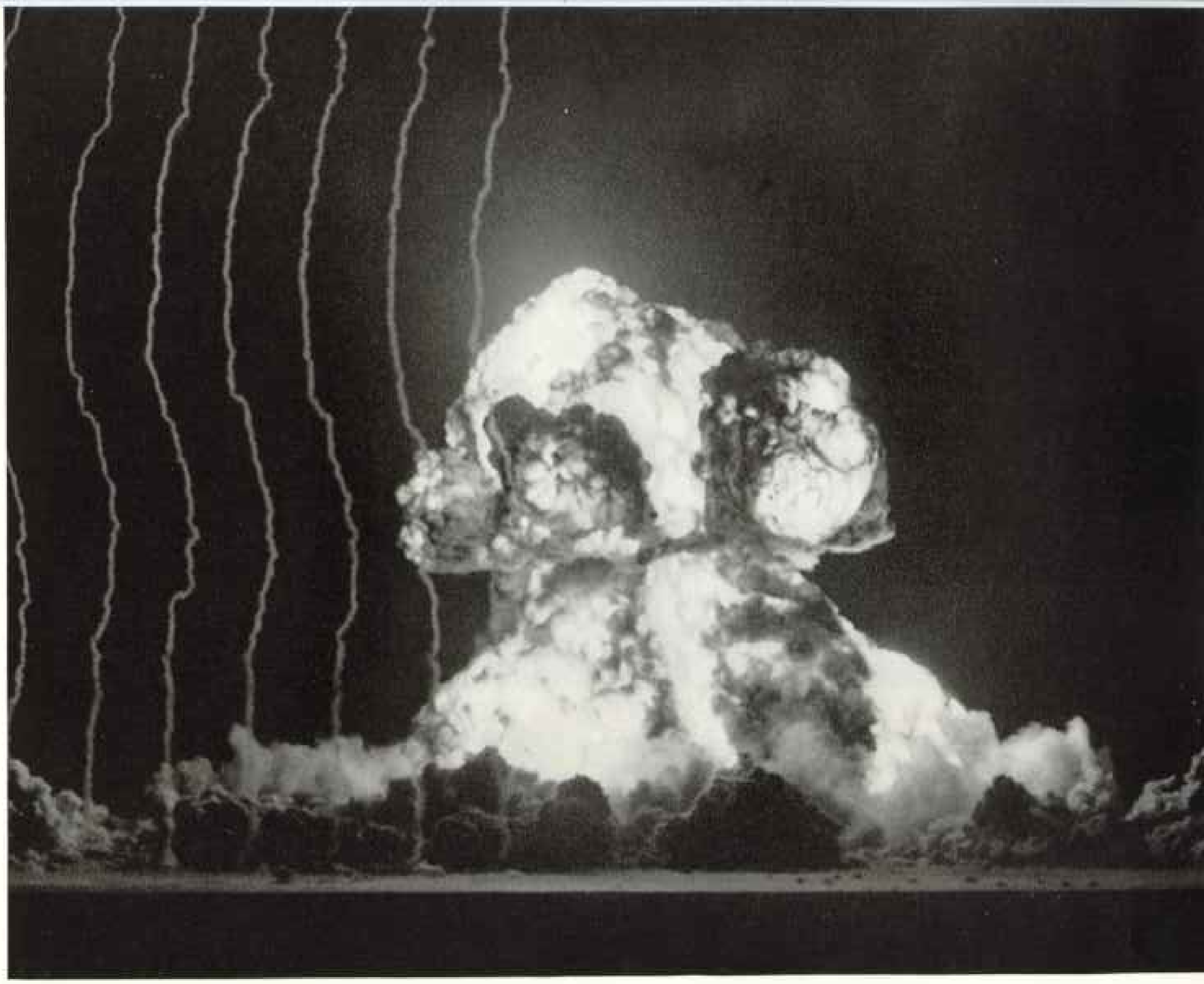
Blast waves churn up black clouds of dust as they race toward the camera at speed of sound. The atomic fireball sears the desert with flame and boils upward just before breaking clear.

The 300-foot steel tower that held the "nuclear device" vaporized in the first split second of fission's heat.

Rockets fired eight seconds before the blast leave vertical parallel smoke trails. Their bend in outrushing blast gives scientists photographic evidence of concussion pressures.

This picture was made from News Nob, seven miles from the blast center.

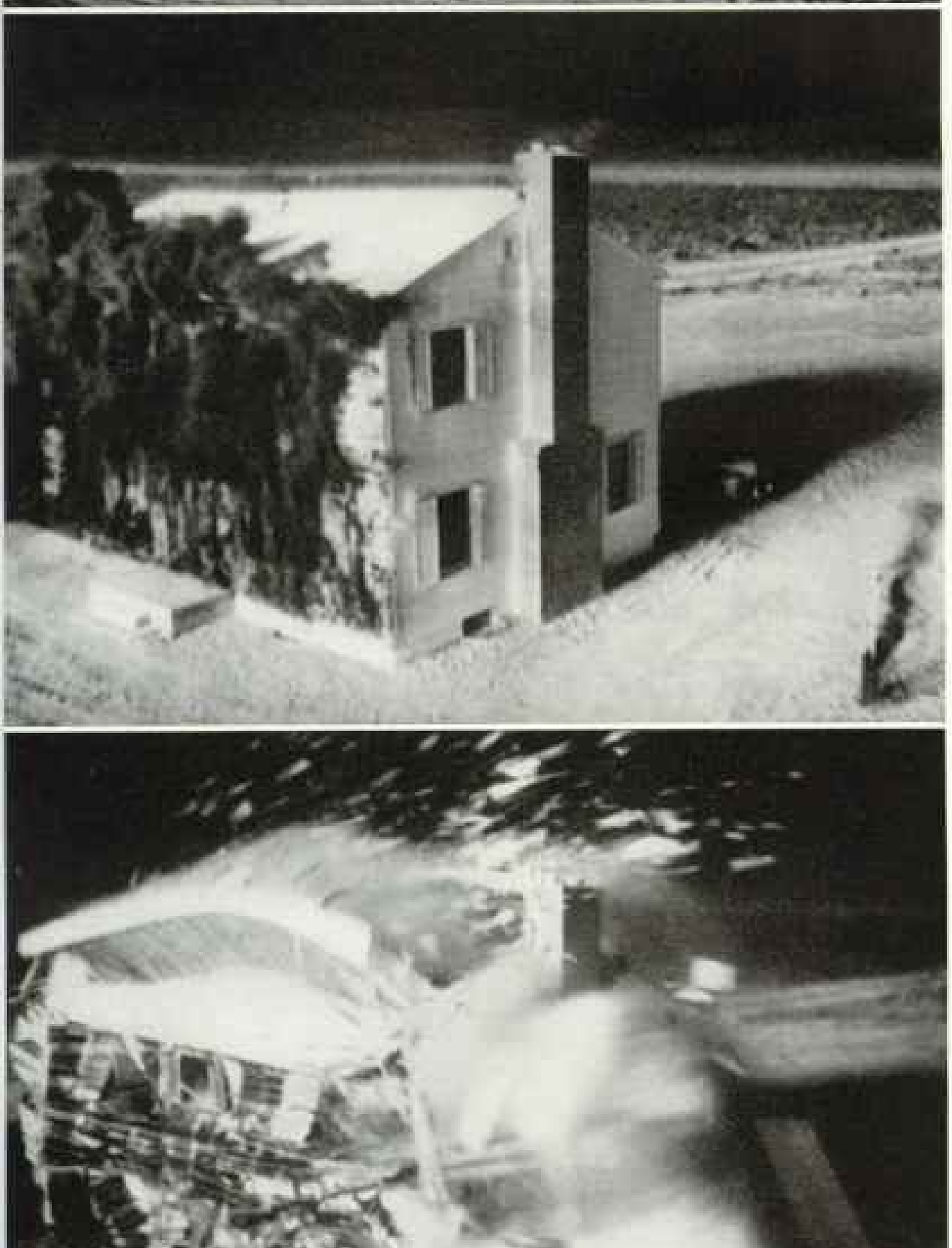
Wide World



Ready for Combat, Troops "Attack" in Dust and Smoke

An imaginary enemy lay dug in on Yucca Flat behind strong fortifications. Atomic artillery holed defenses. These troops, two miles away, go over the top a few minutes after the explosion.

