

VOL. 117, NO. 3

MARCH, 1960

NATIONAL GEOGRAPHIC

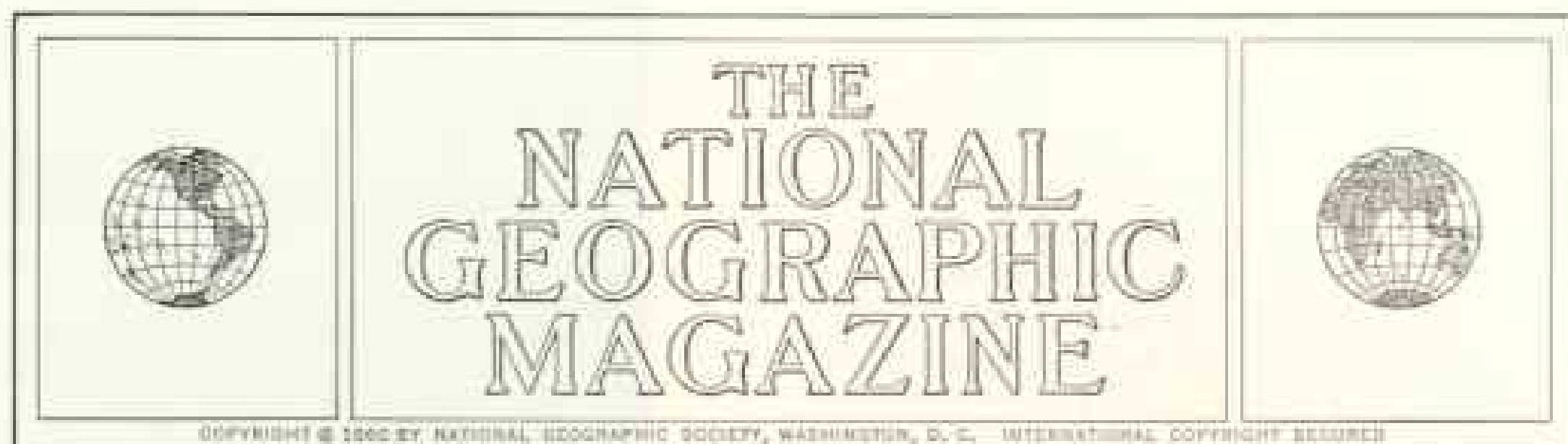


Volcano and Earthquake Show Nature's Awesome Power

- | | | |
|--|--|-----|
| Fountain of Fire in Hawaii | FREDERICK SIMPICH, JR.
ROBERT B. GOODMAN, ROBERT WENKAM | 303 |
| The Night the Mountains Moved | SAMUEL W. MATTHEWS
J. BAYLOR ROBERTS | 329 |
| Afoot in Roadless Nepal | TONI HAGEN | 361 |
| Easter Week in Indian Guatemala | JOHN SCOFIELD | 406 |
| Waterway to Washington, the C & O Canal | JAY JOHNSTON | 419 |
| Colleague of the Golden Years:
John Oliver La Gorce | GILBERT GROSVENOR | 440 |

\$8.00 A YEAR

\$1.00 A COPY



VOLCANO AND EARTHQUAKE SHOW NATURE'S AWESOME POWER

Folklore has forever fed upon the earth's great fevers and agues. When the land trembled, ancient Peruvians assumed their creator had returned for an inspection. Each answered the fearful summons by shouting, "Here I am!" The modern scientist gives a similar answer. At the first hint of action, he hurries to an erupting volcano, and each year he dutifully logs a hundred thousand earthquakes.

In recent months, geologists and photographers have had unparalleled opportunity to study two of earth's mightiest convulsions: a volcano in Hawaii that spewed molten lava higher than any other on record, and an earthquake of top rank that rocked Montana and Yellowstone. Never have such elemental displays been better covered by color photography than in the articles that lead this issue.—The Editor.

Fountain of Fire in Hawaii

By FREDERICK SIMPICH, JR.

*High Speed Ektachromes by
ROBERT B. GOODMAN, Black Star, and ROBERT WENKAM*

IN ONE FASHION or another we all sensed it was coming, this most spectacular of Hawaiian eruptions.

Scientists read it in their instruments. There were more than 2,000 separate quakes under Kilauea Crater on "the big island" of Hawaii in a single day just before it came.

