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Desert River Through Navajo Land

BY ALFRED M. BAILEY

With Illustrations from Photographs by the Author and Fred G. Brandenburg

CLOUDLESS skies greeted us as we stood on the shores of the San Juan, ready to start our 200-mile journey down the swift river.

Originally, eleven of us had planned to make the trip in three boats. But as we dropped down the winding trail along the cliffs of the river, a dusty automobile drove up and its occupants, a young couple, hailed us. They were honeymooners, they announced, and they wanted to go along.

Here was a problem. None of us was superstitious, but adding two would give us a party of thirteen!

The newcomers were strangers, and we soon inferred that this was the bride's first venture west of Philadelphia. However, the groom was well acquainted with the West and vowed he could handle a boat.

We considered the matter gravely. Shooting the San Juan's rapids is a glorious lark, safe enough when ordinary precautions are observed, but the river is a willful one, swift to punish those who approach it with too little respect. One wrong move can turn fun into disaster.

13 Aboard Four Plywood Boats

But young love prevailed, and Norman D. Nevills, the leader of our expedition, ordered another boat hauled down to the shore. It was shoved overboard and christened the *Honeymoon Special*. We never had cause to regret our decision.

So off we went—thirteen persons in four of the sturdy plywood boats which Nevills, an explorer and self-styled "river rat," designed especially for bucking the turbulent waters.

Our starting point was Mexican Hat, which appears only on large-scale maps of Utah and consists of the Nevills's home and lodge plus a few oil wells. The tiny settlement takes its name from an eroded rock formation resembling a gigantic inverted sombrero balanced atop a tall column (page 154).

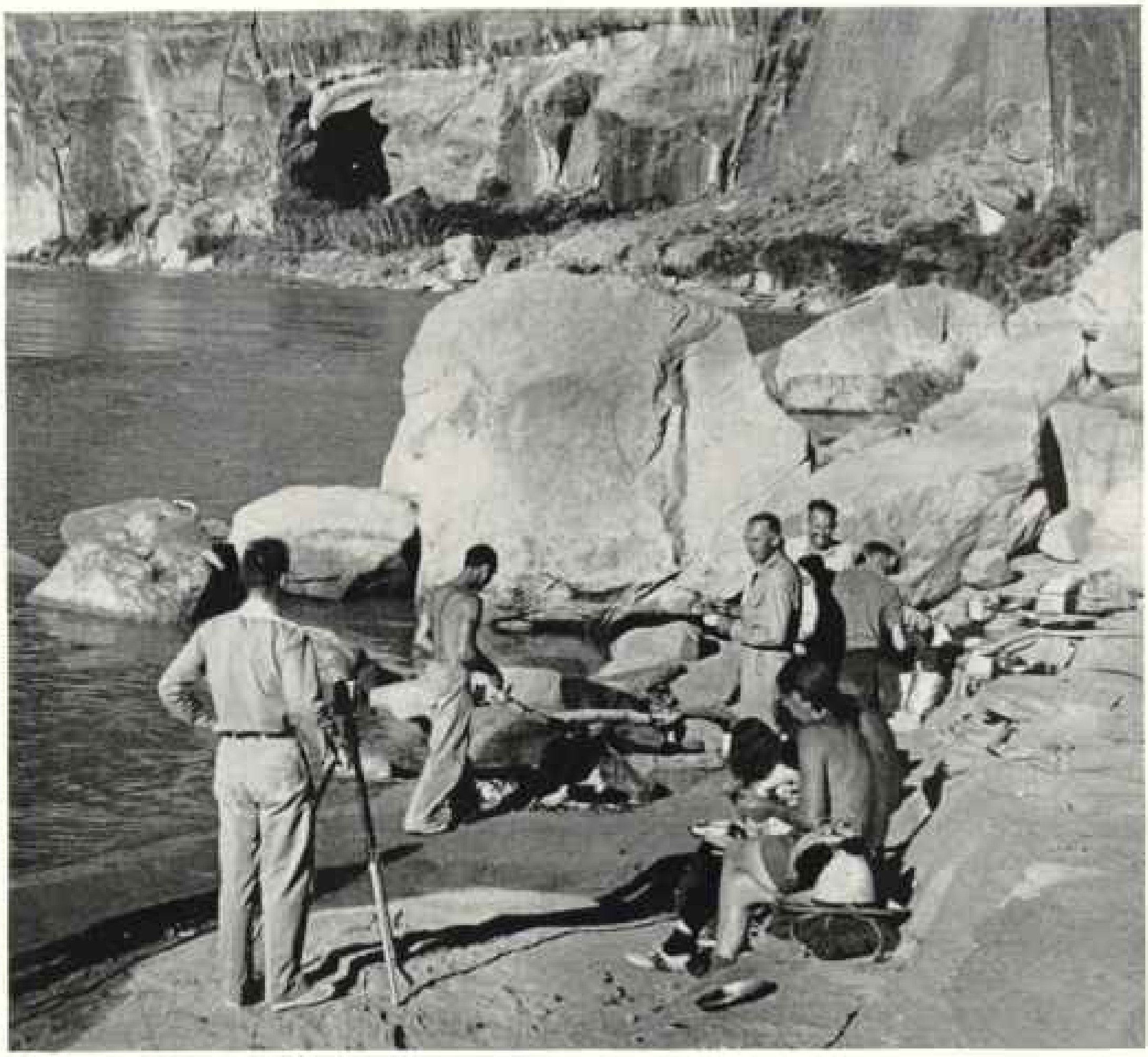
An early explorer in this region said that this monument rested upon such a fragile neck that it would soon tumble to the desert floor. A hundred years have passed since he made that prediction—and the hat is still there.

Assisting Nevills were other "white water" veterans—Wayne McConkie, a biology teacher from Moab, Utah,* who told me he learned more of Nature on his vacation journeys down the river than from his textbooks, and Don Bondurant, a civil engineer who was on leave from his War Department job.

In Nevills's boat, the *Music Temple*, were Marjorie and Francis Farquhar and Randall Henderson, editor of Desert Magazine. With Bondurant in the *San Juan* were Maj. Weldon F. Heald and the Reverend Harold Baxter Liebler, an Episcopal missionary who, through his years of work among the Navajos, has become known as "Father" Liebler, or the "Padre of the San Juan."

McConkie's companions in the *Hidden Passage* were Fred Brandenburg, my associate at the Colorado Museum of Natural History in Denver; my daughter Pat and myself. The newlyweds, Frank and Marjorie Cooke, aboard the *Honeymoon Special*, made up the rest of the party.

* See "Utah's Arches of Stone," by Jack Breed, in this issue of the NATIONAL GEOGRAPHIC MAGAZINE, page 173.



Rocks, Sky, and Water Frame a Breakfast Nook on the Colorado

Norman D. Nevills, explorer and "white water" veteran (center), turns out flapjacks for hungry fellow campers. Frank Cooke (left) photographs the scene in Glen Canyon near the mouth of the San Juan (pages 155 and 158). After breakfast the party explored Hidden Passage, a long, narrow side canyon, its entrance marked by the dark shadow (upper left).

Our boats were shoved off, one by one, and quickly caught by the swift current (page 159). The *Honeymoon Special* all but vanished in a great trough and the bride got a thorough dousing in the first hundred yards of the journey. It was a small matter, but a hint of things to come. Waves frequently broke over the bows and wet all of us. But we thoroughly enjoyed the experience for most of the journey down the San Juan and Colorado to Lees Ferry, Arizona (map, page 153).

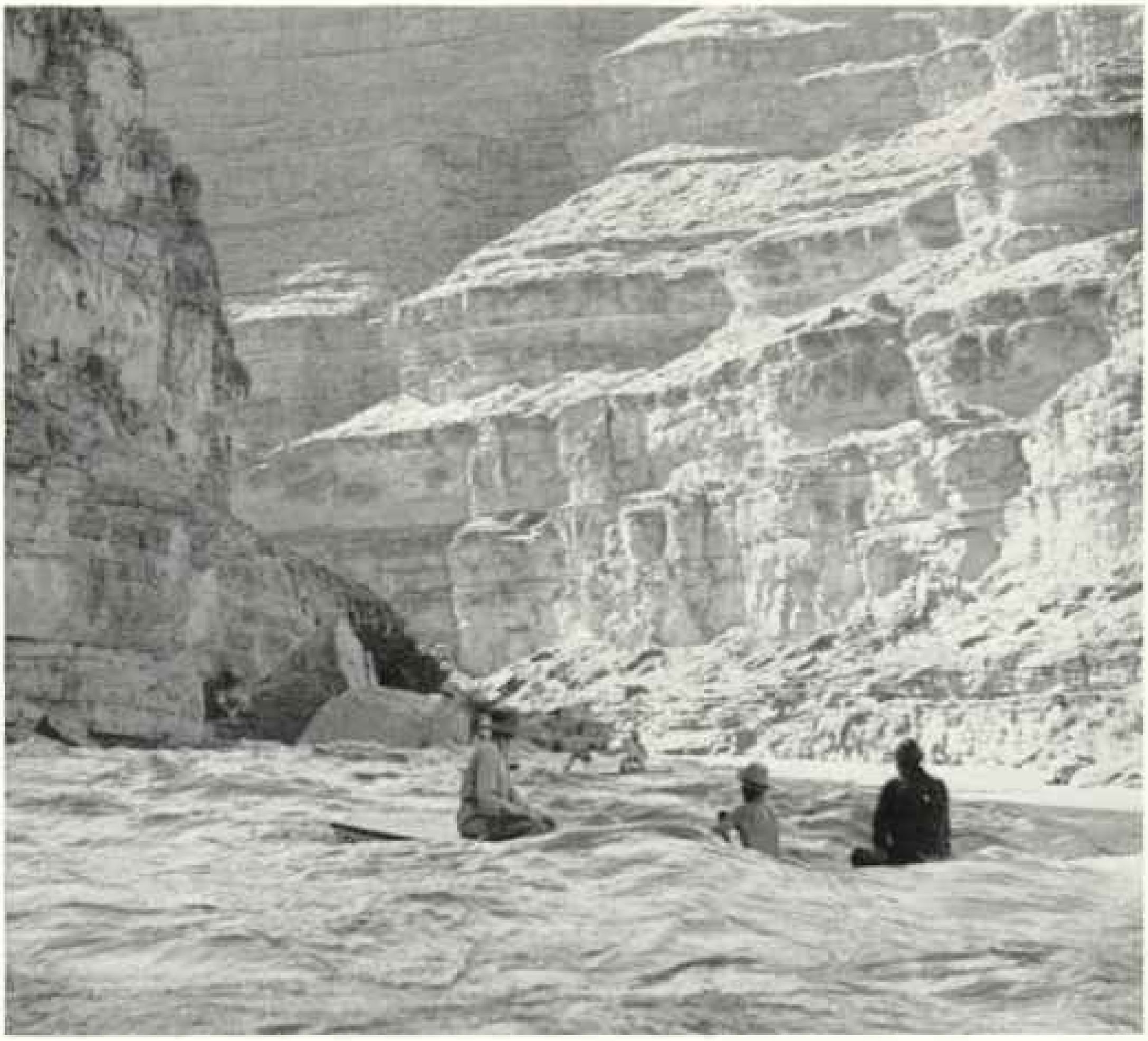
Since my job was making pictures of the expedition, I stayed ashore to photograph the others as the current swept them around a bend. Then, with Doris Nevills as guide, Farquhar and I traveled overland to await the arrival of the boats in the famous Goosenecks (Plate III).

Here, looking down, we saw the San Juan threading its way between the terraced walls of a canyon 1,500 feet deep. Formation of the Goosenecks began some millions of years ago when the San Juan meandered across the landscape and then was trapped as the plateau began to rise.

Goosenecks a Scenic Spectacle

Today the river makes five majestic bends between these towering walls, twisting back on itself so that it journeys 25 miles to cover an airline distance of five, on its way to join with the Colorado in seeking the sea.

Known to geologists as a magnificent example of "entrenched meander," the Goosenecks present a truly remarkable spectacle in a land of scenic splendors.



A Boat Almost Vanishes in a Miniature Ocean of Sand Waves

Movement of sediment on the bottom is believed to cause these hazardous billows, encountered in relatively placid stretches of the San Juan. The oarsman (center) struggles to keep his boat broadside to the current, rolling with the breakers. His passengers, bobbing up and down as if riding a seesaw, watch a sister craft downstream.

When the boats appeared far below us, they seemed mere glistening white toys as they moved dreamily with the current.

Also visible from our lofty vantage point was a strange rippling pattern on the river's surface. This was caused by the famous "sand waves" of the San Juan, waves that roll and break just like those of the ocean.

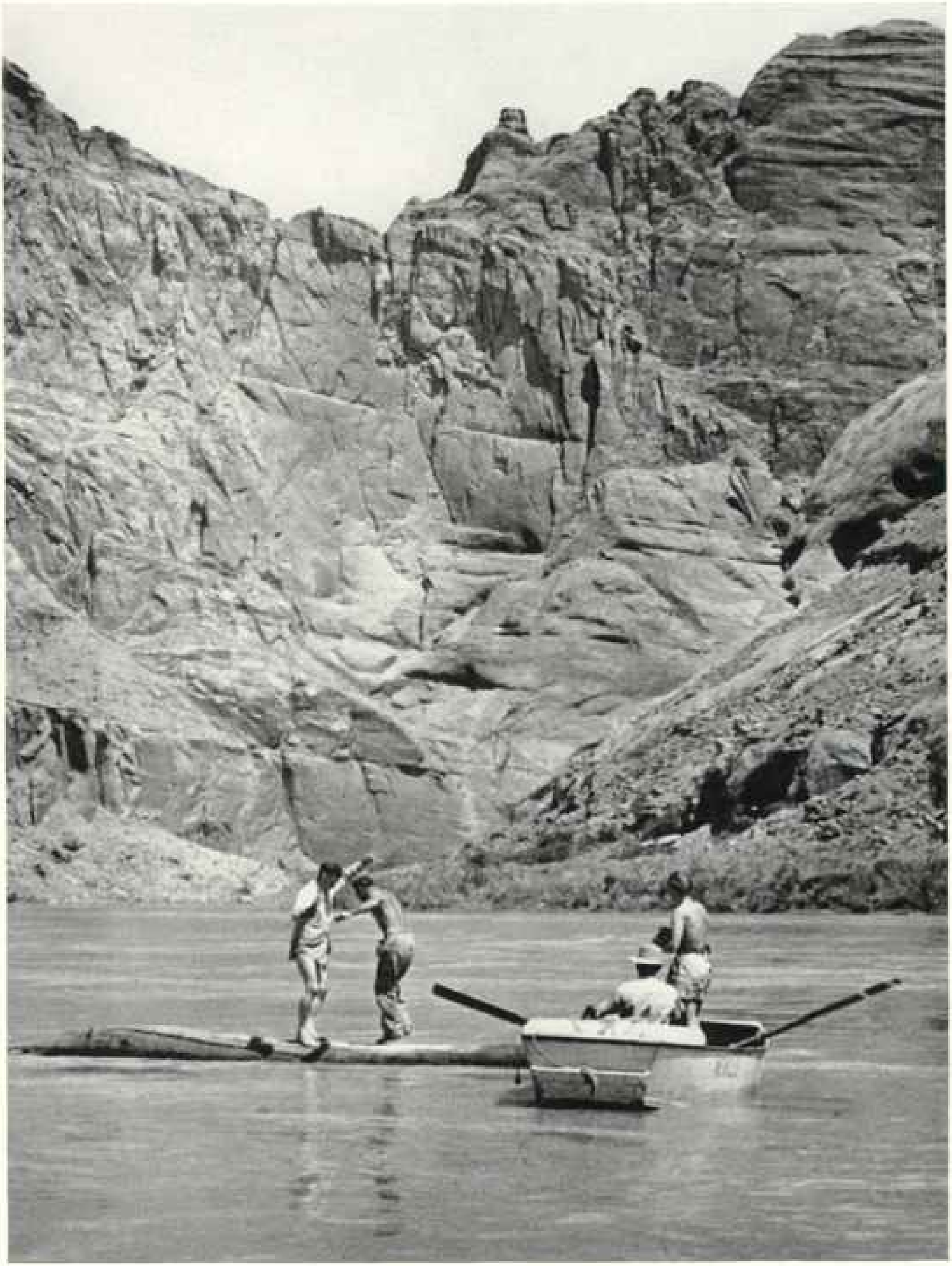
Several explanations have been advanced for the sand waves; the one most widely accepted is that they are caused by the movement of a great deal of sediment on the bottom.

While the others of the party beached their craft and waited on the shore, Farquhar and I dropped down the steep walls on the old Honaker Trail which follows along the ledges by a series of switchbacks. We reached the river easily after a couple of hours of travel.

Once you start on this trip, you are committed to it, for the river flows between steep cliffs. You can climb out in many places, but after you get out there is no place to go. There are no roads leading along the canyon of the San Juan.

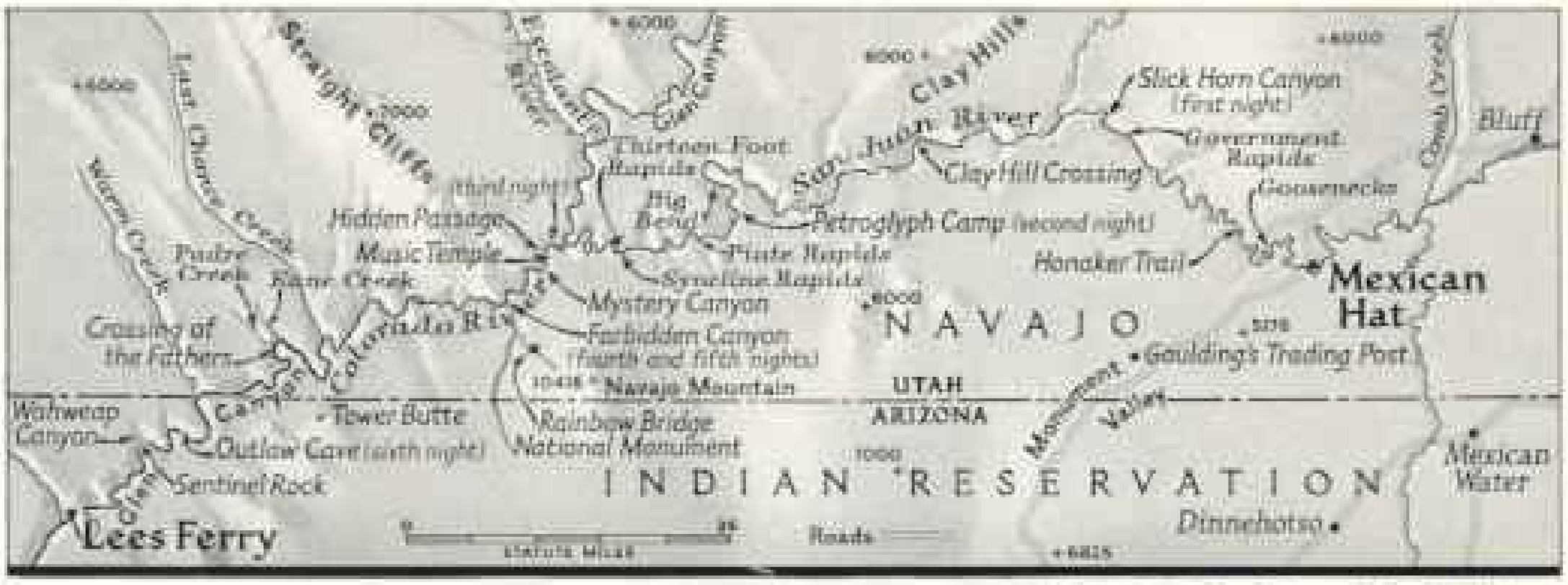
With all thirteen of us aboard our boats, we were off again, drifting easily between gray cliffs so steep that it would be impossible to climb them. In places where the canyon narrowed, the current ran swiftly—and the fun began.

There is a special technique in "white water" seamanship, and Government Rapids gave our oarsmen their first real test. As we swept into them, I remembered that they got their name because two survey boats of an



Near Journey's End, Two Voyagers Try the Lumberjack's Art on a Drifting Log

Steep sandstone cliffs, crowned by craggy battlements, form a backdrop for this bit of sport on a quiet stretch of the Colorado. Near here the party camped in Outlaw Cave, former hiding place of horse thieves, and read the names of early explorers inscribed on its walls. Next day, after a visit to Wahweap Canyon, the author and companions landed at Lees Ferry, Arizona (page 164).



Drawn by Theodora Prior and Irene E. Allemann

Barren Wasteland Trod by Few White Men Borders the Serpentine San Juan

From Mexican Hat, Utah, to Lees Ferry, Arizona, the author's party drifted 200 miles to cover an airline distance of less than 100. West of Thirteen Foot Rapids the San Juan merges with the Colorado in Glen Canyon. The voyagers left their boats beside prehistoric ruins in Forbidden Canyon and hiked overland to visit isolated Rainbow Bridge and explore numerous side canyons (Plate VI and pages 162-3).

early exploration party were wrecked here.

Entering the rapids, Nevills and his boatmen always keep the bow upstream. Thus, the boatman faces downstream and can keep an eye peeled for half-submerged boulders. By pulling adroitly on one oar or the other, he can keep his craft out of trouble (Plate IV).

Shooting the Rapids

Shooting the rapids is an exhilarating experience, especially for neophytes. The boat bobs, bucks, and plunges like an unbroken colt as, guided by the sweating oarsman, it weaves between the rocks. Over the stern—actually the downstream end of the boat—come sheets of water to be bailed out when a quieter stretch is reached. Clothes become soaked, but dry quickly under the desert sun. Swimming suits and canvas sneakers are the favorite costume for travel.

There is scant vegetation along the walls of the canyon, and very little in the way of animal life. A few violet-green swallows and white-throated swifts sailed against the blue, and during the first afternoon we saw four bighorn sheep near the water's edge.

As we approached, the bighorns quickly climbed the rock-strewn slope to the base of the cliff, leaping nimbly from boulder to boulder. When we came abreast of them, they stopped and one fine ram stood in sunlight, silhouetted against the black background for a moment. Then all four turned and disappeared around a jutting promontory.

Our first day's run was 40 miles to Slick Horn Canyon, where we camped (pages 156, 157). It was the site of an old mining operation, one of several encountered en route, where hardy folk had scratched unsuccessfully for gold and silver in paying quantities.

When we awoke it was Sunday. The first glimmer of gold bathed the top of the opposite canyon wall, and long before the glow descended to the swift water of the river McConkie had sounded the call to Sabbath services by beating a frying pan.

Padre Liebler was ready with his vestments and conducted an Episcopal service in as beautiful a cathedral as has ever been used as a place of worship. Age-worn rock of a low ledge served as an altar, and the quiet waters of a crystal pool reflected the morning light as the sun climbed higher.

After a good breakfast we shoved off and traveled for miles between high walls which dropped straight to the water. Gradually the gray rocks changed to the vermilion Wingate and Navajo sandstone formations; the cliffs lowered, and the river widened at the historic Clay Hill Crossing where side canyons gave approach to the shallow waters.*

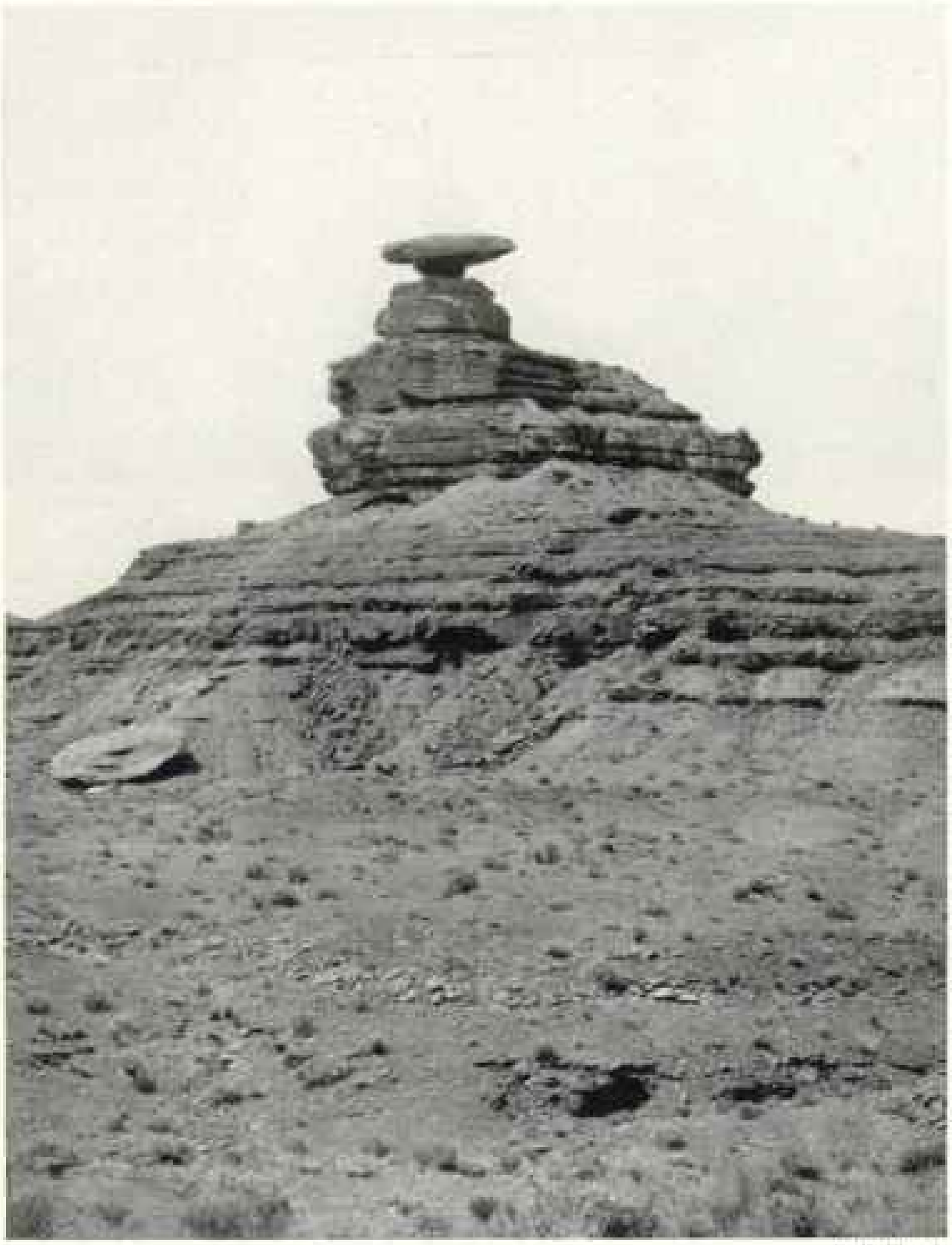
Where Piutes Farmed

It was on the level lands of this fording place that the Piute Indians farmed in the old days, laboriously irrigating their fields of corn with water from the muddy San Juan.

We had a rather difficult time in the wide reaches of the river, for the water was so shallow that boats were constantly being grounded and it was necessary to go overboard to shove them along. A great deal of good-natured name calling ensued whenever a fortunate boat caught a deep channel and rapidly passed another caught on a bar.

One of the fine views during the afternoon

* See "Beyond the Clay Hills," by Neil M. Judd, National Geographic Magazine, March, 1924.



R. P. Flood

An Upside-down Stone Sombrero Crowns Lofty Mexican Hat

Near this Utah landmark the author's party started down the San Juan. The hat, 62 feet wide across the brim, balances atop a red-shale mound nearly 400 feet high. A century ago an explorer predicted it would soon fall to the desert floor (page 149).

was of a tall butte, a red mass against the dark-blue sky, with a foreground of willow and green cane.

The trip down the San Juan is a constant delight because of the ever-changing vistas through a region where no one is seen along the shores. It is a world apart, with three or four people to a boat, all dawdling at ease, the boatmen merely keeping the stern downstream, pulling occasionally to miss a boulder and the rest of the time helping the passengers solve the problems of the world.

Sand Waves Cause Trouble

The current carries the boat along at its own pace, now fast through rapids and again slowly over the calm stretches.

On the second day's run, big sand waves were constantly building up, breaking, and often filling our boats with water. With rapids to run, sand waves breaking at unexpected moments, and swift currents throwing us into the boulders, it was natural that people should go overboard occasionally.

Our experiences were not different from those of others, for practically everyone took an unexpected plunge sometime during the trip. The second afternoon the *Honeymoon Special* hung precariously on a rock, with the current threatening to capsize it, while the newlyweds climbed for the high side and tried to rescue movie cameras from threatened disaster.

Our camp the second night was at the Big Bend, 88 miles from Mexican Hat. Because of pictures on the rocks, drawn by some primitive artist generations ago, we called this the Petroglyph Camp.

Pat and I threw our bags down alongside one great boulder which had been decorated with curious figures, and we wondered how many hundreds of people through the ages had taken shelter in the same place.

The third day's run down the San Juan is through some swift water, hardly comparable to the Grand Canyon of the Colorado, but nevertheless through jagged channels which necessitate careful piloting.

Navajo Mountain, the great landmark in that part of the world, thrusts its head 10,416 feet toward the sky,* and we were able to get occasional glimpses as we traveled along the

*See "Encircling Navajo Mountain with a Pack Train," by Charles L. Bernheimer, NATIONAL GEOGRAPHIC MAGAZINE, February, 1923.

beautiful straight-walled red canyon.

Piute, Syncline, and Thirteen Foot Rapids were run in quick succession, without incident other than the filling of the boats with water.

Slow-motion pictures made from the bank show the boats disappearing from sight and enthusiastic passengers enjoying the thrill of their lives as they emerged from the flying spray.

In the late evening we reached the junction of the San Juan and Colorado Rivers. While the others waited, our boat traveled ahead that we might climb the mountain on the far shore of the Colorado to photograph the others as they emerged from the shadows into Glen Canyon (page 158).

No Laughing Boy Is Joe Navajo, Junior

Before tackling the San Juan, the author visited the Navajos of Monument Valley. Here he found mothers still strapping their babies to cradleboards like those of Basket Maker times. A hoodlike arrangement shields the youngster's eyes from the sun (Plate I).

A Quiet Stretch of the Colorado

It is an isolated region which has been visited by only a few. There are no signs of habitations—just cliffs and narrow shores grown with willows and tamarisk, and rounded, wind-blown rocks of red sandstone which have been incised by the winds of untold centuries.

We had now entered the peaceful stretch of the Colorado,* where it runs swiftly for 80 miles through the last half of beautiful Glen Canyon, named by John Wesley Powell on his first expedition, because of little amphitheaters and wooded caves which broke the overhanging walls.

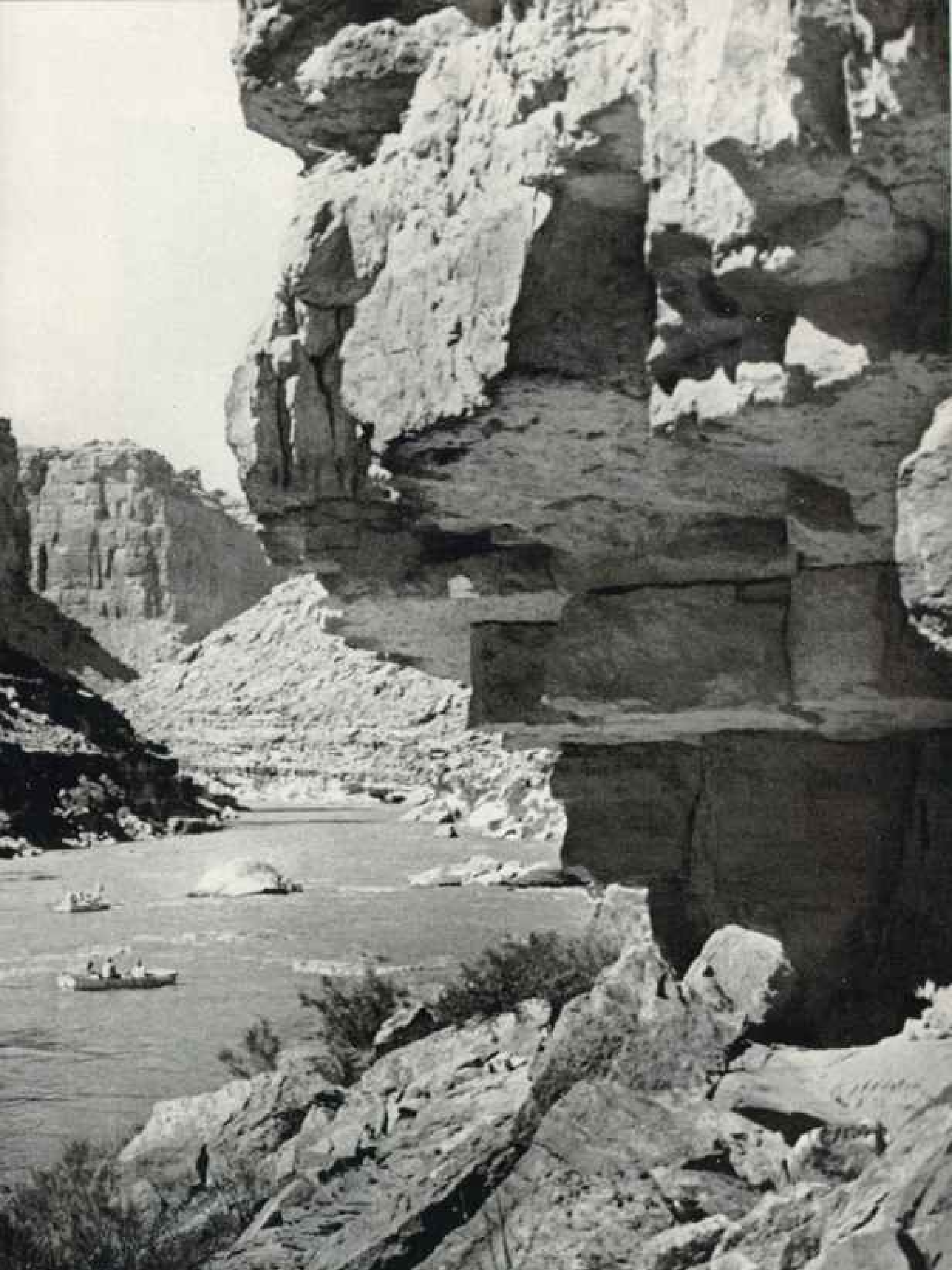
The sand waves and rapids of the San Juan were behind us, but still ahead were scenic and historic places—Music Temple, Rainbow Bridge National Monument, and the Crossing of the Fathers—so far from the beaten path that only a privileged few have visited them.

Our evening camp was on a bar a short distance below the meeting place of the two rivers, and I was out of my bag before sunrise the following morning to photograph the golden glow descending from the summits of the hills beyond. The camp slowly came to life, and while McConkie fried ham, bacon, and eggs, Nevills started throwing flapjacks with reckless abandon. It is surprising how much food can be disposed of by people having a good time (page 150).

The fourth day was given over to the leisurely exploration of side canyons. Hidden Passage, a narrow valley lined with straight

* See "Surveying the Grand Canyon of the Colorado," by Lewis R. Freeman, National Geographic Magazine, May, 1924.

Honeymoon Special Drifts Warily Down upon Breaking Rocks Below Slick Horn Canyon



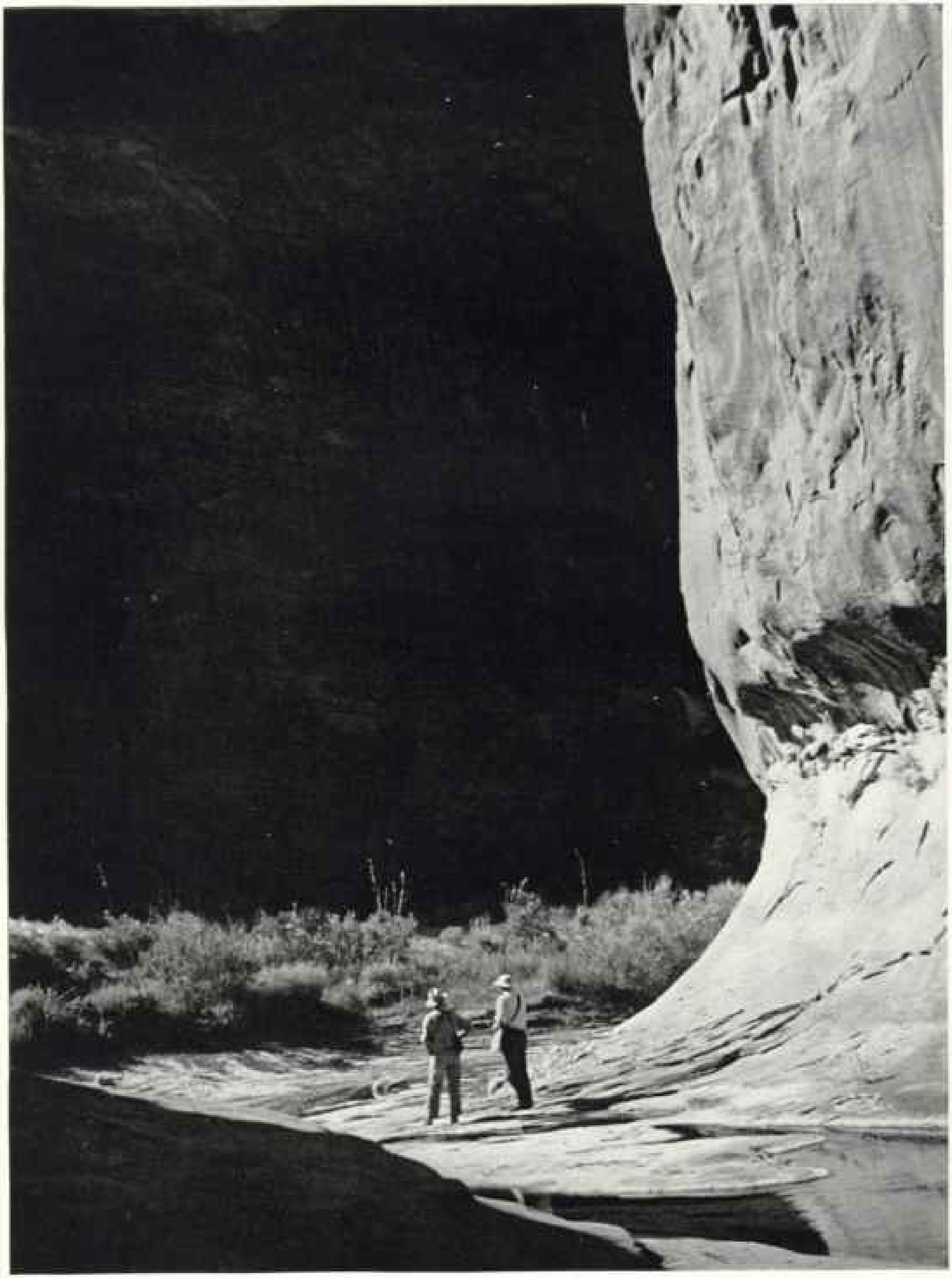
The Party Camped on a Gold Miner's Site, Held Sunday Services in a Rock-walled Cathedral

Near the Arizona Border, Two Rivers Meet in a Wasteland of Timeworn Sandstone

Merging currents of the San Juan (right) and Colorado Rivers form a herringbone pattern. Here the Bailey party's boats enter Glen Canyon, named by explorer John Wesley Powell (page 155). At one point the two streams are only five miles apart, but the winding San Juan travels 54 miles before joining its sister.