Radiological safety monitors lead the way. They found the scorched desert safe for men to cross.



lation of a hazardous amount of radioactivity in the soil."

But what of the people who live within sight and sound and tremor of earth of the massive explosions? Coming of the atomic tests to Nevada has changed their lives remarkably little.

Living Near a Man-made Earthquake

In 1951 unusual atmospheric conditions bounced and focused blast waves on Las Vegas, 80 miles away. Eleven plate-glass windows were broken, and dishes were knocked off shelves of a hotel storeroom.

When similar conditions prevail, pre-blast warnings now alert any of the few towns within 200 miles that may be affected.

Present-day Las Vegas is Hollywood in the desert, a neon-lighted kaleidoscope of resort hotels, casinos, gaudy motels, and trim homes set along shaded streets. The

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Invisible Wave Razes House in 2 Seconds

Atomic light (top), heat (middle), and blast (bottom) hit an $18,000 test house built 3,500 feet from the explosion (page 839).

In the first ½ second, radiant heat, traveling as fast as light, ignites both house and wooden lamppost as the rising fireball casts a shrinking shadow.

A second later the shock wave blows out the fire, punches in the front, and peels back the roof. Side walls explode outward, but the lamppost still stands.

These remarkable pictures were taken from a tower by a lead-cased automatic electronic camera developed by Dr. Harold E. Edgerton, recipient of the National Geographic Society's Hubbard Award for his contributions to high-speed photography (see May, 1953, NATIONAL GEOGRAPHIC MAGAZINE).

Edgerton, Germeshausen, and Grier, Inc., for AEC

847 National Geographic Photographer Volkmar Wentzel

Bottle House, Less than 50 Miles from the Blast, Survived Unscathed

Some 51,000 bottles are embedded in walls of this house at Rhyolite, Nevada ghost town. The St. Patrick's Day test fills the front page of custodian Lewis Murphy's newspaper (page 850).

near-by atomic tests have not kept it from growing like an atomic mushroom. In February, by best available figures, Las Vegas's boom as a resort city had swelled the permanent population to nearly 36,000. Another 5,000 were expected by June. The 1950 census found only 24,624 residents.

Careful estimates indicated that visitors to Las Vegas last year numbered more than 7,000,000, an average of 19,000-odd a day.

Successively a watering stop for thankful forty-niners, Mormon outpost, Civil War fort, and railroad construction camp, Las Vegas has taken atomic tests in its stride. Cab driver and casino owner alike profess complete indifference.

But still, on blast days, the winding, dusty roads up 11,910-foot Charleston Peak are alive with the cars of atom bomb watchers. Angel's Peak, on the northern slope, provides a direct view of tests on Yucca Flat, 55 air miles away.

Follow U. S. Highway 95 northwest from Las Vegas, and for 200 miles there is little but brush-covered desert and eroded mountains on either side. Here in past ages salt lakes washed against tilted ranges and left smooth, rounded basins.

From Indian Springs Air Force Base, on the route of gold-rush wagon trains, planes take off to participate in tests over the proving ground.

"That's how we know when to go outside to watch the flash," Eva Vaden, Flathead Indian

848

U. S. Air Force for FCDA

Unharmed Dummy Shows How a Simple Shelter Could Save a Human Life

The winsome model suffered no visible damage, even though "she" sat in the cellar of the house that all but disintegrated (page 846). Civil Defense engineers placed 10 different types of shelters in the blast area—two basement designs and eight buried outdoors. A manual on home shelters will sum up results of these experiments. A simple lean-to such as this can be built by a home handyman at a cost of $40. Even in this house, placed 3,500 feet from the atomic blast—close enough for destruction—the shelter offered good protection (pages 842 and 843).

849 Department of Defense

Masked Men Hover Over the Blast Area to See if Death Still Lingers There

After each test, airmen protected by respirators, masks, and thick clothing measure radioactivity with Geiger counters (box, center). When radiation subsides, experts move in by jeep to check the damage.

waitress of the near-by Oasis Cafe, told me. "We wait until we hear the planes leave."

North and west of Indian Springs for more than 100 miles stretches the Las Vegas Bombing and Gunnery Range where combat pilots sharpen their fighting eyes.

Animals Take Blasts in Stride

Overlapping this huge Government reservation and extending to Frenchman Flat itself, the U. S. Desert Game Range sprawls across more than 3,440 square miles.

Desolate as the desert may seem, it is home to more than 60 different kinds of animals and over 175 bird species. Mountain lions, mule deer, and bighorn sheep roam mountain canyons; jack rabbits are thick.

After the first atomic blasts a helicopter-traveling biologist studied the area carefully. He reported no sign of injury. The blasts had not driven animals from their natural range, nor had their normal habits been affected in any way. A "mountain lion" reported driven into Las Vegas by the explosions turned out to be a great Dane dog on a morning walk.

Seventeen miles beyond Indian Springs, signs point north to Camp Desert Rock and the entrance to the Nevada Proving Ground at Mercury, Nevada.

Except during test series, Desert Rock is a ghost camp. Concrete tent floors lie bare amid a few metal mess halls. Winds from the Specter Range and Skull Mountain whistle eerily around a sign that reads: "Through these portals pass the most sandblasted soldiers in the world."

Mercury, on the other hand, ranks as a Nevada town, thanks to its U. S. post office. There is only one drawback. No one without official business can get in.

Gray-uniformed security guards man the first check gate. Only AEC scientists, ste-

nographers, and proving-ground workers live at Mercury, in houses with aluminum roofs designed to reflect the sun's heat.

Town Scared Only Once

Beatty, Nevada, is the closest sizable town to Yucca Flat other than Mercury.

"We have a population of about 400, counting kids and dogs—and the dogs outnumber the kids," Nye County's Deputy Sheriff Gilbert Landis said with a grin. The smile lit a coppery face belonging to a full-blooded Paiute Indian.

"Nobody here pays much attention to the bomb flashes any more," he said. "They did once, though. After the first explosion, those radiation fellows came down the main street, stopping with their counters every 10 feet or so. Scared us to death. But we didn't have to be evacuated after all. We weren't 'hot.'"

At Rhyolite, five miles west of Beatty, 8,000 gold-hungry miners and speculators of the early 1900's built a city that was to be the metropolis of southern Nevada. Rhyolite then had two railroads, three newspapers, an ice plant, a telephone exchange, and the conviction that the rich green "genuine Bullfrog" ore would never run out.

Five people live among the weathered ruins of Rhyolite now. Lewis Murphy takes care of one of the two buildings still intact—the Bottle House museum, built of 51,000 beer bottles (page 847).

"Sure, I've seen the flash of that atom Thing," he admitted. "But who wants to get up at 5 a.m. just for that?"

Goldfield, farther up Route 95, preceded Rhyolite to fortune and gaudy fame. Though its glory holes gave up millions of dollars of jewelry gold, not a mill or a mine operates in Goldfield today. There, one September afternoon in 1906, Tex Rickard staged the lightweight "Battle of the Century" when Joe Gans beat Battling Nelson. The purse was $30,000, and the fight went 42 rounds.

Pete Wadika, owner of a service station there, showed us his National Geographic Society membership certificate. He waved proudly at plaster cracks in the ceiling.

"That blast really shook us up!

"Most people coming through Goldfield stop to ask if the air is safe between here and Beatty. It is, but they still seem leery."

We turned off to seek out one of the West's most famous old prospectors, 80-year-old Death Valley Scotty, in his ornate Castle.

"What do I know about the Bomb? Dog-gone it, young fellow, asking my opinion is like pulling a hair out of a horse's tail and asking him how fast he can run! I don't know any more about it than a jackass braying."

Lower in Death Valley a dust storm caught us in a white haze of flying sand and alkali grit. Even at the bottom of this valley of heat, where Bad Water lies near the Western Hemisphere's lowest point, flashes from the atomic tests sometimes light up the sky.

At the Moapa River Indian Reservation 35 miles east of the proving ground we found Luther Hill, a Chemehuevi tribesman.

"People here are not frightened by the flashes," he said. "Perhaps they would be if they were closer. But as it is, they pay little attention."