Two hundred miles away on another island, my wife and I were awakened several mornings before by the unusual call of a pheasant from the meadow below our home. In a moment there followed the sharp rap of an earthshock—as if the bird had sensed its coming. During the next few days Honolulu, where we live, lay in an unnatural calm, un-

touched by the usual trades and bathed in a blue-gray mist—what old Hawaiians call "volcano weather."

Acting on these coincidental and less-than-scientific signs, I confirmed a long-standing reservation for accommodations in the event of an eruption.

The word came on Saturday night, November 14: "Kilauea is erupting again!" In a 4 a.m. phone call from Washington, my standing assignment to cover any major eruption for NATIONAL GEOGRAPHIC was confirmed, and we took off on the first Sunday flight.

In the next two weeks we were to see a 1,700-foot lava fountain, then the highest in

the history of recorded Hawaiian eruptions, perhaps the highest in the memory of man. We were to feel our feet grow hot from stepping on encrusted lava. We were to face heat so great—2,000° F. at the source—that it was like standing before the door of an open-hearth furnace, and our faces were to redden as if they had been exposed to the summer sun. The lava pool that remains may take a century to cool.

But volcanologists and the photographers who made the remarkable pictures in this issue were well ahead of us in reaching the scene.

On that fateful Saturday evening, Jack Murata, scientist in charge of the U. S. Geo-

EDDORAS © NATIONAL GEOGRAPHIC SOCIETY



Devil's Caldron of Liquid Fire Baptizes a Volcano Reborn

At 8:09 p.m. on November 14, 1959, Kilauea Volcano in Hawaii National Park broke the silence of four slumbering years. The long-dormant crater of Kilauea Iki (Little Kilauea) belched steam and incandescent lava from a dozen fountains and turned the somber pit into an inferno.

Among the early arrivals was author Frederick Simpich, Jr., a dedicated volcano watcher, Honolulu businessman, and son of a former NATIONAL GEOGRAPHIC assistant editor.





logical Survey study of Hawaiian volcanoes, watched with members of his 12-man team in the Hawaiian Volcano Observatory overlooking Kilauea Crater. Closely they checked the seismograph needle as it flickered with the vast movements of magma in the earth beneath them. Outside, a party of wives and friends had gathered, for in Hawaii people run to, not from, an eruption.*

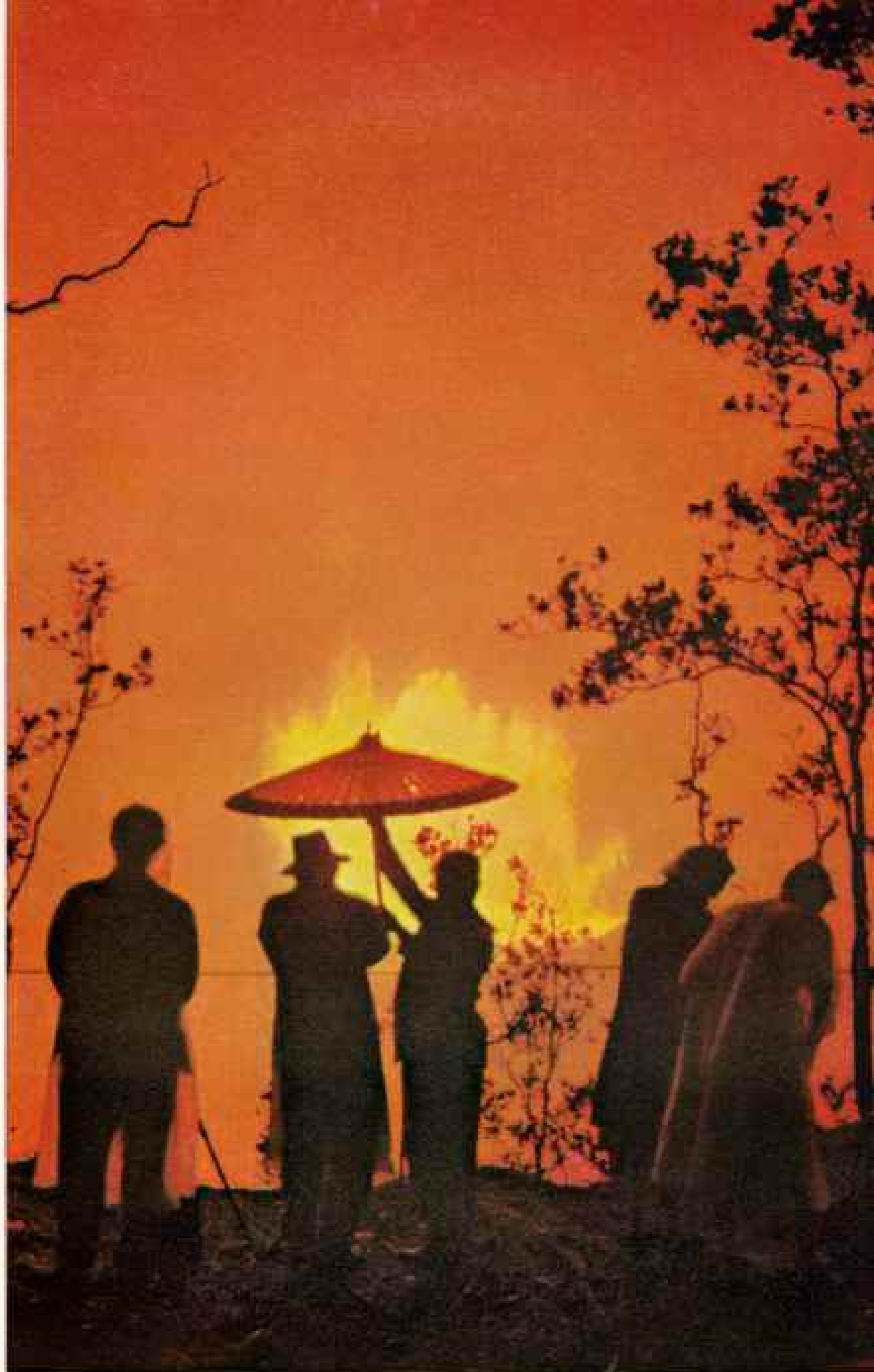
The oval crater below them stretched for two and a half black and forbidding miles. The eruption was expected in the fire pit of Halemaumau, a 430-foot-deep crater-within-a-crater. From the lookout in front of the observatory, all eyes were trained on that