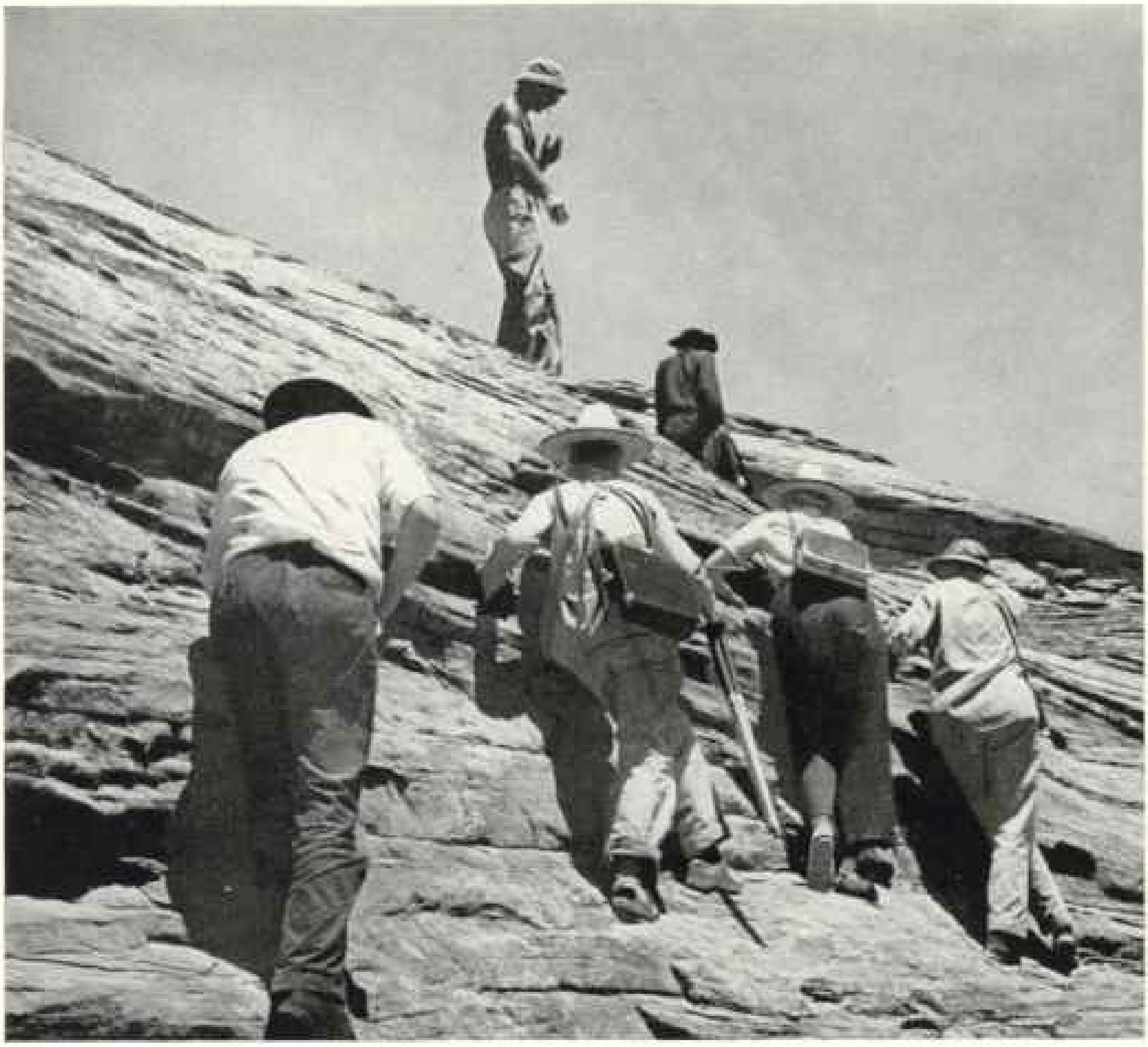
White Water Ahead! Into Specially Constructed Boats Goes Equipment for 200 Miles of Adventure

Cans of food were numbered with paint, for labels would be washed off at the first rapids. Perishable articles were packed in watertight containers. The Bailey party began its journey here near the San Juan bridge, at Mexican Hat, Utah.



Shadows Blacken the Towering Walls of Rainbow Bridge Canyon

Dwarfed by overhanging cliffs, the author and friends hiked through this gorge to see the Navajos' sacred stone arch, discovered in 1909 and visited since then by many famous persons (Plate VI and page 163). Canyon walls rise sheer from 6 to 1,200 feet, broken by many caverns several hundred feet deep.



They Clamber Over Slickrock "Where Saints and Heroes Trod"

To reach the Crossing of the Fathers on the Colorado, the voyagers made a roundabout trip over rocks so hot they raised blisters on fingertips. This inhospitable region was made famous by Padre Silvestre Vélez de Escalante and his associates, 18th-century explorers who cut steps which are still visible (page 164).

walls, ran back for miles and offered adventure in the way of steep slopes to be scaled. A beautiful little waterfall was bordered with ferns, and where light filtered into a bend of the canyon tall yuccas were in bloom.

Where "Old Shady" Sang

Across the river was Music Temple, where Powell camped on his trip of exploration on August 1 and 2, 1869. The explorer aptly named the narrow passageway because Old Shady, his cook, sang nostalgic songs there.

Powell, later to become a founder of the National Geographic Society, said in his notes:

"When 'Old Shady' sings us a song at night, we are pleased to find that this hollow in the rock is filled with sweet sounds. It was doubtless made for an academy of music by its storm-born architect; so we named it Music Temple."

No light entered the canyon for color photography, but it was a delight to wander where early adventurers had trod. On the walls we found the names of William H. Dunn, of the first Powell expedition—who with two other men was killed by Indians when he left the party a day before the journey through the canyon was completed—and of Powell himself and others of the 1871-2 expedition.

Two miles below was Mystery Canyon, so named locally because of steps carved by Indians into the cliffs, a faint trail which leads upward, but so worn by time that no one has been able to reach the ledge above.

Nevills hopes to return with adequate tools that he may solve the mystery of what lies beyond. Pools of clear water mirrored sky

When Tired of Drifting, One Can Always Get Out and Swim

Pat Bailey (left) and Marjorie Farquhar cool off with a plunge in the muddy Colorado near the Crossing of the Fathers. In the boat, Norman Nevills handles the oars, with Francis Farquhar (left), of the Sierra Mountain Club, and Randall Henderson, editor of Desert Magazine, as passengers.

and grass and walls so perfectly that it was difficult to tell where reflection ended and reality began (Plate VII).

Our boats worked through the narrow passageway for several hundred yards, and then we hiked to a great domed room with gently sloping banks grown with ferns and columbines, and with a dark swimming pool that offered an irresistible lure.

A short distance beyond Mystery Canyon, on the opposite side of the river, was another narrow passageway with vast curving amphitheaters cut from the solid rock by rushing water carrying rounded boulders as grinding agents.

The stream bed was filled with the worn stones, which no doubt had been carried many miles by the floods that occasionally rush down the narrow channels. At the entrance was an overhanging rock in deep shade, where an Indian artist of long ago had depicted animals of the region.

Then as twilight descended on the desert river, we made Forbidden Canyon, another overhanging cliff with narrow shelves. We spread our bags alongside prehistoric ruins that were still further reminders of the people who had lived in this remote area and passed on, probably leaving the world about as they found it—no better, or no worse, for their having spent their brief span of years.

The winding stream leading through the canyon for a short distance was full of catfish, and we caught a fine string, so that a bacon and fish breakfast fortified us for the 12-mile hike ahead.

To Rainbow Natural Bridge

Forbidden Canyon is the starting point for the overland trek to one of the scenic wonders of our great American desert—the Rainbow Bridge, made known to the world by Prof. Byron Cummings and his guide, John Wetherill, the trader to the Navajos, back in 1909.

Another party under leadership of W. B. Douglass, of the United States General Land Office, also visited the bridge at the same time. Nashja-begay, a Piute who had already seen the bridge, guided the white men the last half-day of the trip.*

We started early, loaded down with lunch and cameras, and wound along in single file through the deep shadows cast by steep walls.

It was over four miles along the rocky floor of the canyon, which widened in places so there were dense stands of scrubby vegetation with flowering spikes of yucca thrust skyward, to the tributary which leads to the bridge. There in the shadows was the name of Ellsworth L. Kolb, famous in the annals of river exploration, with an arrow to indicate the direction to the bridge, another mile and a half beyond.

And what a journey it was! Massive overhanging cliffs black against patches of sunlight; glistening pools of crystal-clear water which constantly beckoned; the fluttering of ash-throated flycatchers against the blue as they sailed from one scraggly limb to another; and the echoing calls of the canyon wrens. It was cool along the canyon floor; so the 6-mile hike was just one more enjoyable experience (page 160).

The Rainbow Bridge is well hidden below towering walls; so when we rounded an abrupt bend we were not prepared for the breath-taking beauty of this span of wind-smoothed rock arching more than 300 feet above the creek bed (Plate VI).

Here was one of the isolated monuments of our country, for it can be visited only by hiking from the shores of the Colorado River or by a long overland pack-train trip. Before us at last was *Nonnezoshi*, the great "hole in the rock," or "arch" of the Navajos, or *Barohoini*, the "rainbow" of the Piutes. It is the largest known natural bridge in the country, unless one visited by Norman Nevills in a remote wilderness proves to be larger.

A Marvel of the Southwest

Rainbow is of reddish-brown sandstone, laid down in the Jurassic period when dinosaurs roamed over the western States, and was formed by a meandering stream cutting on both sides until an opening was made, allowing the stream to straighten its course. Through the centuries the walls have been worn and polished by winds and rains, and today we have one of the geological marvels of our Southwest.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Great Rainbow Natural Bridge of Southern Utah," by Joseph E. Pogue, November, 1911.

Since then, many notable people have journeyed to view the great arch, and we enjoyed running through the pages of the ledger in its weatherproof box.

Some twenty-one years before our visit, Stephen S. Johnson, using the Navajo name for the bridge, had inscribed:

NONNEZOSHIE

Nonnezoshie, arch of nature,
Carved from hills of reddish sandstone,
Worshipped by the wandering Indian.

As a God to fear yet reverence,
Placed by Him who carved the Universe,
In a spot of fearful grandeur,
Far from human habitation. . . .

Grandest sight that eye may rest on,
Waits us at our journey's ending,
When we see your monster key-stone,
Bathed in gold of desert sunshine,
Nonnezoshie, born of Utah.

And some unknown, no doubt greatly impressed, had written:

Sublime, invention ever young
Of vast conception and flowering tongue
To God, the eternal theme.

Then B. M. G. added the following:

A handstand—cartwheel—yell on top—
It seems at something none will stop
To do the deeds they'll never falter
Those same would jig upon an altar
If you would do a handstand—cartwheel—yeller be
Do it somewhere else than Nonnezoshie.

And someone, a cynic, I fear, objected to something on the opposite page:

A good example of the attitude of many of the thin chested—anemic—hlank's cousins who should be shoe clerks instead of government men in a country as wonderful as this—and by the way—one they never will understand.

We ate our lunch in the shade of small trees at an ever-running spring, and then Marjorie Farquhar, Major Heald, and Randall Henderson climbed the arch. A rope was needed to get from the canyon wall to the bridge, and then the climb was fairly easy.

The return six miles down the canyon with evening shadows massing black was pleasant. The young women had counted the crystal pools and had estimated they could swim a third of the way back to camp, but their enthusiasm wore off after the tenth or eleventh plunge. Nevills, faster on his feet than the rest, was first in camp and had supper under way by the time we straggled in.

The sixth day of the journey was between upright walls of red stone through some of the most beautiful desert country of America. Violent winds have swept the "slickrock" clear of soil, so that there are vast expanses of polished rock blistering in the sun.

This is the region made famous by Padre Silvestre Vélez de Escalante and his associates because of their journey in 1776. For days they followed along the overhanging cliffs on the north side of the canyon, hoping to find a way to get to the river and a ford across to the opposite bank.

Finally, after many hardships, they discovered a route from the barren plateau over slickrock to the creek bed below. Many of the landmarks are so well named that one has no difficulty in recognizing them, particularly Tower Butte, which is an isolated red formation thrust against the ever-blue skies.

Desiring to visit the Crossing of the Fathers, we landed at Kane Creek about one mile above Padre Creek. It was necessary to travel by a roundabout route over slickrocks so hot that they raised blisters on Major Heald's fingertips when he attempted to scale some difficult slopes (page 161).

There is an ancient trail dimly visible across the parched rocks, a pathway probably polished through the centuries by moccasins of natives. The route was along the ridges skirting high over Padre Creek and finally winding down toward the trickle of water below.

Hardships of an Early Explorer

Padre Liebler, Frank Cooke, and I, loaded with cameras, scrambled down the dimly marked course, for we desired to photograph the steps cut in the hard rock over which Escalante had descended to the creek below.

Escalante inscribed in his *Journal*, November 7, 1776: "To lead the animals down by their bridles to the canyon, it was necessary to hew steps with an ax in a rock for a distance of three yards or a little less. The animals would go down the rest of the way but without pack or rider."

The parallel grooves are still visible after nearly 175 years of weathering. Padre Liebler descended in Escalante's footsteps, "where Saints and heroes trod," and we ground off a bit of color film that we might have a record of this historic spot which has been viewed by only a handful of people.

Later, as we passed Padre Creek on our way down the river, we saw the plaque erected in memory of the courageous churchmen, and we photographed the fording place.

Escalante states that after they reached the river, "we went down along it for a distance of two gunshots, now through water, now along the shore, until we reached the widest part of the stream where the ford seemed to be." It was a colorful place, little changed by time.

We crossed from Utah into Arizona at Warm Creek, and on the overhanging wall, during a period of low water, Norman Nevills and Barry Goldwater, some years previously, had marked the State line. They had added, "Arizona Welcomes You."

A Haven for Horse Thieves

Our last night's camping place was in Outlaw Cave, so named because it was a former hiding place for horse thieves. As we spread our blankets in the sands that evening and contemplated the stars, Nevills came over and said to Pat, "You know, the last trip down, I killed the biggest rattler I've seen in the canyon, right where your bag is!"

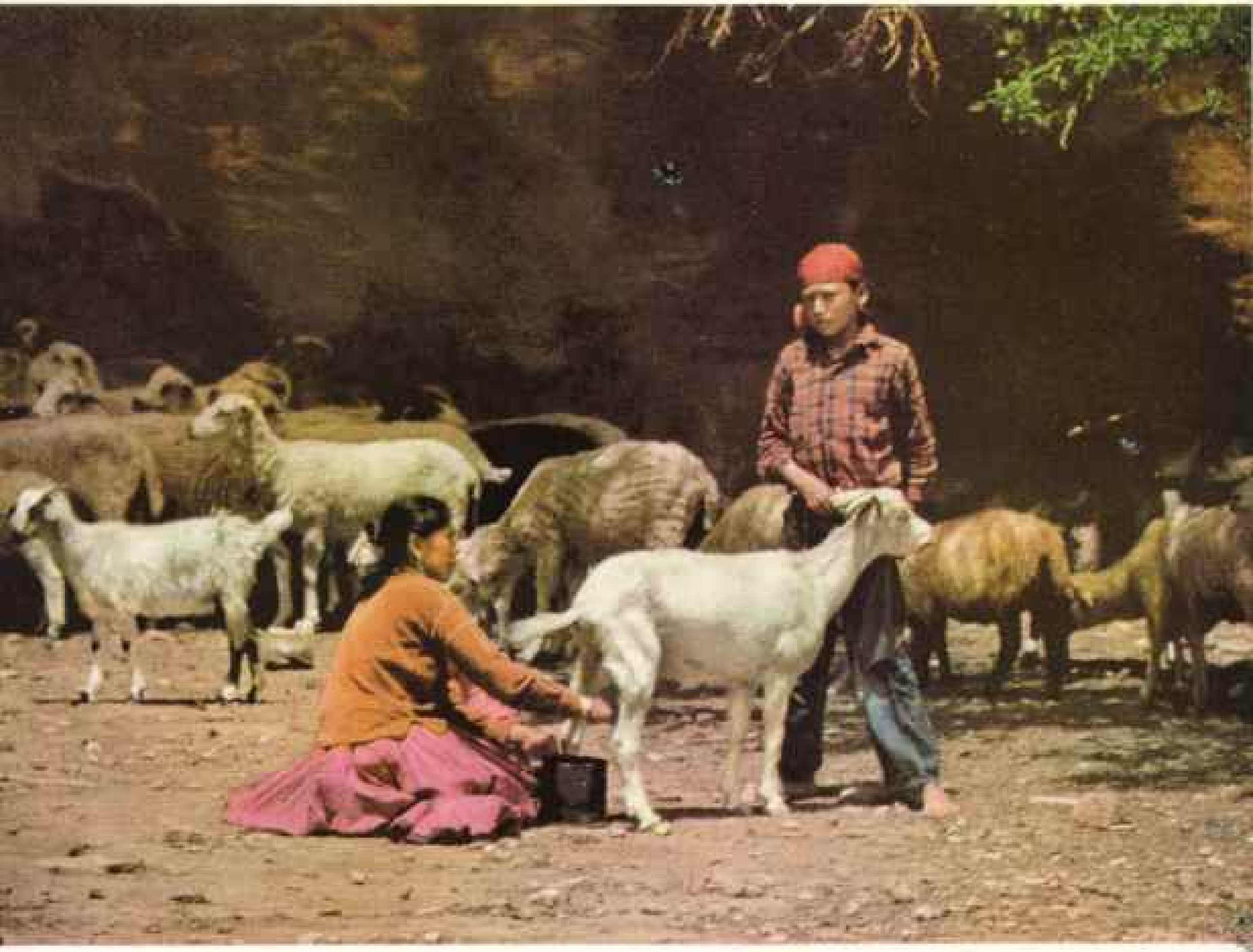
On the wall of the cave are the names of river explorers, including Nate Galloway, who was one of the first to use the technique of going into the rapids sternfirst. Galloway was a trapper who made two trips down the Colorado from Wyoming in 1895 and 1896 and one in 1909 from Utah.

The seventh and last day of the trip was over quiet waters lined with the usual red walls thrust toward the cloud-flecked blue. We could see a difference in the vegetation, for many agaves—century plants—with their tall flowering spikes were visible wherever the cliffs broke away (Plate VIII). A great log piled on a rock intrigued Nevills; it was shoved off, and different members of the party enjoyed a ride until it was finally stranded.

We ran behind Sentinel Rock into Wahweap Canyon, where there was drinking water, and then continued on to Lees Ferry, named for the ill-starred John Doyle Lee, who was executed for his part in the Mountain Meadow Massacre of 1857.

And so ended our journey along the border of Navajo Land. It came so abruptly we were not prepared, for we had been traveling for days without seeing anyone but the members of our own group.

We had rounded a bend, and there before us was civilization as represented by a welcoming party awaiting our arrival. Our trip was over, except for a short visit among the Navajos in Monument Valley, and in retrospect we have the memories of some of the most beautiful desert scenery in this grand land of ours.



Hold Still, Nanny! Milking a Balky Navajo Goat Is a Fore-and-aft Job

While the Indian boy holds a horn to steady the animal, his sister fills her pail, keeping watch for the goat's flicking tail. Navajos of Utah's San Juan River country once were so warlike that Col. Kit Carson had to lead an expedition to quell them. Now they are a peaceable people, depending upon flocks of sheep and goats for livelihood.

Kodachromes by Alfred M. Bailey and Fred G. Brandenburg

Two Jobs—Raising Children and Weaving Rugs—Occupy Navajo Women

The girl (left) wears full skirt and silver-adorned velvet jacket, like her mother's. Beside her, a baby is strapped to cradleboard. Borders of Navajo rugs are seldom complete; a thread leads out to let evil spirits escape.

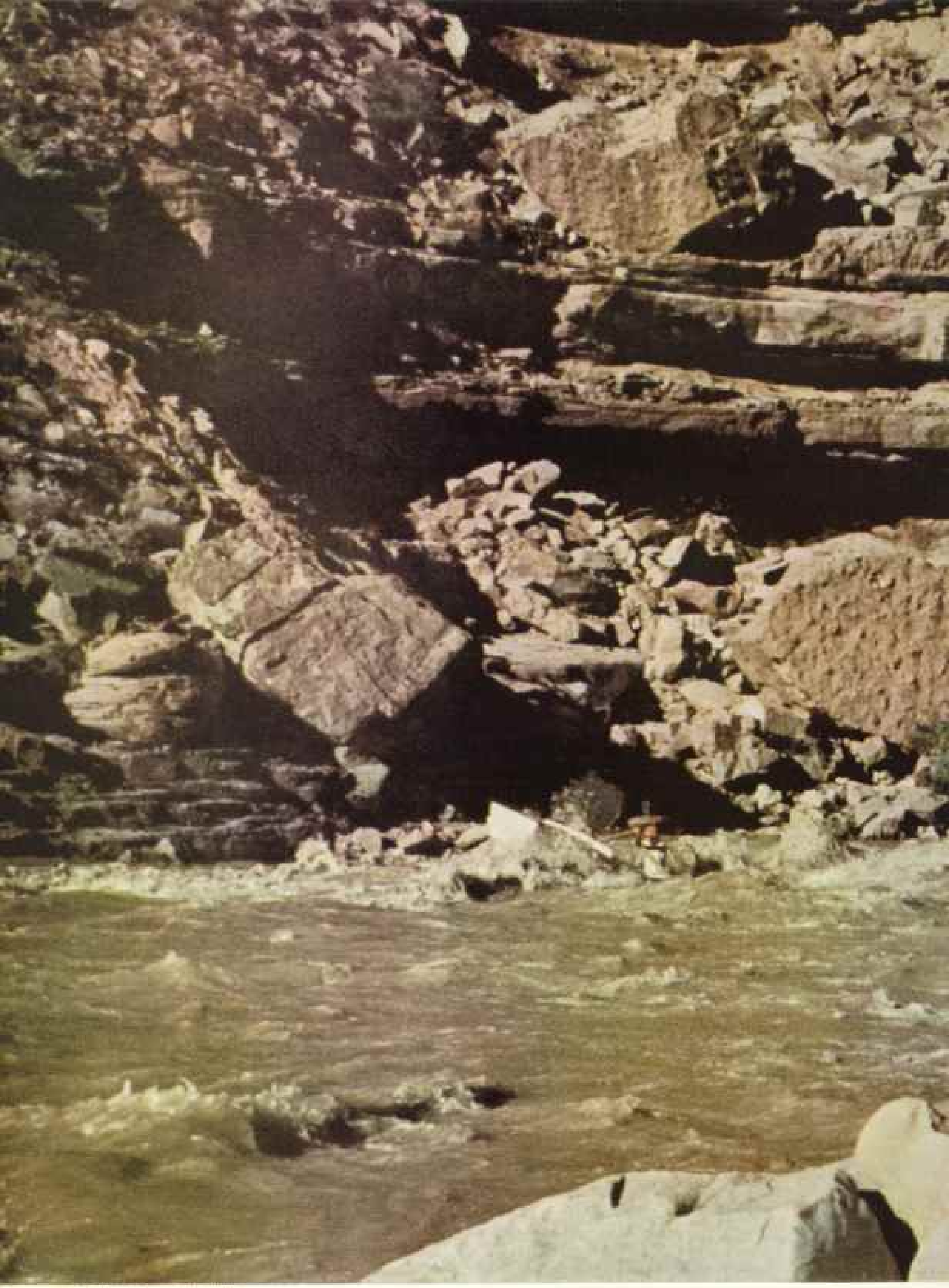
Kodachromes by Alfred M. Bailey and Fred G. Brandenburg

Between Monument Valley's Towering Walls, Navajo Sheep and Goats Trot Along in Their Endless Quest for Food

Forage is scarce in this semidesert area of southeastern Utah. To escape the heat, herders and animals often take shelter in caves or in the shade of overhanging cliffs.

Kodachrome by Alfred M. Bailey and Fred G. Brandenburg

Curving Through the Goosenecks, a Canyon 1,500 Feet Deep, the San Juan Flows Six Miles to Cover an Airline Distance of One



Strong Arms Guide a Plunging Boat in Brawling Government Rapids

Honeymoon Special's bow vanishes while its stern tops a wave. Approaching the rapids, oarsmen hug the quiet water along the far shore (opposite plate) and then turn quickly into the "white water" to evade rocks. Duckings were frequent in the 200-mile 7-day journey down the San Juan and Colorado.

Kodachrome by Alfred M. Bailey and Fred G. Brandenburg

Only Expert Boatmen Brave the Swift-running San Juan

Here a boat, on even keel, is poised for the dash through the rapids at left. Oarsman holds the bow upstream so that he may watch for submerged rocks and quickly pull the boat to one side or the other. The boat drifts with the current; oars are used to keep it out of trouble. A wrong move turns fun into disaster.

Kodachrome by Alfred M. Bailey and Fred G. Brandenburg

Deep in the Desert, Rainbow Bridge Rears Its Graceful Arch Skyward Like an Aurora Borealis Turned to Stone

Over 300 feet high, the Navajos' sacred bridge could shelter the United States Capitol. The author's party left their boats and hiked overland to this Utah wonder.

Kodachrome by Alfred M. Bailey and Fred G. Brandenburg

Quiet Water Leads into the Cool Shadows of Mystery Canyon, Once the Home of a Vanished Tribe

The Desert Agave Sends Up Flowers Like Tall, Feathery Javelins

A 15-foot stalk towers over Pat Bailey, the author's daughter. *Agave utahensis* and other relatives of the century plant yield valuable fiber and a juice from which pulque and mescal are made. The Bailey party reached this point on the Colorado River near Lees Ferry seven days after leaving Mexican Hat.

Kodachromes by Alfred M. Bailey and Fred G. Brandenburg

Pet Animals Take the Place of Toys for Navajo Youngsters

Riding his pony bareback, the boy (left) helps his elders tend sheep and goats in Monument Valley. A kid makes an ideal playmate. The girl's bracelet and buttons are of hand-wrought silver, as is the boy's belt buckle.

Utah's Arches of Stone

By Jack Breed

"BEYOND those mountains," said Harry Goulding one evening as we watched the sunset from the porch of his Monument Valley trading post, "is a natural arch as long as a football field!"

Harry was looking north toward the Blue (Abajo) Mountains in southeastern Utah. Beyond this range we could clearly see, 100 miles from us, the La Sal or "Salt" Mountains, which served as a towering landmark for Arches National Monument of Utah, to which Harry was referring.

An arch that almost equals a football field in length was worth investigating!

The next morning I climbed into the station wagon and headed up the rough, dusty trail that leads from Monument Valley* over the San Juan River at Mexican Hat, past the Goosenecks turn-off,† to the Utah towns of Bluff, Blanding, and finally Monticello, at the very base of the Blues (map, page 175).

From Monticello the snow-capped 13,089-foot peak of Mount Peale in the La Sals, 40 miles ahead, beckoned us to continue along US Highway 160, which boasts a paved surface for most of the journey. We wound through a narrow gorge below the peaks and finally burst forth into a broad valley, paralleled on either side by brilliant red cliffs, that leads to the Mormon town of Moab, Utah.

Center of a Scenic Wonderland

Moab, with a population of about a thousand, is the county seat for Grand County and the center of an extensive sheep- and cattle-grazing area for a little-known sector of eastern Utah. The valley in which the town is located was first settled in 1855. Continuous trouble with the neighboring Piute and Navajo Indians, however, prevented any permanent settlement for nearly 25 years, when in 1879 the town itself was established.

Moab has never grown large. Many of its people are descended from the original settlers of the region.

Most travelers pass right through Moab and remember the place as a verdant farming community sleeping amid a setting of brilliant red cliffs. However, the speeding traveler is really missing some of the most spectacular scenery in the United States.

Behind the ruddy abutments of Moab Valley lies a veritable galaxy of natural wonders—delicate arches, giant natural bridges, and the deep canyons of the Green and Colorado Rivers, climaxed by the startling vistas from Dead Horse and Grand View Points.

Nestled against the slopes of the La Sal Mountains are lovely lake and aspen glades to tempt fisherman and hunter, lonely Castle Valley, and awe-inspiring Fisher Towers, which dwarf modern skyscrapers.

The most readily accessible attraction is the maze of sand-blasted formations included in Arches National Monument, which lies just a few miles north and west of the town.‡

Wagons Lowered by Rope to Valley

With Custodian Russell L. Mahan of the National Park Service as guide, I set out toward the Windows section early one morning to study and photograph its geologic wonders (Plates III, X, XII, XIII, and XVI). We sped northwest on the paved highway up the steep incline of Moab Canyon, following the route of the old Mormon dugway (Plate XIV).

"Over here," said Russell, "you can see where some early settlers lowered their wagons over the rock. They had to dismantle them and let them down piece by piece through these clefts."

Paralleling the road in many places are unusually regular steps cut into the rocks, and on close examination we could still find the marks worn by the old wagon wheels.

Near the top of the dugway, where the highway bursts out of the red-rock canyon into the open prairie, we passed the original jumping-off place, a perpendicular ledge which offered Mormon settlers their first real obstacle in reaching the fertile valley beyond.

A few miles along on the prairie we turned off to the right on an unobtrusive dirt road that leads to the Windows section of the Arches, nine driving miles away.

In the fall of 1936, Harry Goulding of Monument Valley, in his specially equipped car, managed to traverse the rugged sand and rock of the Arches region and thus became the first person to drive a car right into the Arches. Soon afterward a bulldozer followed Harry's tracks and made a passable trail.

Little improvement was done on this rough road to the Windows section until recently. Mahan, aided by members of the Highway Department, has done much to make the way

* See "Flaming Cliffs of Monument Valley," by Lt. Jack Breed, National Geographic Magazine, October, 1943.

† See "Desert River Through Navajo Land," by Alfred M. Bailey, in this issue of the National Geographic Magazine.

‡ See "Utah, Carved by Winds and Waters," by Leo A. Borah, National Geographic Magazine, May, 1936.

an easier drive for the most discriminating motorist.

We followed Goulding's original route, twisting and winding over small dunes and tablelands, across "slickrock," and through several washes which are invariably flooded after heavy rains or during spring thaws.

Windows Section Most Easily Accessible

At the end of eight miles we were in the midst of the red-rock formations that could be seen from the highway, and began to pass many weirdly eroded towers, spires, balanced rocks, and finally some arches. We parked the car, and after a hike of a few minutes and several hundred yards toward Double Arch (Plate I) we passed between two huge buttresses jutting out on either side of the trail. Strewn on the ground below were the chunked remains of a former complete span.

"That used to be a fine big arch," said Russell, "but it eroded too far and fell through. You'll see arches in all stages of erosion here."

In the Windows section the basic geology of the Arches can be studied. The rock strata stand out in bold relief; it is easy to see where one layer ends and another begins.

The arches are holes blasted mainly by the wind through long sandstone reefs. Throughout the Monument I noted that these thin reefs or fins are sometimes 300 feet or more in height, and often hundreds of yards in length.

The freezing of rain water in cracks and joints in the rock mass, along with subsequent thawing, enlarges the cracks until big chunks become loosened and start to fall out.

After this process has been repeated for several thousands of years, huge caves develop in the reefs and eventually, in many instances, a complete break results. Fine sand, driven by high winds, helps speed the process and smooths out the jagged breaks into finely sculptured contours.

In the Arches these windows have been formed in a 300-foot layer of rock called the Entrada sandstone, which lies on top of a darker red sandstone called the Carmel formation. Below is the better-known Navajo sandstone, common throughout southern Utah and northern Arizona.

Since geologists class these rocks in the Upper Jurassic period, it would mean that the general rock matrix of the Arches is some 40 million years old!

It took us a full morning to hike around the Windows section of the Arches to visit each of the major features. In the afternoon we returned to Mahan's headquarters to prepare for the climb to the Courthouse Towers sector (Plates VI, VIII, XIV, XV).

I could see little sign of a trail to Courthouse Towers. We started climbing up the talus slope and slickrock immediately behind the Monument headquarters, picking the easiest way over or around the huge sandstone boulders. Mahan showed me where some work had been started during C.C.C. days to build a road by means of hairpin switchbacks up the face of the escarpment.

This feat has not yet been completed. Eventually it will make the Courthouse Towers section available to travelers in their cars.

Fifteen minutes of steady climbing brought us to the base of the sheer sandstone cliff that forms the north wall of Moab Canyon.

Beneath us was the black thread of highway US 160, which follows the route of an old Mormon trail.

To the left, three miles away, we could see the break in the south wall of Moab Canyon where the Colorado River starts winding through hundreds of miles of high red walls that will eventually bring it into Lake Mead, Nevada.*

The pattern of deep-green fields and trees around Moab contrasted sharply with the brilliant red walls of Moab Canyon and the "behind-the-rocks" escarpment which hems in the town from the south. Farther to the eastward, receding rain clouds atop the 13,000-foot La Sal Mountains formed a backdrop to this breath-taking sight.

We continued along the base of the cliff, working our way back over the rim on to the sandy juniper flat that leads to the junction with Park Avenue Canyon (Plate XV).

At the head of this hidden gorge there is a sudden but easily traversed drop-off into a winding dry wash that runs to the Courthouse Towers section.

Park Avenue of the Arches

Arches' Park Avenue is well named indeed. For a mile down to Courthouse Wash, huge, silent, sandstone skyscrapers looked down on us as we made our way toward Great Organ Rock at the far end (Plates VI and VIII).

The monoliths in this section were named by the citizens of Moab who have explored the area, and the visitor can readily recognize such formations as Sausage Rock, the Three Gossips, Sheep Rock, the Tower of Babel, and many others.

Early the next morning we set out to explore the more distant sectors of the Monument and selected as our first objective remote Delicate Arch.

* See "Nevada, Desert Treasure House," by W. Robert Moore, National Geographic Magazine, January, 1946.

We sped northwest on Highway 160, up the old Mormon dugway again and past the turn to the Windows section. Twelve miles beyond, we cut off to the right on an unimproved dirt trail used by sheepherders and cattlemen to reach grazing lands in Salt Valley, which we soon entered.

Twenty-two miles from the highway turn-off, the trail drops to the floor of Salt Valley Wash, and the rest of the drive was tedious and rugged going.

We plowed through sand, bumped down over rock ledges, straddled boulders, and finally were forced to stop on the brink of a three-foot embankment.

We continued on foot for the remaining half-mile of the trail down the wash to a dilapidated log cabin, known as the Turnbow Cabin, which ordinarily marked the terminus of the automobile road.

The little hut had been tumbling to ruin so long that it virtually melted into the landscape. Years ago sheepherders used it as a camping headquarters, but it has long since passed its usefulness. From here a trail leads across sandy grasslands to the foot of a smooth slickrock ridge where the ascent to Delicate Arch begins.

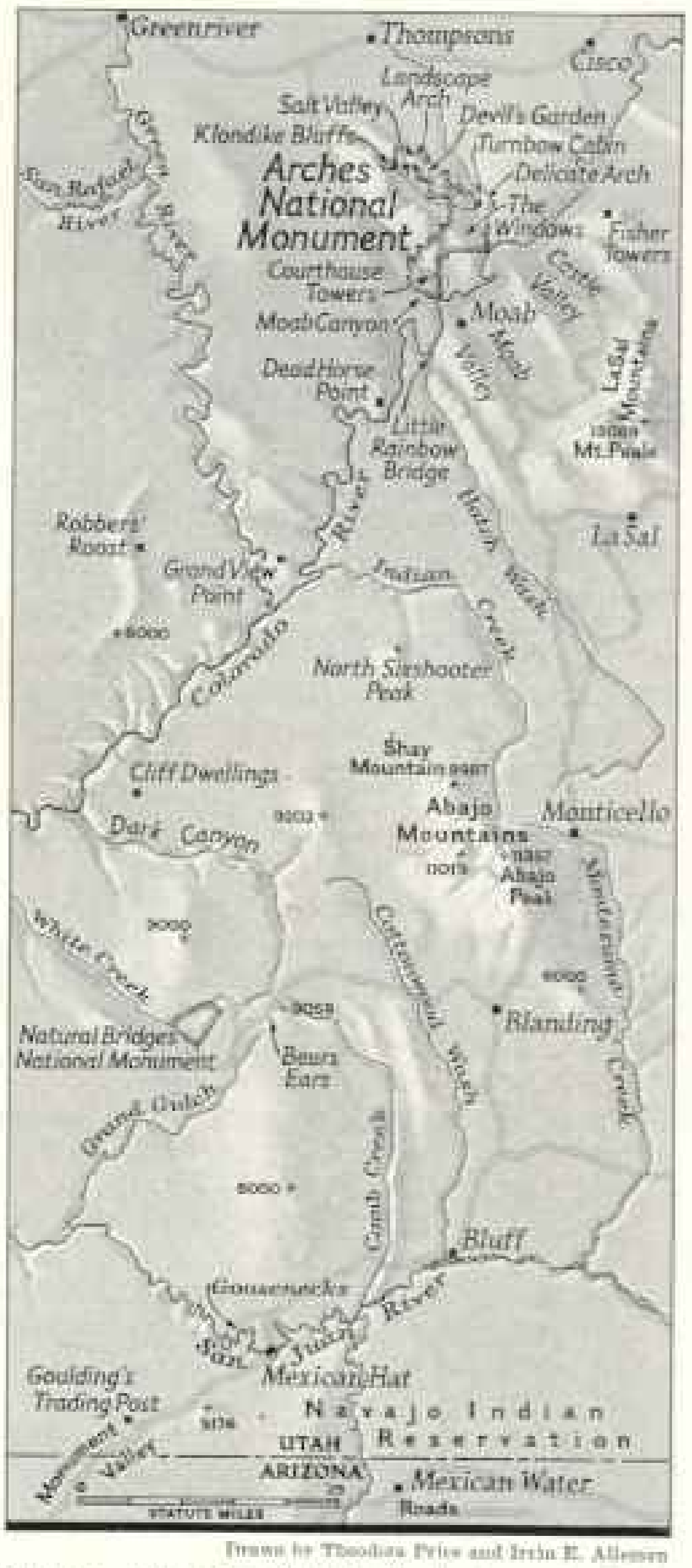
Delicate Arch Is Well Named

Another mile of easy climbing brought us to a gnarled and weirdly eroded mesa top of gorgeous coloring and commanding views of the surrounding countryside. However, the indescribable beauty and unbelievable formation of Delicate Arch itself made everything else insignificant.