One of Nevada's finest natural spectacles is hidden in the mountains southeast of Moapa. Rouge-red sandstone eroded into fantastic shapes makes the Valley of Fire a fitting sentinel to the atom's flash.

Jolted Almost Out of Bed

Northwest of Moapa, 30 miles off Highway 93 in the Timpahute mountains, live the isolated people of Groom Mine, closest inhabited off-site point to the atomic blasts, twenty miles away.

The Sheahan family and their mine employees were sleeping peacefully on the morning of January 27, 1951, when the first explosion on Frenchman Flat almost knocked them out of bed.

The family aids the Atomic Energy Commission by allowing a radiation monitoring station on its property, one of many fixed stations within 200 miles of the test site. The mine workers wear special "badges" of radio-sensitive film during and after each explosion as a further check of exposure to radioactivity. They have had to be evacuated only once under its hazard (page 841).

In their mountain grandstand seat, the owners of Groom Mine have the clearest and closest outside view of the tremendous fireworks which atomic science produces inside this country.

And yet, to Nevadans, the atomic tests are only one more superlative in a State endowed with already spectacular history and scenery.*

* See "Nevada, Desert Treasure House," by W. Robert Moore, National Geographic Magazine, January, 1946.

Notice of change of address for your National Geographic Magazine *should be received in the offices of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your August number, The Society should be notified of your new address not later than July 1. Be sure to include your postal-zone number.*

NATIONAL GEOGRAPHIC SOCIETY

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To carry out the purposes for which it was founded sixty-five years ago, the National Geographic Society publishes The National Geographic Magazine monthly. All receipts are invested in The Magazine itself or expended directly to promote geographic knowledge.

Articles and photographs are desired. For material The Magazine uses, generous remuneration is made.

In addition to the editorial and photographic surveys constantly being made, The Society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, The Society's researches solved secrets that had puzzled historians for three hundred years.

In Mexico, The Society and the Smithsonian Institution, January 16, 1939, discovered the oldest work of man in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November 4, 291 B. C. (Spinden Correlation). It antedates by 200 years anything heretofore dated in America, and reveals a great center of early American culture, previously unknown.

On November 11, 1935, in a flight sponsored jointly by the National Geographic Society and the U. S. Army Air Corps, the world's largest balloon, *Explorer II*, ascended to the world altitude record of 72,395 feet. Capt. Albert W. Stevens and Capt. Orvil A. Anderson took aloft in the gondola a ton of scientific instruments and obtained results of extraordinary value.

A notable undertaking in the history of astronomy was launched in 1949 by The Society in cooperation with the Palomar Observatory of the California Institute of Technology. This project will require four years to photograph the vast reaches of space, and will provide the first sky atlas for observatories all over the world.

In 1948 The Society sent seven expeditions to study the Sun's eclipse on a 5,320-mile arc from Burma to the Aleutians.

The National Geographic Society and the Royal Ontario Museum in 1951 explored and measured newly found Chubb meteor crater, 11,500 feet in diameter, in northern Quebec.

The Society granted $25,000, and in addition $75,000 was contributed by individual members, to help preserve for the American people the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California.

One of the world's largest icefields and glacial systems outside the polar regions was discovered in Alaska and Yukon by Bradford Washburn while exploring for The Society and the Harvard Institute of Exploration, 1938.

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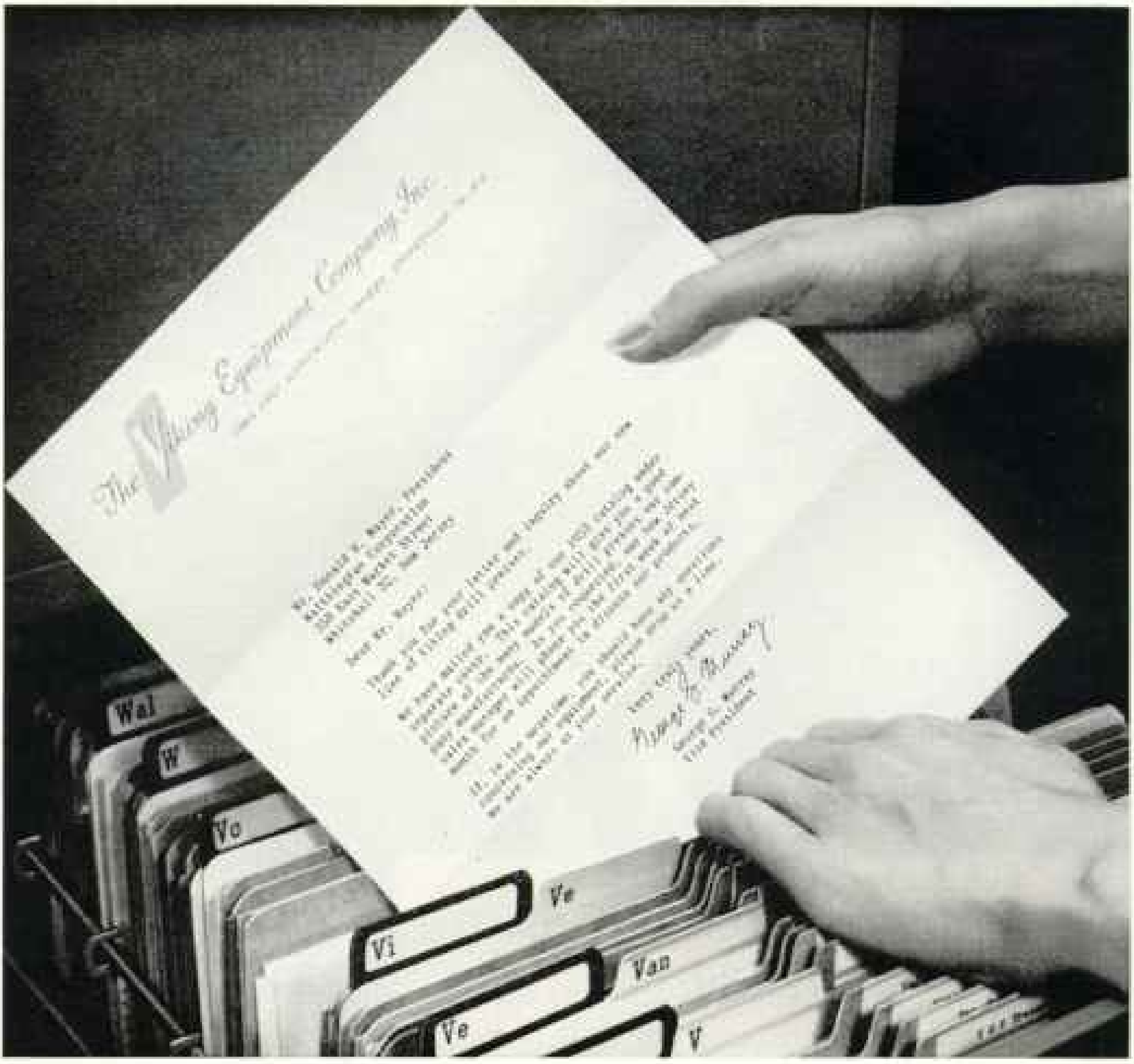

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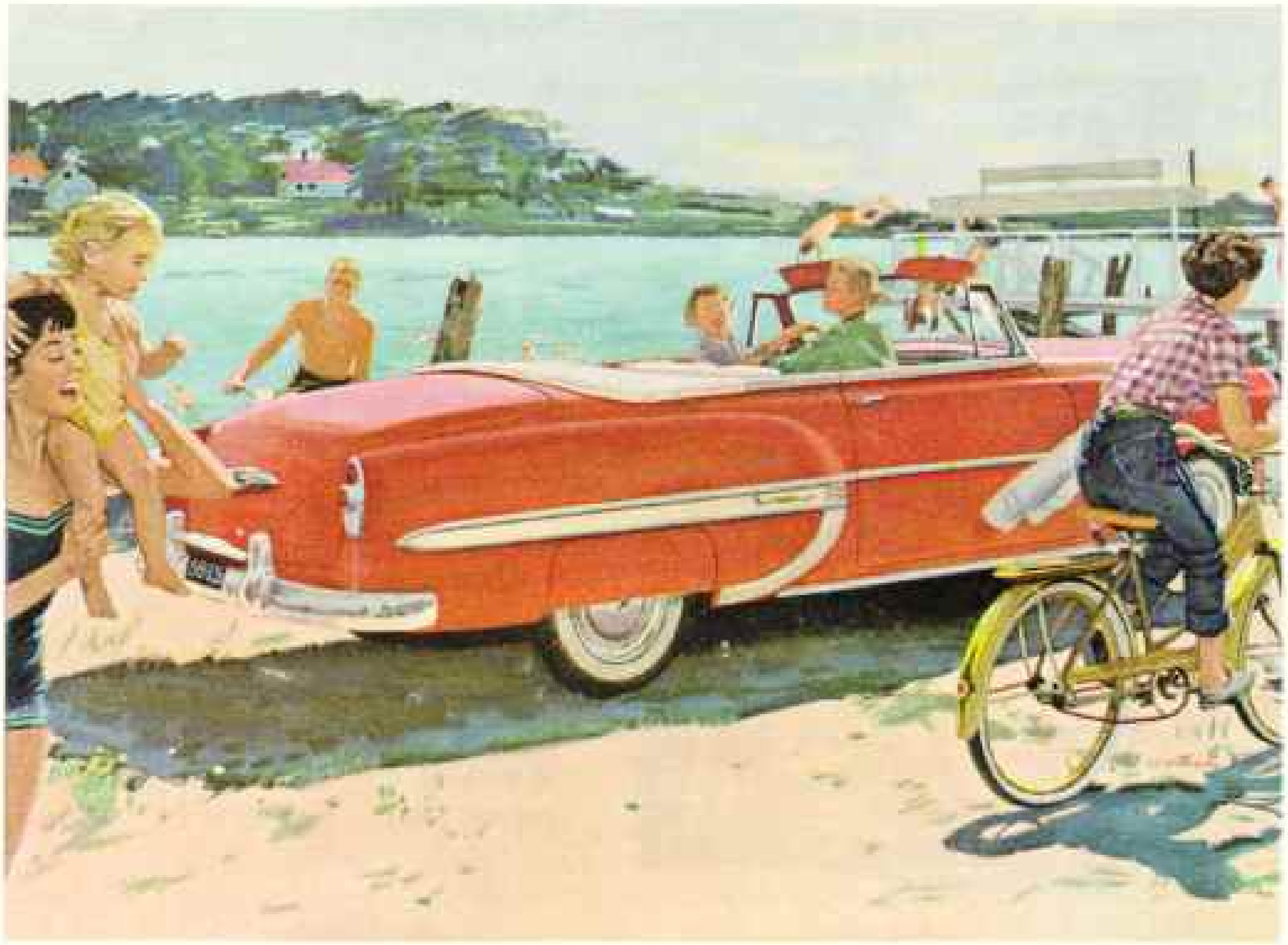

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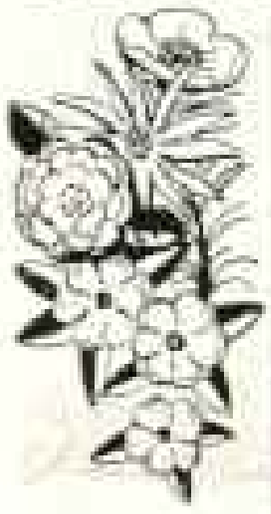

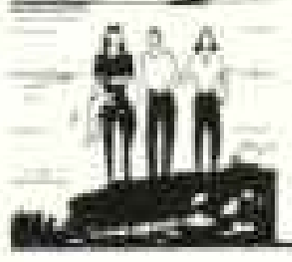

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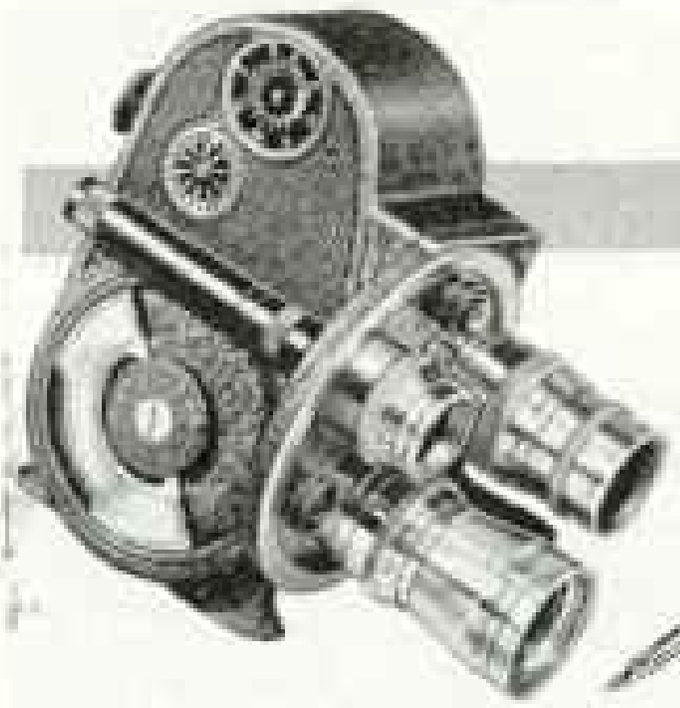

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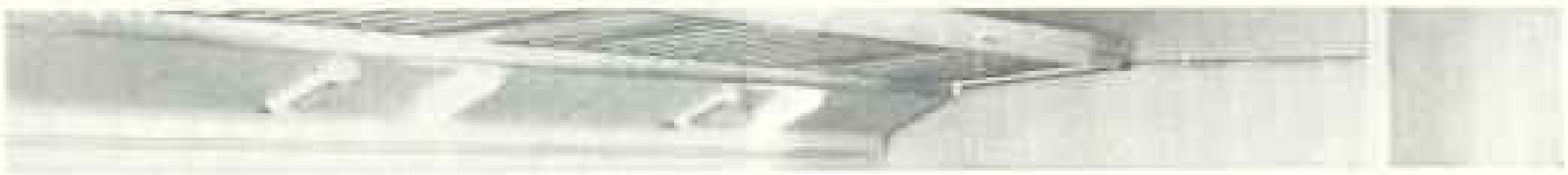

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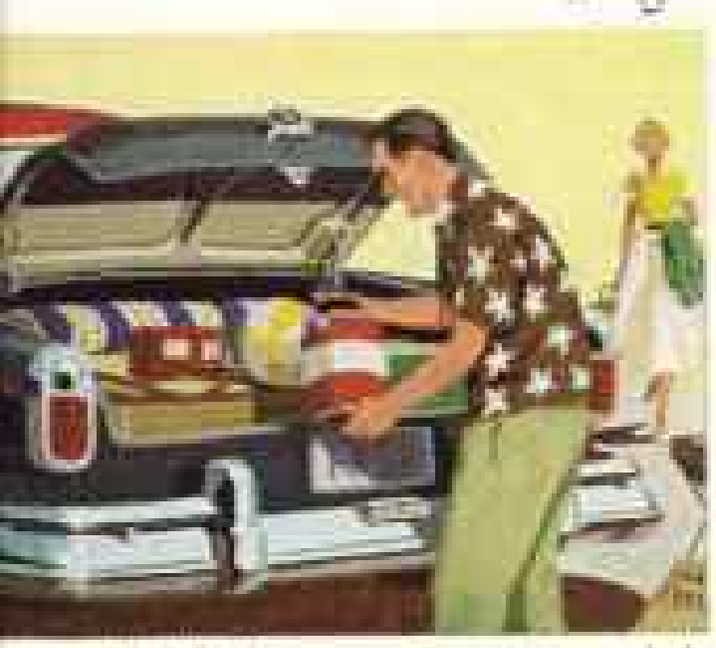