Isolated and alone, the arch seems to sprout from the rim of a natural rock bowl (Plates IV and V). The matrix reef in which it was originally carved has been eroded away, leaving only this finely sculptured semicircle of more resistant sandstone.

"Delicate" is indeed an appropriate name for the arch, for one leg of its 65-foot span is not more than 6 feet thick at its narrowest! Its beauty is further enhanced by the pastel colors which change continuously throughout the day as the sun moves around to the west. On clear days the arch perfectly frames the whole range of the La Sal Mountains, 20 miles southeast, and at any time an inspiring view of Cash Valley may be seen immediately below.

The Devil's Garden section of the Monument (Plates II, VII, and XI) is not far from Delicate Arch. We drove in there the day after our visit to Delicate and cut off to the extreme northwest corner of the Monument before reaching the difficult wash we had had to traverse the day before



Drawn by Theodora Price and Irvin E. Allenson

Nature Wrought Weird Sculptures in Utah

From Arches National Monument to Monument Valley on the Arizona line the southeastern part of the State is a wonderland of awesome canyons and strange figures carved in glowing rock by mighty rivers and restless winds of the desert.

Leaving the car at the base of a steep, rocky escarpment, we started climbing toward the plateau area that forms the base of Devil's Garden. Our guiding landmark was a massive 125-foot, black-rock pinnacle, the Dark Angel, visible from most sections in this part of the Monument.

On some of the cliff walls along our route we encountered our first visible signs of Indian

peoples believed to have frequented this area. Hundreds of petroglyphs, depicting human figures and animals, are scratched into the blackened walls. Because of the present lack of potsherds or other concrete signs of early Pueblo culture,* some archeologists think these drawings may have been made in comparatively recent times by the Ute Indians, whose range includes the Arches area.

Of the Monument's 83 known arches, 64 are found in the Devil's Garden. We first paused to examine unusual Double-O Arch, a phenomenal feature where one arch has been carved immediately above another (Plate II).

Beyond Double-O the trail enters an unbelievably rugged maze of fins and reefs that seems to form an impenetrable forest of wildly eroded slickrock. The most concentrated group of these fins, known as the Fiery Furnace (Plate XI), is located at the lower end of the appropriately titled Devil's Garden.

Longest Known Natural Arch

Mahan led the way over dozens of these fins, each one of which looked just like its predecessor, and at times even he had trouble making certain we were not lost. Our goal was the giant sandstone fin in which ribbonlike Landscape Arch has been carved—the longest known arch of its kind in the world (Plate VII). After an hour of laborious hiking we came upon it suddenly, hidden in its own little canyon draw that frames the lovely desert landscape from which it gets its name.

"This is one place that few people get to," Mahan told me. Remembering the ruggedness of the terrain, I could understand why. A friend who visited the Monument sometime later told me he had spent a day wandering hopelessly among the hundreds of fins trying to find Landscape Arch. He never did catch sight of it until nearly sundown when it was too late in the day to approach it.

Admiring Landscape Arch, which averages more than 100 feet above the canyon floor, I could not help wondering if it would fall through in the next windstorm. Its 291-foot span, just nine feet short of the length of a football field, has been eroded down to six feet at one point!

Talking with some of the residents back in Moab, I became aware of the feeling in the town that the arches are certainly not the most unusual features in the region.

Several individuals were anxious to take me by boat down the Colorado River to visit Little Rainbow Bridge or the Colorado's junction with the Green River. Upstream were fluted Fisher Towers, knifelike pinnacles of deep ruddy sandstone, isolated in a remote canyon that is reached only by a treacherous drive up a stream bed noted for its quicksand.

However, Moab's residents firmly believe that Dead Horse Point (Plate IX), at the end of a broad mesa top overlooking the Colorado River, commands a canyon vista surpassing that of the Grand Canyon to the south in Arizona.

Accompanied by Mahan and his family, I drove to Dead Horse Point one morning to have a look for myself. The winding dirt road twisted through lovely pink mesa and sandy grassland country for 35 miles to a point only 11 airline miles from the town.

We left the car in a grove of junipers and walked across a rocky neck only a few feet wide with a sheer drop of a thousand feet on either side to reach the main point itself.

My first view from Dead Horse Point convinced me that here indeed is another Grand Canyon! Three thousand feet below us was the Colorado River, meandering through immense goosenecks before it continues in a less circuitous pattern to its junction with the Green River, 40 miles downstream. The maze of brilliant colors is breath-taking.

In one sweeping view was unfolded to us some 5,000 square miles, one of the largest relatively roadless areas in the United States. Southwest of us was another commanding promontory, Grand View Point, which marks the junction of the Green and Colorado Rivers.

On our right were the isolated Henry Mountains, which guard the entrance to Utah's little-known Wayne Wonderland.

To the south we could see the Bears Ears buttes, which pinpoint the location of Natural Bridges National Monument, and directly beyond them Monument Valley and the Navajo country.

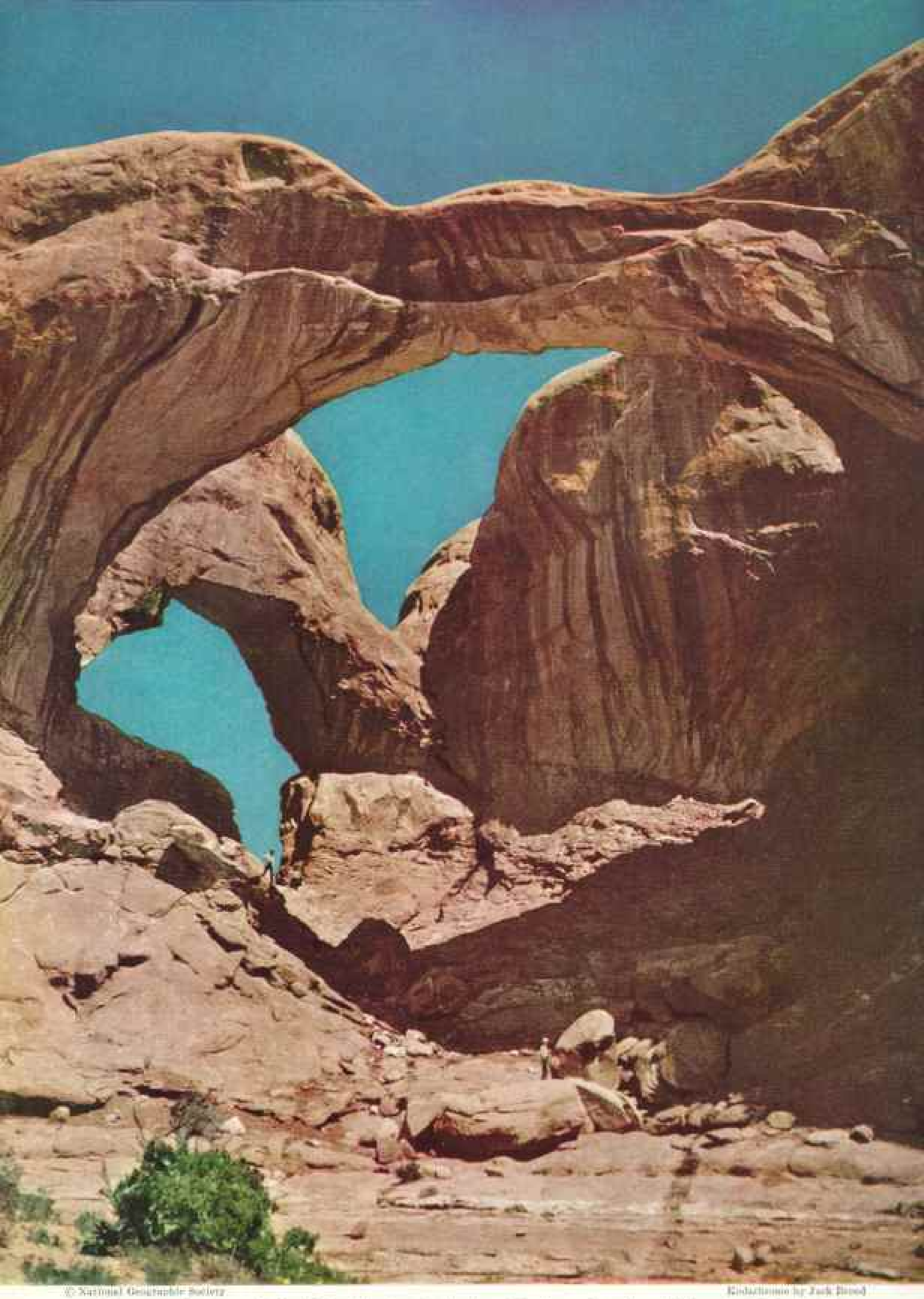
Also to the south were the Blue Mountains near Monticello, and to the east the snow-capped La Sal Mountains.

Here in one magnificent vista was one of the largest areas of incompletely explored country remaining in the United States, forbidding, colorful, silent, and inaccessible.

It was easy to realize that Dead Horse Point, Arches National Monument, and the many other attractions of spectacular beauty in this region place the peaceful farming community of Moab, Utah, at the hub of a long-neglected scenic wonderland.†

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, by Matthew W. Stirling, "Indian Tribes of Pueblo Land," November, 1940.

† For additional material in the NATIONAL GEOGRAPHIC MAGAZINE on scenic southern Utah, see: "Encircling Navajo Mountain with a Pack Train," by Charles L. Bernheimer, February, 1923; and "Beyond the Clay Hills," by Neil M. Judd, March, 1924.



Kodachrome by Jack Breed

Mormon Settlers Called Double Arch, in the Windows Section, "The Jug Handles"

The larger of these two sandstone rainbows in Arches National Monument, Utah, towers 157 feet, spans 103.

Kodachrome by Jack Breed

To Make Double-O Arch, Desert Winds Blew Through a Sandstone Fin Two Symmetrical Openings, One Huge, One Tiny

Kodachrome by Jack Breed

Framed by 98-foot North Window Is Turret Arch: As the Cracks Weather, Rock Will Fall, Thus Enlarging the Opening

To Cowboys and Sheepherders Lovely Delicate Arch Is "The Old Maid's Bloomers"

High atop a remote expanse of "slickrock," this amazingly sculptured freak of wind erosion stands on slender legs, one only 6 feet thick.

The arch is reached by a tedious motor drive of many miles down an almost impassable wash, followed by a hike of two miles through sand and up slickrock.

Framed here by the arch (left), Salt Valley and Cash Valley provide fine grazing for many herds of sheep.

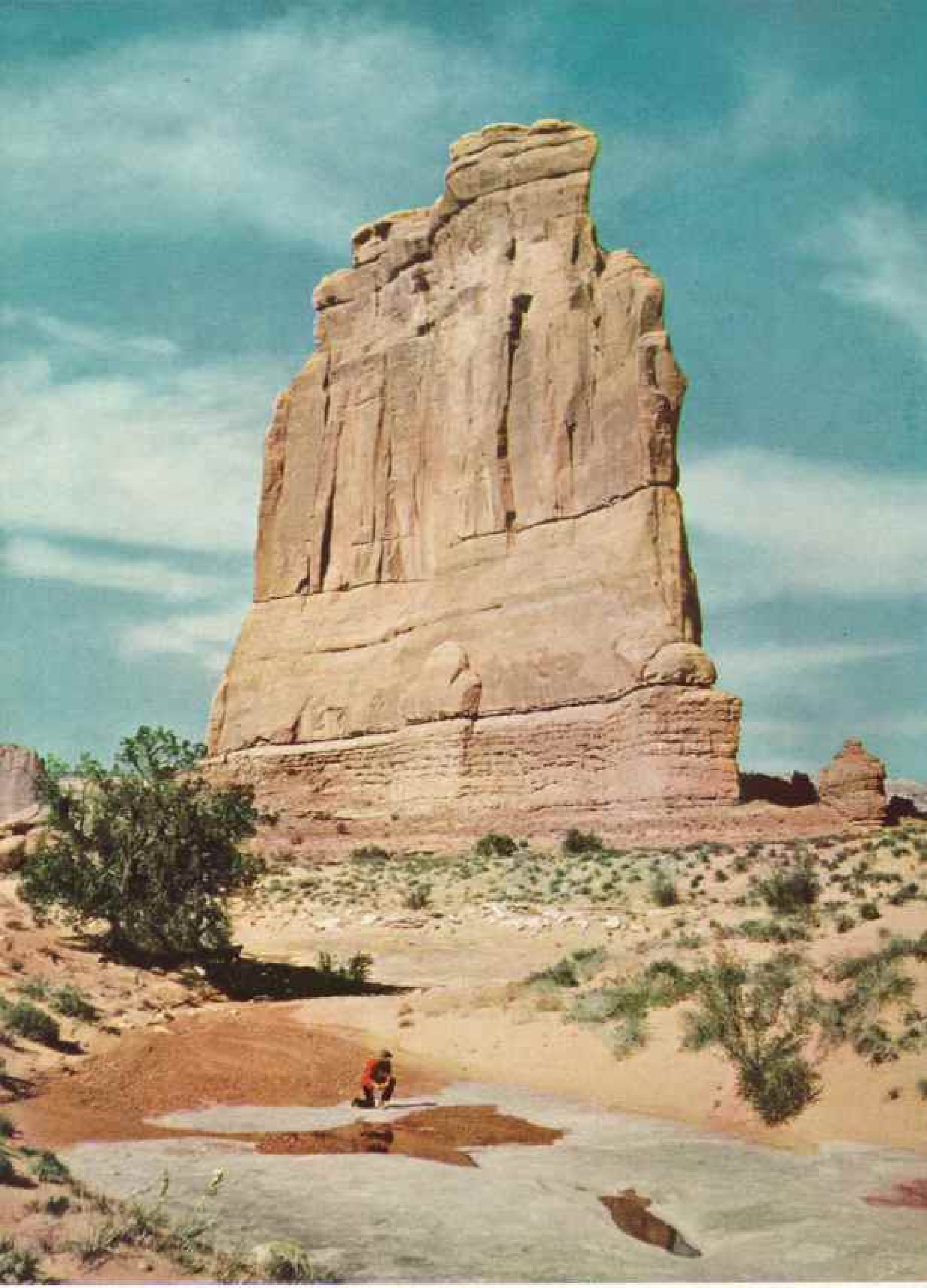
Salmon pink in color, Delicate Arch is 85 feet high and 65 feet wide.

Kodachrome by Jack Breed

Amid the Courthouse Towers Rises the Great Organ above a Choir of Black-eyed Susans (Plate VIII)

Kodachrome by Jack Breed

Nearly as Long as a Football Field, Ribbonlike Landscape Arch Is Only Six Feet Thick at Its Thinnest Spot



Kodachrome by Josh Reed

Like a Stone Knife Blade the Great Organ Thrusts Up Hundreds of Feet from Courthouse Wash

Sandstone skyscrapers rise from a canyon floor in contrast to the neighboring arches carved from cliffs.

© National Geographic Society

Kodachrome by Jack Breed

Within Sight of the Colorado, Confused Wild Horses Died of Thirst on Dead Horse Point

Eleven airline miles downstream from Moab, Utah, this point drops a breath-taking 5,000 feet to the river.

Kodachrome by Jack Breed

Tail to Rump, 100-foot-high Stone Elephants Form a Circus Parade Across the Windows Section

Fiery Fins in the Devil's Garden Defy Penetration by the Hardiest Walker

Freezing and thawing in the crevices, leaching by water, and blasting by wind-blown sand created these sandstone slabs. Many arches have been gouged from such fins.

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In the Windows Section of the Monument Nature Has Cut a Pair of Spectacles

Kodachrome by Josh Reed

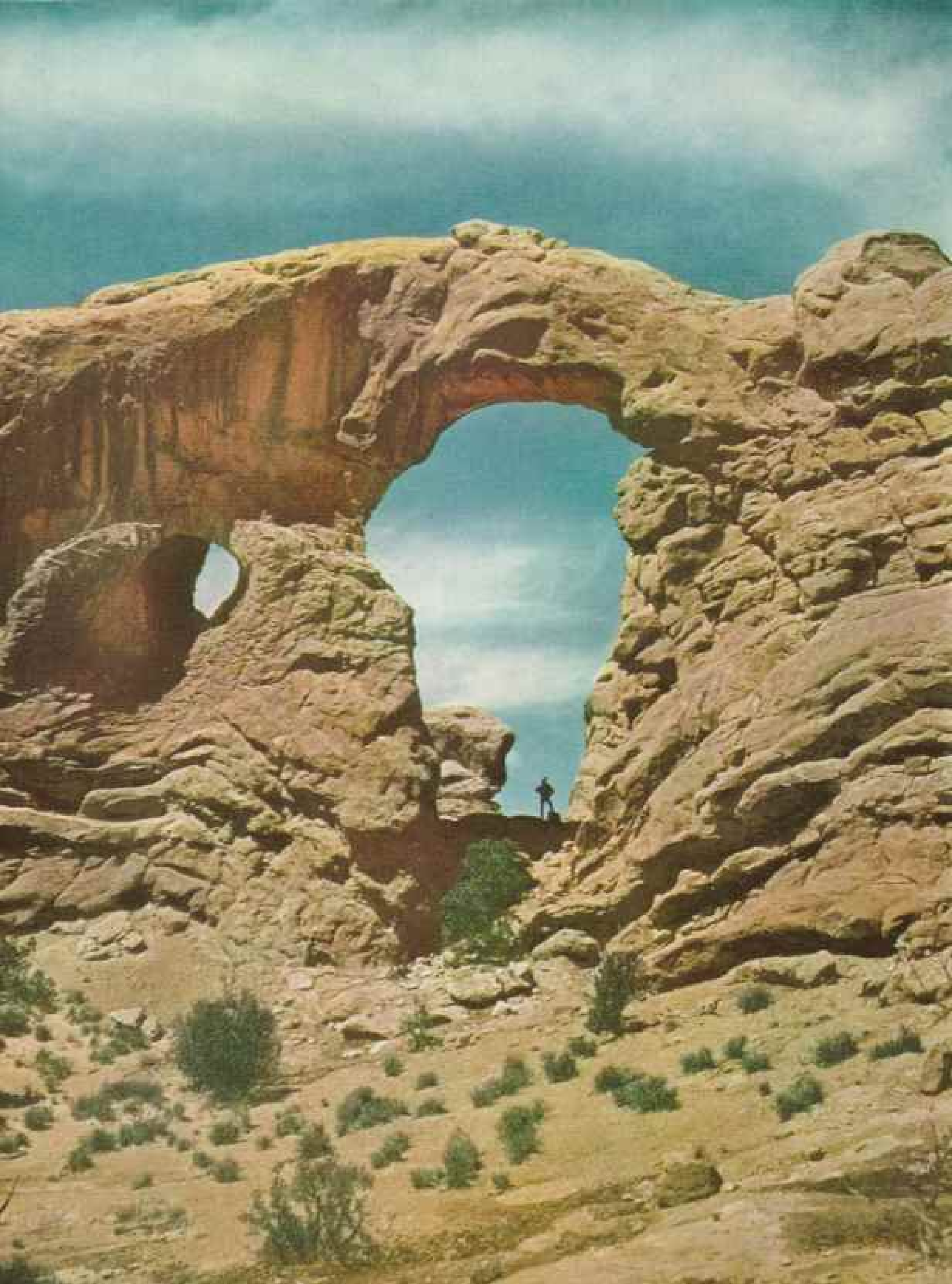
South Window, on the Left, Is Separated from Its Mate (Above) by a 100-yard "Nose Bridge"

Kodachrome by Josh Reed

Where 90 Years Ago Mormons Had to Lower Wagons by Ropes, a Paved Highway Leads to Moab

Kodachrome by Jack Breed

A Mile-long Avenue of 300-foot Sandstone Skyscrapers Rambles down to Courthouse Wash and the Great Organ (Plates VI and VIII)



Kodachrome by Jack Breed

An 86-foot Keyhole Is Turret Arch in the Windows Section—Beside It an 8-foot Opening

Land of the Pilgrims' Pride

By George W. Long

With Illustrations by Staff Photographer Robert F. Sisson

ACROSS Plymouth Bay a driving nor'easter beat mercilessly at the venerable hotel on Cole's Hill above the famous Rock. I stood inside before a crackling fire and peered out at white-capped waters. To my mind came those pitiful words in Bradford's history describing the arrival, more than 325 years before, of the Pilgrim band in these same waters:

"They had no friends to wellcome them, nor inns to entertaine or refresh their weather-beaten bodys, no houses or much less townes to repaire to, to seek for succoure. . . . Besides, what could they see but a hidious and desolate wilderness, full of wild beasts and willd men?"

Staunch Pilgrim courage built a beachhead of civilization in that wilderness.

Expanding slowly, it became the Old Plymouth Colony, stretching from Cape Cod's tip to Narragansett Bay, from Scituate to Nantucket Sound (map, page 196). Pilgrim traders founded outposts from Maine to the Connecticut Valley, matched wits and wampum with French, Dutch, and Indians.

"A Thoroughfare for Freedom"

Others tilled local soil, took to the sea, or "a thoroughfare for freedom beat across the wilderness." Plymouth, 72 years capital of this Pilgrim republic, did not long hold many firstcomers. Perhaps better land was the chief attraction, but I heard another explanation put forth vigorously by 101-year-old Mr. Theodore Adams, long-time Plymothian.

"The Pilgrims must have been unsociable people," he said. "Bradford and Howland went to Kingston; Standish, Alden, and Brewster moved to Duxbury; Winslow went to Marshfield.

"In the 1640's half of Plymouth moved to Eastham on Cape Cod. John Cooke moved all the way to Fairhaven on Buzzards Bay. I'm descended from 14 *Mayflower* passengers, but I *still* say they were unsociable people."

Those remaining few were laid at rest on Burial Hill. From this quiet, shaded height I looked out across the terraced town to the blue expanse of bay.

Imagination can easily picture the settlement of 320 years ago. And a tiny, compact settlement it was—Leyden, Middle, and North Streets running from harbor to Main Street, which roughly parallels the shore. Summer Street, winding uphill along Town Brook, reached the stout palisade which girded the town from brook to harbor. A scant collection of hewn-plank and thatch-roofed cottages!

Today modern Plymouth is a bustling, busy market and manufacturing community of about 13,500 people. Some 25 mills turn out a dozen varied products, including rope, fine worsted goods, zinc plates for photoengraving, curtains, and tacks.

A noted resort, Plymouth doubles its population in summer. Modern schools, yacht club, libraries, hotels, and movie theaters form a complete roster of contemporary living. Shoppers throng the miscellaneous array of modern stores along Main Street, bottleneck on the main road from Boston to Cape Cod. Summer week-end traffic crawls through town at almost bumper-to-bumper intervals.

Plymouth's early Pilgrim stock has been overlaid with successive migrations of Irish, French, Portuguese, and Italians. New England's first permanent settlement has become a mininature American melting pot.

My thoughts of past and present were interrupted by shouting schoolchildren short-cutting across the Hill. An old man carrying a basket of flowers trudged slowly after them.

"Near 80 years old I am," he told me, "but I come down here from Boston every so often. Lots of my people buried here. Gotta take care of 'em, I do."

On this very hill Pilgrims built "a fort of good timbers, both strong and comely," and mounted brazen cannon to overawe the "salvages." In the fort's lower room voices were raised in freedom of worship. Assembling on Leyden Street "at beat of drum," Pilgrims marched together in family groups uphill to enjoy the privilege for which they had dared so much.

Old "Pilgrim Progress" Re-enacted

A *Mayflower* descendant once drove her young daughter across the continent to show her historic Plymouth. Standing on Burial Hill, the mother closed her eyes.

"I can see them now," she murmured, "on their way to worship on this very hill."

Drumbeats interrupted her pleasant reverie. Her startled eyes beheld a strange procession of men, women, and children dressed in the white caps and kerchiefs, the steeple-crowned hats of the Pilgrim congregation.

Since 1921 this "Pilgrim Progress" has

Relics in Plymouth's Pilgrim Hall Take Visitors Back to the Colony's Birth

Built by the Pilgrim Society in 1824, the museum exhibits personal effects of firstcomers and collections from early Colony history. Its library contains rare 17th-century books and the charter of 1621. The large painting is Henry Sargent's "Landing of the Pilgrims." Beneath it is the wicker cradle of Peregrine White, New England's first-born white child. Ship is a scale model of a typical English merchant vessel of the period, class, and tonnage of the *Mayflower*. Figure on the table is a miniature of the Massasoit statue on Cole's Hill (page 197).

been faithfully re-enacted, usually on August Fridays. Many of these modern "Pilgrims" bear the names of firstcomers. Women who were carried as babies in the first processions now carry their own babies (page 195).

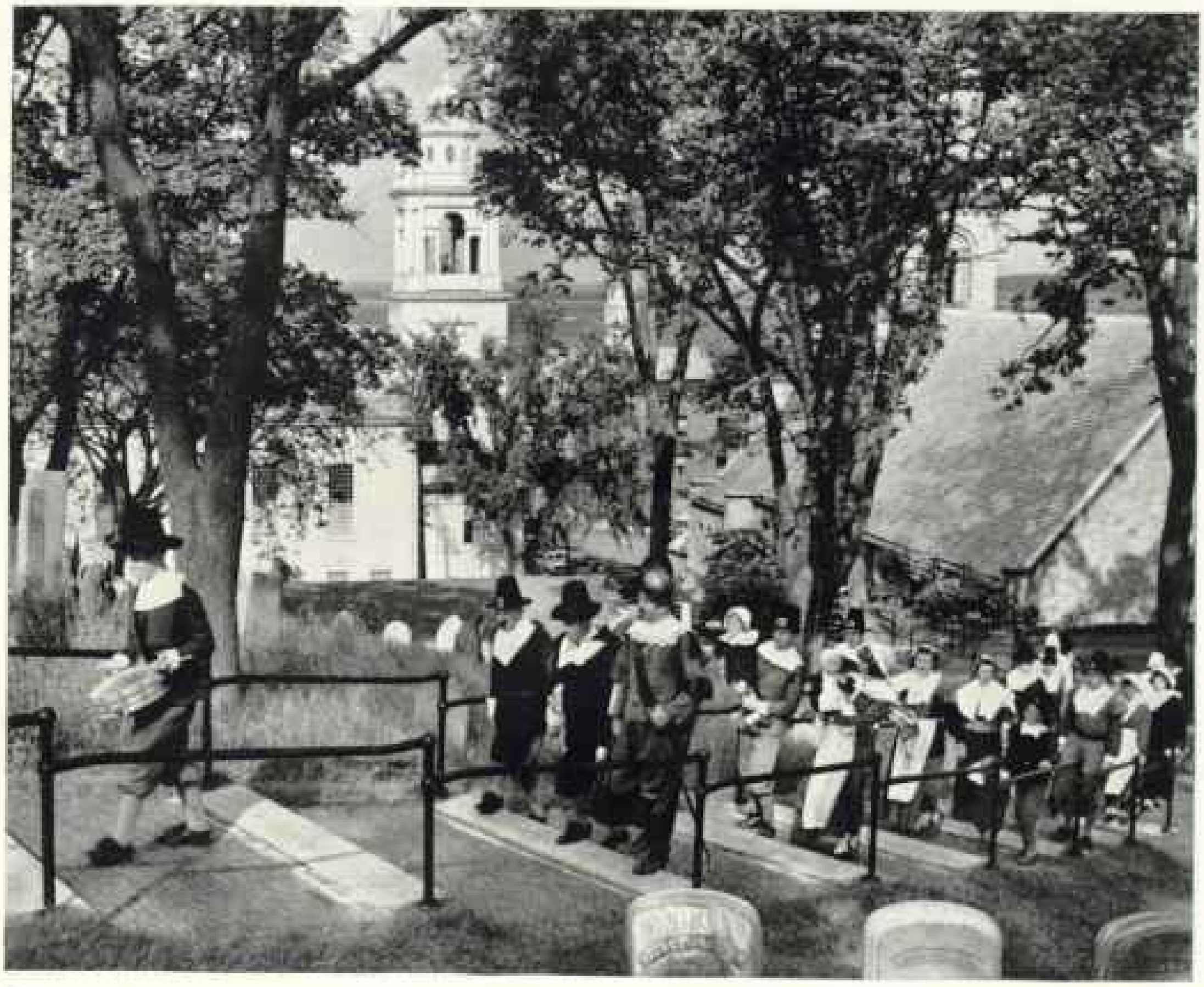
Mecca for visitors to Plymouth is the famous Rock. To most of them it somehow seems too small. "Most people expect a cliff, I guess," said a guide, who, in Pilgrim garb, lectures to the crowds for the donations dropped into his tall black hat.

The Rock, itself a glacier-brought pilgrim, has gathered no moss in its eventful life. In 1774 sweating patriots with 20-ox teams broke off and dragged its top third to Town Square. Placed beneath the Liberty Pole, it helped rouse the patriot spirit.

In 1834 this fragment, much smaller because of souvenir chippers, was hauled to the front of Pilgrim Hall. But so many people marveled at the Forefathers' stride that in 1880 it was returned to tide level and a small canopy built over it. For Plymouth's Tercentenary the harbor by the Rock was cleared of docks and wharves, a small park created, and a classic granite canopy built to house the wanderer come to rest (Plate VII).

Well over $1,000,000 has been spent by national, State, and local groups to commemorate the Pilgrims and restore historic houses. But to some people this is only a beginning. Mr. Sidney T. Strickland, architect, dreams of a project like that of Williamsburg, Virginia—restoration of an entire section of old Plymouth.

I descended with him to the cellar of his sea-gray house on Leyden Street. There I saw a museum store of artifacts from the site of John Howland's house at Rocky Nook. Everyday tools they were for the most part,



Pilgrims Assembled at Beat of Drum and, Protected by Muskets, Marched to Worship

Their first church was a blockhouse atop this wooded height, which they called Fort Hill (now Burial Hill). Alert for Indian attacks, they enjoyed there the religious freedom for which they dared so much. Usually on August Fridays, Plymothians in Pilgrim garb re-enact the procession of 320 years ago. Many bear the names of *Mayflower* passengers. A description written in 1627 by a visitor from Dutch Manhattan is the basis of the modern pageant.

but to my host each one divulged some aspect of Pilgrim life.

Wrinkled Records of Early History

Long antedating Plymouth's bronze and stone memorials are written records of colony and town. I saw and touched time-yellowed pages written by Governors Bradford and Winslow, vital annals of the infant republic.

First dated record is a rough drawing of First (Leyden) Street with the plots allotted the first settlers. By another it was established in 1623 that "all crimynall facts, and also all matters of trespases and debts between man and man should be tried by the verdict of twelve honest men. . ."

Later that day I visited the ivy-covered Georgian Courthouse and saw the jury system in action. In the high-ceilinged, mahogany-paneled courtroom where Daniel Webster once tried cases the fate of a returned veteran hung on the verdict of "twelve honest men."

But most early records revealed less momentous decisions—a bounty on blackbirds and wolves, prohibitions against exporting "corne" and covering dwellings "with any kind of thatche." Finally, "Edward Winslow hath sold unto Captain Myles Standish his six shares in the red cow in consideration of five pounds ten shillings to be paid in corne."

Mr. Edward C. Holmes, Registrar of Deeds, brought in the patent granted the colonists in 1629. Together we read the words on the wrinkled parchment and examined the great wax seal in its wooden skippet.

Plymouth is birthplace of the New England town meeting. Its Board of Selectmen is responsible directly to the voice of democracy as raised in the March meeting of citizens.

Town government has varied little in three centuries. Curious offices still remain from the old days. There are Field Drivers and

Drawn by W. E. Eastwood

From 1620 to 1692 Plymouth Colony Was a Vigorous, Independent Pilgrim Republic

Its territory covered most of present southeastern Massachusetts (inset, above). The young republic established outposts in Maine and the Connecticut Valley, traded with Dutch, French, and Indians. Its envoys journeyed to Boston, Manhattan, and England. Colony towns sent representatives to a General Court (legislature) in Plymouth, the capital. Dotted line on inset map marks the Massachusetts Bay Colony-Plymouth Colony boundary before Pilgrim land became part of Massachusetts.

Fence Viewers, a Surveyor of Wood and Bark, Pound Keeper, and Town Sexton. According to old Pilgrim custom, the Sexton rings the Paul Revere bell in the steeple of Pilgrim Church at certain hours.

"For a while we stopped ringing the bell," the Chairman of Selectmen said, "but so many people missed it we started again."

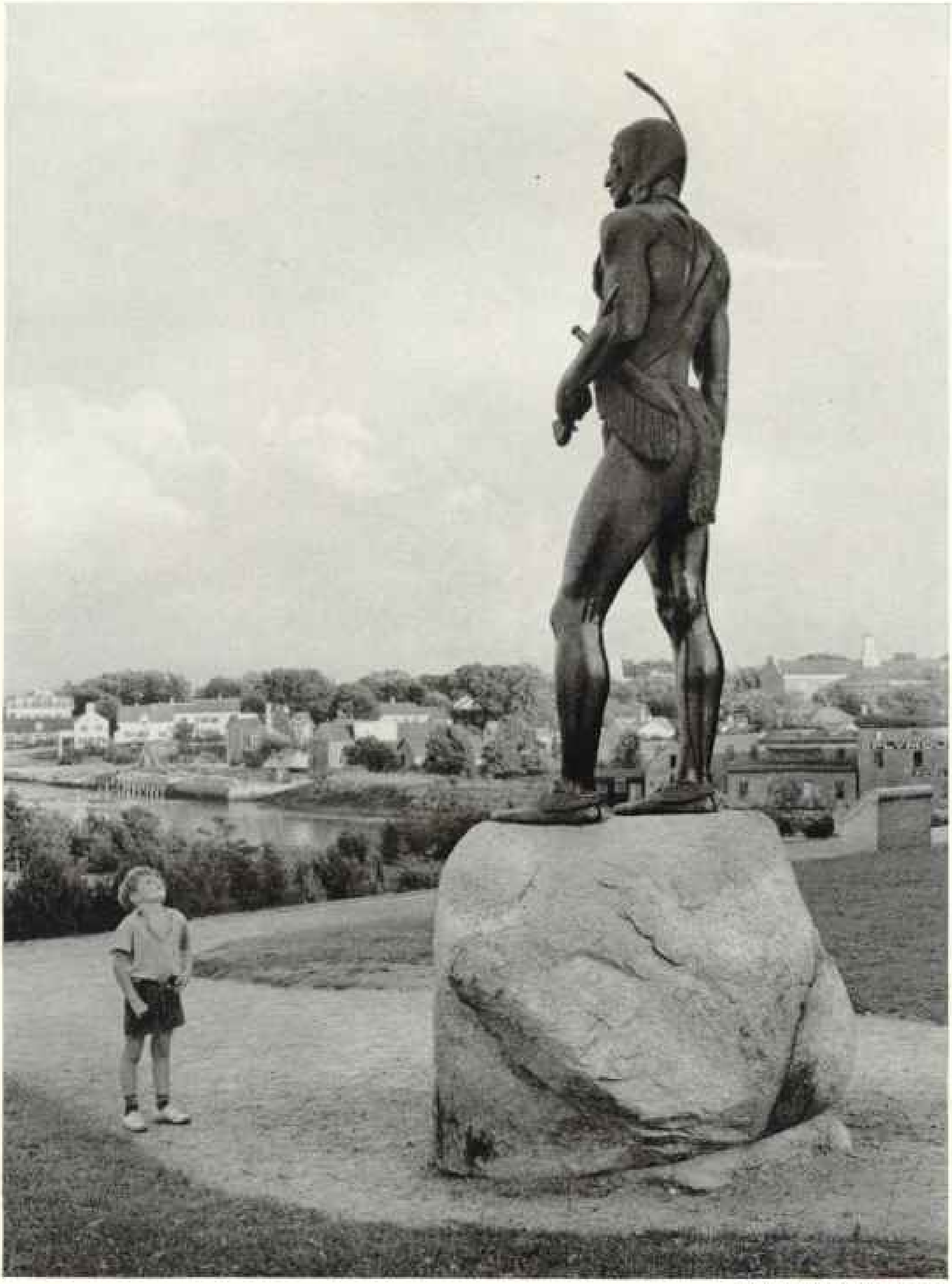
The town is run from unpretentious, gray-clapboarded, nearly 200-year-old Town House, the oldest town government building still in use in New England (page 199).

Behind Town House I chanced the open door of a small building marked "Old Chapel."

"Who are you and what do you want?" challenged a crisp voice.

The Art of Letter Writing Survives

Entering, I met Miss Alice Barnes. With eyes sparkling, words popping, she told me of Plymouth and its people. In 1941 Miss Barnes, now 78, created in this old building an information center which showed interesting exhibits of the town. That first summer she briefed more than 8,000 signed visitors on where-to-go and what-to-see in Plymouth.



Staff Photographer Howell Walker

On Cole's Hill Overlooking Plymouth Bay Stands Massasoit, Sachem of the Wampanoags

Ruler of Indian tribes from Cape Cod to Narragansett Bay, he proved a staunch friend to struggling Plymouth. In 1621 he signed a treaty of amity and alliance with Pilgrim leaders, died with word unbroken 40 years later. His younger son, Philip, took the warpath in 1675, led a short but devastating war.

"They Brought Up Their Families in Sturdy Virtue and a Living Faith in God . . . ."

So reads the citation on this fountain memorial to Pilgrim women, which stands near Plymouth Rock (background). Unlike some colonies, Plymouth was founded by families. Twenty-nine women and girls braved the *Mayflower* voyage and the terrors of "a hideous & desolate wildernes." Fourteen, including the wives of Bradford, Standish, and Winslow, died before the first year had passed.

Plymouth, Birthplace of the Town Meeting, Clings to Its 198-year-old Town House

Its gray clapboards have housed town offices since 1749. The site has been a governing center since the Colony's early days. Plymouth patriots, protesting the Stamp Act, wrote from Town House to their delegate in Boston, "We will never be slaves to any power on earth." Until 1858 food markets filled the basement; in 1829 a room housed fire-fighting "Torrent No. 4," a suction hose engine.

In 1942 she put that aside, "took to writing to Plymouth boys and girls in service." Since then some 1,800 around the globe have received her individually typed letters. In return, letters, presents, and souvenirs have come to her from the earth's corners. Snapshots from Egypt and a package from India arrived that afternoon.

"Some day I'm going to arrange NATIONAL GEOGRAPHIC picture exhibits of faraway places. These boys ought to keep up with places they've seen. So much to do! Will I ever have time for it all?"

Old Plymouth Colony mirrors three centuries of architecture and living. Seventeenth- and eighteenth-century life is reflected in the houses which survive from those days. I visited a dozen gambrel-roofed or salt-box restorations nearly 300 years old and a score of square, spacious mansions 100 years younger.

Plymouth itself boasts at least four houses from earliest days. Jabez Howland's house, 1667, sheltered his father, John, when the latter's Rocky Nook home burned. It may be the only remaining house which echoed to a firstcomer's steps.

On old Summer Street, off the beaten tourist track, is the Richard Sparrow house, 1640, restored some 15 years ago. In it lives Miss Katharine L. Alden, descendant of the famous John.

An accomplished craftsman, she has taught more than 300 Plymothians the skill of the potter's thumb (Plate III).

The "Oldest House in Plymouth"

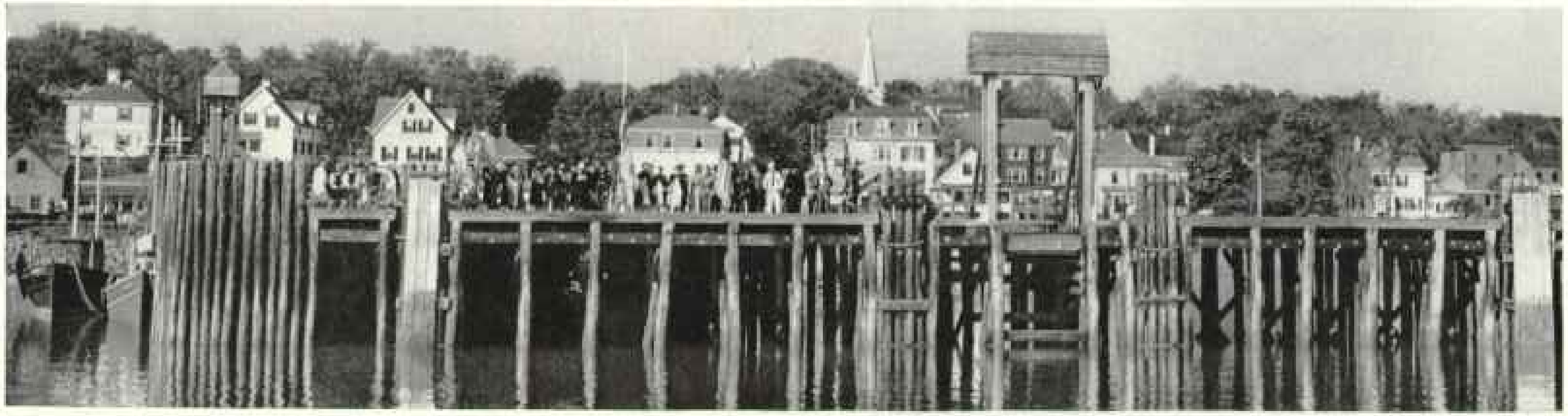
Together we examined this "oldest house in Plymouth." We admired the huge, round-cornered fireplace, wide boards, six-inch red oak beams, and hand-carved paneling. The front door, one board 31 inches wide, was

Cyclists Push Their Bikes up a Historic Slope—First Main Street of Plymouth and New England

Pilgrims laid the first street from the harbor to Fort Hill and called it The Street. It became successively First, Great, Broad, and finally Leyden Street. Narrow house lots ran from The Street south (right) to Town Brook. A more recent street, left, circles the top of flat Cole's Hill; at its foot is the Rock.

Cranberry Bogs of Massachusetts' Old Plymouth Colony Produce Two Thirds of the Nation's Sauce for Turkey

Workers enlarge a bog (right, background); others plant seedlings (left). Mature bogs, flanking gasoline engine, have a peat base, covered with three inches of sand.



Plymouth Honors the Memory of Its Many Sons Who Have Died at Sea in Their Country's Service

In a simple Memorial Day service, mothers drop spring flowers on the sheltered waters of the harbor. The outgoing tide carries the tribute seaward.

"For Which Mercie They Also Sett Aparte a Day of Thanksgiveing"

After a lean winter in which half their band died, Pilgrims celebrated their first harvest by declaring a holiday for giving thanks. Massasoit and 90 braves joined them in communal amusements and feasting. Thus began the New England custom of Thanksgiving, which President Lincoln made a national holiday in 1863. He set aside the fourth Thursday in November; Pilgrims celebrated in October. Here modern "Pilgrims" enact an early family Thanksgiving dinner.

buttressed by another board. "To withstand tomahawk blows," I was told.

The Kendall Holmes House, 1653, is a "delightful, long-remembered stopping place" for visitors. Said to be the first home of William Harlow, this quaint cottage has seen "a heap o' livin' "—294 years of it!

But the house which relives its youth most successfully is the William Harlow House, built in 1677 "from the timbers of the old fort." In spring school children follow Pilgrim custom by planting corn and flax in the yard "when the oak leaves are the size of a mouse's ear." Corn hills are fertilized by alewives from Town Brook, three to the hill.

Harlow House reflects the thrift and industry needed to supply a colonial household with food, light, and clothing. That labor was considerable in this house, for William Harlow had 14 children.

"Pilgrim Breakfasts" on Sunday Mornings

Today, those who exhibit the house dress in Pilgrim garb. They spin flax and wool, weave them on old looms, dye them with plants from field and wood. Bayberry candles are dipped. Maize grown in the garden is pounded and cooked in the old-fashioned way.

Periodic "Pilgrim breakfasts" are held on summer Sunday mornings, open to the public. Menu: fish cakes, baked beans, brown bread —all cooked over the open hearth in the style and utensils of William Harlow's day.

By the middle 1700's many Old Colony families lived in comparative luxury. None fared better than the men made wealthy by the sea—shipowners, masters, and merchants. They were the men of substance.

About 1754 Edward Winslow, grandson of the Pilgrim governor, built one of the finest 18th-century mansions. Importing English oak timbers, he built a house which even today, nearly 200 years later, retains an air of distinction suggestive of the pomp and vanity of the old régime.

There Dr. Charles T. Jackson conducted experiments in etherization on himself. In the spacious living room his daughter, Lydia, was married to Ralph Waldo Emerson. Recently this stately Tory mansion became National Headquarters of the General Society of Mayflower Descendants.

Sea-borne prosperity is also reflected in the gracious Antiquarian House, on its terraced

site overlooking Plymouth Bay. Built in 1809, its main section follows the octagonal style employed by Thomas Jefferson. It is completely appointed in early Federal style, even to books, papers, clipper-imported china, clothes, and children's toys. In every room are souvenirs of long sea voyages to strange places.

On Main Street I often passed a solid-looking house with wide, comfortable porch. On the lawn a bronze tablet announced: "Old Colony Club, Founded 1769." Later, as a guest, I partook of the Club's hospitality, played numerous games of ping-pong in its modern rumpus room.

"We're the oldest social club in America," I was told. "Founded by some young Plymouth men, Harvard graduates mostly, to raise the town's social tone."

The Club was the originator of Forefathers' Day, anniversary of the Pilgrims' arrival. Through a mix-up caused by the calendar change of nearly 200 years ago, the Club still observes December 22; the town, December 21.

Both celebrate with steaming bowls of Plymouth succotash—a delicious concoction which includes, besides the usual corn and beans, corned beef, salt pork, chicken, turnips, and potatoes. Many an old family has its own handed-down recipe, which it keeps a secret and knows is the best in town.

Oldest Industry Still Going Strong

Kingpin of modern Plymouth industry is Plymouth Cordage Company. Founded in 1824 by Bourne Spooner, a *Mayflower* descendant, "Cordage" is the Nation's oldest and largest manufacturer of rope. It supports about a quarter of the town's population.

Plymouth's weekly war production of binder twine was enough to encircle the world three times. Its annual production of rope—roughly three feet for every American—found more than 400 vital uses with our armed forces and was at times flown directly to invasion beachheads.

In Spooner's original ropewalk fourth- and fifth-generation employees apply 123 years of accumulated "know how" in making special-order rope. But most rope is made on near-human machines, which comb and oil raw fibers, twist them into yarn, the yarn into strands, the strands into rope.

In the Cordage laboratory I saw rope that Spooner never dreamed of—chemical-resistant Saran, heat-resistant Fiberglas, floating polyethylene, and that "glamour girl of rope," nylon. I watched the hydraulic testing machine exert a fraction of its 60,000-ton pull

"It's Myles Above the Sea"

So Duxbury residents claim the Myles Standish monument as the world's tallest! It stands on land the doughty captain farmed after moving from Plymouth in the 1630's. Near by is his son's house, built in 1666 partly from the charred timbers of the captain's home. Able, courageous, quick-tempered, Standish was Plymouth Colony's "buckler in the wilderness" for 36 years.

Robert Yarnall Richie

Forty-one Years of Experience Guide His Hardwood Fid

Chief Splicer Peter Schmidt, of Plymouth's famed Cordage Company, makes an eye splice for a mooring line. He handles special orders, from huge hawsers to cowboy lariats. Largest ever made here was a 21-inch hawser weighing 4.7 tons sent to Chile as a mooring line. Splicing is an art, retains some 90 percent of rope's tensile strength. Plymouth Cordage is the nation's oldest and largest rope maker.

to snap a stout nylon rope with the report of a pistol shot.

Cordage is proud of its tradition that "management owes labor something more than a living." The company was a pioneer in group insurance and old-age pensions. Its 33 acres of campuslike grounds contain a school, library, dining hall, recreation hall, and auditorium. More than 300 attractive company-owned homes are rented to employees for as little as $3.50 a week.

Returning, cordage conscious, to the hotel, I viewed with new interest our fire escape—a knotted rope spliced into a staple in the window casement. Over it a card stated laconically: "Notice—Throw the rope out of the window, put knot between the feet, and come down."

Cranberries, long associated with Thanksgiving, have become an industry which brings a yearly average of $10,000,000 to Old Colony growers. So well is the sandy, lake-studded peat terrain of the Old Colony suited to cranberries that it produces two-thirds of the U. S. crop.*

Today the large majority of cranberries are processed—frozen, dehydrated, or canned in the form of sauce, relish, or marmalade. Chemists have begun to find new ways to utilize the cranberry. Important waxes, acids, and oil from skins and seeds promise new wonders of chemurgy.

Show bog of the Old Colony is the 1,800-acre "plantation" of Mr. E. D. Atwood in South Carver. Its imposing brick Georgian screening house, resembling a country club, overlooks a small hamlet of workers' homes. Called Edaville, this little "town" has a paved main street of two lanes separated by a 900-foot flower bed.

Edaville's chief attraction for visitors is a chugging, whistling narrow-gauge railroad. The road is part hobby, part useful business adjunct. Weekdays it dons working clothes and hauls sand. Week ends, stubby, puffing No. 37 proudly pulls a day coach and museum-piece parlor car.

This "Rangeley Lakes," of 1901 vintage, was once the pride of the Rangeley Express, which used to make three trips daily between Farmington and Rangeley, Maine.

Strictly luxury class, she boasts a smoking compartment, observation section, hot-water heat, carpeted floors, betasseled windows, in-

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

laid mahogany woods, crystal mirrors, kerosene lamps, and individual swivel seats. In her heyday there was a white-coated colored porter, too.

"Yes, sir," said E. D. A., as we sat in style in the observation section, "we kept right on running through the big railroad strike.

"That fellow in the cab," he went on, "is a young aeronautical engineer from New Jersey. He drove most of last night just so he could run this engine today. He'll have to drive most of tonight to get back to work tomorrow. Most hobbyists are crazy, but I guess we railroaders are crazier than most."

After riding the rails we took to the water to explore seldom-visited Clark's Island in Duxbury Bay. Named for the *Mayflower's* mate, this green, whale-shaped island lies just inside the south-extending narrow leg of Duxbury Beach, of which the Gurnet and Saquish form the heel and toe. There, on the night of December 19, 1620, the Pilgrim exploring party, battered and exhausted by a sou'easter, found refuge. There they rested, made repairs, observed the Sabbath before landing on Plymouth shores.

Our own boat followed the tortuous channel, and, like the Pilgrims', "gott under the lee of a smalle iland." Guided by a member of the Watson family, who have owned all or most of the island since 1690, we explored the neatly cut paths which crisscross it. We quenched our thirst at the old locust-shaded well and climbed Pulpit Rock.

To "Gurnet's Nose" by Jeep

Legend tells that in the rock's shelter the Pilgrims worshiped God. They liked the island well enough to consider making the first settlement there. But all we found to remind us of them were words cut into the rock face: "On the Sabboth Day Wee Rested."

Another sparkling day we jounced and skittered in a Coast Guard jeep to Gurnet Point, called "Gurnet's nose" by the early comers. On this wind-swept promontory at the outer harbor's mouth are the embankments of old Fort Andrew, built in 1776, which fought off H.M.S. *Niger* in 1812. The lighthouse, the first twin light in America, has lost its brother but is still an important beacon for ships using the Cape Cod Canal.

It was there I met old Jim Watson. "Man and boy," he told me as he weeded onions, "I been comin' to the Gurnet for over 60 summers. Great place, too. Cool and quiet and mighty pleasant."

Later, the onions finished, he took my arm

AP from Three Arts

With a Roar, an 80-foot Comber Engulfs Minots Light

For 87 years this staunch lighthouse has defied the fury of the sea. It stands offshore on a sea-swept ledge some seven miles southeast of Boston Harbor. In storms, spray clouds reach the lantern, coat the glass with ice in winter. Located near the old Plymouth Colony-Massachusetts Bay Colony boundary, it marks a coast famous as a graveyard of ships.

Samuel Kitrosser

From the Land of the Pilgrims WRUL's Powerful Voice Speaks to Four Continents

Its tall antenna towers stand on old gun emplacements at Hatherly Beach. Founded in 1933 by Walter S. Lemmon on profits from his invention of single-dial tuning, it beams cultural and news programs abroad 20 hours a day. During war years it did patriotic service as "the voice of free America" (page 219). Sign-on and sign-off theme is *The Star-Spangled Banner*.

and led me to his little cottage on the water's edge. We sipped a friendly glass of port together while he talked of old days.

"Son," he said, "see this table?" I looked with special interest at the rough pull-down table, painted gray with a ship's blue star on its center.

"You're sittin' at the very table where ol' Dan'l Webster used to have his grog. He was a great hunter, was ol' Dan'l. And the Gurnet was a fav'rite place of his fer duckin'. This shack belonged to an old lobsterman, name of Ransom. Every duck season Dan'l'd chuck his troubles and come down here shootin'."

The Gurnet's history goes back into legend. There the bold Norse chieftain, Thorwald, is reputed to have been buried in 1004, his grave marked with wooden crosses at either end. The intrepid French explorer, Champlain, landed there in 1606 and sketched the bay. Eight years later Capt. John Smith cruised this coast and gave to Plymouth its name. Pilgrims used the surprisingly accurate map he drew.

Gurnet's first lighthouse, built in 1768, housed America's first woman keeper, Hannah Thomas, widow of a Revolutionary general.

An occasional fishing boat still puts in past the Gurnet. I watched a Gloucester seiner unload 30,000 pounds of shining mackerel at Town Wharf, Plymouth, where I talked with George Sampson, local fish dealer, about alewives.

These fish, a species of herring, spawn in fresh water. Anadromous, like the salmon, they have for their life cycle an extended trip to the ocean and back again to the waters of their birth. There they lay their eggs and die. This important resource may well have saved the Pilgrim colony in its early starving times.

Time out of mind the town fathers have

sold the right to catch these alewives that swim up Town Brook each spring. Sealed bids are made by interested parties, and the contract is awarded the highest bidder.

A Runway for Alewives

"Not much competition lately," Sampson told me. "Nobody but me has the equipment, I guess. Contract says you have to get 15,000 of the fish up to Billington Sea. I rush 'em up by tank truck. The State's putting in a runway so's the fish can get up themselves."

Shades of the Pilgrim Fathers—a runway for the alewives!

"Before you leave Plymouth," I was advised, "see Guy Cooper at Jabez Corner. He runs a real old-fashioned general store. Always prided himself on having anything anyone asked for; that is, before the war he did."

They told me of the summer resident who thought to stump Guy by asking for a pulpit. Without a word, the old storekeeper led him to the barn, showed him one of staunchest oak. "Got her from the church down the road they took down some time ago," he explained. "Thought some darn fool'd ask for it."

The store, 150 years old, with 14 additions to its original building, sprawled back from the Cape road in accumulated abandon. Inside, a confusion of merchandise was heaped on counters and shelves. Many of the articles I hadn't seen in years.

"Know where everything is?" said Guy. "Sure I do. Ought to. I've tended store here for more than 60 years. Want to see around?"

We did "see around," talking of storekeeping, its trials and tribulations. Occasionally the tinkling front door bell sounded, and Guy would hurry off to get a quart of milk or penny's worth of candy.

"Now here's where the nailkeggers gather, winter nights," he said when we reached the back room. There they were—a dozen kegs and a fat, pot-bellied stove. "Most people think things is run from Washington. Ain't, though. Right here's where everything's settled. These fellers always leave in a body, too. Anyone leavin' before the rest naturally loses his argument."

Business picked up, so I sat on a sack of grain and played with four frisky kittens. Plenty of good-natured fun crossed the counter with money and goods.

"Ever try these?" Guy asked a summer customer, pointing to a dozen fluffy buns wrapped in cellophane.

"Are they *good?*" she countered, rising to the occasion.

"Don't know. Never et any," came the brisk reply.

Driving southeast toward Cape Cod, we were intrigued by a sign which stated "Priscilla Beach Theater—America's Largest Summer Theater Colony." On a side road we found it—a huge red barn surrounded by numerous trim white farmhouse buildings. Young people were everywhere.

For ten summers Priscilla Beach has coached some 1,800 aspirants to stage and screen. From every State in the Union they have come, some 150 boys and girls a season, to study and act together.

We watched four rehearsals going on simultaneously, on the stage and under the trees. Later we attended creditable performances of *Pride and Prejudice* and *First Lady*.

Plymouth's northern next-door neighbor is Kingston, leisurely tree-shaded town of 3,000 people. Part of old Plymouth until 1726, it became "home" to ten *Mayflower* passengers, including their able governor.

Bradford an Erudite Governor

William Bradford, the colony's erudite governor for 31 of its crucial first 37 years, was one of the great figures of 17th-century America. His journal, *History of Plymouth Plantation*, ranks among the Nation's most valued historical works.

Still standing is the home of Maj. John Bradford, the governor's grandson, which for a time housed this priceless manuscript (Plate VIII). Loaned to the Reverend Thomas Prince in 1728, it eventually became part of a library in Old South Church, Boston.

The book evacuated Boston with the British in 1776, dropped mysteriously out of sight. Discovered in the library of the Bishop of London in 1855, it was finally returned to Massachusetts after an absence of 121 years.

Flowing placidly past Bradford House is historic Jones River, named for the *Mayflower's* captain. In reality a meandering tidal creek, this "river's" past matches its ambitious name. Between 1776 and 1876 some 270 Kingston-owned vessels up to 600 tons were launched, mostly sideways, from its busy shipyards. Ox teams dragged them on flood tides to the bay.

Jones River launched one of the earliest American privateers, the brig *Independence*, in 1776. Kingston men and Kingston ships sailed the Seven Seas for a century thereafter. The *Pilgrim*, Kingston-built in 1829, was made famous by its young crew member, Richard Henry Dana, in *Two Years Before the Mast*.

On a wooded knoll at the end of a lane I found the home of Wrestling Brewster, grand-

son of Elder William Brewster. I talked with Miss Charlotte Cutts, Brewster descendant.

"Built in 1690," she told me. "Reconstructed by Thomas Brewster during the Revolution. He was quite a fellow, too. Because his wheat saved the town from famine one year he was never run out for being a Tory. His name was always on the proscription list, but just before it was to be read off somebody'd yell 'Beat the drums!' And beat 'em they did, so no one could hear his name. Kept a hogshead of British tea in his attic all through the Revolution, too."

"Myles Above the Sea"

Dominating the town of Duxbury stands the granite monument to Myles Standish, topped by a 14-foot statue of the doughty captain (page 203). Old-timers catch newcomers to Duxbury by telling them it is the world's highest monument. "Sure," they say, "it's Myles above the sea."

We climbed countless circular stairs, lugged cameras through narrow trapdoors, finally sat at the statue's base 288 feet above the bay. The day was crystal-clear. There before us to the south and east spread a breath-taking panorama—the bright blue of Plymouth, Kingston, and Duxbury Bays, the green and white of Gurnet Point, Saquish Head, Clark's Island, and the tall pine-clad headland of Manomet. Clearly outlined in the distance we saw the whole 65-mile sweep of Cape Cod's upraised arm. Twenty-five miles east the Pilgrim Monument at Provincetown was silhouetted against the azure sky.

Founded by early Pilgrim summer residents, Duxbury is now a favorite summer retreat for Yankee families who love to sail. At season's height some 150 craft crowd the inner bay. Children start to sail at seven. Center of social life is the 52-year-old Duxbury Yacht Club (Plate VI).

A century ago Duxbury was a major American port, known round the world. Fourteen shipyards launched vessels by the score. Duxbury captains matched skill against the sea, crowded canvas till masts trembled and straining rigging sang.

Still remembered is the name of fabulous Ezra "King Caesar" Weston, who founded in 1764 a million-dollar shipbuilding business family-owned through four generations. Westons ruled a wide commercial empire with firm but benevolent hand. Weston enterprise built, outfitted, rigged ships; fished on the Grand Banks; traded in every sea and ocean. Lloyd's of London listed over 100 Weston-owned vessels in 1857, noted Ezra Weston II as "largest shipowner in America."

"King Caesar's" stately mansion still reigns supreme over other "square-rigged" houses built by sea captains along fashionable Powder Point. The 153-year-old Weston Store, in South Duxbury, with original age-mellowed shelves and counter, has relics of the South Sea trade.

Outstanding among wide-ranging Duxbury captains was Amasa Delano. Between 1786 and 1822 this courageous captain thrice encircled the globe, explored widely among Pacific isles, traded extensively with China, India, the East and West Indies, and Europe.*

Roosevelt Ancestors Settled in Duxbury

First Delano in America was Philippe de La Noye, who arrived at Plymouth in the *Fortune* in 1621 and later removed to Duxbury. He was also first among the maternal ancestors of the late President Franklin Delano Roosevelt.

A trio of typical square-rigged shipmasters' homes are those built by Col. Gamaliel Bradford for his sons, Gamaliel, Gershom, and Daniel, about 1809. Entering Gamaliel's, I was astonished to see a colorful oil painting of the lethal chrysanthemum created by the atomic bomb burst over Nagasaki.

"That was painted by my husband, Capt. Charles Bittinger," said my hostess. "It would be beautiful—except for its implications."

Captain Bittinger was official artist of the National Geographic Society-U. S. Navy Eclipse Expedition which in 1937 observed the sun's total eclipse on Canton Island. His unusual painting of the eclipse now hangs in Explorers' Hall at National Geographic Society headquarters.

When I was visiting Captain Bittinger's home in Duxbury, he was in Bikini to paint the experimental explosions about to take place there.†

Duxbury ranks second to Plymouth in early Pilgrim associations. There can be found the site of Myles Standish's home and the house built by Alexander Standish from the charred timbers of his father's home. The secluded, pine-shaded Old Burying Ground is the resting place of that eternal triangle—the Captain, Priscilla, and John Alden. The John Alden House, built by son Jonathan in 1653, saw the death of John and probably Priscilla. Now a museum, it has been in the Alden family 294 years.

We traveled the "Old Coast Road" (3A)

* See "American Pathfinders in the Pacific," by William H. Nicholas, in the NATIONAL GEOGRAPHIC MAGAZINE, May, 1946.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Unfurling Old Glory on Canton Island," June, 1938, and "Operation Crossroads," April, 1947.

Kodachrome by Robert F. Sisson

No Finer Figurehead Graced the Prow of a Clipper Ship than This Plymouth Lass

Chief sport of summer residents on the coast of Massachusetts' Old Plymouth Colony is sailing. Pilgrims named the headland "Gurnet's Nose"; its historic light guides ships using Cape Cod Canal.

Kodachrome by Robert F. Sisson

On Warm Summer Days Children Swim and Sun at Scituate Yacht Club Pool Beside the Town's Snug, Historic Harbor

They prefer salt-water pool to colder harbor. Scituate was settled about 1630 by "men of Kent" who arrived via Plymouth. It was Plymouth Colony's "frontier" town adjoining Massachusetts Bay Colony. Breakwaters make the harbor ideal for small craft, afford good protection in rough weather.

While the Photographer Worked, Deft Fingers Molded a Jar

Miss Katharine Alden, descendant of famed John and Priscilla, teaches pottery classes in her 300-year-old Plymouth house. Her clay comes from a local century-old pit. Pilgrims found Plymouth clay "excellente for pots."

Kodachrome by Robert F. Sisson

". . . And English Roses Thrive Very Pleasantly"

So reported a London gentleman in 1672. He visited Plymouth twice and listed 32 English plants growing there only some 50 years after the colony's founding. Today climbing roses adorn many old Plymouth houses.

Kodachrome by Robert F. Sisson

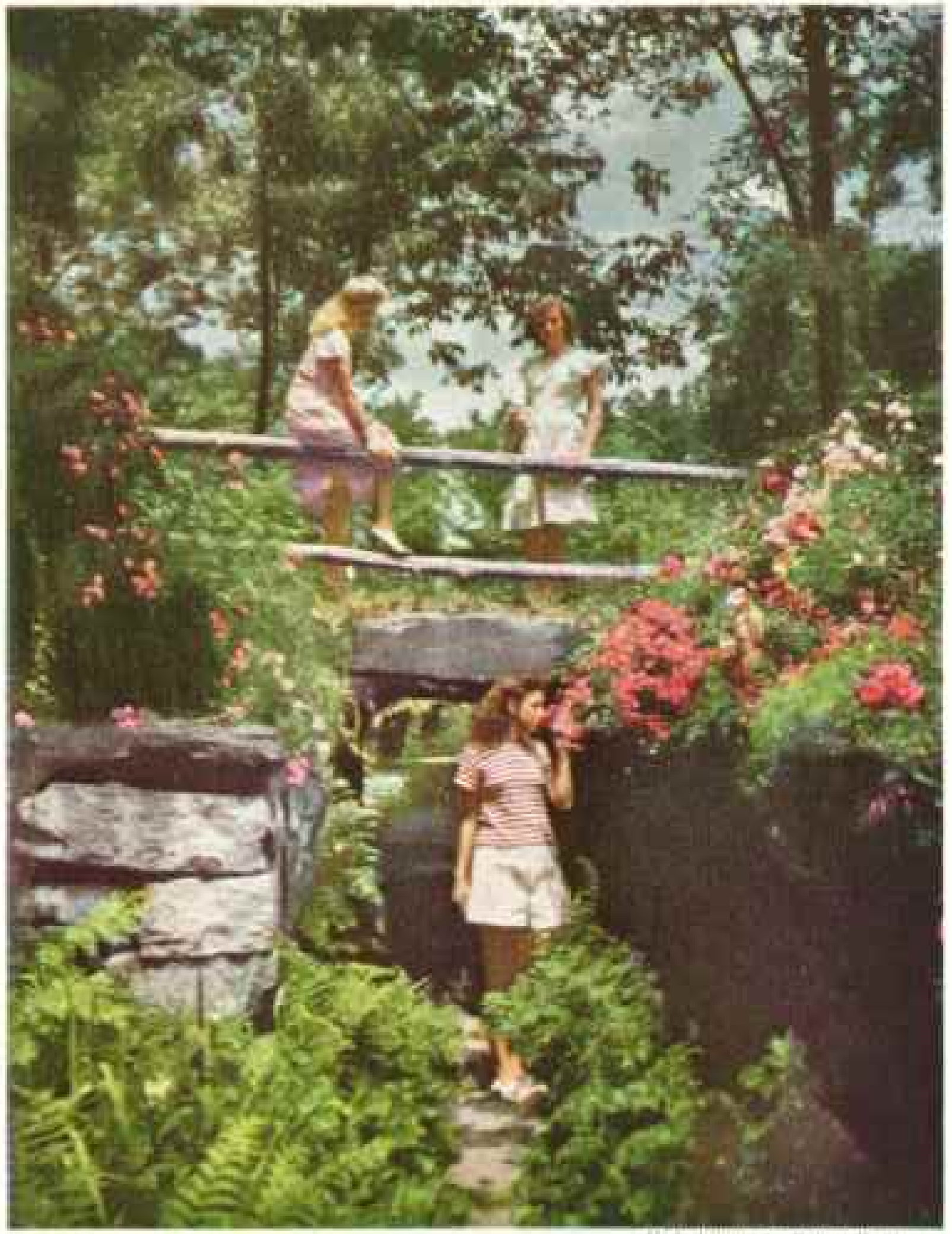
Like Tom Sawyer and Huck Finn, Two Vacation-free Lads on a Homemade Raft Land a Two-pound Pickerel

Countless ponds and lakes dot southeastern Massachusetts, original "land of the Pilgrims' pride." They provide recreation spots and water for cranberry bogs. Plymouth, the State's largest town (township) in area, claims 365 lakes. "One for every day in the year," Plymothians say.

© National Geographic Society

Heroic Statue Honors the Courage of Pilgrim Women

Its boulder base bears the inscription: "To those intrepid English women whose courage, fortitude, and devotion brought a new nation into being." It stands in Brewster Gardens, Plymouth, where Pilgrim women grew herbs.



Kodachromes by Robert F. Sisson

Roses Bloom Where Anvils Clanged a Mighty Chorus

In 1649 Myles Standish and others bought a large tract from Massasoit for $30 in goods. As West Bridgewater, part became a busy manufacturing center. In Memorial Park cellar holes of abandoned foundries now are rock gardens.

Kodachrome by Robert F. Sisson

Duxbury "Pilgrims" Crowd Canvas on the Home Stretch to Win the Season's First Race

Duxbury is a sailing town; in midseason 150 small craft crowd its harbor. Landlubbers spot "Pilgrims," largest boats, by tall Pilgrim hat on mainsails. Smaller types are "Ducks," "Bugs," "Wood Pussies." Standish, Brewster, Alden, and Philippe de La Noye (Delano), maternal ancestor of President Roosevelt, settled here.

Famed Plymouth Rock Is the "Steppingstone of a Nation"

It now rests at high-water level beneath a classic granite canopy. A cement collar holds the top third, broken off in 1774 and dragged to Town Square, to the original base. Guides in Pilgrim garb brief visitors on the Rock's history.

Kodachrome by Robert F. Sisson

A Well Marks "The Site Made Famous by a Song"

Fond recollections of his Scituate childhood inspired Samuel Woodworth in 1817 to write "The Old Oaken Bucket." It became one of America's best-loved songs. The well remains, but not the original "moss-covered bucket."

From This Historic "Salt Box" a Priceless Manuscript Began Its 169-year Journey

Governor Bradford's important *History of Plymouth Plantation* was borrowed from here in 1728. It turned up in London 177 years later and was given to Massachusetts in 1897. The house is in Kingston.

 Kodachromes by Robert F. Sisson

Plymouth Ladies, Like the Wives and Mothers of the Firsteomers, Are Ardent Gardeners

But Pilgrim women grew edible herbs, fewer flowers. Here the Garden Club adds color to the annual July fair. Plymouth also continues the Pilgrim tradition of handicrafts, chief exhibits at the fair.

north to Marshfield and to Scituate, Old Colony border town. This historic snakelike road follows the line of least resistance laid out by moccasined feet centuries ago. It was proclaimed a "highway" as early as 1639 and was a vital link between Boston and Plymouth when each was capital of a sovereign state.

Two names, Winslow and Webster, remain forever linked with that of Marshfield. Edward Winslow, thrice Old Colony governor and its trusted diplomat, became the town's first citizen in 1636. Diplomatic missions, to England and in the service of Oliver Cromwell, prevented his seeing much of his fine estate, Careswell. He died of fever in the West Indies, 1655, and was buried beneath Caribbean waves amid the thunder of a 42-gun salute.

Edward's son, Josiah, the colony's first native-born governor, lived at Careswell until it burned. His son, Isaac, built an aristocratic mansion in 1699 which still remains in all its original beauty. Part was remodeled by Gen. John Winslow upon his return from the onerous job of expelling the Acadians from Grand Pré.

In Pilgrim Hall, Plymouth's museum of intimate Pilgrim relics, are grouped the interesting portraits of the early Winslows. That of Edward Winslow is the only known likeness of a *Mayflower* passenger.

Webster Fell in Love with Marshfield

Daniel Webster, driving from Sandwich to Boston in 1824, fell in love with Marshfield in general and the estate of Capt. John Thomas in particular. Then every year for eight years he stopped to ask the same question. In 1832 perseverance triumphed, and Webster bought the farm.

The famous Massachusetts Senator wrote to his son: "Giants grow strong again by touching the earth; the same effect is produced in me by touching the salt seashore."

Webster became "Ol' Dan'l," friend and neighbor to all, the squire of Marshfield. He fished Old Colony streams, hunted in its woods, scientifically developed his acres. Amid Washington's pressing business he sent numerous and detailed letters of instruction to his caretaker.

In the old Winslow Burying Ground we found his simple grave with its Biblical epitaph: "Lord, I believe; help thou my unbelief." On his estate we found his separate law study, lone survival of the fire which consumed his house in 1878. We stood beneath the elms he planted to commemorate his children's births and felt the spirit of a great man.

Marshfield, under the aristocratic Winslow influence, was a Tory stronghold 175 years ago. General Gage sent a regiment of redcoats to protect the town, quartered them on what was later the Webster place. We saw the giant oak to which, we were told, British soldiers were tied to receive their disciplinary lashes.

"But the sentiments of Marshfield are not those of the Old Colony," wrote a Duxbury patriot. Marshfield narrowly missed undying fame as first battleground of the Revolution. Militia from Kingston and Duxbury, sent to expel the redcoats, waited to act until word arrived of Lexington and Concord.

In 1647 one Walter Hatch was granted part of a two-mile section, then in Scituate but now in Marshfield, and built a house thereon. In his will, dated 1681, he gave house and land to his son and his heirs "not to be mortgaged or sold out of the family from generation to generation to world's end."

The house has passed from father to son through eight generations. I visited this pleasant home and talked with its present owner, author-teacher Richard Warren Hatch. Just released after three years with the Navy in the Pacific, Mr. Hatch was taking life easy.

"We don't say much about it," he told me. "Three centuries in the same place—just means we love it, that's all."

Between Marshfield and Scituate the North River meanders placidly through ever-widening meadows to the sea. Like the Jones River, this limpid tidal stream belies its proud, historic past.

"River of a Thousand Ships"

From 1678 to 1871 more than 1,000 ships were built in some 20 shipyards along its banks. One, the brig *Beaver*, figured in Boston's famous Teaparty. Another, the *Columbia*, 212 tons burthen, first carried the American flag around the world, opened the Northwest fur trade with China, and gave the Columbia River its name.

North River ships first carried Old Glory to British waters after the Revolution. In 1825 the *Smyrna*, North River-built and owned by Ezra Weston of Duxbury, was first United States ship on the Black Sea.

Framed of native white oak, North River ships were famous for their strength and the honesty of their builders. These men built for the Nantucket, New Bedford, and Edgartown whaling fleets. In the 1830's they designed a vessel which captured and long held the Mediterranean fruit trade.

North River history is a tribute to Yankee grit and ingenuity. The river's shallowness; the narrow, winding channel; and the treach-

At "The Trading Post" It's Buy, Sell, or Barter

In Hanson, near Plymouth, an enterprising Yankee turned a 130-year-old school into a happy hunting ground for antique-lovers. Old manikin and spinning wheel are his trade-mark. Odd merchandise crams the school's one room, overflows outside. The owner treks to Florida in winter to conduct his business there.

erous, sand-barred mouth made the meeting of vessel and salt water an arduous task.

Sometimes 14 tides were required to accomplish it. New vessels drifted down on the tide, were hauled by heaving up to the anchor dropped ahead by pilot boat. The crew on either bank pulled on long ropes. The pilot sat between the knightheads and bawled out, "Haul 'er over to Ma'shfield," or "Haul 'er over to Sit-u-wate."

Getting over the sand bar was a real problem. But in 1898, some 25 years after North River became too small for more modern boats, a roaring gale cut a wider, deeper mouth for the river. It was three miles from the old mouth, and considerably shortened the river's course.

Soon after their arrival Pilgrims discovered "bog iron," deposits of iron particles in marshy lowlands and slow-moving rivers. Crude iron foundries and "bloomeries" sprang up, and during most of our colonial history eastern Massachusetts was the chief seat of the iron industry on the continent.

We found numerous sites marking early "furnaces," anchor forges, and foundries. Hardware and anchors for locally built ships were hammered out in nearby towns. The original anchors that held "Old Ironsides," pride of our post-Revolutionary fleet, were fashioned in Hanover, near Marshfield.

Scituate and Marshfield boast more varied views than nearer-Cape towns. Green hills are more prominent, rocks and stone walls more numerous, and the coastline is sterner. Salt meadows lie like lush green carpets among the rounded hills. Great foaming breakers dash across rocky ledges against the seaside cliffs.

Off this rockbound coast defiantly stands "the most dangerous beacon in America"—Minots Ledge Light (page 205). It replaced historic Cedar Point light, still standing at the entrance to Scituate's snug harbor.

"The American Army of Two"

Simeon Bates first lighted Cedar Point in 1811. Legend tells how his young daughters, Rebecca and Abigail, saved the town in 1814. A raiding party from H. M. S. *La Hogue* was approaching the harbor. Grabbing fife and drum, the girls shrilled and beat out "Yankee Doodle" from behind the sea wall. Initial surprise gone, *La Hogue* signaled return of the party, fired a vengeful shot at the light, and disappeared over the horizon.

Scituate was settled about 1630 by "men

of Kent" who arrived via Plymouth. Timothy Hatherly, prominent first citizen, created what may well have been the first American land boom by actively seeking settlers. More liberal than most early New England towns, Scituate allowed even Quakers within its bounds.

Mordecai Lincoln, ancestor of the sixteenth President, established an ingenious triple mill in the town. His son of the same name moved on to help found the Pennsylvania iron industry.

Justice William Cushing of the first U. S. Supreme Court was a Scituate man. In the absence of John Jay, Cushing was unofficial Chief Justice and administered the oath of office to President Washington in 1793.

Samuel Woodworth, returning home on a hot summer afternoon in 1817, took a drink of New York City pump water. Its lack of refreshment set him to reminiscing about the cool, clear well water of his youth in Scituate.

"Write a poem about it," urged his wife. And write a poem he did, "The Old Oaken Bucket."

We found the well, although the poet's house has been replaced by one only 100 years old (Plate VII). But near by are "the orchard, the meadow, the deep-tangled wildwood . . . the wide-spreading pond, and the mill that stood by it."

"Moss" a Valuable Sea Crop

Rocks along the Old Colony coast, unlike rolling stones, gather a valuable seaweed known popularly as Irish moss. For more than a century "mossers," chiefly from Scituate, have gone out in dories and gathered this moss at low tide with 12- to 16-foot rakes.