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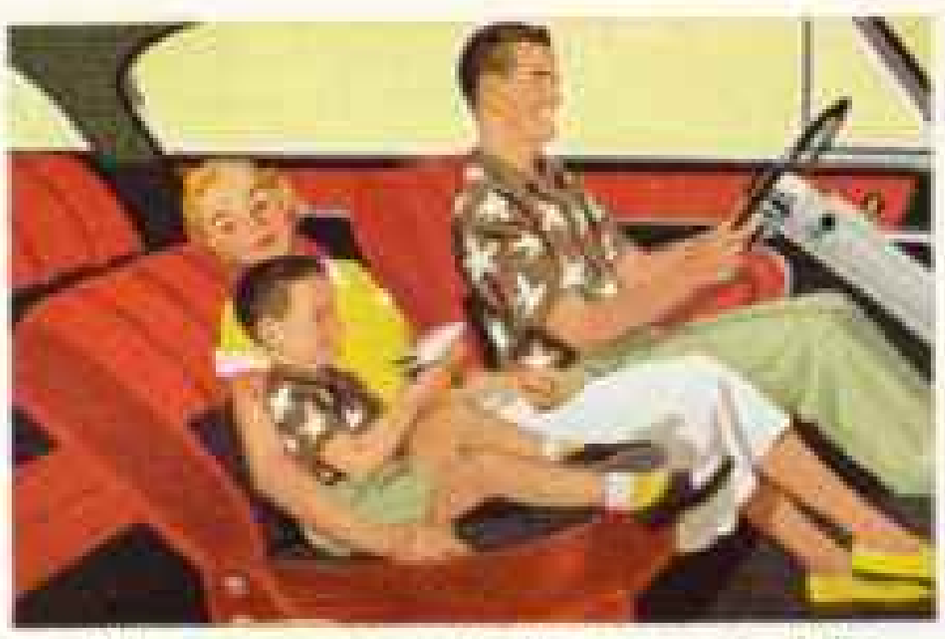

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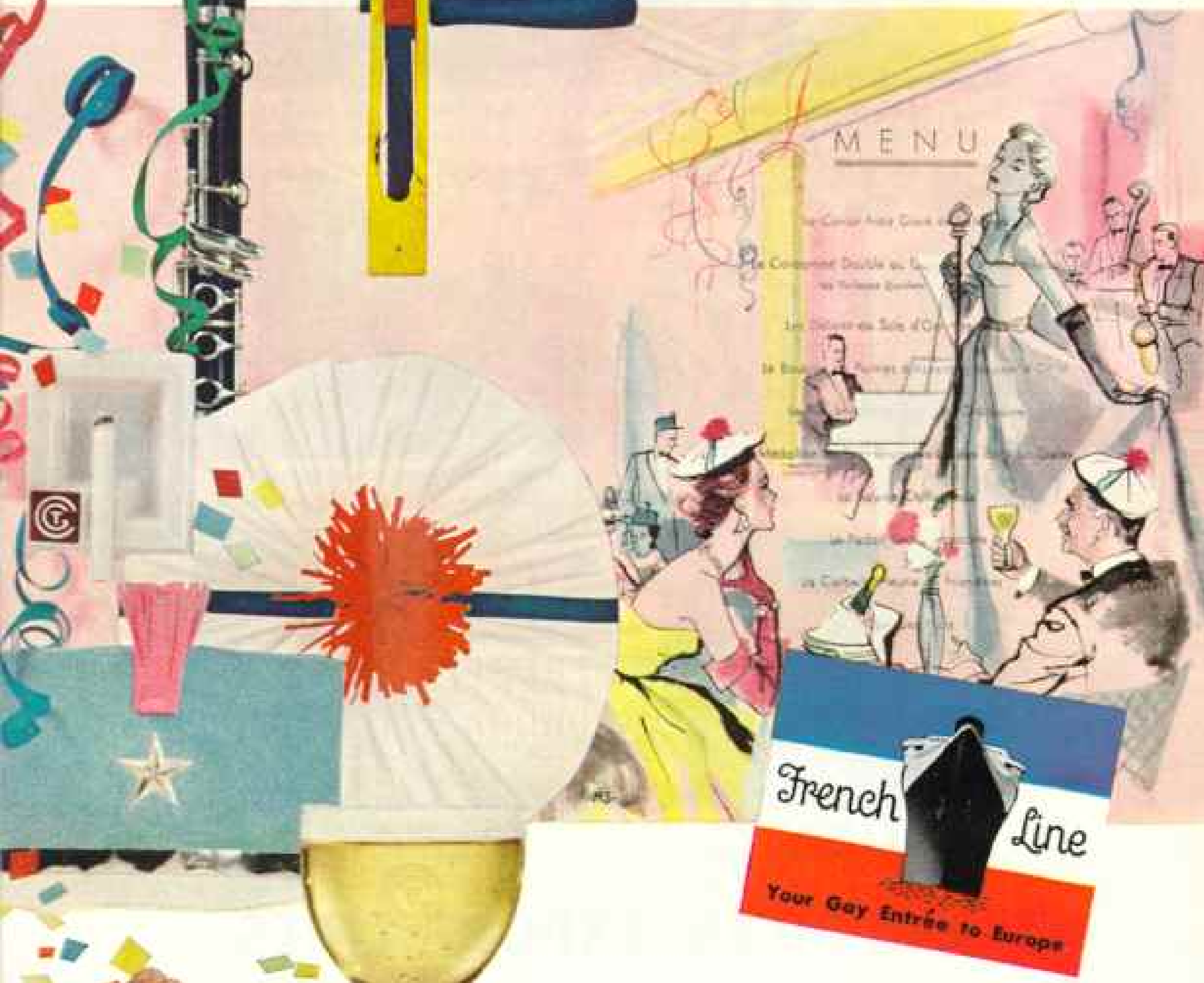
Consult your authorized French Line travel agent



Sailing dates from New York and one-way in-season minimum fares to Plymouth (slightly higher for Le Havre): **Liberté** leaves New York July 7, 23, August 12, 28, September 15; First Class, $345; Cabin Class, $235; Tourist, $175. **Ile de France** sails July 1, 18, August 5, 22, September 9; First Class, $310; Cabin Class, $225; Tourist, $175. **Flandre** sails June 24, July 11, 28, August 19, September 5, 23; First Class, $320; Tourist, $175.

Other French Line offices: Beverly Hills, Boston, Chicago, Cleveland, Halifax, Montreal, New Orleans, Philadelphia, Portland, San Francisco, Seattle, Toronto, Vancouver, B.C., Washington, D.C., Winnipeg, Man.

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Have you been unable to get the type of space you want on a ship to Europe this Spring? Remember . . . late Summer and Fall are *wonderful* for a Sun-Lane voyage to the Mediterranean . . .

90% **of the days are rain-free** August thru November on the Sun-Lane to Europe via the Mediterranean, and temperatures average a mild 70°.

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Best of all, enjoy the comfort of the Water Level Route . . . through gentle, scenic valleys between East and West.

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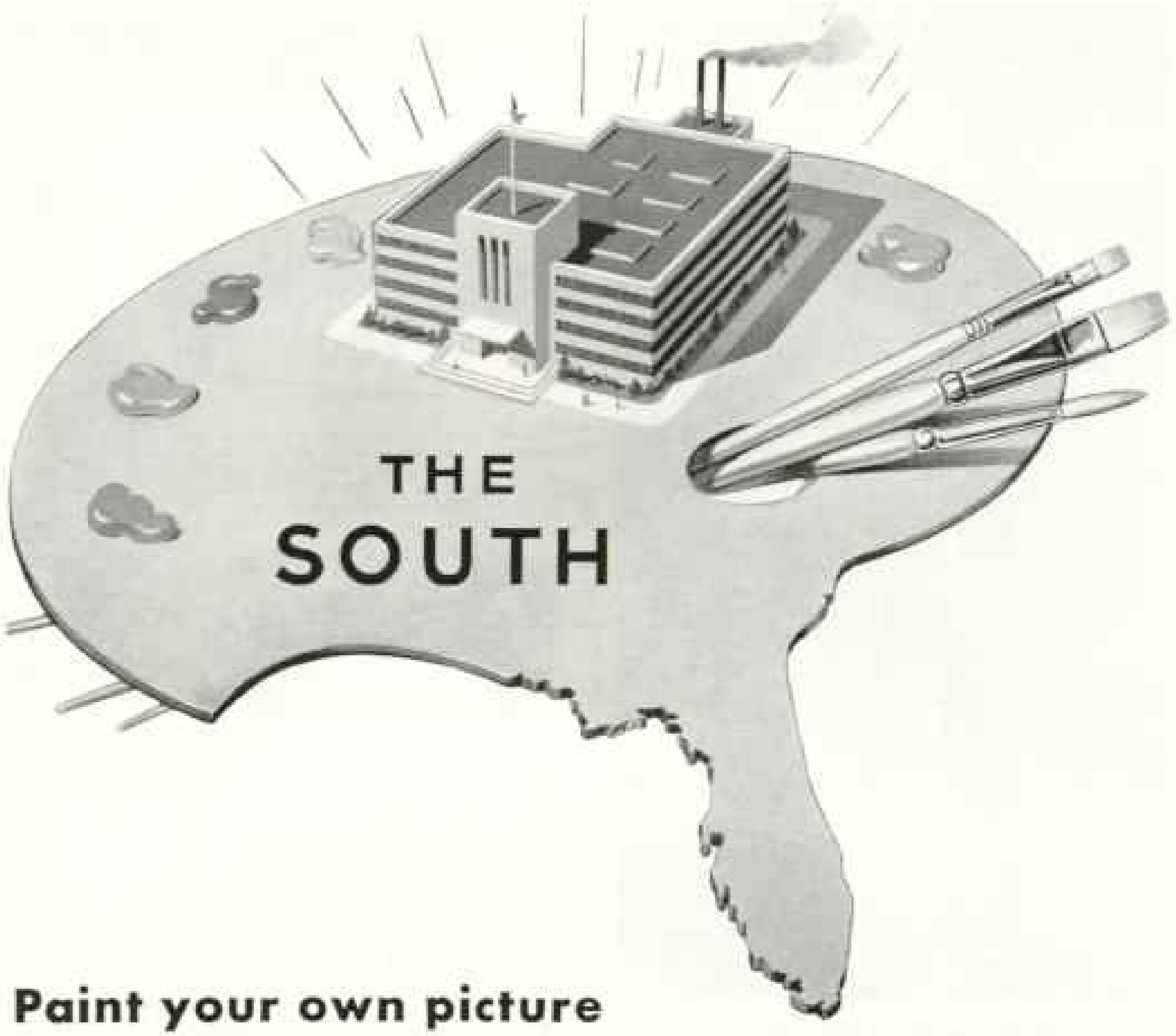

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YOU'LL FIND THAT here in the Southland of today the picture almost paints itself. And here's why —

Picture your factory in a land blessed with abundant resources just waiting to be tapped. In the picture is a mild and temperate year-round climate. In it, too, are the benefits of plentiful power and fuel—eager-to-work, easy-to-train manpower close at hand — and the great buying power of fast-expanding consumer markets.

Isn't your factory entitled to a place in this picture of the modern South?

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President

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You'll fill your sketch book, run through many a roll of film recording Gaspé's Old World charm . . . its friendly people, its fascinating bird life, its majestic coasts, the changing colors of land, sea and sky.

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10. **Romantic French Canada** (Gaspé and the Saguenay)—like taking a trip abroad.

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AUTOMATIC—AND WORKS ON BOTH AC AND DC!

Every traveler will welcome this small, compact, lightweight iron to freshen up travel-tired togs!

It takes up less space than a pair of slippers. The fabric dial gives the right heat *automatically* for the material you're ironing. The whole iron weighs only 24 ounces—and works on both AC and DC.

See it today at your G-E dealer's! What better gift for youngsters on vacation trips, for service friends, for *any* traveler, including *you!* General Electric Company, Small Appliance Division, Bridgeport 2, Connecticut.

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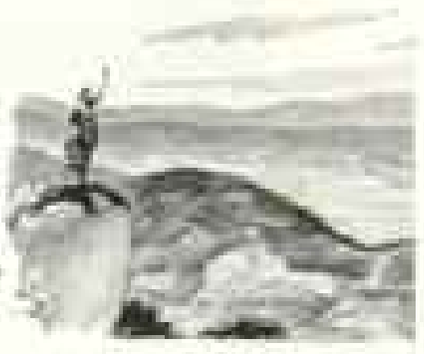

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Wolf's Head Oil—100% Pure Pennsylvania—will add many more miles of trouble-free driving to your car. For Wolf's Head is scientifically fortified—provides complete protection against wear, corrosive acids, deposits. Be particular—always insist on Wolf's Head Oil. And send for Wolf's Headfree Guide-to-the-Weather Folder that helps you forecast weather.

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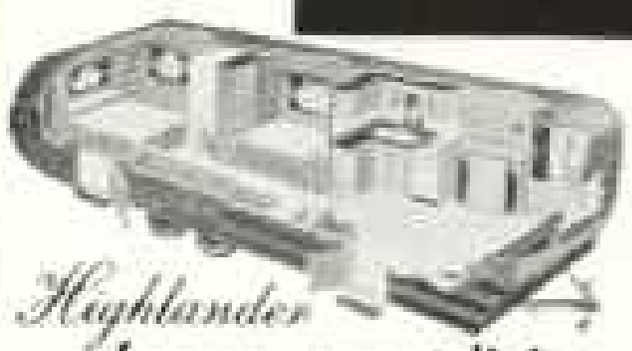

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NEW cushion plastic tightens LOOSE FALSE TEETH

Stop slipping, sliding and sore gums! Chew and enjoy all foods. Reline your plates at home with DENTUR-EZE. *Not a paste or powder*, but a *cushion plastic* that lasts weeks. Thousands delighted. 60c and $1 tubes. If druggist hasn't it, send check or m.o. to DENTUR-EZE, 902 John St., Seattle 9, Washington.

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Ophelia . . . you'll go
walking in the meadow, too. Someday in
another Springtime even sweeter
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fine, strong, light and wonderful enough for a
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Get in this new DE SOTO *and see what's happened to motoring!*

EVERY time you start, stop, turn or park—every mile you drive, you're reminded that motoring has changed, *if you're driving a De Soto.*

Let's start at the beginning. Its new low-contour design *looks* better. And the moment you get in the car you *know* it's better. From the driver's seat you have a safer view of the road.

Touch the accelerator. The 160 h.p. Fire Dome V-8 (*world's most powerful engine design*) gives an entirely new feeling of freedom-with-security.

Now turn the wheel. Nudge it to right or left. See how it turns easily without tugging. That's *Full* Power Steering. Now try parking. It's easy as dialing a phone. You're an expert in two minutes.

You drive without shifting, too. And Power Brakes are another surprise. They need but the gentlest pressure. You never "jam" them on.

That's what happened to motoring. It's a joy that goes beyond mere transportation. But the question is: When will *you* discover it? It's easy. Ask your De Soto dealer to arrange a drive in the Fire Dome V-8 or Powermaster Six . . . soon.

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Parking's a pleasure. With *Full* Power Steering, you turn the wheels with one finger. Park in close spaces effortlessly. And no "wheel fight" from ruts, soft shoulders!

With America Fore Insurance, You Have a Friend in *Every Town!*

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Before you start on that vacation trip, a little advance preparation can forestall happenings which might mar an otherwise happy journey.

First, have your car checked to be sure it is in perfect mechanical condition—so that your comfort and safety will not be threatened by mechanical failure.

Then, have your agent or broker check your insurance—to be sure that the property you leave behind is properly covered and that your automobile protection is adequate.

And most important—when you have your insurance in a company of the America Fore Group you will have the comfort of knowing that no matter where you might be—nearby there is an America Fore insurance man—ready and anxious to help you in case of need.

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This year America Fore is observing 100 years of proven insurance protection by two of its companies, The Continental Insurance Company and the Fidelity-Phenix Fire Insurance Company.

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Send for our "Trip Tips" booklet.

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Gentlemen: For peace of mind while on my trip please send me, without obligation, a copy of "Trip Tips."

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1. When you whisper—Denture Breath may tell everyone you wear false teeth.

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Without harmful brushing, Polident cleans your false teeth—as no soap or toothpaste can. Polident is guaranteed to be the safest, quickest, easiest way to keep plates naturally white, fresh and odor-free or *your money back*. Get Polident today.

World's Largest Selling Denture Cleanser

POLIDENT

Recommended by More Dentists Than Any Other

How to enjoy a Safe Vacation

Millions of Americans are now looking forward to their vacations . . . relaxing on ocean shores, camping in cool mountain country, or fishing in lakes and streams.