World War II cut off foreign supplies of moss and boomed this picturesque industry. Between March and September mossers now gather some 2,500,000 pounds of the seaweed from Scituate to Plymouth.

Sun-dried along the beaches, Irish moss is converted into a downy white powder. It thickens, gels, stabilizes, and emulsifies, and will suspend particles in liquid solutions.

These versatile properties have created an ever-increasing number of uses. To mention a few: it may be in your chocolate milk, suntan or hair-wave lotion, cough syrup and medicines, puddings and pies, salad dressing, beer and ale, toothpaste, face creams, shoe polish, or candy. It is also used in the manufacture of light bulbs, paint, submarine batteries, dental impressions, agricultural sprays, fertilizers, and leather goods.

Off Hatherly Beach, lobstermen use the tall steel antenna towers of short-wave radio station WRUL and its three associated transmitters to "line up" their pots. Founded in 1935 by Walter S. Lemmon, famed radio engineer and inventor, WRUL is a powerful radio voice, which beams programs all over the world.

As a young scientific aide to President Wilson on his history-making Versailles trip, Mr. Lemmon dreamed of using radio as a powerful force for creating "one world." Profit from his invention of single-dial tuning turned his dream into a nonprofit reality.

For several years, until war broke out, WRUL beamed college courses, good-will programs, travel talks, and world-affairs discussions around the globe. From 1939 on, its powerful voice broadcast in 24 languages to oppressed peoples. They risked life and limb to listen, smuggled out notes of gratitude.

After Pearl Harbor the station beamed "the voice of free America" 24 hours a day.

Warily I walked with Chief Engineer Louis H. MacDonald through the Marslike maze of WRUL's larynx. Proudly he showed me his pet—a trolley-polelike apparatus for redirecting short-wave beams in a few seconds.

"No heating plant here," he said. "Channeled heat from the transmitters keeps us snug in New England's coldest weather."

A hundred years before the Revolution, Old Colony hinterland was wild frontier. Every old town history recounts the terrors of King Philip's War. From Scituate to Buzzards Bay scalping knife and firebrand plied their terrible trade. Many a lonely frontier family died sudden death before the conflagration was stamped out.

Photographer Sisson and I toured the frontier of 270 years ago. Time and war had left few traces of the 17th century. We did find Pilgrim John Cooke's grave in Fairhaven and a settler's cabin in Westport, said to be the lone survivor of the Indian war thereabouts.

We saw on every side a busy, modern Old Colony. Large industrial towns, like New Bedford, Fall River, Brockton, and Taunton, were humming with activity. Pleasant, elm-shaded New England towns formed islands in still-wide forest tracts. Rolling acres were just showing their first green, and sleek cattle grazed in lush pastures.

Returning to Plymouth in a gentle summer shower, I stood again beneath the giant linden on Cole's Hill and looked across the bay. The setting sun peeped out, tinged sky and water with a subtle pink. Then did I glimpse the real, enduring Pilgrim heritage—courage, faith, and love of freedom—which transformed a wilderness into a land for free men.

Staff Photographer Edwin L. Wisherd

Camera! Nonchalantly Mr. Hummingbird Plays His Role under the Lights

Mary Fidelia Webster poses with her feathered guest as Mr. Edgerton makes a Kodachrome shot under electric flash lamps at 1/3000 of a second. Combination of shutter speed and brilliant light "stops" the rapid action of the bird's wings (page 224). The set is the Laurence Webster home at Holderness, New Hampshire.

Hummingbirds in Action

By Harold E. Edgerton

"WHY don't you take high-speed pictures of hummingbirds?"

Many a visitor to our laboratory at the Massachusetts Institute of Technology has asked that question. Our stock answer was, "You furnish the birds. We will snap the pictures."

Through friends I heard that Mr. and Mrs. Laurence J. Webster of Holderness, New Hampshire, had been training wild ruby-throated hummingbirds to become accustomed to the presence of human beings. As a result of their untiring patience, the birds had become tame and friendly.

Hence, I went with my photographic equipment to Holderness, and was amazed to find the birds there so tolerant of people.

It was a comparatively easy task to make the high-speed photographs, since I could focus the camera on the spots where the birds normally fed.

Later I learned with deep sorrow of the death of Mrs. Webster. This gentle woman, a bird lover for more than 35 years, was primarily responsible for taming the scores of hummingbirds which eventually made their home on the Webster property.

Third Generation Cares for Colony

Chiefly from Mrs. Webster's notes, supplemented by the observations of members of her family, I am able to recount the family's interesting experiences with a hummingbird colony over a period of nearly 20 years.

Since Mrs. Webster's passing, Mr. Webster has carried on the work of caring for the birds, aided recently by his granddaughter Mary Fidelia (Plates I and VIII).

As early as 1903, Mrs. Webster took up her hobby of feeding wild birds. Many of the stations she set up then have been in continuous operation ever since. The most important is the one established on an open piazza just outside the Webster living and dining room windows (page 220).

At one end is a vine-covered arbor, and at the other a few tall lilacs; low bushes line the front. With a southerly exposure, and protected from the prevailing winds, it is an ideal location.

Numerous and varied types of feeders have been put out, developed through experience to meet the requirements of the different birds. Millet, hemp, sunflower seed, suet, doughnuts, and chopped raw peanuts are kept here throughout the year, so that every feathered visitor can find something to his taste.

In winter pine boughs are woven into the vines and placed under an overhanging window to provide protection from enemies as well as weather. Thus at all seasons this piazza is a bird haven.

Chickadees and red-breasted nuthatches were the first birds to feed from Mr. and Mrs. Webster's hands. They were so tame that they came to them freely even when they were on horseback or in a canoe on the lake, long distances from home. In recent years the hummingbirds have received most of the attention, although the others have not been neglected.

Feeding Bottles Bound to Vines

Mrs. Webster's interest in hummingbirds was aroused by an article which appeared nearly 20 years ago in the National Geographic Magazine.* After reading it, she placed some vials filled with sweetened water on the vines, and was fortunate in having them discovered almost immediately. Ever since, the hummingbirds have patronized them constantly, and the colony has steadily increased.

These bottles were bound to forked branches with adhesive tape, then covered with ribbon and fastened to the vines at an angle convenient for feeding.

At first, ribbons of different colors were used to match the birds' favorite flowers. Now the feeding ends of the bottles are of colored glass. Most popular is red.

The ideal bottle size is just under an inch in diameter and two inches deep. Once Mrs. Webster used a larger bottle to avoid refilling so often, and a bird slipped in when reaching for the last drops of liquid.

He could turn around, but could not use his wings; so he was held prisoner all night. His bill provided an excellent handle for rescue, and after he had been fed a little, he flew away, fortunately unharmed by his trying experience.

Visitors Have a Sweet Tooth, Too

Squirrels and chipmunks like the sweetened water, as well as bees, wasps, moths, and ants (Plate II); while purple finches, catbirds, Baltimore orioles, hairy and downy woodpeckers, white-breasted nuthatches, and myrtle and black-throated blue warblers often come for a drink.

* See "Holidays with Humming Birds," by Margaret L. Bodine, in the National Geographic Magazine, June, 1928.

Staff Photographer Edwin L. Wisherd

A Quarter Will Cover the Floor of a Hummingbird Nursery

Saddled to the limb of a tree and fastened securely with spider webs, the nest provides a safe home for the tiny young. Usually two white eggs, resembling pearls against the plant-down lining, make up a set. Occasionally one egg, and rarely three, are found.

The squirrels place their paws around the bottle and pull it down, causing waves of liquid to flow into their mouths. At first, when they could not get their drink, they became very angry and gnawed off the branch. This difficulty was overcome by using wire forks instead of branches, inserted in metal sockets which are taped to the larger stems of the vine.

Flying squirrels also appreciate the sweetened water and often make evening visits to the upstairs bottles and bird-feeding shelf.* After a feast of sunflower seeds, doughnuts, and chopped peanuts, they literally drape themselves around the bottles and have their dessert, remaining even when the lights are shining full upon them.

In order to have the solution of the right strength, Mrs. Webster first sucked the nectar from various flowers for use as a sample, then sweetened the water until the taste was similar. This provided a "nectar" which would attract but not upset the birds.

Avoidance of a too-concentrated diet was justified later, when Mrs. Webster visited the Bronx Zoo in New York City to see some hummingbirds in captivity.

She learned there that the birds are subject to many human ailments and that sweets had to be decreased materially in order to prevent enlargement of the liver.

Apparently her original mixture of one part sugar by volume and two parts water was correct.

In a normal season (from May 10 to September 10) 80 to 100 pounds of sugar were required to provide the amount of liquid consumed. In recent years honey has been substituted for sugar, in the proportion of one part honey to three parts of water. Thirty vials and ten special test-tube feeders are used, and many of these must be refilled several times during the day.

To attract the birds this liquid must be fresh; therefore the bottles are cleaned with swabs every day or so before filling. During this operation the birds show their fearlessness and appreciation in a gratifying manner, hovering outside or flying to their benefactor when the door opens, or drinking from the vials as the liquid is being poured.

When working in the diet kitchen, prepar-

* See "'Flying' Squirrels, Nature's Gliders," by Ernest P. Walker, in the NATIONAL GEOGRAPHIC MAGAZINE, May, 1947.

ing their food, Mary Fidelia usually whistles or hums, as her grandmother used to, and this seems to act as a dinner bell. Birds immediately begin to congregate even when none have been around previously.

Mothers Bring Young to Feed

At first there were only three or four birds in the colony, but one summer recently it was estimated by two eminent ornithologists that at least forty birds were feeding here, and that possibly the colony numbered as many as one hundred birds. This probably represents a natural growth, because the young are brought to feed on leaving the nest, and they remain.

Often a mother is seen feeding her young, and later the youngsters are easily recognized by their awkwardness in feeding themselves. They often try to insert bill and tongue between bottle and ribbon, but when they once find the opening they ensconce themselves on the perch provided and refuse to be driven away.

For some undetermined reason there is decided preference for special bottles. As the bottles are uniform in size, shape, and color, and all are placed conveniently and filled with the same solution, it is difficult to understand why they are not patronized equally.

Fortunately, the favorites are on the post outside the dining-room windows, and it is like a three-ring circus to watch the remarkable exhibitions of dodging and rapid flight here each evening. The birds are so numerous and so active that it seems as if they came together for a last game of tag before retiring.

Everyone connected with the Webster household seems to enjoy an opportunity to care for the birds; as a result, there is never a time when food is not provided—a factor in attracting birds which cannot be overemphasized.

Hummingbirds have the reputation of being very pugnacious. Often they come to grips in the air, and once a female was seen to land squarely upon the back of another and literally claw her victim away from a vial. On the other hand, varying combinations of these birds often feed contentedly from the same vial—two males, two females, males and females (seldom), and occasionally three males together (Plates IV and V).

A Finger Becomes a Perch

Perhaps the perches provided near many of the bottles are conducive to more peaceful feeding, for once two males perched side by side while a third hovered above, happily awaiting its turn to drink.

An enforced rest provided Mrs. Webster with an opportunity to experiment further with these fascinating birds, and it was then that she succeeded in enticing them to perch on her finger while feeding. A branch was fastened to the chair in such a way that the bottle was just above her hand, where it rested naturally and comfortably on the arm.

Under these circumstances the birds provided increasing interest and entertainment throughout the summer. They are now so tame and friendly that they come to the Websters at some distance from the house.

In the garden, Mr. Webster has been able to place a finger under a bird feeding from a delphinium spike and move her from blossom to blossom. Apparently she appreciated the lift.

It was at an upstairs window that Mrs. Webster had her most intimate experiences with these tiny birds. Five bottles are placed here permanently. In addition, Mrs. Webster often held two vials in her hands and two in her mouth.

The latter were attached to a wire "bit" with small perches, where the birds alighted and remained even when she winked and moved her eyes.

The Hungry Male Intervenes

Often eighteen or twenty birds would hover and perch near her, with three feeding together from the small bit bottles at times. It was a thrilling experience when a male pre-empted this bit, and fought off all comers for a whole evening.

They also would investigate Mrs. Webster's glasses. When they drank from the vials in her hands, she could see plainly the division at the tip of their tubular tongues. Often they would hover just outside while she raised both window and screen; then they would fly into the room and circle her head in their eagerness to get the fresh liquid.

One evening, when Mrs. Webster sneezed, a bird on her bit perch rose in the air, but immediately settled back again with perfect confidence.

Another time, when a bird was sitting with his back to her, she slowly moved her hand and touched his tail. After she had exerted considerable pressure, he turned his head; then seeing the bottle of liquid, reached over his shoulder and drank. This he did three times, though she continued to press upon his tail.

From this window one can watch an almost continuous succession of entertaining episodes in bird and animal life. It overlooks the

piazza already described, as well as a bird-bath, two revolving feeders, and shrubbery planted especially to attract birds.

Many visitors come to feast on the fruit of the cornel, lonicera, viburnum, and elder. Five scarlet tanagers were seen here at one time on the weeping mulberry tree; flocks of bluebirds and thrushes come for the woodbine berries; and partridges arrive regularly for cracked corn and the fruit of the bittersweet.

Families of young are brought here for meals; foxes appear at the edge of the woods beyond; owls fly over, pursued by robins or other birds; and once the Websters saw a hawk being chased by two hummingbirds.

A pileated woodpecker flies over frequently, and one year a pair of wood ducks passed by every afternoon on their way from their nest to the lake for feeding. Perhaps the most unusual occurrence was seeing and hearing a redpoll in full song—an exceedingly rare privilege so far south.

Here, too, the hummingbirds are seen bathing. They usually take a "shower" in the rain, or in the spray from garden hose, but occasionally they "splash" vigorously on a rock wet with spray, or in a few drops of rain or dew in the depression of an upturned leaf. The latter makes an ideal bathtub for them.

Evening Is Playtime

Hummingbirds continue to feed until dusk, and during the peace and quiet of the evening show their greatest friendliness and fearlessness.

Experiments tried at this time seem almost like games, which the birds apparently enjoy as much as the Websters do, for they flock around the upstairs window and allow many surprising "liberties."

During this performance the family usually resorts to an insecticide, because bees, wasps, and mosquitoes also gather in large numbers. Curiously enough, the odor does not disturb the hummingbirds at all, but they are sensitive to strange voices and will not come freely when a visitor is talking.

It is interesting to observe the variation in pitch of the hum characteristic of the hummingbird's flight. The pitch of extremely rapid flight, which is occasionally heard, is more than an octave higher than the lowest hovering note.

In the spring, as the day for the birds' return approaches, everything is in readiness to provide their special refreshment. On their arrival they fly directly to the position where each bottle was located the previous year, then watch as the bottles are filled and put out, as if there had been no interruption in their visits.

This has happened so many times that no banding is necessary to prove the same birds return year after year.

These birds have become so accustomed to being studied at close range by large groups of people that they were only temporarily disturbed by the assembling of my photographic equipment.

The series of Kodachromes reproduced with this article was made last summer with both $2\frac{1}{4}''$ x $3\frac{1}{4}''$ and $4''$ x $5''$ cameras, with two Kodatron electric-flash lamps spaced about two and one-half feet from the subject. A CC15 filter was used to correct the color of the light to give true rendition. An aperture of f:8 was used.

Kodachromes were also made with an experimental flash unit some ten times more powerful than the Kodatron.

Most of the birds would fly a few feet away after the flash of light, but invariably they returned immediately to continue their repast. Eventually some of the birds ignored the lights, even when the larger flash units were concentrated only a few feet away to obtain sufficient illumination for color photography at f:16.

High-speed motion pictures were also taken of the birds with a stroboscopic lamp synchronized to the motion of a continuously moving film. This camera was operated at 800 frames per second with an exposure time of 0.00001 second per picture.

Camera Whir Disturbed Birds

The sirenlike noise of the camera running at this speed seemed to disturb the birds, so the camera was put in the house and the movies taken through the window. A shield was constructed to obscure the direct daylight from the camera; otherwise it would have produced a blur on the film.

A collection of motion pictures was taken which showed the birds in several phases of flight, landing, and take-off. Many people have enjoyed these pictures on the screen, since the motion of the wings can be slowed down until it is possible to see what is happening.

A study of the film shows that the wings beat 55 times per second on the average when the bird is hovering. The wing-tip velocity is about 20 feet per second (20 miles per hour).

With an exposure of 1/3000 second, as is used in the color pictures, the wing tip shows about a 1/10-inch blur because of the motion.

Confident Mr. Hummingbird Accepts Mary Fidelia's Finger for a Perch

The young male ruby-throat belongs to a colony which has spent the last 20 summers on the grounds of the Laurence J. Webster home at Holderness, New Hampshire. Mr. Webster's granddaughter helps keep vials filled.

Kodachromes by Harold E. Edgerton

Honey Water Lures Him On; Widespread Tail Means Either Bravery or Defiance

The bird ignores Mary Lou Edgerton, the photographer's daughter, who stands motionless. High-speed photographic flash stops the action of the bird's wings, although they flutter about 55 times a second.

A Dainty Luncheon Guest Disdainfully Eyes an Interloping Bee

The honey solution in the numerous vials and test-tube feeders attracts bees and wasps. A bird often runs its long beak into a feeder, only to remove it with disgust when it finds an insect inside.

 Reproduction by Harold E. Edgerton

Colored Ends of Feeding Vials Attract Hungry Visitors

Red is their favorite hue. When a hummingbird hovers, as here, wings move with a sculling, or figure-eight, motion. Here the wings are seen in the forward position of the stroke.

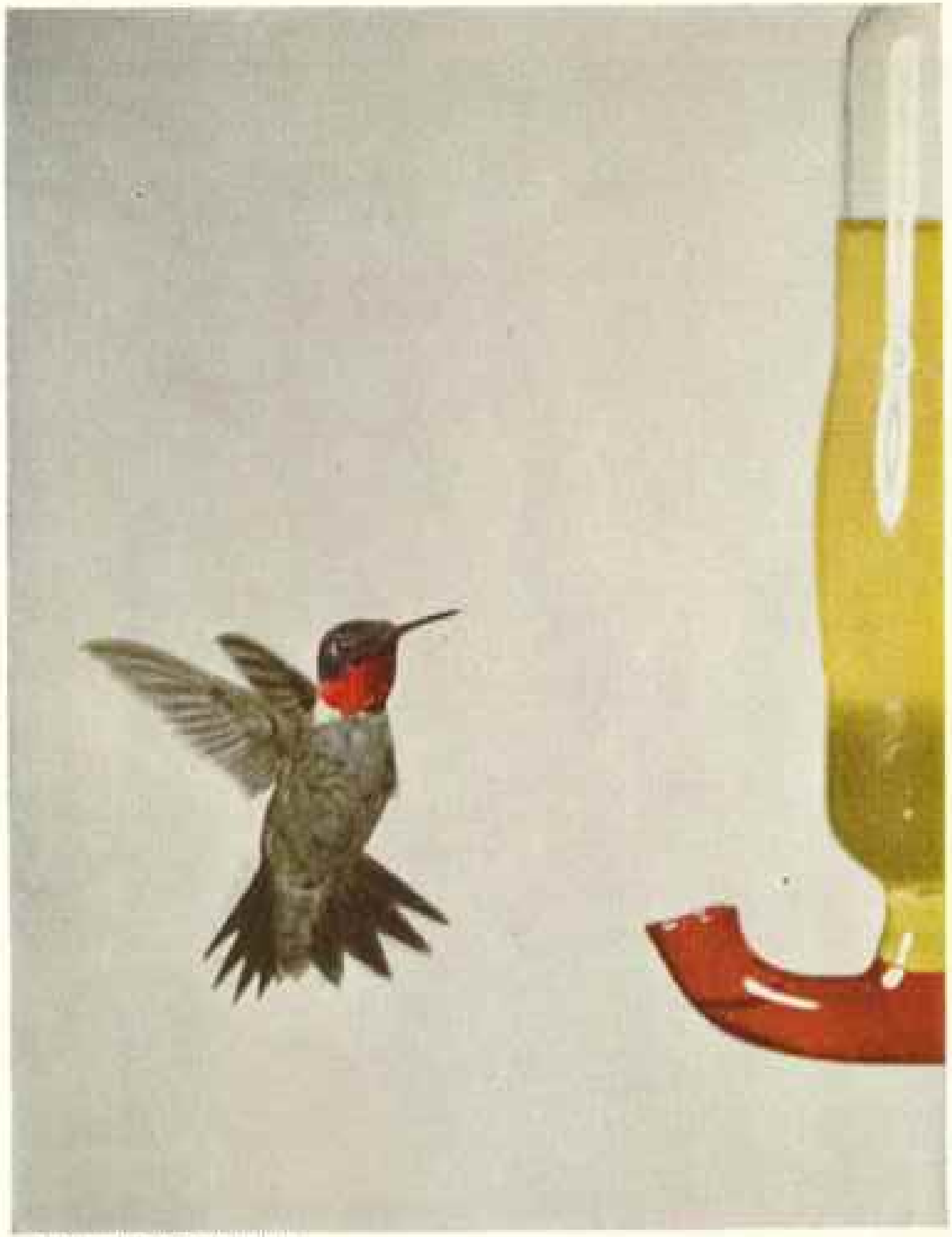
Soft Plant Down and Milkweed Line the Hummingbird's Nest

Mr. Edgerton placed it close to the feeding vial so he could show its relative size. So artfully does the hummingbird conceal its nest that to find one in nature is a rare event, even though many are present.

 Kodachromes by Harold E. Edgerton

Obligingly This Young Male Ruby-throat Flew Back for a Second Portrait "Sitting"

When the first photograph (upper) was made, he flew away, but he returned after film had been changed and flash units recharged. The male's throat spots enlarge as he grows, merging into a brilliant red gorget.



"Stand Back, Men, I Was Here First!"

Sharp chirps and spread tail warn that the little fellow is prepared to fight for his rights at the drinking fountain. Should the ultimatum be disregarded, a flurry of wings will carry him to the attack. Male hummingbirds are born fighters. Only rarely will they feed together peaceably.

Kodachromes by Harold E. Edgerton

Dinner Time for a Bottle-fed Ruby-throat

The brilliance of this hummingbird's throat plumage is best displayed in a full front view. Seen from the side, the feathers take on a darker hue (Plate VI). Photographing the birds was comparatively easy for Mr. Edgerton, as they had become most tolerant of humans.

Kodachrome by Harold E. Edgerton

Congenial Female Hummers Get Together for an Afternoon Spot of Honey Water

The bird at left steadies herself by grasping the perch with one foot, but supports most of her weight with wing power. The other one simply hovers. Adhesive tape binds the perch to the bottle. Male birds seldom feed with the females.

"A Flash of Harmless Lightning, a Mist of Rainbow Dyes"

So the poet, J. R. Tabb, described the hummingbird. This tiny summer guest darts toward the feeding station with beak wide open. Viewed from the side, his ruby throat appears almost black (Plate IV).

Kodachrome by Harold E. Edgerton

Tongue Extended in Anticipation, a Female Comes In for a Drink

When she is feeding, her tongue darts in and out of the liquid with amazing rapidity. Hummers, known to ornithologists as the Trochilidae, are the smallest birds in existence.

"Hanging" in Mid-air, a Wary Hummingbird Looks for Possible Danger

Like all his fellows, he pauses frequently to straighten up and reconnoiter. Since he was almost always in perpetual motion, catching this pose with the camera, says Mr. Edgerton, was partly a matter of luck.

Except for Whirring Wings, on the Backstroke, the Bird Here Is Virtually Motionless

Although there are more than 600 kinds of hummingbirds in the world, only 16 exist in North America, north of Mexico (but including Baja California). Only one, the ruby-throat, ranges east of the Mississippi.

Mary Fidelia Pours Man-made Nectar into a Feeding Vial on the Webster Sun Porch

One part honey to three parts water make up the enticing beverage. Each night she washes the bottles and refills them, so they will be clean and ready for the early birds at the crack of dawn.

Kodachromes by Edwin L. Wisherd

As Mary Fidelia Fills One Vial, a Feathered Visitor Sips at Another

His fast-moving wings appear as a blur in this photograph made with conventional camera equipment. Containers often must be refilled "on location" several times during the day. Hummers consume surprising quantities.

Scenes of Postwar Finland

By La Verne Bradley

With Illustrations from Photographs by Jerry Waller

WE WERE dead serious about our trip to Finland in January. And in no mood for humor. Having just returned from zero temperatures in Poland, we didn't think Sam's telegram, which met us in Paris, a bit funny. It said, "Suggest you wait two weeks. Not sufficiently cold!"

We waited. Then, late in the month, our little Swedish steamer, making its last run from Stockholm to Finland's capital before the big freeze, crunched through floe-blocked waters and into the ice-banked harbor of Helsinki.

We had followed a course across a wildly rolling Baltic and into a path carved by ice-breaker through the sprawling islands of the Turku archipelago. Two weeks later we crossed this path by horse and sleigh, and learned why up to then it had not been "sufficiently cold."

The temperature was only 10° above zero F. that first raw night in Helsinki.* While we were waiting for the greater cold and our ultimate tour of the southern islands, plans had been laid for a hurried trip to the north of Finland.

We Head for Lapland

At 8 the next morning, with barely a flush of light over the runway, we lifted into a frosty sky and headed for Lapland (map, p. 237).†

"We" included Jerry Waller, our photographer; Samuel Krakow, the American Red Cross representative for most of Scandinavia and Finland; and myself, on a survey of relief activities in Finland.

We flew in an old DC-2, handled by giant Finns of serene self-confidence.

Below us lay a land of snow, increasing in white intensity as we moved northward. Tampere, largest industrial city of Finland, lay perfectly patterned to the right, smoke curling from its textile and paper mills, its leather and metal factories.

Farther north in the cultivated lands along the coast, fields were dotted with tiny sheds holding the summer hay and stores of hard-working farmers waiting out the long winter. The frozen Gulf of Bothnia sent icy fingers into the land and held it in its grip. Forests, weighted with their burden of snow, slept quietly under the spell.

As we circled Kemi, we noticed cargo ships frozen in the harbor, and fishing boats, lined bottoms-up along the ice-sheeted shore. The days were offering a little more light now, but the worst cold lay just ahead. The land and the sea seemed locked in readiness. Cities, rural communities, people, and animals adjusted themselves to the elements.

Within 18 hours of landing in this white country of the North, we had seen the wonder of winter as it lays its hand over a nation and bends the lives of the people to its will.

Within 24 hours we were to see the strength of these people, whose tragedy lay not in the battle against snow and cold, but in the failure of mankind to guarantee them the right to make the most of it.

Warm Welcome in the Frozen North

Following the destruction of Rovaniemi, Kemi was made the provisional capital of Finland's farthest-north province. In Kemi, the Governor of Lapland had lunch waiting for us.‡

This bright and unexpected gesture of hospitality was due to more than the traditional Finnish sociability.

First, we represented the American Red Cross, which had sponsored the biggest American relief program in Finland since the war (pages 234 and 238). Second, the Finns were touched by the fact that we had picked their most difficult season to visit them! Third, and most important, not many Americans have found their way to this country in the last seven years, and the Finnish people have an admiration for America which barely falls short of idolatry.

Any contact with the United States becomes a matter of national and personal importance to every one of them.

The aching tragedy of having been even briefly on opposite sides of a war involving America lies heavy on their hearts. For the most part, they attempt to dismiss it by saying we were not at war. They are oversensitive about what the current feeling in America

* See, in the National Geographic Magazine, "Farthest-North Republic," by Alma Luise Olson, October, 1938, and "Helsingfors—A Contrast in Light and Shade," by Frank P. S. Glassey, May, 1925.

† See "Nomads of Arctic Lapland," by Clyde Fisher, National Geographic, November, 1939.

‡ Lapland is the name of the vast area stretching across northern Norway, Sweden, Finland, and into part of the Soviet Union. It has no political boundaries other than those of the individual nations. In speaking of Lapland throughout this story, I refer to the Finnish province.

"I Didn't Know the World Could Be So Kind"

With these touching words a Helsinki housewife, Mrs. Sirkka Michelson, weeps tears of gratitude for the warm clothing sent her from the people of America. One of thousands to be helped through their second year of postwar need, she is receiving through the Finnish Red Cross a sweater knit by American Red Cross volunteers of Nashville, Tennessee, warm pajamas for her children from New Britain, Connecticut, a dress, and other items from chapters throughout the country.

On the Lerche Estate at Vikom, a Cook Does the Monthly Baking in a Centuries-old Oven

Tunnbröd ("thin bread") and this heavier sour rye bread are the islanders' favorites. The doughnut-shaped disks will be strung on poles and hung across the kitchen ceiling to dry (page 250). Most families in the Turku archipelago, during the present rationing, bake once a month. Formerly all breadmaking was done in the autumn for the whole winter.

might be toward Finland, and spend many unnecessary hours expiating their "error."

Unrealistic as Finland's second successive war with Russia may appear, historians will agree that it was inevitable. At the time, Russia was her only known and traditional enemy. Aside from the fresh memories of the 1939–40 war, there was still a generation of Finns who could recall the periods of Russification, both Czarist and Commissarist, which had preceded her national independence.

They had never, of course, been under German rule. Today, living among ruins incurred by Nazi wrath, the Finns give thanks that their little country high-tailed it back into the right camp in time for the future.

The "Petsamo Triangles"

From Kemi we drove that afternoon to the "Petsamo triangle," lying near Tervola by the beautiful Kemi River.

A glance at a map of prewar Finland shows a dancing girl with swirling skirt and arms stretched out to the north. Following the peace with Russia in 1944, the dancing girl had been impoverished by 12 percent. Her waistline was thinner. She had dropped one arm and appeared to be holding back the skirt which brushed her former enemy on the south. She had lost the Petsamo region and 13,000 square miles along her eastern and southeastern frontiers.

And she had absorbed within her new borders more than 450,000 refugee Finns from these lands, who were faced with the problem of finding new homes and new ways of living.

The people of Petsamo, the 4,000-square-mile arm of territory stretching from the northeast shoulder of the land to the Arctic Ocean, had been mainly fishermen, businessmen, seamen from the strategic ice-free port of Petsamo (Pechenga), and laborers in the valuable nickel and copper mines of the area.

In resettling these groups, the Government had evolved a plan of establishing entire new communities, usually in triangular chunks of Government land which were laid out about the northern Inari lake region, around the headwaters of the Lutto and along the Kemi. These became known as the "Petsamo triangles."

The snow lay thick over "New Town," graphic name given the central village in the southern triangle. This was deep woodland, and men could be seen moving along the snow-packed road carrying axes and small saws

Warmly Clad, the Author Stands on the Arctic Circle

When the Germans devastated northern Finland in their 1944 retreat, they destroyed even the marker which indicated the Polar Circle just north of Rovaniemi on the highway to Petsamo. This new marker bears the Red Cross and American Friends Service Committee symbols. Miss La Verne Bradley, formerly a member of the NATIONAL GEOGRAPHIC MAGAZINE editorial staff, was in Finland as a representative of the American Red Cross. She wears a Finnish Army coat used by troops in winter.

from their brief day in the forests. It was 3 o'clock and beginning to darken. The community was settling down for the long night.

Life Begins Anew

Spread out from the central village, with its long barracks set up for the builders and their families, were cottages for new permanent settlers, and beyond these, into the distant reaches of the forest, new farmhouses, huts, or temporary shelters of the simplest form. Everything looked new, smelled new, as a new lumber camp in the American Northwest.

Life was new. These people had begun again. They were to be woodsmen now, or carpenters, or sawmill workers, or farmers.

The man handling the distribution of Red Cross supplies* in New Town lived with his family of three in a two-room cabin. The cabin had been completed barely in time for winter use. Before this, they, and many of the others, had lived in wigwamlike tents, such as the Lapps use farther north. The man had been an insurance salesman in Petsamo. Now he assembled brick and cast-iron stoves for the settlers.

His neighbor lived in a much larger building, but out of the bigger space, he, his wife, and four children also confined themselves to two small rooms.

The rest of the building, beyond flimsy cardboard walls, was for livestock. Next summer, when a barn could be built and new walls put up, the family would move into the rooms where the cattle and sheep now were.

Meanwhile, the benches could be drawn out to make beds, and there was straw for the floor. The animals were part of the family—and a very important part. They were the wealth—they, and the inner strength of these people, who were facing with equanimity and confidence unexpected hardships which can be compared only with those of our own land settlers of pioneer days.

They had chosen this way. The people who had left the territories ceded to Russia might have kept their homes and land if they had agreed to become Soviet citizens. I once asked a Government official how many had

* Since war's end, the American Red Cross has sent to Finland $4,300,000 worth of clothing, shoes, milk, transportation equipment, and medical supplies.

chosen to remain. He said, "About 10."

"About 10,000?"

"About 10 people."

We were hardly prepared even yet for the shock which met us at Rovaniemi.

This former sparkling little capital of Lapland lies on about the same parallel as Beaver, Alaska, just a sliver south of the Arctic Circle. Before the war it was probably one of the most sophisticated backwoods cities in the world. Its modern hotel of shimmering glass and concrete was known throughout Scandinavia —and the skiing world.

It was a storybook town of old and new, people in smart ski clothes moving among modern buildings and mingling with lumberjacks and millworkers lounging along the edge of wooden sidewalks. People tell of the Lapp couple who used to appear at the hotel for a week each winter and sit in full brilliant costume sipping champagne at its fashionable bar, then quietly disappear for another year to their nomadic life of tents and reindeer.

Today Rovaniemi is called "the city of chimneys." Totally destroyed in the vicious punitive retreat of the German Army in 1944, the only remnants of its former outline are the brick chimneys of the burned houses, which stand like ghostly tombstones among its ruins. They are known as "Hitler monuments" (page 240).

Throughout northern Finland they identify the former farms and villages demolished in the fury of Nazi defeat.

When Finland signed the armistice with Russia in 1944, it caught an estimated 100,000 German troops in the northern and eastern parts of the country.

As the Finnish Army re-formed along the Oulu River and began its drive to push the new enemy out of the land, the Germans fell back to the north, to retreat through Norway. Those in the Petsamo area hurried south and west to follow the same corridor.

In their wake they left perhaps the most thorough devastation of any battlefield of the war. The only part of Finnish Lapland that was spared was a small section in the southwest which the Germans were forced to abandon before they had time to scourge the earth.

An area of some 35,000 square miles was laid waste. Every farmhouse, barn, or haystack in their path was destroyed. Isolated

Drawn by Theodora Price

Travelers Go to Sea in Sleighs in Southwest Finland

When winter locks the waters, boats are put away, and the ice becomes a roadbed for all sorts of conveyances from skates to automobiles. Inset shows the whole country, the large-scale map the area in which the author made her journey over the ice for the American Red Cross. Free Finland is governed by a President and a single legislative chamber. Its population is now 4,046,000.

Dire Want Forces Helsinki People of All Walks of Life to Seek Relief

Although many of these folk appear well dressed in clothing purchased in happier times, each carries a certificate of need approved by Finnish Red Cross authorities. They are receiving quilts, afghans, children's clothing, sweaters, socks, shoes, and many other items sent by the American Red Cross to help meet the critical shortages in market-bare Finland. Severe rationing here does not begin to meet the cold-weather requirements of a country living through its eighth year of war-caused suffering.

cabins and even lonely Lapp huts on northern barren fells were fired. Mines were left in their place. More than 170,000 people fled their homes, moving west and south and across the Torne River into Sweden.

Most of these families have returned to their land by now, and with the refugees from the lost territories have begun to rebuild.

Rovaniemi, in the hands of Finland's famous architect, Alvar Aalto, is to rise again, compact and streamlined, the most modern city in Finland—a sort of gem tossed off in the wilderness.

Some of the new concrete buildings are already beginning to take shape, incongruous in their pristine whiteness against the dark devastation around them. But for the most part, Rovaniemi as we found it was more like a boom town of the Alaska heyday.

All the temporary houses are wooden, and most of the population lives a makeshift barrack existence, trading at temporary wooden stores, being treated at a temporary wooden first-aid station, and sending their kids to temporary wooden school buildings. People live and work with the lusty energy of all northern

inhabitants, increased twofold because they are Finns.

A Steam Bath and Snow Roll

It was in Rovaniemi, on the Arctic Circle, in January, that I had my first *sauna* (steam bath) and *pichtaroida* (snow roll)!

The Finnish steam bath is not only a national institution, a social function, and a family law; it is one of the experiences of a lifetime.

Saunas, usually built as separate little houses near the main homestead, are arranged inside like small amphitheaters with raised rows of benches, to be mounted progressively according to one's capacity for absorbing heat. In one corner is the big pile of stones heated from underneath by a roaring fire. Near by, a caldron of hot water, and, alongside, either a hose, a faucet, or standing buckets of cold water.

As dipper after dipper of cold water is dashed upon the hot rocks, great clouds of steam rise to the ceiling and settle over the bathers like a suffocating blanket. After the first gasp, the next is not so bad. Then the atmosphere becomes soporific. People unaccustomed to the oppressive heat must have someone along who knows how to gauge the steam.

In Finland, one seldom takes a bath alone, anyway. Usually it is either the whole family at a time, or all the men, then the women. There are almost always guests. Two Finnish women accompanied me to a neighbor's sauna, which had been heated specially, since this wasn't traditional Saturday sauna night.

About the time I started to melt down like a wax figure and slip through the scrubbed planks in liquid form, one of the Finnish women reached down, dipped some birch leaves in a bucket of water, and began to beat me. A pungent haylike smell filled the sauna. The birch beating is to stimulate the skin and leave it with the clean scent of the broken leaves.

They told me when I had had enough. They told me! We descended from the gallery and began to wash down in lukewarm water from basins. Because I was a guest, one of the women must scrub my back—hard, quick strokes with rough paper sponges. Soon I began to feel cohesive again.

The snow roll was my idea, of course. They had done it before, I later learned, but not often. I thought it was part of the ritual.

We opened the door, great swirls of snowflakes rushing in, and stepped into the Arctic night. I steadied myself for a second, then followed them with a swift pitch into the nearest snowdrift.

The shock was paralyzing, but over quickly. We staggered back and leaned limply against the warm walls.

Suddenly I was more completely alive than I had ever been in my life. I exulted. I washed down in buckets of ice water and began to sing excerpts of "Finlandia."

We went into the dressing room where there was a small fireplace blazing and, wrapping ourselves in towels, stretched out to begin the "warming" process.

I was tingling with a physical well-being that made me wonder why this famous orgy is not world-wide. No wonder, I thought, *no wonder* this is a race of runners and fighters!

The Spell of Space

It is hard to say what makes Lapland so impelling—the haunting half-lights, the vast stretches of solitude, the sense of the infinite.

Looking over the long reaches of white land with the quiet timbered ridges in the distance, one can stand for hours caught in a hypnotic spell of space. The problems of a worried world seem remote and out of keeping here. It was inconceivable that these extravagant wastes had been caught in the sweep of war.

One feels that man tempted fate by bringing his discordant failures to the hallowed beauty of this wild country. The frozen bodies of soldiers lying across its wind-swept face once testified to that.

I wondered what Axel Munthe's "Little People" must have thought about it all.

We took off at dawn one morning, which was about 9 o'clock, to head for one of the worst war-damaged districts of east Finland.

It was an all-day trip. When it was over, the snow roll had paled into insignificance, but my respect for the Finns had increased by leaps and bounds—precisely.

We drove in a sedan, which was warm, fortunately, but the driver was a madman. Besides, he had a wooden leg. He wasn't a madman, actually. We learned that all Laplanders drive this way. We raced wildly over snowy roads at 50 or 60 miles per hour, leaving a cloud of powdered snowdust billowing over the countryside. We sped through thickly forested valleys, around ice-banked bends, across frozen lakes and rivers.

Roads were incidental. There was nothing to do; he couldn't be stopped. And it seems he didn't need to be. He knew more about handling a car in snow than Santa Claus knows about his Lapp reindeer. When we found this out, we grew very fond of him. He was, in fact, Risto Manninen, one of Finland's much-decorated war heroes (page 261).

"Hitler Monuments" Scar Finnish Lapland

In their retreat before the driving Finnish Army, German troops, caught in the north of Finland at the time of the Russo-Finnish armistice of 1944, left 35,000 square miles of devastation, burning every village, home, and haystack in their path. Stark chimneys stand like tombstones throughout the land. This one, rising in tragic solitude amid a rich forest of pines, is near Rovaniemi, Lapland, on the Arctic Circle (page 237).

Kuusamo, also a lumber town, and a former summer resort where people once fished and boated among the beautiful lakes and streams of the area, was as badly wrecked as Rovaniemi.

A Tragic Shifting of People

There has been a strange and tragic shifting of populations here. Just to the east, about 15 miles, lies the strip of land ceded to Russia at the end of the "Winter War" of 1939-40. At this time, when the people evacuated the territory, they spread to Kuusamo and its neighboring communities up and down the new frontier.

During the "Second War," German and Finnish troops pushed the Russians back to regain the land; and the people returned to their homes. Then the Finns signed their armistice with Russia, and the strip went back to the Soviets.

Again the people left their land, this time, as far as we know, for good. But now they were forced to push far west to escape the new conflict.

It was along this eastern border that the Germans began their destruction. Two houses in Kuusamo were left standing; industry, communications, and livestock (including the valuable reindeer herds) were destroyed.

The refugees who returned have struggled to restore a livable city, but here, more than anywhere we went, we found a piteous people, crowded into crude temporary shelters of loose planks stuffed with paper or huddled in abandoned military bunkers—anywhere to find refuge from the unrelenting northern cold.

Kuusamo, too, has its name—"the city of *korsus*." These are the low underground huts, built as barracks, first by Finnish soldiers, and later, in greater numbers, by the Russians. Designed as protection against artillery fire, they were also found to be the warmest shelter for troops against wind and blizzard. Ten men would be billeted in the one tiny underground room (pages 249, 259).

Today families of ten and more live in the same space. The roofs slope to the ground. They look like doghouses. There is little light, no air. They smell of stale smoke, and drying boots and shoes, and bits of poor food being cooked in crude fat.

There was little tuberculosis in this clean lumber town before the war. Today it is a crisis.

"Finnish Red Cross—Gift of the American Red Cross"

To waiting trucks on the docks of icy Helsinki comes one of the final shipments of American relief supplies to Finland. Over a two-year period the American Red Cross has donated to this war-wracked little country $4,300,000 worth of medical equipment, clothing, shoes, layettes, milk, Junior Red Cross parcels, trucks, and ambulances (page 243).

We walked from hovel to hovel, visiting families half-sick, undernourished, poorly clothed. We saw the children in the new hospital, first building to be restored, waiting for the machinery of reconstruction to reach their isolated homes.

At Last, "Sufficiently Cold"

There is no way of comparing the misery of war-wrecked lives between one country and another. We had seen tragedy in many lands. But as we drove quietly back through the clean beautiful land of east Finland, past the stark monuments of burned homes, past hard-working people fighting to regain their self-dependence, we felt that fate had here enjoyed one of its most ironic tricks.

A few days after our return to Helsinki, word came that the Turku archipelago was at last frozen in. It was finally "sufficiently cold" to proceed with our southern expedition.

We took the train to the ancient seaport city after which the islands are named, and found ourselves in the heart of Swedish-speaking Finland. We learned that we were headed not for the "Turku archipelago," but for the "Skärgården" of the "Åbolands." (Åbo is the Swedish name for Turku.)

Swallowed in Mist, Dozens of Icebound Islands Form a Panorama of Vast but Lonely Beauty about Pensar

The bungalow housed officers of the Finnish Civic Guard, who trained here during summer months. Dissolved by the Russo-Finnish armistice of 1944, the Guard left the place a neatly laid out camp, with barracks, dance hall, and steam-bath house (page 260). Now it is a resort in summer, and ice seiners use it in winter.

Though No U. S. 1, This Route Across the Frozen Baltic near Gullkrona Is a Posted Highway

Small trees strung for miles along the ice mark the safest path for commuters crossing wide stretches of frozen sea between islands (page 251).

Six American Ambulances Bolster Finland's War-depleted Medical Equipment

Gift of the American Red Cross to the Finnish Red Cross, they will be placed in key districts from cosmopolitan Helsinki to cold and barren Lapland.

Though Snow Is Deep, Public Health Service Carries On

Eliisa Airila, Finnish Red Cross and Public Health nurse, shows how she and many of her sisters ski sometimes 40 and 50 miles to take medical supplies and assistance to isolated families. In her knapsack are medicines, compresses, hypodermic needles, and other vital items (pages 247, 261).

Turku itself is now predominantly a Finno-Finn city, but the islands are still 90 percent Swedish-speaking, the people being descended from the Swedes who lived here when Finland was part of her western neighbor.

The Turku chain is one of the most thickly islanded archipelagoes in the world. In winter, caught between icy winds blown down from the frozen Gulf of Bothnia and up from the raging Baltic, it is also one of the coldest. Legitimate islands number some 30,000. Beyond, between, and peppered over the 3,000-square-mile area are thousands of smaller unnamed, uncounted skerries, reefs, and rocks abutting impudently in the path of coastal traffic—when there is any.

The permanent population also numbers, curiously, about 30,000. This does not mean one per island (though at times it seemed so); people cluster mostly about the larger land groups.

Spread among the small outer islands, however, are the others, the true "Skärgårdeners," who for generations have lived a life of resigned isolation; backwards, for the most part, but self-sufficient—unto war.

They are a hardy race, used to extremes of climate, minimum comfort, and simple needs. Now war restrictions, rationing, and the privations suffered by the country as a whole had caught them in their isolation and brought many to the brink of disaster.

Across a Bridge of Ice

In the fall or winter when the ice is forming, and in the spring when it begins to break, these people are completely cut off from all physical contact with the world. Horses, sleds, and boats are immobilized. Weeks may pass, but no living thing does. Not even the postman, who is one of the few to make the island trip in winter, anyway. They must simply wait for the mixed blessing of severe cold to restore their bridge to the mainland.

And so had we.

We began our strange expedition by car from Turku across the handsome arched bridge spanning the sound to the island of Alö. There, near Sandvik, at the outer edge of the island, horses and sleighs were waiting.

This was it. We looked out across the limitless sheet of ice—and hoped our Finnish friends knew what they were doing.

Pulling on fleece coats, we slid under heavy fur robes; our feet were placed in fur sacks

over hay packed on the bottoms of the sleighs for insulation. The horses swung toward the trackless waste. We pulled off the shore on to the frozen sea (page 252).

A new four-inch snow muffled the rhythm of the hoofbeats; the sleighs moved quietly into space with only the soft whir of the runners sounding in the silent darkening afternoon.

There was no other motion, no sign of life for more than an hour. Even we were silenced by the enormity of the vast white panorama.

Suddenly in the distance we made out some figures standing by what looked like a giant rent in the surface of the ice, and soon we drew up to the floe-strewn steamer channel, through which we had passed farther south on our way to Helsinki two weeks earlier.

As we approached, attendants had come out from a tiny shack sitting forlornly beside the stream and rolled a bridge over the gap for the sleds to cross. People traveling ice-wise to the islands must know their way to this point. Expert on island geography, our new guide, Capt. Kurt Leon-Lindh, formerly of the Finnish Army, led us to each strategic spot with infallible ease.

In the Heart of an Island Group

It was dark when we reached Vikom, in the heart of the Nagu group. We drove up an avenue of tall snow-laden pines to a baronial old farmhouse. Stretched on each side were smaller houses, great barns, and rolling fields; beyond these, the shadows of rich forests. This was to be our most lavish experience for several days.

There are few large working estates left in the Skärgården. This, our first night's stop, was owned by another former Army officer who had bought it as a summer home. The archipelago is one of Finland's most popular summer vacationlands. At the peak of the season the population is more than double its winter complement.

But the owner now lived here the year round, working the 1,200 acres of timber and pastureland and supplying his family, friends, and workers with food and goods that could not otherwise be obtained on Finland's present depleted market. In a much larger way, he was doing what the smaller farmers in the outer islands have been doing all their lives.

Mrs. Lerche today bends over her *Martha-växstol* (Martha loom),* weaving scarves, blankets, etc., from home-grown wool she has spun herself, just as the outer-island women have done for generations (page 246).

While Captain Lerche directs the land work, his wife supervises the care and feeding of the livestock, the weekly baking in the outer ovenhouse (page 235), and the management of the big home.

As Public Health nurse for the government district in which they live, she also travels by sleigh or ski (and by boat in summer) to the outer islands, checking the health of the people and carrying medical supplies (from America) to those in need.

It is a hard and busy life, and as isolated as the distant fisherman's, but in a warm home stocked with good books, music, and food, they live well. In years of want they have found self-sufficiency.

Among the farmers and fishermen of the outer islands, the situation was reversed.

At Mattnäs, in the southern part of the Nagu chain, we picked up Harry Lindell, the postman, a hardy, placid Swedo-Finn, who knew each tiny island outpost and, more important, the ice between (page 262). With Lindell, Sam, and me in the lead sleigh, and Kurt and Jerry in back, we turned to the open sea and headed south.

Finnish Family Johanssen

The family Johanssen lives on the island of Rockelholm. Their three-room cottage sat on a snowy slope overlooking a tiny cove where fishlines leading into small holes in the ice were the only evidences in the whole glacial scene that there was life anywhere within miles.

In the crowded little kitchen three people were hard at their winter's work. The mother sat in one corner by a basket of raw wool, carding it into soft rolls for spinning. Her son had his bicycle apart, repairing the wheel joints. Mr. Johanssen was off in another corner mending a huge "bottle" net, which stretched in circular billows across the room.

Unlike the many farmer-fisher families we visited over the islands, the Johanssens were fishing people only. They had no land. They bought their year-round provisions in summer from a community store on one of the bigger islands.

This year, with strict rationing making it impossible to get in supplies, they were reduced to a diet of potatoes, porridge, and fish. In a good year the Johanssens earned about $800 from their summer catch.

But, the old man said, there had been only a small market during the war, and it was hard to get material to make new nets or repair equipment. A big herring net is good for only three years.

* Named for the Martha League, a Finnish women's group which had, during recent years, introduced this and other homecraft projects among the housewives of Finland.

A Landowner's Wife Does Her Own Weaving

Because of Finland's restricted trade and depleted markets, Mrs. Brita Lerche, whose husband owns one of the largest estates in the Turku archipelago, has learned to depend on her *Marthavävstol*, a special home loom introduced by the Martha League, a Finnish women's homecraft organization (page 245). Behind her is the traditional tile stove, which heats several rooms.

As we talked, the elderly mother prepared coffee, inevitable sign of Finnish hospitality. No matter how dire the circumstances, it is accepted in Finland that a certain store of coffee will be kept on hand to maintain the prewar tradition. It is as rude to refuse to share it now as it was when there was plenty.

A Coffee-hungry Country

In coffee-hungry Finland we had had enough to float a battleship. We carried in our pockets bits of saccharin and sugar lumps as the only gesture we could make in return.

The old man took us down to his lines. He was trolling for ice pike, using herring as bait. These were for his own use. In summer he and his sons took their two seine boats to the herring banks for their summer catch. He was proud of his boats, his nets, and his sons.

He was glad we had come; the ice had been "slow freezing" this year.

He helped feed the horses and sent us off with a warning about a certain "track" (deeper boating channels between islands) where the ice was thin. And we left him standing in his tiny cove, swallowed in the background of bleak and passive solitude.

Toward dusk, as we headed south again over the barren sea, an east wind came up, blowing the fine snow in sweeping sheets across the ice. It was a painting of gray, blue, and silver, done in long strokes. The horses began to frost over, clusters of caked ice forming around their mouths and nostrils.

Lindell and Kurt, who were driving, sat in the front seats of the two sleighs in the open wind with only fleece-lined jackets and caps.

We were always heavily wrapped in the big fur rugs. It was a ridiculous contrast of veteran and tenderfoot, but it illustrated the concern felt for our lack of experience. Kurt had had his training during winter fighting in Lapland. We could well understand the strength of the Finnish soldier.

As we rolled along, Lindell would get out from time to time and run ahead to drive a long ice shaft into the frozen crust of the sea. Usually all went well and he would motion us to come on.

Once he plunged the pick forward, and almost lost it. We retreated and sought a new route to the east, following a small string

of islands along their more solid shores.

This was good for about half an hour, when we again had to turn south into the open. Everything looked fine; the ice was about three feet thick. Suddenly we hit an unexpected fissure, and water struck the horse's feet. He shied and charged ahead in violent fright. We landed across safely and knew the sleigh behind us would, but we turned to warn them, just as they hit it. Their horse jumped and broke into a run which almost threw Jerry and Kurt on to the ice.

The Wisdom of Horses

Animals have a strange instinct for danger that turns to inordinate anger when surprised. Usually the horses were as careful as Lindell, slowing down and flexing their nostrils as if to determine the thickness of the ice by smell. They wore special spikes attached to their shoes for ice travel. They could have galloped with complete security. They were never asked to.

We came to love these animals with an almost human attachment. They were considered equally in all our plans. One morning I was not surprised to find Lindell warming their steel bits with his own mouth.

It was on this morning that we learned we could not continue across the ice to the southern islands. A cold wave, which had dropped the temperature to —58° F. in northern Sweden, was heading south. It had already begun to show its effects.

We had stayed overnight on Berghamn Island, farmed out individually among the different island families.

Undaunted by Cold, She Goes on an Errand of Mercy

Nurse Tyra Backman (page 261) mounts her bicycle to carry medicines and check the welfare of families unable to reach village health centers. The bicycle is one of 500 purchased by the American Red Cross in Sweden to assist Public Health authorities in Finland in their campaign to restore and maintain the health of the war-blighted Finnish people. To the rear is the community Baby Health Center operated by the Finnish Red Cross.

I had passed the evening alone in a two-century-old cottage with an aged widow and her fisherman son, and I had huddled by the big brick stove, which with its great metal canopy took up about a fifth of the kitchen and still didn't keep us warm.

I was cared for with gentle simplicity and concern. Even the big tile stove in the one bedroom (closed off for winter) had been heated, a costly sacrifice on this little island which, rocky and barren, had to import its fuel.

And before I went to bed, the old lady had popped a precious sugar cube in my mouth

Maxwell Hamilton, U. S. Minister to Finland, Presents a Gift to the Finnish People

Prof. Oskar Reinikainen, Chief of the Medical Staff of the Finnish Government and Vice President of the Finnish Red Cross (left), receives the title to the six American ambulances to be used by transportation-short hospitals (page 243). In the rear is Col. G. Taucher, Secretary General of the Finnish Red Cross, and at the right, Samuel Krakow, A. R. C. representative to Finland.

drenched in some home-brewed alcohol to "warm me up inside" for the night. It didn't work.

By morning the temperature had dropped to —10° F., a completely unexpected turn in our plans. With news of the approaching cold wave, Lindell and Kurt relaid the course to take us to nearer islands which would still be representative of what we wished to see, but where travel time between could be kept to a minimum.

Faces Frostbitten

We pulled away from Berghamn and headed east. As we struck the open sea, an icy wind caught us head on. Within ten minutes Jerry's cheeks were frostbitten. Kurt grabbed a handful of snow and began to rub the frozen white patches vigorously.

A few minutes later, one side of Sam's face went white, and Lindell, actually frightened for the first time, quickly began the same procedure. The two victims sat from here on with faces completely swathed in scarves. I seemed to be luckier, and was enjoying the vast and melancholy beauty of the wild scene, when suddenly my eyelashes began to get heavy and quickly froze together.

Anything that happened for the next few miles is pure hearsay. The temperature in the open wind was —34° F.

Two hours and a whole lifetime later, we drew into Brännskär, as strange a looking group as the Brännskärians had ever seen. Our face scarves were white and stiff with frozen breath. The horses were frosted from stem to stern. Even Kurt and Lindell seemed to have shrunk a little with the cold.

After Brännskär, island by island, in short runs of an hour or so each, we eventually reached Pensar (pages 242, 260).

Pensar, the Island with a "Summit"

Girt by sea cliffs and pebbled coves, covered with luxurious vegetation, and richly timbered with evergreens and birch, Pensar is one of the most beautiful islands of the archipelago. It rises in swelling ridges to a rocky summit which commands a dramatic view of neighboring islands for miles around. It is one of the few islands with sufficient altitude (about 300 feet) to boast a "summit."

Pensar was formerly a summer training base for a naval unit of the Civic Guard, 100,000-member volunteer organization which functioned in Finland as a form of citizen militia.

Children Ski Over the Roof of Their Home in Kuusamo

Destroyed by the Germans in 1944, this town in east Finland has an entire new village composed of these *kortes*, one-room ex-soldier barracks built by the Finnish and Russian troops who occupied the area at different times. Mostly underground, they offered protection against both artillery and northern blizzards. Homeless families, sometimes numbering ten or more, now find shelter in the one room. These doghouselike huts admit little light and air; the people seemed half-sick and undernourished (pages 240 and 259).

In a Fisherman's Cottage on Brännskär, Housewives Toil as Have Their Mothers for Generations

The soft rolls of raw wool being carded over the steel-toothed block at the right will be spun into yarn of varied thickness. As wool now must be shared with the State, the islanders are left with barely enough for a few needs such as mittens, socks, etc. The dress worn by the older woman is a gift of the American Red Cross. On a pole under the ceiling disk-flat loaves of sour rye bread are strung for drying (page 235).

For two weeks each year members would spend their holidays in gunnery practice, seamanship, and barrack life amid a resortlike atmosphere where they could also swim, sail, and train physically for whatever national service they were asked to perform.

Serving them as cooks, canteen workers, and nurses were the women of the Lotta Svärd, their feminine auxiliary.

Because of political inferences (the Civic Guard was an outgrowth of the White Guard of 1918, formed to fight communism), both organizations had been dissolved by the 1944 armistice with Russia.

The island was bought subsequently by a private company which operates the huge lime quarry near Pargas. Today, in summertime, it is a resort camp for the company's workers. In winter, a number of the buildings are occupied by a group of seine fishers who quarter here in order to reach each day the herring banks to the south.

Worst Winter of an Icy Land

The day we arrived at Pensar happened to be the coldest day of February, in a year when all Scandinavia and Finland were suffering their worst winter in decades!

The situation was now out of hand. The horses would have to be sent back. There was not sufficient feed for them at Pensar to risk waiting for the cold spell to break. And since no three freshmen could stand the open ride back to Vikom, Lindell would have to return alone.

Even he was slightly nervous as he lashed the sleighs together that morning and accepted for the first time the offer of extra gear, including the mirror of my vanity case to check his own face for frostbite. He made the trip back, we later learned, without serious effect, but it had been an extreme experience even for him. Meanwhile, we were to wait developments, if any, at Pensar.

A family of four brothers and their sister had charge of the resort. They put us up in the former Lotta barracks and fed us well.

We had planned to travel from here to the seine-fishing grounds to the south, but, with no transportation, we were immobilized. We could not ask the fishermen to take us along, and then wait for them all day on the ice. Not us.

We could only wander about the island, watching the brothers working on the island boats, going to the village for milk, and climbing to the top of the hill to see if there was anything coming this way. There never was. Perhaps spring would bring a change?

There we were, stranded in the middle of the Turku archipelago, surrounded by ice, cut off from civilization.

So we called a cab.

It was Jerry who looked up from a book one night and tossed off this facetious suggestion. To our astonishment one of the brothers said, "We could try," and put in a call to Pargas. To our further surprise, he found a driver who, for a nominal sum, was willing to risk his car across the ice and come for us.

It was not an unheard-of thing. Cars do ply between the islands over the ice, but, cold as it was, it was still too soon after the final freeze to expect one to come this far out (page 243).

Seine Fishing for Baltic Herring

The next day in a shiny Chevrolet sedan with heater, we headed for the seine-fishing grounds. The car followed the tracks of the fishers' sleighs and some five miles southeast pulled up to one of the busiest scenes in the fishing industry.

Seine fishing for Baltic herring is a year-round occupation in the archipelago, varying only by season, as the herring move from one bank to another, and by method of seining. Both free-water and ice seining are highly skilled operations.

The Pensar fishermen made up a typical "team." Under a head man, known as the "seine king," were 19 men and two women, each with his, or her, special job to perform. The "king" is in complete authority, making the original test to determine how the undersurface currents (and therefore the herring) are running, deciding how the net shall be placed, and ruling with heavy hand, and voice, over the workers.

Every man knows his job and moves almost silently from one phase of the operation to another. Hard luck if he doesn't; he makes one mistake and is replaced. There is no time to be lost in the brief daylight hours, with temperatures at zero or below.

When the area has been picked to cast the giant net, a specialized architecture begins on the ice. Bordering a pear-shaped area of nearly a mile in length and about 1,310 feet at the broad base, are cut dozens of precise holes, spaced about 15 feet apart and measuring two or three feet in diameter. At the base end where the net is inserted and at the neck where the haul is drawn, are bigger openings of 8 to 12 feet. When the course is laid out, two long (117-foot) "needles," made from slender pine trees bolted together, are run into the base opening in opposite directions to begin the threading process (page 254).

The "threads" or lead lines are carried to

Sleighing at Sea Is Fun—on a Sunny Day

When the winter temperature permits, it's really "fun to ride in a one-horse open sleigh" over the ice between islands in the Turku archipelago off the southwestern coast of Finland, but most of the time only necessity justifies a trip (page 244).

each consecutive hole, where a man stands with a thick scythe-shaped instrument and T-hook which direct the needle and recover the line as the "eye" passes (page 253). It is then the women's job to fasten another hook into the line and pull it through.

Attached to this lighter line is a huge rope which eventually draws the seine. Hauling the heavy rope through the holes is a job for horse and pulley (page 255).

This same process is going on simultaneously along both sides of the "pear."

A 4-hour Haul Begins

The great net, which with its bulbous center sack here measured 1,300 by 975 feet, finally sinks through the base hole and the haul has begun.

It takes about four hours to draw the net in. The base team, meanwhile, loads upon the sleds and moves up to the neck where the big show will occur (page 256).

Sleds are drawn up in the rear to receive the seine, and the horses released to one side to feed.

When the needles and lead lines have been recovered and the hauling rope is nearing its end, the men put on leather aprons and special platform shoes with long spikes, to be ready to wrestle the big net. As the two great seine arms emerge, they line up in columns of two on each side and grasp the lips of the net with heavy hooks slung over their shoulders by leather strap or rope.

Then with terrific strain they begin a rhythmic backstep, leaning heavily against the

The Seine King Does the Seemingly Impossible—Sets His Giant Net under the Ice

Around a pear-shaped area nearly a mile in length the herring fisherman and his team cut these openings 15 feet apart in the 3-foot-thick frozen surface. Then, with the instruments shown, spruce-pole "needles" are pushed under the ice from hole to hole, threading a line for the net (pages 251, 254).

straps, stamping their spikes into the ice, and singing a drumming chant to keep in unison —one-two—one-two—one-two. Foot by foot the huge net piles up on the waiting sleds (pages 256, 257).

When a third of each arm has been loaded, it is severed from the rest (a waxed thong holds the parts together) and an empty sled moves in to receive the next installment.

Not a man or woman in this scene was without a stirringly active job. The women were on the sleds arranging the inpouring nets. Men not hauling were preparing the weighing scales, cleaning the needles, untangling the lines, harnessing the horses for the next move.

Even Jerry was running from one end of the operation to the other, and I, slipping on live herring if not ice, went racing after him to hold his gloves while he worked and to offer suggestions, which he seldom used.

As the main sack drew nearer, thousands of small fish, caught in the folds of the scooping arms, fell free along the sides and were stamped into a bloody stream. Then the hole itself began to swarm, and as the sack reached the surface, it became a seething frenzy of motion, silver and gray flashing madly in millions of separate life struggles.

Scooped up in small nets, the tiny fish were dumped into a cart to be hauled to a spot near the weighing scales. Here they were tipped out upon the ice to lie writhing in a shimmering mass till they died.

A good day's haul on an operation of this size averages around 8,800 pounds. When fishing teams use the same area again, they

Thrust Through Fresh-cut Holes, 117-foot Spruce "Needles" Begin Their Stitch Work under the Blanket of Ice

These poles are "threaded" with lead lines which in turn pull heavy ropes attached to the giant herring net (page 251). Up both arms of the seining course the lines are led from opening to opening (page 253). Island fishermen seine for herring in all seasons, summer or winter, sunny or zero temperatures.

As the Heavy Seine Rope Reaches Every Fifth Hole, It Is Drawn and Held by a Horse-turned Winch

Coated with his frozen sweat, spike-shod Dobbin plods round and round, pulling the capstan bar to wind in the net. A hook and chain caught in the ice keeps the sled winch from sliding backward. The big rope is supported here while the lead line is carried forward to the next hole.

At the End of the Seine Course the Final Herring Haul Is Withdrawn

As arms of the net are pulled up, they are folded upon waiting sleds. Each arm is severed in three parts to lessen the load. If possible, a seine course is laid out with the neck end near the shore of an island where the ice is sure to be more solid under the heavy motion of the final hauling operation.

Pulling in Perfect Rhythm, Fishermen Slowly Draw the Two Long Arms of the Seine from the Hole at the Neck of the Course

Singing and chanting so as to keep step, the seiners heave steadily on the heavy net. They dig in spike shoes and back up, pulling the net by a hook attached to a flat leather strap or thick rope over the shoulder. Thus, section by section, the seine with its catch is brought up from under the ice.

Around the Canopied Brick Stove Socks and Boots Are Hung to Dry

This family lives on the island of Gullkrona. The young husband hunts seal and fishes for herring as the seasons vary—and when there is a normal market. War and postwar restrictions have left this and many other island families in straitened circumstances. To assist them through the difficult period of Finland's rehabilitation, clothing, shoes, medicines, and many other items have come from the American people through the American Red Cross.

attempt to complete two runs in a day.

Leaving home long before dawn, they are on the site and ready to begin operations at the first crack of light, working straight through till darkness again sends them on their long two-hour trip back over the ice to Pensar. Small wonder they move quickly. No one seems to think of stopping for food, any more than he seems to notice the cold.

Asked if one ever slipped into the icy waters as the heavy net was pulled in, they said, "Frequently." But it was an unpopular thing to do, since it meant sacrificing a sled to send him home. They could remember no serious casualties; they knew their ice, and their job.

We headed back to Pensar, silent with wonder at the men (and women) who performed the Herculean task of providing the world with one of its daintier delicacies.

A Sunny Trip Across the Ice

It had taken us several days by horse and sleigh to complete even our abridged journey through the archipelago. It took us less than ten hours to return by car. We don't know now which was more harrowing.

Mrs. Arvi Tauriainen Lives with Her Family of Eight in a 12-by-12 *Korsu*

At night the two tables are covered with straw and blankets to make beds. Older children sleep on the floor. The baby was born on the table now serving as "cradle." This refugee family at Kuusamo is one of many from territory to the east ceded to Russia following the 1940 and 1944 armistices (pages 240 and 249).

The sunny trip across the ice back to Vikom was exquisite. The world glistened with radiant beauty. The miles and miles of mesmerizing whiteness rolled by without incident. Distant islands, even snow-covered, seemed warm and friendly. We arrived at Vikom in the late afternoon.

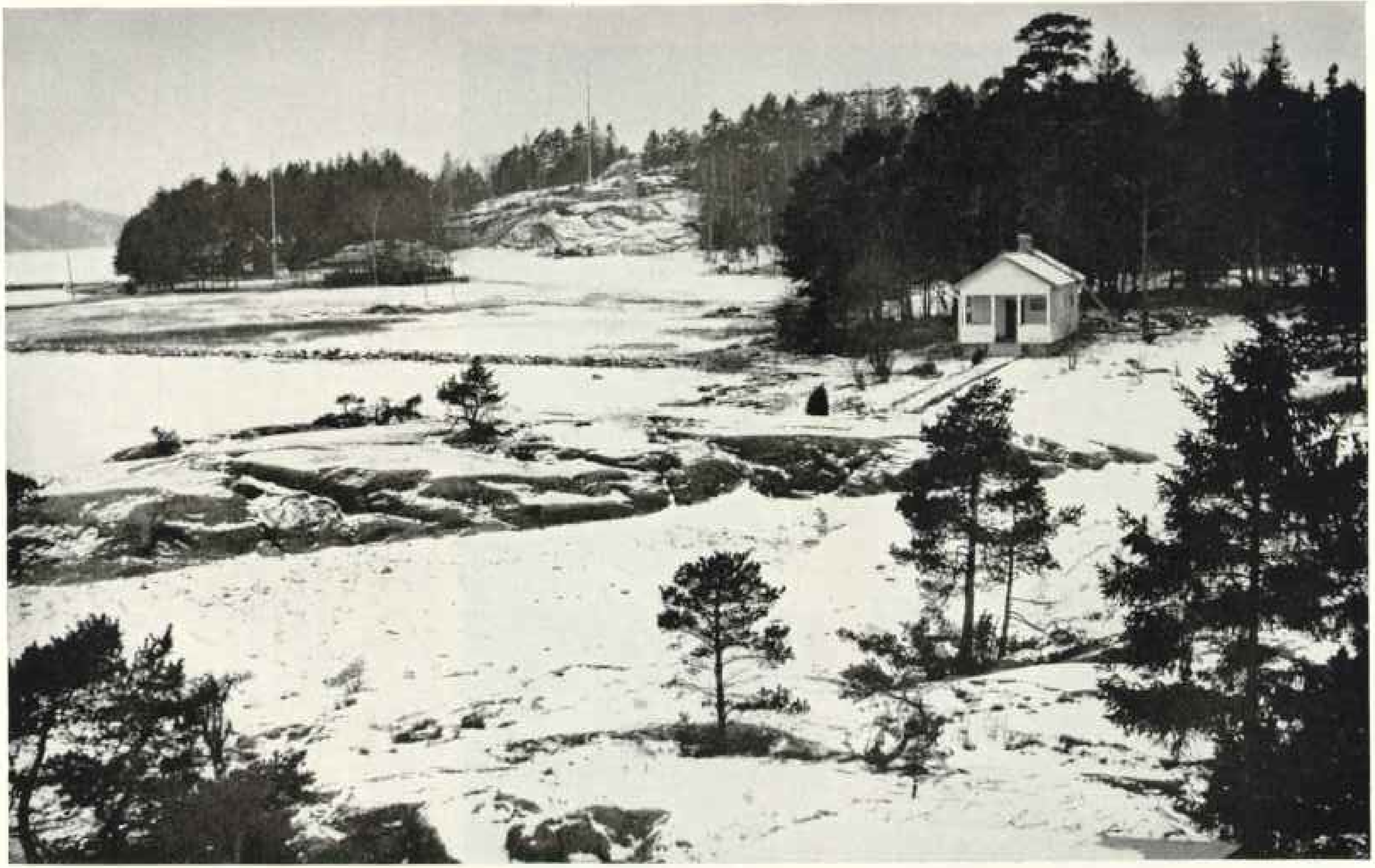
We left, in the darkness, to return to Turku. This was the original mistake.

Before we had gone halfway, the sky closed in and snow began to fall. Our hope of following the stars or the outline of the islands, which is the usual simple procedure, was eliminated. There was no point in turning back.

Kurt was not only embarrassed, he became obviously worried. Every few hundred yards he would jump out of the car and disappear into the night to check the ice or attempt to get a bearing. He kept the car door open and rode half the time on the running board to watch for an island light or some sign of life in the blind thickness that had settled over us.

This is what he told us at the time. Later we learned he had kept it open for our quick escape in case of thin ice!

The heater was impotent. From time to time, to warm our hands, Jerry would set off a round of flash bulbs for us to hold.



No Family or Organization in Finland Would Do Without Its "Shock Treatment" Bathhouse

On the shore next to the recreational field of the former Finnish Civic Guard training base on Pensar Island sits the *sauna*, traditional steam bath. Whenever possible, these buildings are placed beside lakes, ponds, or the sea, to permit the bathers emerging from the hot steam to plunge immediately into cold water. In winter the more hardy cut holes in the ice and drop into the freezing water. A few, as did the author, roll in the snow (page 239).

This Husky Finn Weighs 8½ Kilos, or Nearly 19 Pounds

Nurse Tyra Backman (page 247) carries the portable scales on her back by bicycle or ski when she makes her rounds in rural Finland. These scales are among 200 sent to the Finnish Red Cross by the American Red Cross.

One Tire Gone, This Auto Goes Right On as a "Skimobile"

Risto Manninen, Finnish war hero, checks the ingenious front-wheel block which skims over icy northern roads. A resident of Rovaniemi, Lapland, he wears the famed Lapp boot of reindeer skin with curled toe (page 259).

Only Broken Ice Can Keep the Mail from Going Through

In winter Harry Lindell, postman for part of the Turku archipelago, covers the miles between islands by ski, horse and sled, or by kicksled. These small chairs built on runners are propelled like scooters and directed by swinging the long runners one way or another by foot. The visitor sees them sweep by over the loneliest reaches of ice and snow, rhythmically kicked along by old and young alike. Mothers air their young, grandmothers do the marketing, children travel to school—all by these handy contrivances.

Homemade Skates Carry Their Owner over the Frozen Main

Alf Öhman of Pensar Island has made this pair from scrap steel, pine, leather, and string. They are his quickest means of travel over the winter-locked miles of sea. He tests the ice with his steel-tipped stick.

The Big Freeze Has Come—Boats Will Not Be Needed for a While

When the miles of water between the islands turn to ice, all craft are hauled into shelter and blocked or strung up for the winter. The four Öhman brothers, who build and repair island boats, are carrying a skiff to its winter garage. All of them, except the youngest (second from left), are Finnish war veterans.

At last a large island loomed in our path. Kurt recognized it instantly, and with good infantry training led us out in a mathematical arc to where we eventually picked up the half-obliterated sleigh tracks of the main "highway." We went forward easily now.

Then suddenly he ordered the driver to stop short. Again he disappeared. We were somewhere near the channel crossing, but how far? And where was the light on the shack?

A minute or so later, as we moved slowly ahead, eerie shafts of light appeared. Both Kurt and the driver got out to investigate.

There was no one at the shack, because the channel was frozen over and the bridge withdrawn. The lights were on a ship breaking its own path and heading this way. We would have to hurry, or let it go first and wait till morning for the bridgemen to return.

As we sped ahead, Jerry remarked grimly that he'd "heard about people who raced trains to crossings."

At the edge of the channel, Kurt ordered us out of the car; the driver was going to back up and take the thinner ice alone at flying speed—just in case. Just in case, we grabbed the cameras and ran far to the other side, lest the motion should rend the surface in any given direction. As we held our breaths, the car bumped wildly over the rough channel strip and eventually pulled up alongside. We jumped in and again raced forward. The lights on the ship were getting closer. It was feared here, too, that the vibration might cause a rift in the surface toward the pressure area where we were moving.

We were no longer cold. Nervous tension had taken care of that. And our nerves were not helped when we passed the spot, now marked, where a car had gone through the ice the day before!

A few minutes later, we rolled up the shore on to the island of Ålö, and relaxed to enjoy the security of good solid ground again.

"Stand Close. Chin Up. X-ray Won't Hurt!"

School children of Pargas queue up for X-ray tests to detect tuberculosis. Film and equipment were donated to the Finnish Red Cross by the American Red Cross to help make possible the continued vigilance in all Finnish schools against war-caused undernourishment and disease.

But too soon. As we crossed the island, the driver decided on his own to save time by traveling up the frozen sounds.

The man was on home ground, or ice, now and proceeded with abandon. He drove like a Laplander, zigzagging across the ice at extravagant speed. At last, approaching the city with its ships lying frozen by the outer docks, we had to ask him to slow down. We had suddenly realized it would be difficult to explain an expense account which included, item: "Damage incurred to auto in collision with steamer in Turku harbor, Finland."

It had been three weeks of extremes. We had seen people in extreme want and extreme cold, carrying out, in one of the most thoroughly devastated areas in the world, one of the most advanced jobs of reconstruction.

From the lumbermen of Lapland to the fishermen of the Skärgården we had found them working with courage and energy to overcome the problems which had engulfed them. With the badly needed tools they had received, they were restoring their industries, their homes, and their lives. They expected nothing more.

There is no self-sympathy in this little nation. In its short but variable history, Finland has met each challenge with spirit. And it is doing so again.

Men, Moose, and Mink of Northwest Angle

By William H. Nicholas

With Illustrations by Staff Photographer J. Baylor Roberts

BENJAMIN Franklin, John Adams, John Jay, and their British colleagues muffed their geography when they signed the Treaty of Paris at the close of the American Revolution. They thought the source of the Mississippi River was several hundred miles north of its real origin in Lake Itasca.

As a result of their misinformation, Northwest Angle, Minnesota, is completely cut off from the rest of the State by the waters of Lake of the Woods and is hitched on by land to the Province of Manitoba.

The National Geographic Society's new Map of the United States (July, 1946) shows how this area of about 130 square miles juts out north of the long U. S.-Canadian border, which stretches along the 49th parallel.

Northwest Angle is an "enclave," in the same sense that Gibraltar, hitched on to Spain by land, is an enclave of Great Britain.

Our boundary across Lake of the Woods offered little difficulty to the treaty makers of 1783. They ran the line from its southern to its northwest tip, and everybody was satisfied. But then they decreed that the border should continue "on a due west course to the river Mississippi." Since the river didn't run that far north, such a line was impossible.

"A Mixed-up Morsel"

Not until 1925, nearly a century and a half after the Treaty of Paris, was the boundary here definitely established, although several attempts were made in the meantime on a patchwork-quilt basis (page 274).

Northwest Angle turned up as part of the United States in 1824 after an accurate survey of the area had been made.