No matter what point of the compass lures you, there are many things that you can do to make your vacation happy, healthful, and safe. Indeed, you can make your *entire* summer more enjoyable if you plan now against the hazards of this season. Some of these are listed below—with suggestions about how to guard against them or what to do if they should occur.

Accidents in the water . . . About half of the 6,500 drownings that take place each year occur during June, July, and August. Safety authorities say that many drownings could be prevented through these simple precautions: *never swim alone or when tired, overheated, or too soon after eating*. Above all, learn how to give artificial respiration, and always observe safety rules posted on beaches.

Burns from the sun . . . Never over-expose yourself to the sun, especially during the hottest part of the day. Begin your tanning with brief periods, no more than 10 minutes the first day, with gradual increases thereafter. If long periods are spent in the sun, use a lotion or cream which may help to protect you. Apply it after each swim—and every two hours while sunning.

Injuries from outdoor activities . . . Over-stretching can *strain* a muscle. Should this occur, rest the muscle and apply heat. Should a sudden wrench *sprain* a joint, it is best to elevate it and use cold applications. Cover bruises with an ice bag or cold cloths. Cuts and scratches should be treated promptly with an antiseptic such as 2-percent solution of iodine. Always have *deep wounds* and other serious injuries treated by a doctor.

Hazards of the highway . . . Too often automobile accidents mar the family vacation. So, have your car thoroughly checked for safety before starting off. Particular attention should be given to the steering wheel, brakes, tires, lights, horn, windshield wipers and door locks. Drive at a safe speed, obey all traffic signals, and stop driving or rest whenever you feel fatigued. Remember, even if you are driving safely, watch out for other cars.

Moreover, it is wise not to try to crowd too much activity into too little time. Take it easy . . . if you want your vacation to give you that refreshed, rested and relaxed feeling. Finally, wherever you go—whatever you do—take along a newly stocked first-aid kit and a first-aid booklet. Metropolitan will be glad to send you a copy of its free booklet, which tells how to deal with many hazards of the summer and vacation season.

It's only human to get a glow when others view your car with admiring eyes.

The satisfaction of Plymouth owners doesn't end here. For they know that their car contains admirable traits you can't see in a glance—advanced engineering, quality materials, honest craftsmanship, and an enduring performance that constantly sustains their judgment in choosing a Plymouth.

PLYMOUTH

Chrysler Corporation's No. 1 Car

The Plymouth Cranbrook Convertible Club Coupe, shown at the Shadow Mountain Club, Palm Desert, near Palm Springs, Calif.

Drive safely... drive *refreshed*

Here's a good Rule of the Road.
When you begin to feel tense
and the steering wheel fights back,
stop at the friendly Coca-Cola cooler.
Pause, stretch, relax and have a Coke.
In a minute or two you're ready
to drive on safely
... because you drive *refreshed*.

"You bring back more of your vacation...

when you make not only snapshots— but full-color movies, too"

Horace Sutton

Travel Editor, The Saturday Review, photographer, author of the famous Footloose books . . . "Footloose in France" . . . "in Italy" . . . "in Canada" . . . "in Switzerland"

"I've seen travelers forget their passports, their luggage, even the name of their destination, but never their cameras. It's more than likely you'll take snapshots on your trip...some in color. And if you own a 35mm. camera you'll be bringing back some handsome color slides.

"But to bring home a collection of pictures that will capture your trip with *all* the action and color . . . you really should take along a movie camera, too.

"From the moment you leave your front door, you'll be on the move. You'll see new people, new places, the unpredictable. Will you remember it all? The pageantry of the old world . . . the mountain with the mists gathering round its head . . . the sunburnt hands that strummed the guitar...the people, the color, the action?

"No—you simply can't do full justice to your travels with a 'still' camera alone. The world around you just won't stand still! If you want to *make* the next trip the best trip, *make movies.*"

So movies are wonderful. *But aren't they hard to make . . . and expensive, too?*

Not a bit of it! *Movies are simple as snapshots.*

There's an exposure guide on every Kodak movie camera. Some models don't even have to be focused. The others, if you like, can be set to work at any distance.

A fast lens does a perfect job under varying light conditions. It has a sunshade, too, so you can follow action almost right into the sun.

As a matter of fact—you can learn all you need to know about movies just from the instruction book . . . get grand ones from the start!

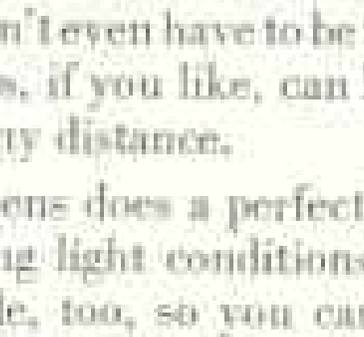
It's easy, then, to *make* good movies. But what about the cost?

Well—the Brownie Movie Camera sells at $39.75. It uses economical 8mm. roll film . . . only $3.95 for full-color or $3.25 for black-and-white, *including processing!* And that's enough to make 30 to 40 average-length movie scenes!

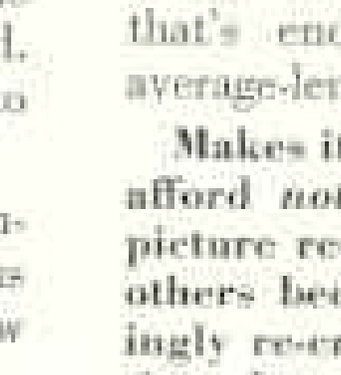
Makes it hard to see how you can afford *not* to make movies . . . a picture record precious above all others because it faithfully, excitingly re-creates the color, the action, the reality of life itself.

But get the whole fascinating story for yourself from your Kodak dealer. Or just mail coupon to Kodak—for free copy of "Let's Make Movies."

Eastman Kodak Company, Rochester 4, N.Y.



Cine-Kodak Royal Magazine Camera—For 16mm. movies at their most luxurious best. With *f*/1.9 lens, $176.25.



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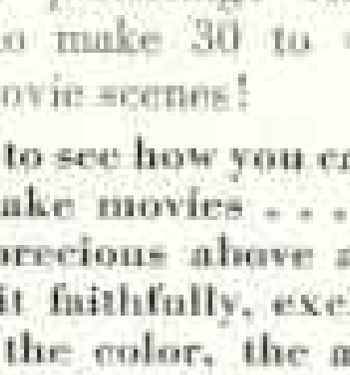

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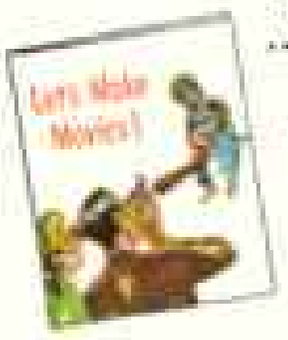

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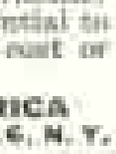

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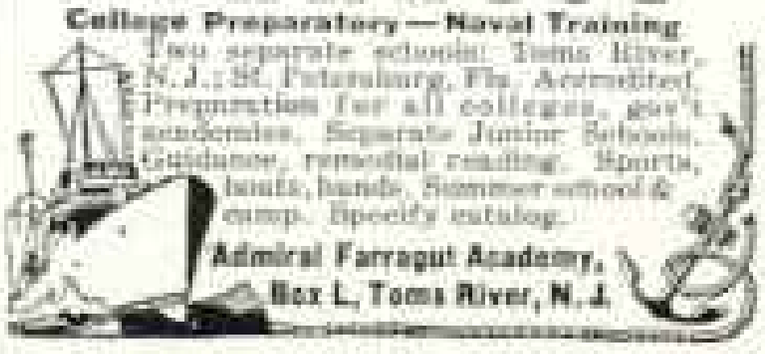

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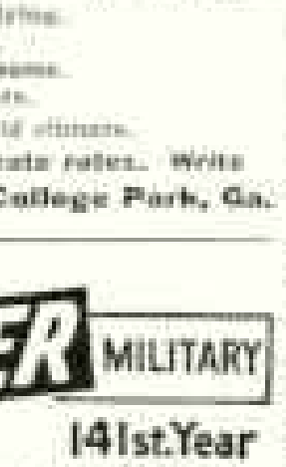