Lady Dufferin, wife of one of Canada's early Governors General, wrote: "The Angle is a morsel of the United States mixed up with our land."

No roads lead from Manitoba into this wild, wooded area. Unless you go by air, the way to reach Northwest Angle is by boat from the Lake of the Woods port of Warroad, Minnesota (map, page 268).

So I boarded the Warroad local at Crookston for a dusty ride across northern Minnesota's flat clay-loam country. It was a warm May day, and the windows of the ornate old coach were wide open. Down in Illinois and Iowa corn had been planted, but here much of the land had just been put to the plow.

As we approached Warroad across some swampy ground, a mallard, disturbed by the clatter of the train, frantically took to the air. Scores of red-winged blackbirds rose from the bracken.

The veteran conductor looked at his watch. "We're on time," he said proudly. "Warroad, end of the line."

The village fronts on Muskeg Bay, which with Big Traverse Bay forms a large sheet of open water separating Minnesota and its Angle Township. Warroad is just a few years removed from pioneer days. Although Pierre Gaultier de Varennes de la Vérendrye, French explorer, ascended the Warroad River in 1734, and the American Fur Company had an early trading post at its mouth, the first settlers did not arrive until about 1895.

They found Jake Lochland operating a fur station near an Indian village on the north side of the river, close to the bay.

Named for Indian Warpath

Before the white man came, this spot was a terminus of a principal Indian war road, or warpath, of the Northwest—hence its name. The old war road led from the southwest corner of Lake of the Woods to the Roseau River, thence west to the prairies beyond Red River of the North. Bedecked in their war paint, Lac la Pluie Ojibways, Sioux, and possibly Assiniboins took to the warpath here long after the Indian had ceased warlike ways in eastern States. Warroad still has a small Indian community.

As a crossroads of immigration, Warroad attracted many nationalities early in this century. I met men whose fathers came from Scandinavia, some by way of the Red River; others whose parents were Yankees arrived from the east by way of Rainy River; still others of French or Middle European descent emigrated from Canada.

Warroad still is young country. Third-generation residents are, for the most part, children. The population numbers only 1,300, but 15 families have members in the National Geographic Society.

The morning after my arrival the *Bert Steele*, Booth Fish Company boat, departed for the Angle, and I was aboard. Our ultimate objective was the northernmost post office in the 48 States, on a 50-acre island

Capt. Fay Young Can't "Pull Rank" on His Daughters—They're Captains, Too

Skipper Fay, right, and Skipper Kay, left, both are licensed pilots. For 27 years their genial father has sailed between Warroad and Northwest Angle. He carries mail and supplies to the Angle, and also acts as unofficial shopper, business agent, and general messenger for its isolated housewives. Matching thread and keeping a weather eye out for scarce items in Warroad are routine duties for him (pages 276, 279).

called American Point, which lies about a mile northeast of the Angle mainland.

Other scheduled stops were Oak and Flag Islands, timbered haunts of a handful of commercial fishermen and of summer vacationists, and also Angle Inlet, the only settlement on Northwest Angle proper.

We pushed across Muskeg and Big Traverse Bays, centuries-old water routes of the Northwest Indians and early explorers. These stretches of open water belong to the United States. Although Lake of the Woods has some 13,000 islands, all but about a dozen are clustered thickly on the Canadian side. It is about one-fourth as large as Lake Ontario, smallest of the Great Lakes.

As we drew farther north and approached Oak Island, we began to see a string of timbered strips of land to our right. One of them, bleak and forbidding, bears the name of Massacre Island. Here a tragedy was recorded more than two centuries ago, after La Vérendrye had ventured into the lake on his futile search for the Western Sea.

This French Army officer established Fort St. Charles on Magnusons Island, which lies near today's settlement on American Point. Here he traded with the Indians from time to time throughout his period of exploration, which included the discovery of Manitoba, the Dakotas, western Minnesota, and parts of western Canada.

The winter of 1735-36 brought suffering and starvation to the men of the fort. Expected supplies from the East did not arrive. In June of 1736 La Vérendrye sent 21 men out from the post in canoes to look for the relief party.

At the close of their first day's search, the men encamped on the bleak island I could now see on our right. Here they were discovered and all 21 of them beheaded by a party of Sioux on the warpath.

Louise the Duck Rivals Oscar the Dog in Dennis Hanson's Affections

Dennis's father operates the Ivar Hanson fishing camp on Oak Island in Lake of the Woods. The boy makes friends with vacationists who come to the resort in summer for fishing and in autumn for hunting. He has felt at home in a boat since he was able to walk. Travelers entering the United States from Kenora, Canada, by boat report at the Oak Island U. S. customhouse.

The slain included the explorer's eldest son and Father Jean Pierre Aulneau, a Jesuit priest. La Vérendrye, alarmed some days later by the protracted absence of the party, sent out other men who discovered the scene of the tragedy and brought the mutilated bodies to Fort St. Charles for burial.

Since that day few white men have set foot on Massacre Island. No passenger boats stop there. Lake Indians give it a wide berth.

We touched briefly at Oak and Flag Islands, where the flag of the United States identifies post offices and the Oak Island customhouse. Some of our fellow passengers, holiday bent, disembarked at these lovely lake resorts, but we pushed on.

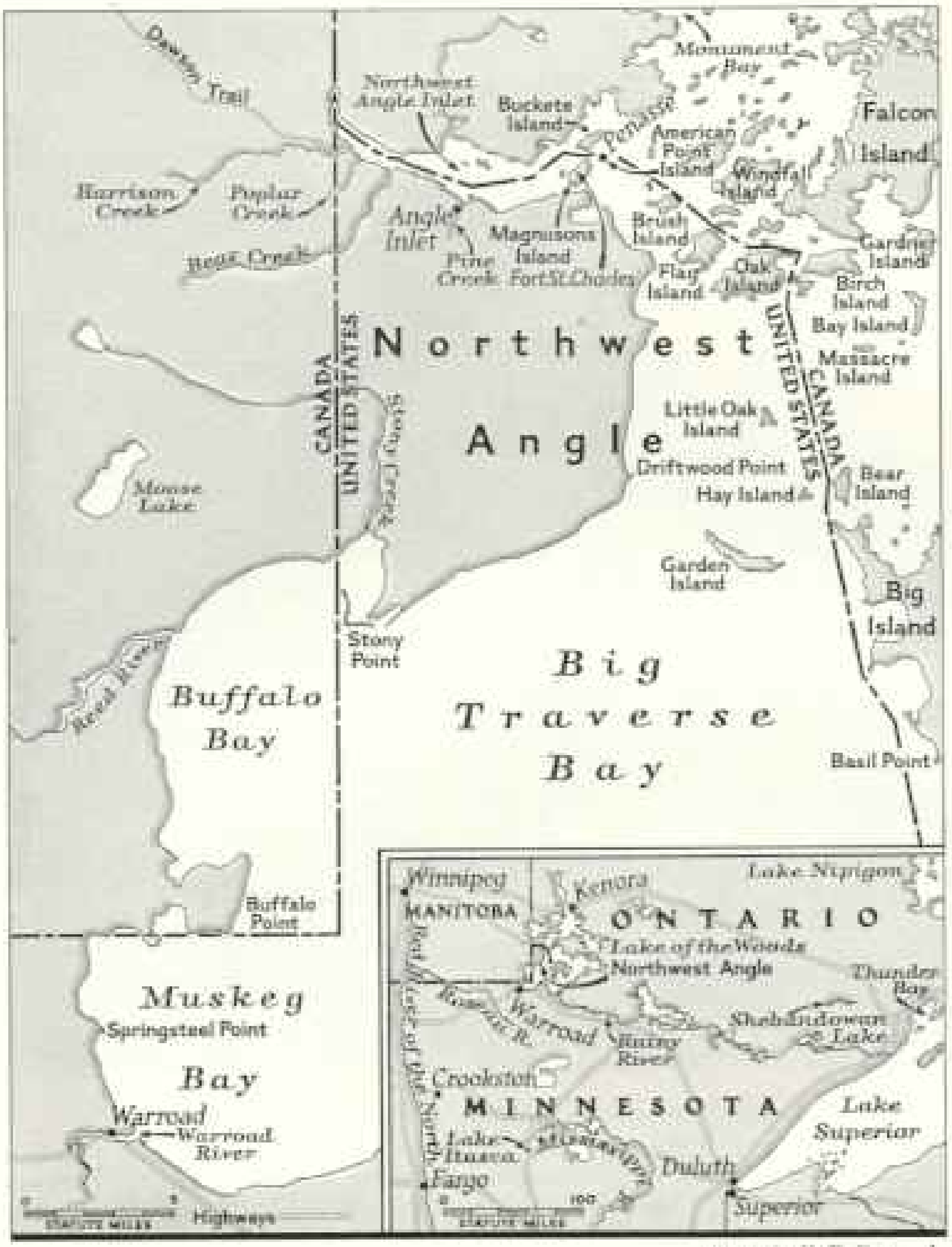
Soon we were skirting the shores of deserted Magnusons Island. No sign of life revealed that here was the first fur-trading post in Lake of the Woods. By 1900, when settlers came to Northwest Angle and American Point, even the knowledge of the location of the fort had been lost. Its timbers had crumbled into dust. Magnusons Island was like hundreds of other islands in Lake of the Woods—a mass of rock formations, timber, thickets.

Jesuits Find Massacre Island

In 1889, interest in Fort St. Charles had been suddenly revived by a strange coincidence in far-off France.

Three Jesuit priests were holding a men's retreat in the village of La Vendée. A venerable resident of the town approached one of them and told him that one of his relatives, a Father Aulneau, had been a Jesuit priest. He added that this man had been killed by savages in North America a century and a half before. He also said that his family had preserved a packet of letters which they had received from Father Aulneau.

The letters described Lake of the Woods



Drawn for H. E. Eastwood

What Is the Northernmost Point in the United States?

It's Northwest Angle, Minnesota. This area of about 130 square miles is an "enclave." Although part of Minnesota, the Angle is separated from the rest of the State by the waters of Lake of the Woods, and is hitched by land only to Manitoba. Benjamin Franklin and the other negotiators of the Treaty of Paris, at the close of the Revolution, muffed their geography when they tried to fix the Canadian-U. S. boundary in the Lake of the Woods region; hence this little piece of U. S. land got mixed up with Canada (page 265).

and Fort St. Charles. The priests sent the documents to St. Boniface College, a Jesuit institution near Winnipeg, where they aroused much interest. In 1890 priests from that college located Massacre Island. But no trace could they find of Fort St. Charles.

In 1902 the Archbishop of St. Boniface visited Massacre Island and interviewed two old Indian chiefs, Powassin and Andagamigowinini, in an effort to gain clews to the location of the fort. Acting upon their vague information, the Archbishop tentatively identified a spot on Northwest Angle as the site, but further investigation proved that this was incorrect.

Finally, in July, 1908, an organized expedition set out from St. Boniface. Landing at American Point, the priests pitched their tents, cut evergreen boughs for beds, built a rustic altar and a fireplace, and set up their headquarters. They carefully reviewed the information which the chiefs had given in 1902. On neighboring Magnusons Island they discovered the site. Subsequent excavation revealed the remains of the 21 men who had been slain on Massacre Island.

The priests raised a mound of stones and upon it erected a wooden cross with the inscription: "Fort St. Charles, erected 1732, rediscovered 1908." Then they departed, leaving the island to the deer. But the mound of stones and the cross still stand on this deserted spot in the lake. I saw them a few days later when I clambered up the rocky shore from a rickety landing and made my way across an overgrown trail to this historic spot (page 273).

As the *Bert Steele* passed Magnusons Island, American Point came into view, with its flag, its landing, and its trading post. I disembarked and walked up the boardwalk to the trading post. There, over the door, was a sign which read: "United States Post Office, Penasse, Minnesota, The Most Northerly P. O. in U. S. A."

Presiding over the affairs of the U. S. postal service in this isolated spot was the charming postmistress, Miss Helen Arnold, who has since been succeeded by Mrs. Fran Cole (page 276).

Two Can Play Different Tunes on This Double Bull Fiddle

An ingenious pioneer of Minnesota homesteading days built the bass viol for two. P. O. Fryklund, curator of the Roseau County Historical Society, and his fair companion try it out. On the museum walls hang primitive home and farm implements of the early homesteaders who carved farms out of the wilderness in northern Minnesota.

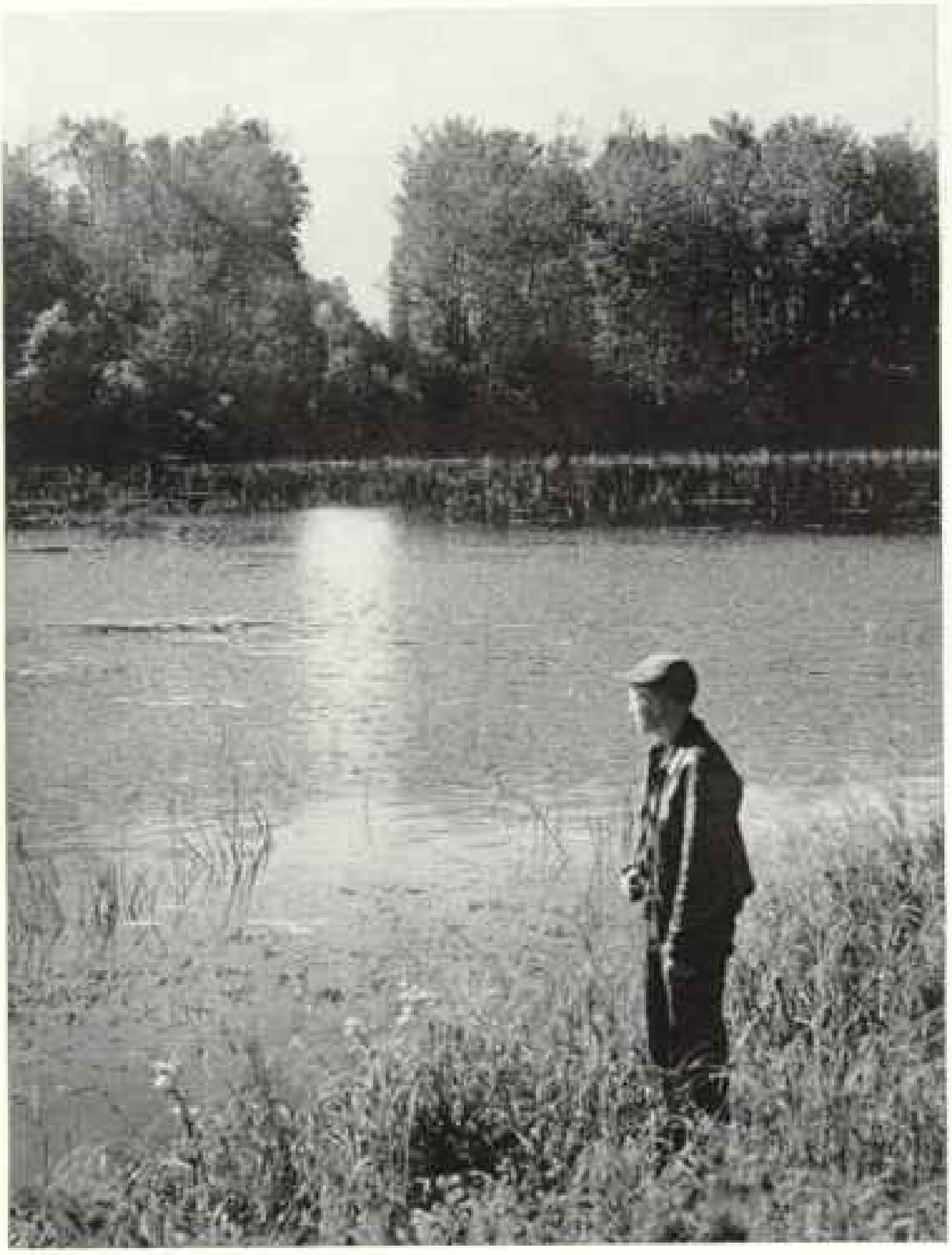
Winnipeg's Pioneers, Taking the Dawson Trail from Eastern Canada, Crossed U. S. Soil Here at Harrison Creek

The old land-and-water route led from Lake Superior to Lake of the Woods, thence across the latter to this landing. Here the emigrants disembarked, then rode across the tip of Northwest Angle in oxcarts and buckboards, and pushed on to Fort Garry (now Winnipeg), 100 miles west. The trail was abandoned in 1876 (page 275). The cabin is used by duck and deer hunters.

Minnesota Department of Conservation

Lordly Moose, Startled in Their Forest Hide-out, Run Wildly from a Game Census Plane

The count, made on March 14, 1946, indicated a Northwest Angle moose population of only 42 (page 277). As a result, Minnesota did not proclaim an open season for moose there in 1946-47. The lumbering males have shed their antlers for the winter. In the spring new ones will grow, reaching full size in the autumn.



Harrison Creek Reflects the Minnesota-Manitoba Line

To the left of the cleft in the trees lies Northwest Angle; to the right, Manitoba. The creek rises in the Canadian Province and flows across the northernmost tip of the United States to reach Lake of the Woods. Trees are cleared from the boundary line every ten years (page 274).

Penasse is the official name of the village on American Point. It did not take long for me to reconnoiter the entire settlement. The post, a hotel, a storage warehouse, half a dozen cabins sheltering in the woods close to the water's edge, and several hundred martins in a dozen man-made houses atop tall poles—that was all.

But the setting was superb. I stood at the landing and looked out over unruffled Lake of the Woods. On the far side lay Canada, timbered to the water's edge with hemlock, spruce, poplar, and aspen.

I knew that moose, deer, mink, and muskrats lurked in those thickets, that fighting fish swam beneath the lake's surface, that in the fall migratory waterfowl swarmed to the wild rice swamplands. Yet now there was only an overpowering sense of peacefulness and calm.

I could understand why Meyer Selby, whom I met at American Point, and who came to Lake of the Woods from New York City 15 years ago to recuperate from illness, never wanted to go back East.

Fortunately for me, my arrival at American Point coincided with that of Bill Cameron, son of Selby and a youthful discharged veteran of the Royal Canadian Air Force. After his long absence Cameron was anxious to renew old friendships in the Angle area and readily consented to accompany me on jaunts.

In an outboard motorboat we made our excursions from American Point. Leslie Sandy, a young Chippewa, presided over the "kicker" and was the official guide, but Bill remembered the way.

We sped over the lake, veered to our right, and soon saw the shoreline of Northwest Angle. Before I could observe any break in the foliage, Bill spied the entrance to Pine Creek.

We changed course slightly, and almost before I knew it we were in the mouth of the creek, flanked on either side by acres of reeds and rushes.

Now the log cabins and small houses of Angle Inlet came into view, next a few nondescript piers, then some Shorthorn cattle grazing along the river bank.

Plane Brings Mail in Winter

At the landing we were greeted by half a dozen men who looked up from a disabled outboard motor which had engrossed their

attention. A "kicker" to these isolated men of the lake is what a train is to a commuter, or an automobile to a tourist.

Before the plane came to Angle Inlet, its handful of inhabitants were virtually isolated from the rest of the world during the winter months when the lake freezes up and boat service with Warroad is suspended. Now Rudy Billberg, an Angle resident, owns a small plane (page 278). He brings in the mail regularly all winter by air, and any other necessities, such as medical supplies, can be flown in when needed.

I met Frank Colson, proprietor of the small store at Angle Inlet and postmaster of the "next-to-the-farthest-north" post office in the United States. His family is one of about a dozen which live at Angle Inlet, or close by, all year round.

Some of the heads of these households are farmers, "homesteading" much as the pioneers did in Kansas and Nebraska not so many years ago. I saw several small clearings, miniature pastures, and vegetable gardens. Meager farm income is supplemented by trading in mink and muskrat pelts in winter and fishing in summer. In the winter of 1945-46, mink pelts brought $40 and muskrat, $2.50.

Even this tiny settlement is too crowded for some of the Angle residents, who prefer deeper isolation in this sparsely settled area.

On one jaunt we pushed far up Northwest Angle Inlet toward the tip of the lake, entering Bear, Poplar, and Harrison Creeks.

The tiny tributaries are much alike—quiet streams which merge almost imperceptibly with the lake in masses of reeds and rushes, through which tiny cleared channels permit passage of a boat.

At the noise of the motor startled waterfowl rose from the marshy banks—mallards, wood ducks, teal—and winged their way upstream.

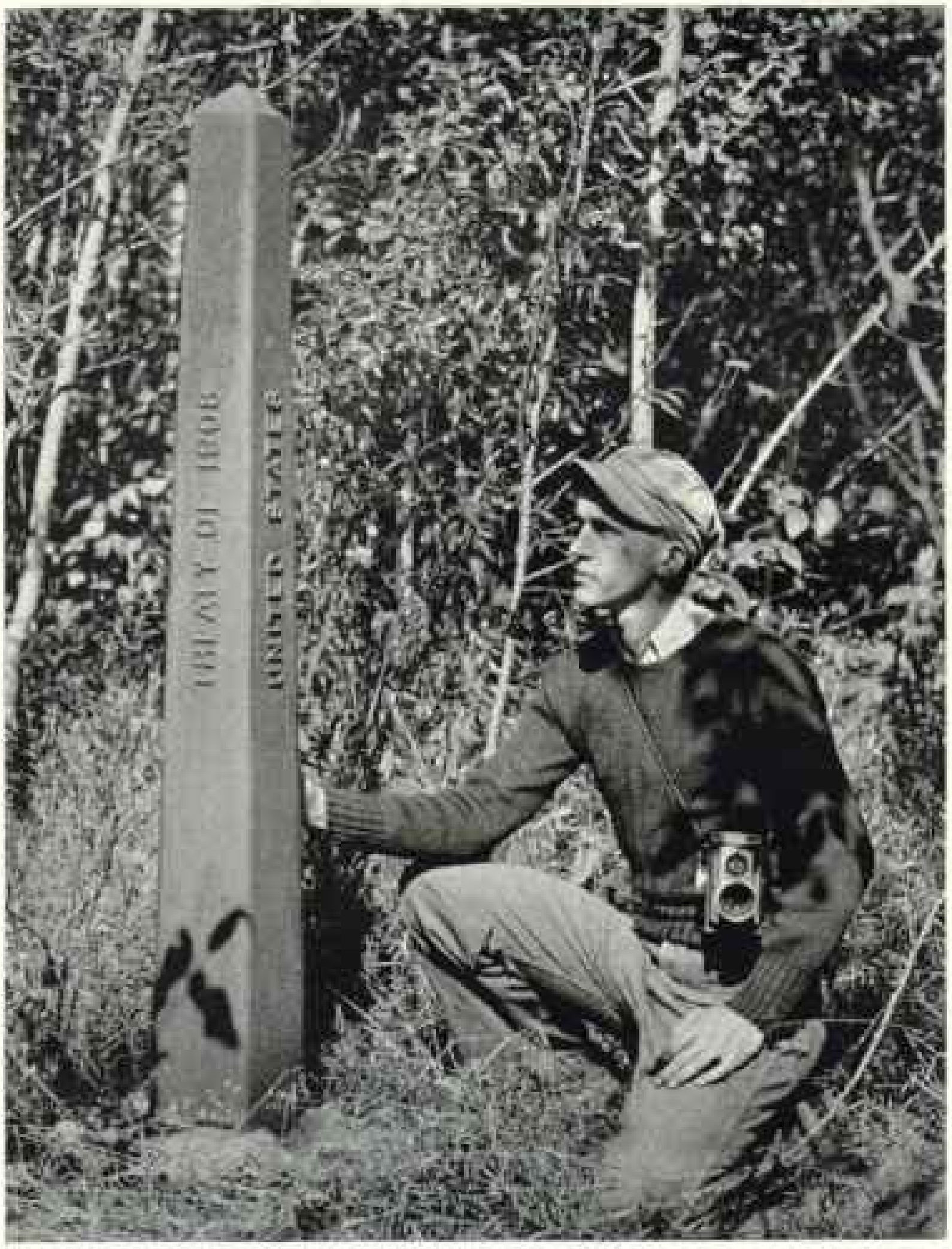
Up Bear Creek stands the cabin of Raymond Obenchain, guide in summer, trapper and hunter in winter. When war broke out, he joined the U. S. Engineers and spent four years in all parts of the Pacific. Yet as soon as he was discharged from the Army he headed back for lonely Northwest Angle, bought a new boat and kicker, and settled down in the isolated country he likes best.

Up Poplar Creek we stopped at a landing badly in need of repair and entered an empty cabin, once the dwelling of a homesteader who had moved away. The building stood in a little clearing, surrounded by a few tiny fields, a small barn and yard, and a grown-over garden.

"I think I can find the boundary line from here," Bill said, so we went through the

Here Fort St. Charles Once Stood

Built in 1732 by the French explorer La Vérendrye, the stockade crumbled to dust and was forgotten. Jesuit priests from St. Boniface College, Manitoba, found the site in 1908, along with the skeletons of 21 Frenchmen who had been massacred by the Indians in 1736 (page 266). The priests raised this cross upon the site. The inscription reads: *"Fort St. Charles, Fondé 1732, Retrouvé 1908."*



Pillar of Cast Iron Marks the Angle Boundary

By a treaty signed in 1908, the north-south dividing line between Manitoba and Northwest Angle was fixed after a thorough survey. But it was not until 1925 that Canada and the United States agreed on the northern limit of the line, thus settling a boundary problem which had existed since the Revolutionary War.

deserted barnyard and followed wagon tracks for a few hundred yards. We came to an open stretch some 30 feet wide, extending north and south as far as we could see. At an early date this passageway had been hacked out of the forest to mark the boundary running due north and south between Northwest Angle and Manitoba. Every 10 years new growth along the line is cleared away (page 272).

An Auto That Runs Only in Winter

We returned to the Inlet and headed northwest again, soon reaching Harrison Creek, which takes a westerly swing and crosses the boundary a few hundred yards from its mouth.

Near the entrance I was surprised to see an old automobile standing in a field.

"It belongs to Jimmy Gibbons," Bill explained. "He is an Indian who lives a little way up the creek. He brought it up here to drive on the ice when the lake freezes up."

Around a bend in the creek we came upon the Gibbons house and, on the opposite bank, an old landing, to which we tied.

Dawson Trail Remnants

"Now you're going to see the Goulette homestead," Bill said, "and just back of it the wheel tracks of the old Dawson Trail."

We approached the log house which for forty years was the homestead of the Goulette family. Now it has been abandoned. The Goulettes have retired and moved to Kenora, Canada, on the northern shore of the lake. It was a sturdy, comfortable structure, about which clustered a few outbuildings.

In the kitchen doorway a fat porcupine sat sunning himself. As we neared the animal, it took its departure with a clumsy waddle. Making for the nearest tree, it scrambled up, then peered down at us with an injured air from a low branch.

We crossed a fenced field and soon came upon half-obliterated wagon-wheel ruts—the remnants of the Dawson Trail, which extended almost due east and west.

In the middle of the 19th century, Canada was anxious to find a cross-country route for its immigrants to Manitoba and the Far West.

Finally, S. J. Dawson, a Glengarry Scotsman who had been in the Canadian West on several expeditions, planned this 450-mile land-and-water route from Lake Superior to Winnipeg.

Pioneers crossed Lake Superior to Thunder Bay. Then they went west by wagon to Shebandowan Lake. Here Indian guides met them in canoes and led them by a series of lakes and rivers into Lake of the Woods at its southern tip.

Steam tugs towed them across Lake of the Woods to Northwest Angle Inlet, and up the inlet to Harrison Creek (page 270). Here they stepped from their boats on soil of the United States. At the landing they clambered into Red River oxcarts and buckboards, or mounted saddlehorses, to ride over the Dawson Trail for more than 100 miles to Fort Garry (now Winnipeg).

Lady Dufferin described the road feelingly. She wrote:

"We had . . . a road made with rough-hewn trees. When first made, this sort of perpetual bridge is not disagreeable, but when time has worn furrows in it, the jogging of the ambulance wagon upon it is not to be described!

"When we had been knocked about as much as we could bear, we got out and walked a couple of miles; but almost our whole journey was over corduroy road, and as we had to go at a foot's pace, it was very fatiguing.

"As you may guess, a 'corduroy' road is a Brobdingnagian imitation of the material worn by rough little boys, and when an occasional 'cord' has broken away altogether, when another has got loose, and turns round as the horse puts his foot on it, or when it stands up on end as the wheel touches it, the corduroy road is not pleasant to drive many miles over!"

Yet in 1869 most of a Canadian appropriation of $1,460,000 was expended on the Dawson Trail. Station keepers were posted at intervals to care for travelers, but, despite the efforts made, the road soon deteriorated. The entire route became so unpopular it was discontinued in 1876.

One irate traveler is quoted as complaining: "When I refused to paddle on one of the boats, an Ottawa Irishman told me to go to the devil, and said that if I gave him any more back-chat, I could get off and walk to Winnipeg."

Gentle Rocking of the Canoe Sent This Papoose to Slumberland

With her mother, Mrs. Frank Sandy, and brother Patrick, baby Agnes has come to American Point from the Chippewa settlement on near-by Buckete Island, Ontario. Chippewa women are expert mink pelters. Aided by two Indian men, but doing the most delicate part of the job themselves, they can remove the flesh from 300 to 400 pelts a day (page 284).

Angle Animals

Human habitations in Angle Township are concentrated along the northern shore. The

Captain Young Brings the Mail to Penasse, Northernmost U. S. Post Office

Mrs. Fran Cole, the postmistress, takes the sacks from the veteran skipper of the mailboat *Resolute* on its arrival from Warroad (page 279). Penasse is on American Point, a 50-acre island in Lake of the Woods. The Chippewa Indian boys are fishing guides for summer visitors and live on near-by Buckete Island.

"Be It Ever So Humble, There's No Place Like Home"

Vivian Gemmeke, at the folding melodeon, and David Colson give an impromptu recital in the Gemmeke log cabin at Angle Inlet (pages 273, 282). Half a dozen cabins like this, a tiny general store and post office, and a one-room school make up the settlement. Only contact with the world in winter is by plane. Beneath the stairs which lead to a loft is a tepeelike clothes closet.

rest of the area is inhabited by moose, deer, mink, and muskrats, of which the latter are by far the most numerous.

As they do in marshy areas all over the United States, the muskrats build roughly conical lodges of roots, stems, and mud in marshy soil. These houses often rise to a height of more than four feet above water level. Underwater passages lead to the dry interior chamber which affords shelter in winter. Sometimes the young are born in these rooms, but more often they are raised in large grass nests built in dense marsh vegetation.

Every winter Northwest Angle yields several thousand pelts, which net trappers about $2.50 each.

More profitable but less numerous are the mink, restless little members of the weasel family, at home on land or in the water. Unlike muskrats, they do not dwell in colonies but roam widely and live wherever they find convenient shelter—sometimes in abandoned muskrat houses.

Northwest Angle's moose colony is well protected by State game wardens, and Angle residents hopefully look forward to the day when a moose-hunting season will be proclaimed. The Minnesota Department of

Saturday Night Comes to the Billberg Cabin at Angle Inlet

Close to the kitchen stove, the baby of the family takes his bath by the light of an oil lamp. Painted log walls add brightness to this wilderness dwelling. A huge woodbox stands at right. The boy's father owns Northwest Angle's only airplane—its link with the mainland when Lake of the Woods freezes up (page 273).

Conservation recently completed an aerial census of the Angle's moose population and concluded that it now numbers 42—not enough to permit hunting.

About 60 percent of the area contains hardwood and brushy land, which moose prefer as their home. For three hours the census takers cruised over this section, routing the big fellows from their retreats by the noise of the plane's motor (page 271).

Counting the numerous deer from a plane was difficult. But the massive moose, seen against a snow background in brush, popple, and open bog habitat, were spotted with comparative ease.

Bill Cameron and I made one jaunt into Canadian waters to visit Potts Camp, Mr. Selby's fishing and hunting lodge on Monument Bay, about five miles from American Point.

En route we threaded our way among a score of the thousands of little islands that intervene between the American side of the lake and Kenora, its Canadian port on the northern shore.

Potts Camp is a cluster of modern buildings—a boathouse, store and dining room, individual cottages, bathhouse, service cabins—clustered about a timber-enclosed greensward. To it come muskellunge fishermen in summer and duck and deer hunters in winter.

Muskie Tries to Catch Indian

Muskellunge weighing more than 50 pounds have been pulled out of Lake of the Woods. One muskie, in turn, nearly pulled one of the fishermen in last summer. I met the boy and heard his story.

The near victim was little Ronald Sandy, younger brother of our Indian guide. He was fishing from a slight embankment at Potts Camp when a big muskie struck viciously and began a furious battle.

Ronald didn't want to let the prize go, so he clung gamely to the line and yelled for help. A carpenter working on a near-by cottage came to the rescue just in time, for the embattled fish had pulled the little Indian knee-deep into the water.

Muskellunge, whose Indian name has been spelled at least 24 different ways, are the most celebrated fighters of the pickerel family.

I had no opportunity to try my luck with them, but I did go fishing for wall-eyed pike, or yellow pike-perch, with a group of enthusiastic Warroad anglers. We took some beauties, weighing close to five pounds, and lost as many more. Wall-eyed pike is a splendid food fish.

Lake of the Woods also boasts northern pike, small-mouth bass, and trout, the latter sometimes reaching 40 pounds each. Highly esteemed whitefish also abounded here once, but today nearly all have disappeared.

Ready to return from American Point, I stood with my luggage on the little landing one noon and watched the approach of the U. S. mail boat *Resolute*, which was to take me back to Warroad (page 284).

Grizzled Capt. Fay Young, Lake of the Woods skipper for 27 years, edged his 62-footer up to the landing. Youthful and fair Capt. Fay Young, the veteran pilot's daughter and a licensed captain in her own right, jumped nimbly to the dock and made fast the craft. Once more they had brought the mail to Uncle Sam's northernmost post office.

A third captain in the family, daughter Kay Young, was not aboard, but she, too, is a qualified lake skipper (page 266).

Crates of fish were put aboard, and we headed over to Angle Inlet. Here several passengers joined us, including one couple from Iowa who had tried their luck in the lonely north and had decided to go back where the tall corn grows. The isolation of the Angle was not to their liking.

Captain Young, in addition to carrying mail and supplies to the Angle country, also acts as confidential messenger, special agent, and shopping service for the housewives of the area. As we departed, he promised to look after a number of feminine wishes in Warroad.

"I do a little of everything," he said. "I match ribbon and thread, try to buy sugar and any other little items they want."

In his 27 years on the Lake, Captain Young has learned to know every man, woman, and child of the Angle territory. Like any veteran skipper, he had tales to tell.

Perils of Woods and City

One was an experience of some years ago, which had a typical O. Henry ending.

"It was winter, and the lake had frozen over," he said. "Another man and I were walking over the ice, heading from Warroad up toward Oak Island. When we started out in the morning, the sun was shining brightly, and it got warmer as we walked along. Finally we began to notice a crack in the ice, which started to open up parallel with the shore line off Buffalo Point. At first we didn't think much of it, but suddenly we realized that it was serious, and we headed for shore.

"We got to the Point and stopped to rest. As we did, we looked out over the ice, and to our surprise we saw a man in the distance, also heading for Oak Island and taking along with him a team of dogs pulling a sled.

From Warroad's Docks, Mail, Freight, and Fish Boats Put Out for Northwest Angle and American Point in Lake of the Woods

Weekly trips also are made to Kenora, Canada, on the northern shore. Warroad is the only United States port directly on the lake.

Ranch-raised Mink Live Pampered Lives in Individual Cages until Their Pelts Are Ready for a Fur Coat

Rations of fish and horse meat are carefully prepared for them on this mink farm of Shorty Joyce near Warroad. Spoiled food can wipe out an entire farm's mink population (pages 282-4). Shipping cases in foreground are for breeding stock consigned to another ranch.

Minnesota Department of Conservation

Startled by the Roar of the Plane's Motor, Wild Elk Circle in the Snow, Then Dash for Shelter

In a Piper Cub, Minnesota Conservation men make an aerial census of elk over a 494-square-mile area of Lake of the Woods country. In 17 hours of flying time during March, 1946, they counted 71 elk, including this large band and several smaller ones. They also saw 260 moose.

Vivian Gemmeke's Pump Stands High to Surmount Snowdrifts

Before the airplane age, Angle Inlet was cut off from civilization nearly half the year, when Lake of the Woods was frozen over. Near-by homesteaders keep in touch with the settlement in winter by iceboat. Every family owns an outboard motorboat for summer use (pages 273, 277).

"He paid no attention to the crack in the ice, which was now so big that we could see open water between him and us. Finally we realized that he was on a big floating cake of ice and didn't sense any danger.

"In another hour or so he probably would have floated out to the center of the bay, the cake would have broken up, and he would have drowned. We tried to signal to him, but he didn't pay any attention. He just kept on in the direction of Oak Island.

"Well, we found a leaky boat on the Point, and my companion rowed out and convinced him he was in danger and persuaded him to come ashore. The dogs were rescued, too. We all had a long, hard walk back to Warroad.

"The man wasn't very grateful to us, even though my friend had taken a big risk in going out and getting him. Now that I look back upon it, I doubt whether it was worth while. For that man went to Minneapolis two days later and was killed there by an automobile."

We reached Warroad, and Captain Young helped tie up the boat and remove the fish crates. He paid no attention to his passengers until, one by one, they came up to him and voluntarily handed over their fare.

"Don't you pay any attention to collecting fares?" I asked him.

"Don't have to," he said. "They always pay. Sometimes, if they don't have enough money, they pay double on their next trip."

"But don't you lose any money that way?" I asked him.

"Of course not," said the captain. "Although, as a matter of fact, now that you mention it, I did extend two dollars' credit to an Indian chief about 15 years ago. A week later, before he got around to paying it back, he died. I guess I never will get that two dollars. His relatives probably have spent all his money by this time."

Before my departure from Warroad, I met F. L. (Shorty) Joyce, the first mink raiser in the Warroad area. He is a Marine Corps veteran of World War I and has grown and bred mink for 25 years.

Today, 20 percent of the mink commercially grown for pelts in the State of Minnesota comes from ranches along the southern shore of Lake of the Woods.

"You probably didn't see a live wild mink all the time you were up at Northwest Angle Inlet," Joyce said. "How would you like to see a lot of them at one time?"

So he drove me out to his ranch a mile from town.

Caprices of the Moody Mink

A quarter-century of experience has given Joyce an uncanny insight into the temperament of a mink. His pens or boxes, most of them housed under long, narrow, and specially ventilated roofs, are off the ground. They occupy about an acre of carefully fenced grassland. Two sheep within the enclosure keep the grass well clipped (page 280).

He showed me his breeding boxes, each housing a mother and her young—usually two or three to the litter in captivity.

"A mink makes a good mother," Joyce said. "She keeps her babies warm and dry, which is most important. We have our hands full when we separate them. Never, in all my experience, as I recall, has it failed to rain the day we put the young ones in individual pens.

"The youngsters are lonesome without their mothers and sit all afternoon of the first day in their wire enclosures. When night comes, they just continue to sit there and refuse to enter the sheltered boxes at the end. If it rains, they just sit there anyhow until they drown or contract pneumonia, which is also fatal.

Shorty Joyce Keeps a Wary Eye on Two Valuable Mink

The mutation at left is a Royal Kohinoor, or black cross, whose pelt is esteemed for scarves. The other is a silver blue, or platinum mink. Both types bring higher prices than the dark-brown pelts of standard mink. Joyce, a World War I veteran of the U. S. Marines, specializes in raising high-grade breeding stock on his farm outside Warroad (pages 280, 282).

Diet a Problem, Too

"I'll never forget one year we took 90 mink from their mothers and put them in individual pens. During the night a storm broke without warning. There they sat in the rain. They were soaked through before Mrs. Joyce and I could reach them. We brought them into the house, built a big fire in the fireplace, and stretched them out in front of it, more dead than alive. Then we went back to bed.

"A few hours later we were awakened by a crash. One of the plates along the dining-room plate rail had dropped. Then another fell, and another. We rushed out to investigate. The young mink had dried out and revived. They were climbing and running all over the house. Not a plate on the rail escaped. Until you have tried to capture 90 lively young mink all loose at once in your house in the middle of the night, you have no idea how busy you can be."

But that is a minor problem in raising mink, Joyce pointed out. Chief difficulty

The *Resolute* Threads Her Way among Hundreds of Islands en Route to Kenora, Ontario

No one knows exactly how many islands dot Lake of the Woods. Best estimate is approximately 13,000, nearly all in Canadian waters. Passengers making the weekly trip between Warroad, Minnesota, and the Canadian lake town wonder how the skipper finds the passageways. Though the boat seems headed for land, a waterway will open up as she approaches the distant woods (page 279).

comes in regulating their diet. One batch of food with an impurity, or with an ingredient unsuitable for mink, can easily kill off the entire population of a ranch.

Joyce's food house consists of a big refrigerating unit, in which he stores tons of frozen fish.

Fish make up over half of a farm mink's diet. In prewar times frozen jack rabbits composed most of the rest of the bill of fare. But last year only 16 tons of frozen jack rabbits appeared for sale in the Fargo, North Dakota, market, compared with 330 tons in prewar years. So horse meat has to do.

Joyce showed me Royal Kohinoors with black crosses on their backs; golden sables with sky-blue underfur and golden cover, or guard, hairs; silver blues; ebony blues; and six-point Panda mink, with white face, four white feet, and white-tipped tail, especially desirable for scarves.

We stopped before one box housing a Panda mink.

"Just because this one doesn't have a white tip on its tail, don't think he isn't a good Panda breeder," Joyce said. "The last time he was mated, the female took a sudden dislike to him and without any ceremony stripped the white hair right off his tail."

When pelting season arrives, the Chippewa Indian women around Warroad are invaluable. When the animals are skinned, the Indians take the pelts home to flesh them. The men are capable of removing the fat in the middle of the pelt, but it takes the Indian woman's sure touch with a razor-edged knife to remove the gristle about head and shoulders and to cut away the fat from the tail and hind legs. At each end the skin beneath the fur is greatly reduced in thickness, sometimes to the thinness of paper. Four Indians can flesh from 300 to 400 pelts in one day.

NATIONAL GEOGRAPHIC SOCIETY

GEOGRAPHIC ADMINISTRATION BUILDING
SIXTEENTH AND M STREETS NORTHWEST, WASHINGTON 6, D. C.

ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

To carry out the purposes for which it was founded fifty-nine years ago, the National Geographic Society publishes this Magazine monthly. All receipts are invested in The Magazine itself or expended directly to promote geographic knowledge.

Articles and photographs are desired. For material The Magazine uses, generous remuneration is made.

In addition to the editorial and photographic surveys constantly being made, The Society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, The Society's researches solved secrets that had puzzled historians for three hundred years.

In Mexico, The Society and the Smithsonian Institution, January 16, 1939 discovered the oldest work of man in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November 4, 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 nearly a ton of scientific instruments, and obtained results of extraordinary value.

The National Geographic Society-U. S. Navy Expedition camped on desert Canton Island in mid-Pacific and successfully photographed and observed the solar eclipse of 1937. The Society has taken part in many projects to increase knowledge of the sun.

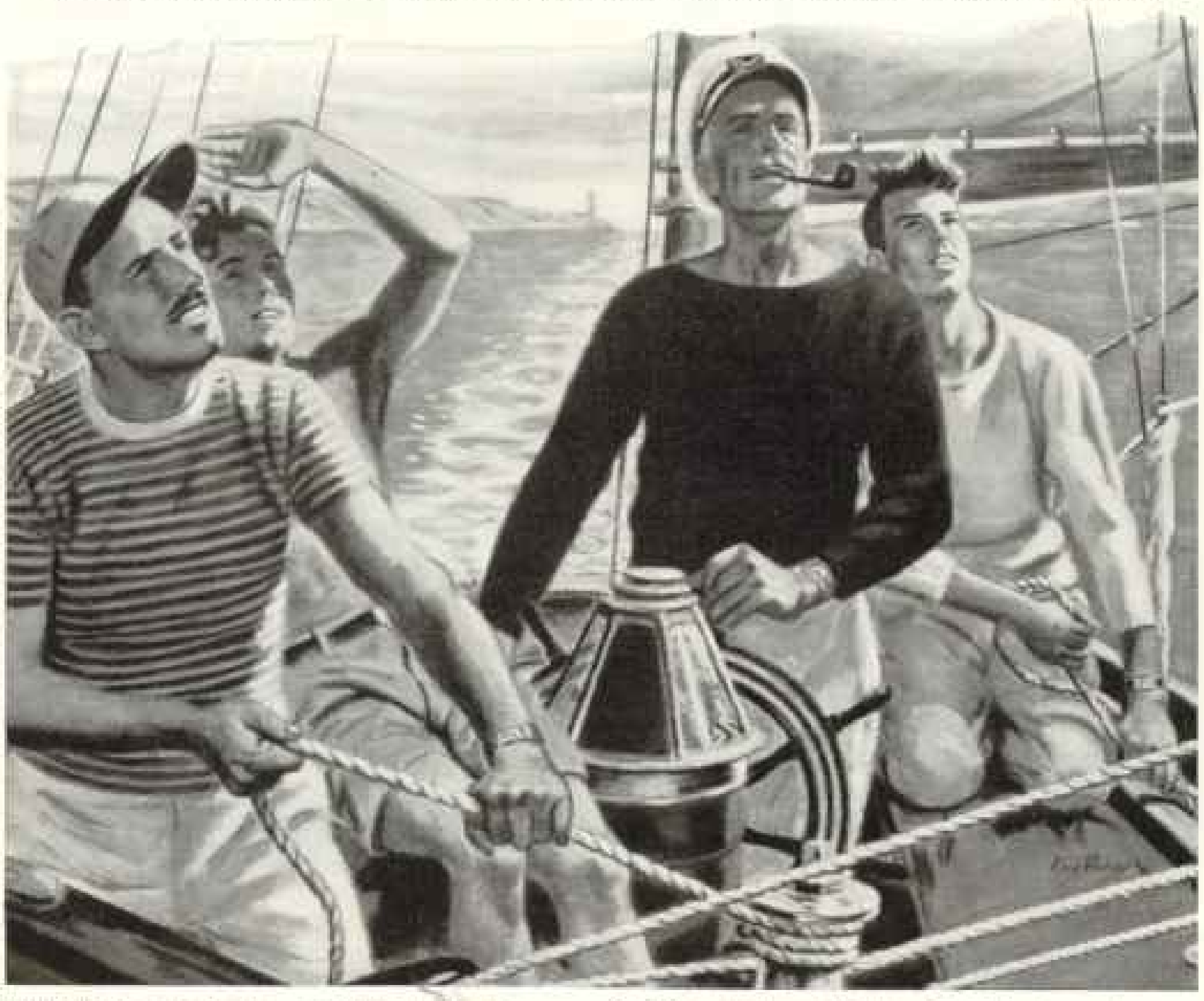
The Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda, during which a world record depth of 3,028 feet was attained.

The Society granted $25,000, and in addition $75,000 was given by individual members, to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California were thereby saved for the American people.

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.

Who is the No. 1 man in your life?

(WHOEVER HE IS, YOU'LL BE HIS NO. 1 GIRL IF YOU GIVE HIM THE GIFT HE'S ALWAYS WANTED—A FINE HAMILTON WATCH)



HUSBAND. Remember the day you married him? He'll love you even more on your anniversary if you give him a Hamilton. Below is the WILEY, 19 jewels, 14K natural gold case, finest *Medallion* movement . . . **$180.**

BROTHER. Is he getting married soon? For generations the most prized of all wedding gifts has been a faithfully accurate Hamilton Watch, like the DONSON, below. 17 jewels, 10K natural gold-filled case . . . **$52.25.**

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SON. When he graduates, on his birthday, or for Christmas, give him the gift he'll wear proudly for a lifetime—the fine American watch. The 19-jeweled, 14K natural gold-filled NORMAN, below, is a suggestion . . . **$66.**

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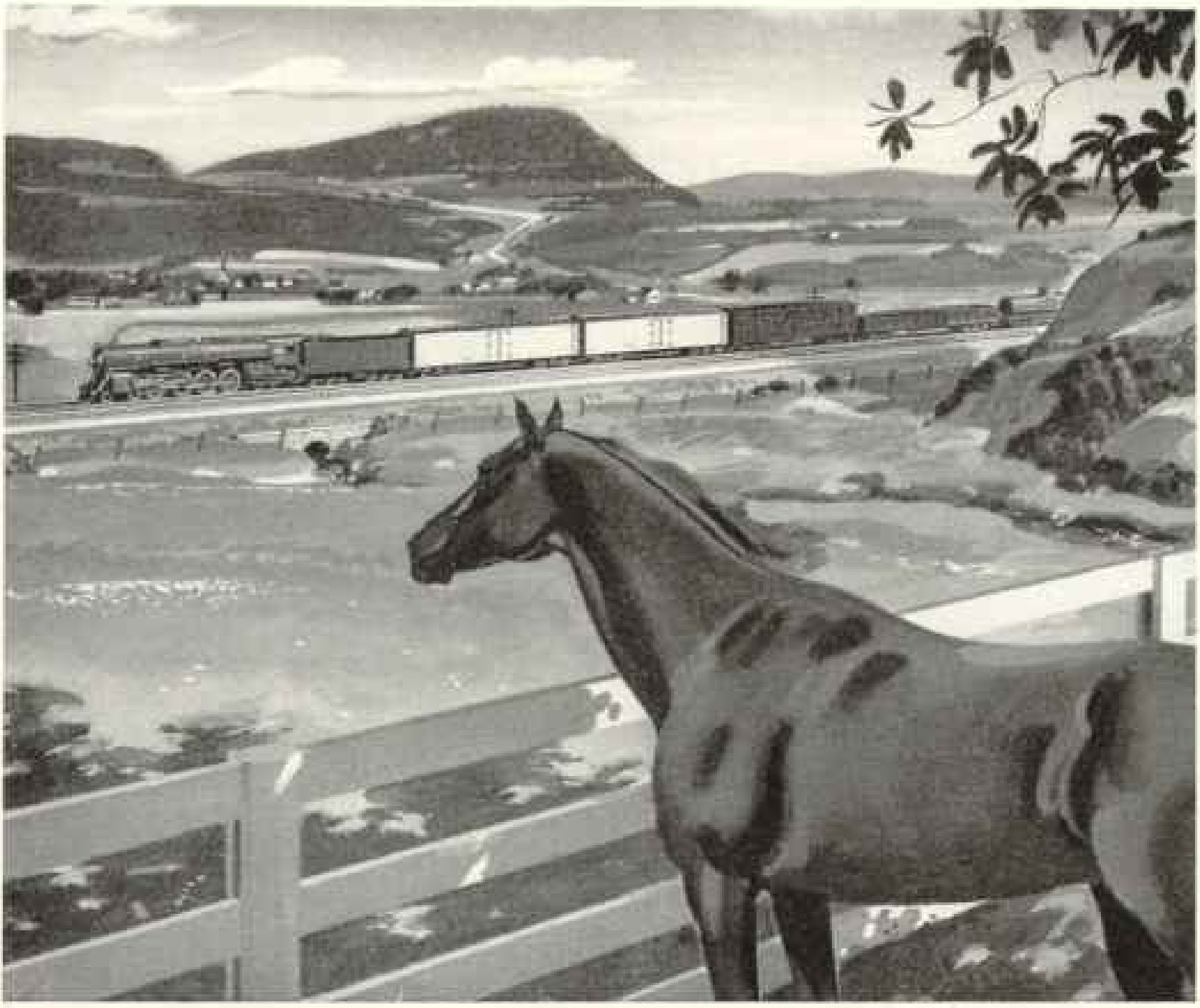

Where Does the Iron Horse Get its Oats?

YOUR RAILROADS need investment dollars just as much as a thoroughbred needs oats.

Investment dollars nourish research and invention, improvements in plant, equipment and service—the railroads' life and future vitality.

But to attract these investment dollars, and to finance improvements needed to serve you better, the railroads must have reasonable earnings.

Most folks think 6% is no more than reasonable. Last year, however, railroads as a whole earned an average of only 2¾% on their net investment. Many railroads actually lost money. And this year, even though hauling a record peacetime traffic, your railroads will probably average only about 3%.

Why are your railroads faced with this situation? That's simple. Since 1939, wages are up more than 50% . . . costs for materials and supplies up 60%. At the same time, the average charge for hauling a ton of freight a mile is less than 15% above 1939! Railroads are still hauling freight for less, on the average, than any other comparable transportation in the world.

Any business should earn at least 6% if it is to continue as a progressive, self-supporting enterprise. The railroads are no exception.

Doesn't this strike you as fair in principle . . . sound in practice . . . and to *your own* best interest in the long run? *Association of American Railroads, Washington 6, D. C.*

AMERICAN RAILROADS

THE NATION'S BASIC TRANSPORTATION

The Musaphonic shown above is the Westchester *Hostess Gown by Emma Molof*

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Familiar records never seemed so perfect before. You'll listen, enthralled, as the amazing G-E Electronic Reproducer reveals new and unsuspected beauty. You'll delight in the miracle of natural color tone whether you play recordings, or tune in standard radio or FM. In General Electric FM you'll find, at last, flawless reception virtually free from the annoyances of static, fading and station interference.

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GENERAL ELECTRIC

179-F4

RADIO-PHONOGRAPHS

General Electric Co., Electronics Park, Syracuse, N. Y.

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"Here we were in our own private Pullman room, with wash basin, toilet facilities, closet, clean towels and deep, comfortable seats—all *for* ourselves! No wonder he likes to travel *this* way, I thought. Who wouldn't?

"And that lovely lounge car they reserve for Pullman passengers! What luxury—what nice people—what wonderful service . . . even to the latest magazines at your elbow. I already envied him his many trips.

"That night, when I slipped between the crisp, clean sheets of that full-size Pullman bed and nestled into those big, soft pillows—I couldn't have stayed awake if I'd tried!

"Next morning I thought, traveling like *this* is fit for a king and queen. And the next time the 'king' takes a Pullman trip, the 'queen' will trot right along with him—if I can wangle it!"

* * *

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- Low Pressure Comfort • Smart Style!

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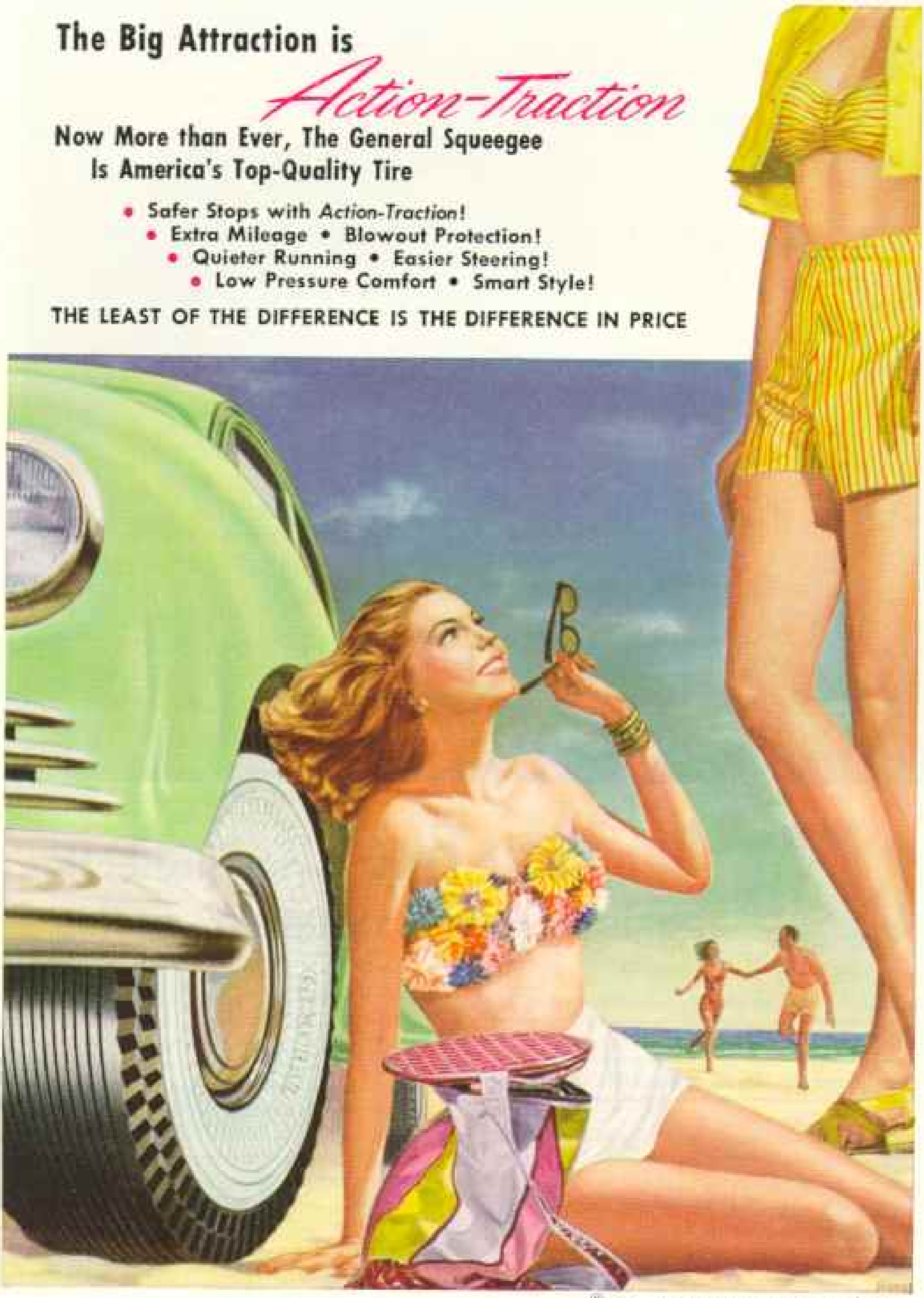

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Zenith Radio Corp., Chicago 39, Illinois

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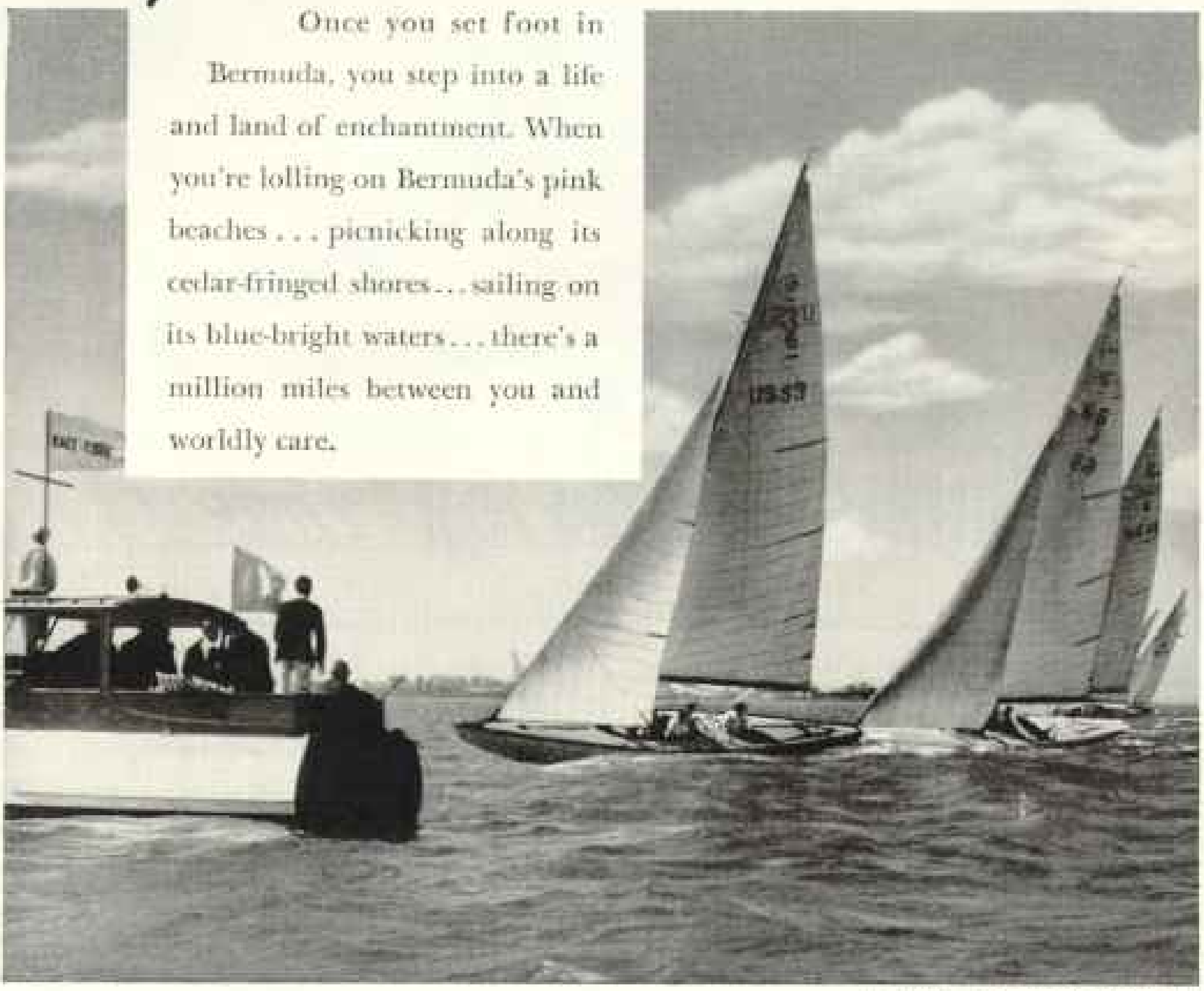

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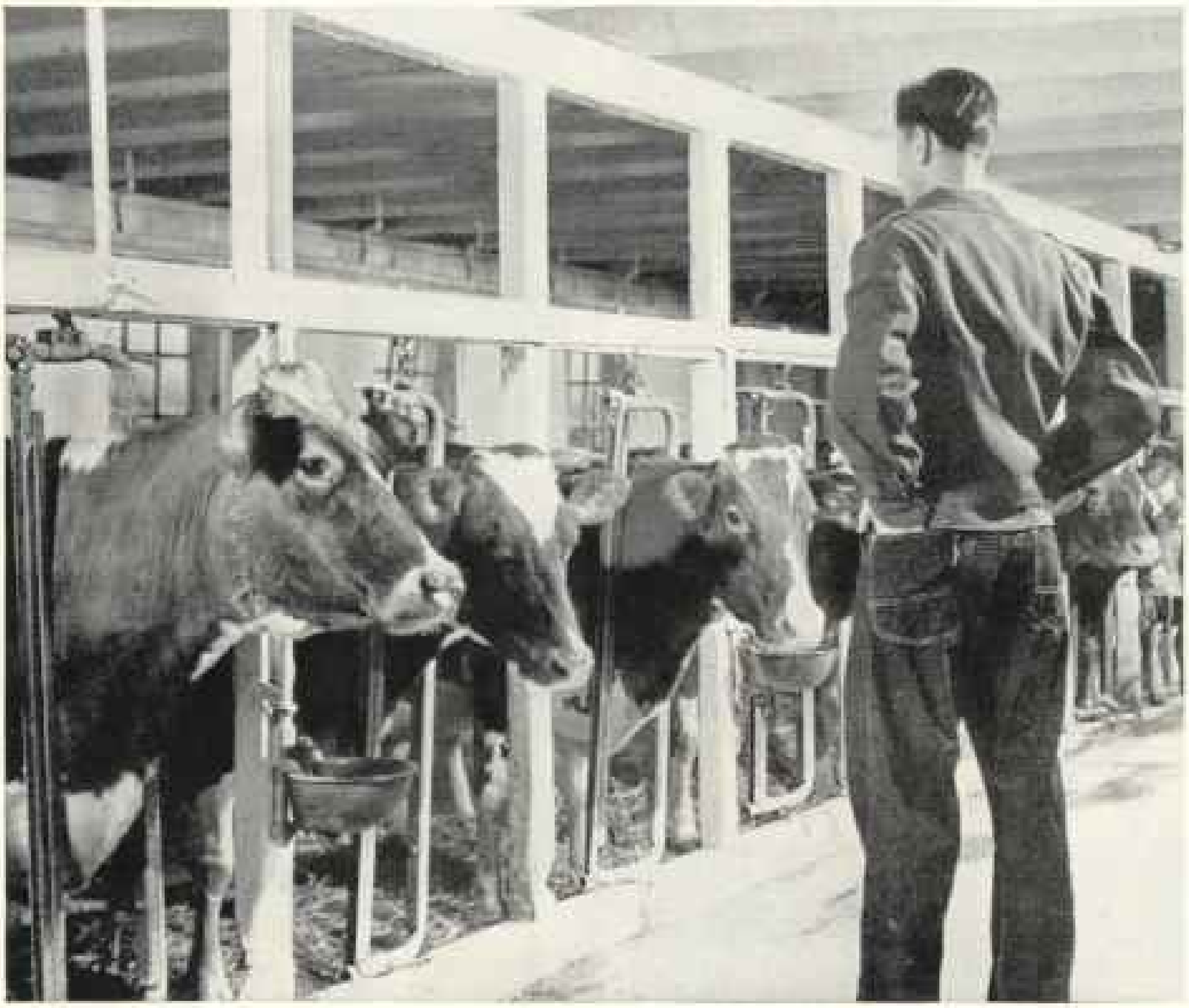

The sergeant's a general—again

When Joe came home from Uncle Sam's army, he took command of another army which lines up twice a day in the barn. *Both* Joe and his army had fine war records. His is tucked away in a bureau drawer. His cows' records are in the U. S. crop reports.

But those figures reflect a war production job to equal any other. The demand for milk hit a new high during the war, when the energy and health in milk were needed more than ever. The response from America's dairy farmers was magnificent. Wartime milk production was the highest in history—peacetime production continues higher than in any pre-war year.

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Dedicated to the wider use and better understanding of dairy products as human food . . . as a base for the development of new products and materials . . . as a source of health and enduring progress on the farms and in the towns and cities of America.

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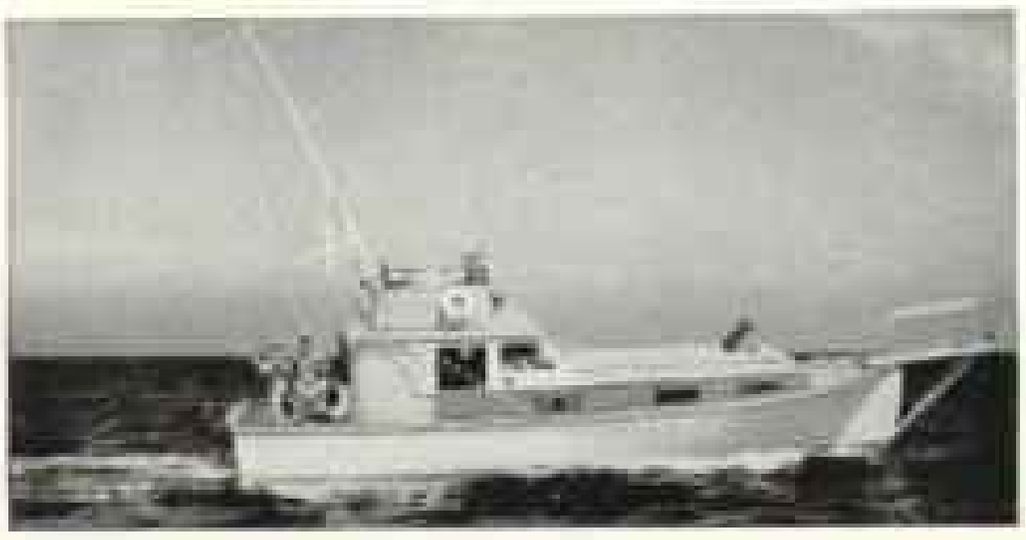

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Ask for

Can you answer these questions about

HIGH BLOOD PRESSURE?

Q. What is high blood pressure?

A. High blood pressure, or hypertension, is a condition in which the pressure of the blood against the walls of the arteries and their smaller branches shows a persisting and large increase above normal. A temporary rise in pressure, such as may result from physical or emotional strain, is a normal reaction, and is NOT high blood pressure. However, if such rises occur frequently and are excessive, they may indicate a tendency toward hypertension in later years.

Q. What are the causes of hypertension?

A. Sometimes high blood pressure is associated with kidney ailments, local infections, or glandular disturbance, but the cause in most cases is unknown. It *is* known that hypertension occurs most frequently among those who are *middle-aged or older*, those who have a *family history* of hypertension, and those who are *overweight*.

Q. How does hypertension affect your health?

A. Persistent high blood pressure makes your heart work harder and nearly always results in enlargement of the heart muscle. The arteries are usually affected; there may be damage to kidneys, eyes, and other organs. Fortunately, *if discovered early*, hypertension can often be controlled.

If you have periodic physical examinations your physician will check your blood pressure regularly. His guidance can probably help you keep your blood pressure down, or, if it should go above normal and stay there, he may be able to start corrective measures at once, before serious damage has been done.

Real hope for those with high blood pressure

Thanks to medical science, people with high blood pressure can often avoid serious complications, and enjoy a long life . . . especially if the condition is discovered in its early stages.

In many cases treatment such as diets, rest, elimination of infections, reduction of weight at least to normal, and special drugs may be necessary. Surgery has been used effectively in some instances, and psychotherapy has proved helpful at times in removing fear of the disease.

Medical science is constantly increasing its knowledge of high blood pressure. Aiding in this work is the Life Insurance Medical Research Fund, supported by 150 Life Insurance Companies, which makes grants for special research in diseases related to the heart.

To learn more about this subject, send for Metropolitan's free pamphlet, 87-N, "Blood Pressure—Everybody Has It."

Meteorologist—Sioux style

Among the legends of the Sioux Indians are stories of a sacred cave, a cave of the winds, in the Black Hills of South Dakota.

This cave had a natural opening about ten inches wide. Through it, the ancient Sioux were supposed to enter their happy hunting ground. And from it, legend says, issued the life-sustaining bison.

More practical-minded Sioux soon discovered that the cave could be used to forecast the weather. Rising atmospheric pressure, which heralds good weather, forced air into the cave. But when foul weather threatened and pressure dropped, the air whistled out of the aperture. By placing his hand near the opening, the Indian could tell whether to take to the hunting trail or stay snug in his tepee.

With their primitive "barometer," the Sioux did a pretty good job of foretelling the weather. But they had no way of learning in advance about future misfortune a lot more serious than bad weather. And neither does modern man!

But in coping with misfortune, man today is a lot better off than the Sioux. For he can provide, through *modern insurance*, for the losses which his misfortunes may entail. Think of this:

If you are hurt, accident insurance will help you meet your expenses while you're laid up—and pay your medical bills besides. If your house burns down, insurance will help buy a new one.

If thieves break in, burglary insurance will repay you for the loot they take away, the damage they leave behind. And through life insurance, you can make sure that those who depend on you for support will have an income, no matter what happens to you.

If you're not absolutely certain that you have *enough* of these and other kinds of insurance that you and your family need, why not see your Travelers agent or broker today?

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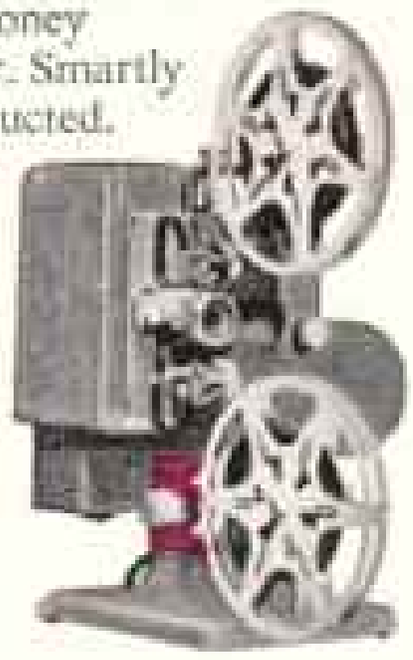

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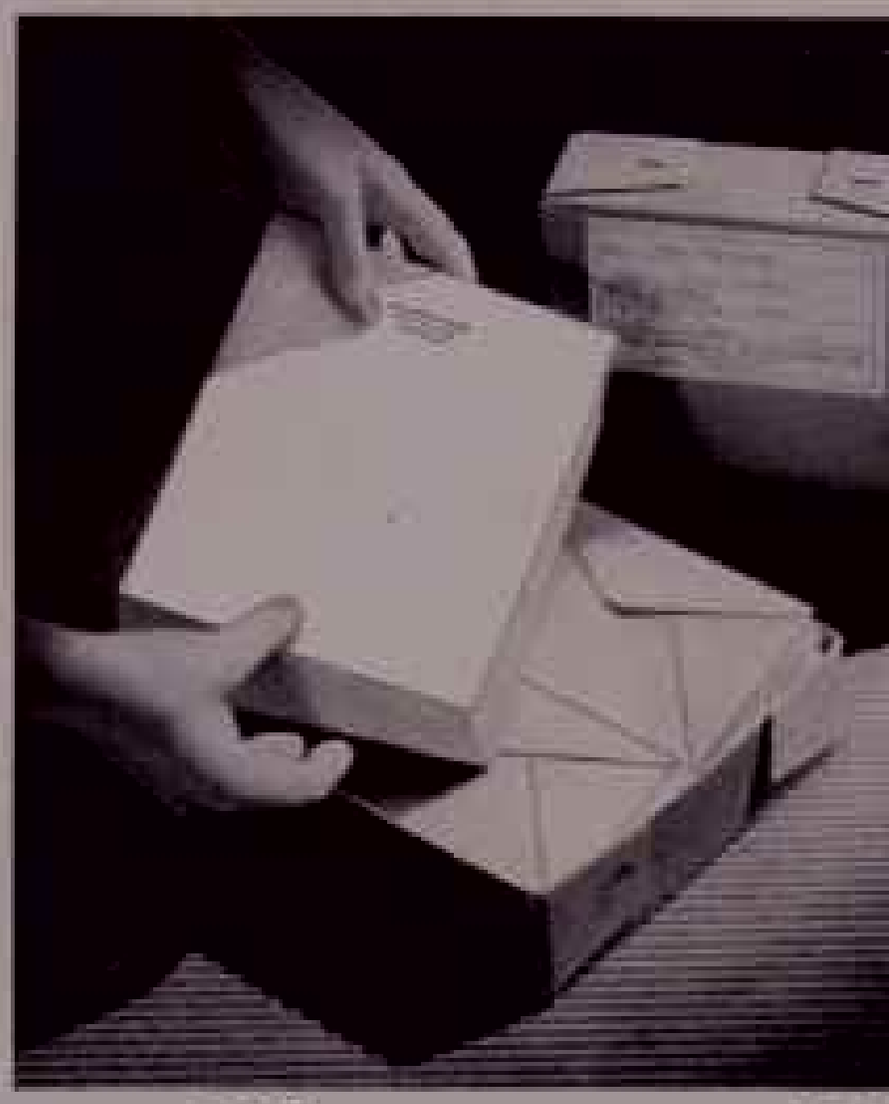

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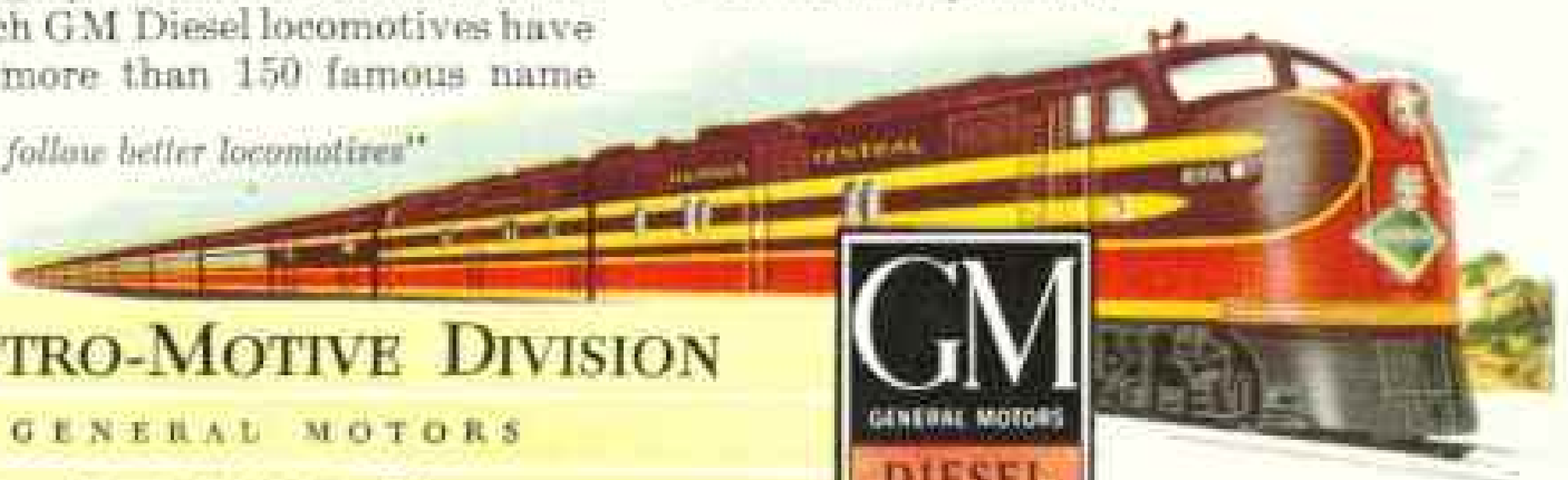

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