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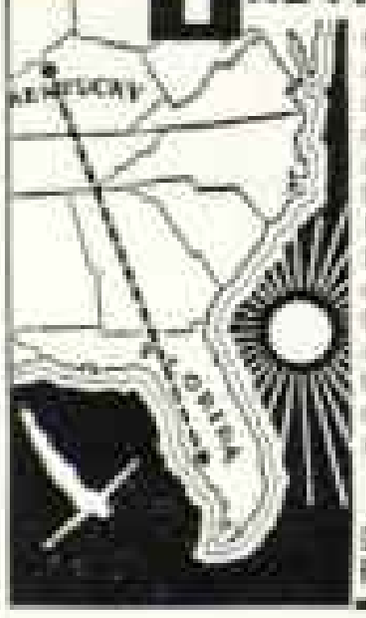

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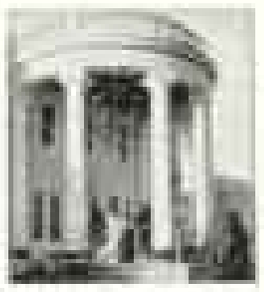

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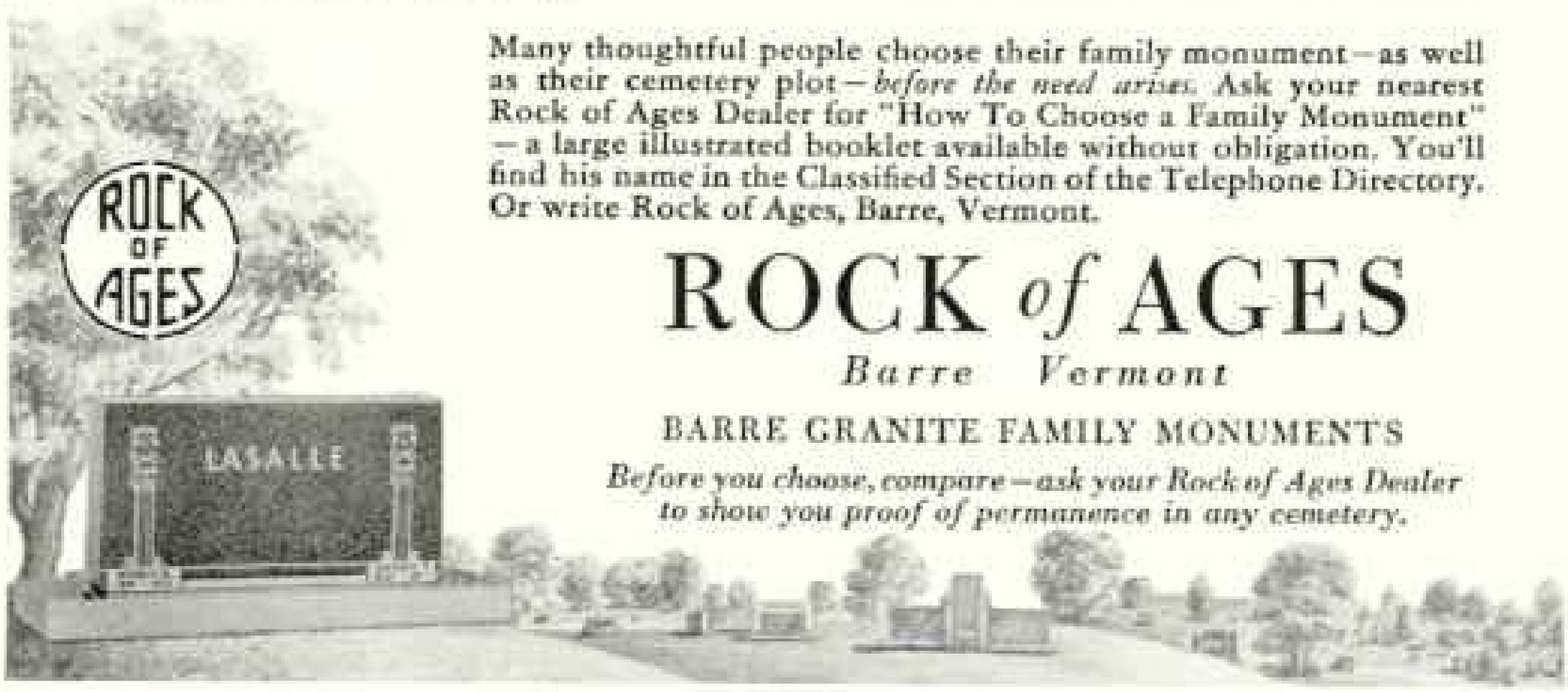

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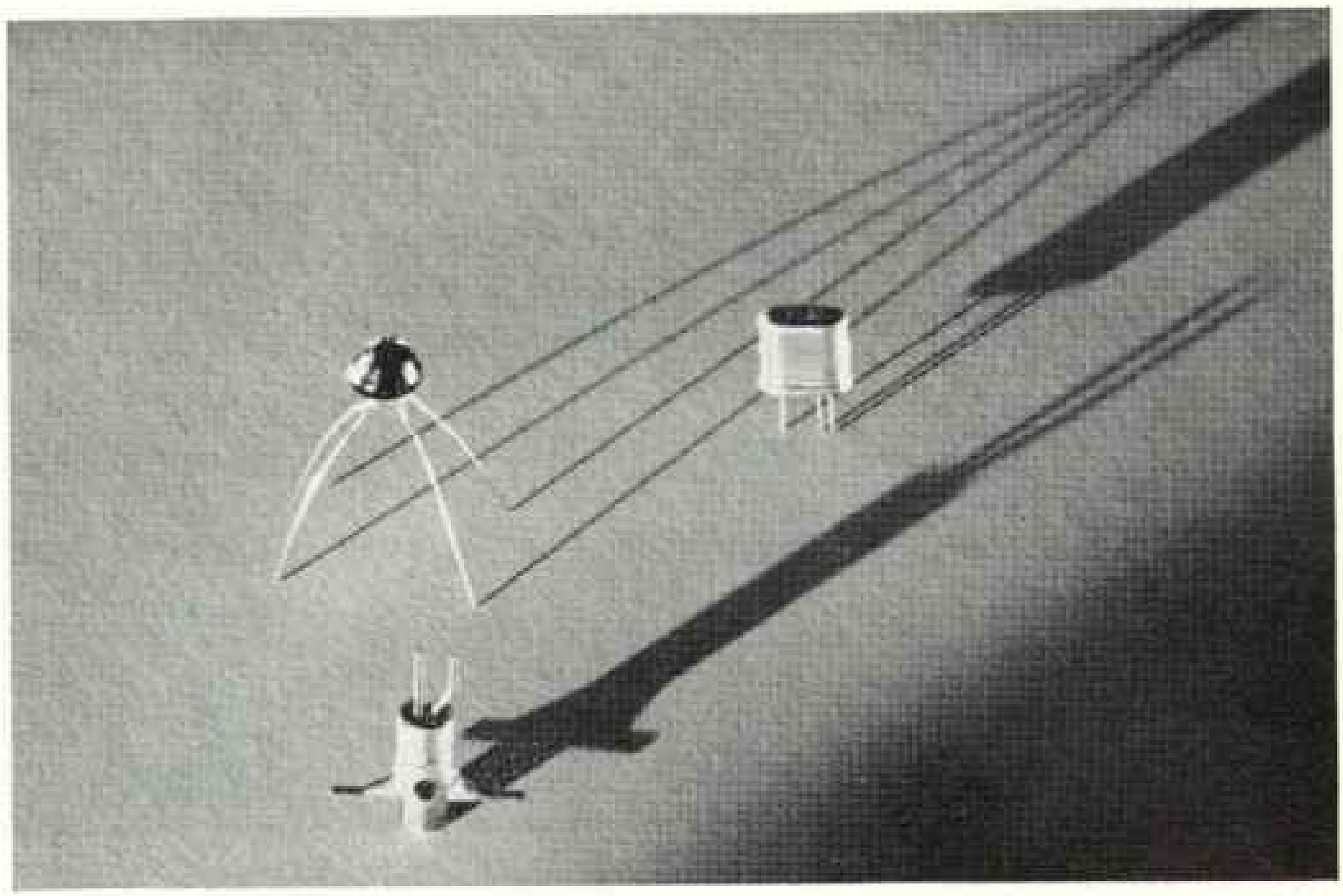

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