spot. At 8:09 p.m. the sky turned red, on beyond Kilauea's rim. This was it—but in an unexpected quarter. The activity came from Kilauea Iki, a subsidiary crater on Kilauea's 4,090-foot crest (map, pages 322-3). There had been no activity there for 91 years.

"We were set for it," Dr. Wayne U. Ault, geochemist of the observatory, recalled. "We had every available vehicle parked outside and our gear all assembled. We were at the rim

* See, in the NATIONAL GEOGRAPHIC: "Volcanic Fires of the 50th State," by Paul A. Zald, June, 1959; and "Photographing a Volcano in Action," by Thomas J. Hargrave, October, 1955.





GOODMAN © NATIONAL GEOGRAPHIC SOCIETY

Under a Japanese parasol, spectators become silhouettes in flaming mist. Raindrops diffused the volcano's light, creating the ghostly orange haze. "It was like walking through a cloud of cinnamon," reports photographer Goodman. "Even in dense forest, the rain was my flashlight."

Like an oriental scroll, a golden torrent of lava winds across the crater floor and disappears over a ledge at upper left. Within hours all but one fountain subsided. At peak flow the surviving spout hourly gushed two million tons of liquid rock heated to 2,000° F. Jewel-like dots bordering the flow are brush fires lighted as lava climbed the slopes. Halation, a photographic phenomenon, makes the glowing river appear to flow through the twigs in foreground.



Aircraft Lights in a Jeweled Strand Crown Kilauea Iki's Fiery Tresses

Interisland and transpacific airlines jammed the skies above the blazing crater with sightseeing tours. Pilots flew full circle about the volcano until rocketing pumice cracked a windshield and canceled further downwind sweeps.

Gas and steam produce the wind-swept, mile-high plume, which reflects light from the crater.

This time exposure turns flashing wing lights into glowing beads.

in 15 minutes. Only two fountains were working at first. Then more sprang up."

Meanwhile, photographers Robert Goodman and Robert Wenkam were having troubles. They rushed to the Honolulu airport, only to find the terminal filled with sightseers clamoring for space.

It was as if the airline had staged a great "come-as-you-are" party. Sleepy-eyed men in hurriedly donned shorts and aloha shirts and youngsters still in their sleeping garments mingled with celebrators in dinner dress from Waikiki night spots.



GOODMAN © NATIONAL GEOGRAPHIC SOCIETY

Only one plane was then available, with 10 aspirants for each of its 52 seats. More people came by the minute.

At last a line of lucky passengers began to board, and the two agonized photographers stood by, still without seats. Volcanoes were their business. They felt abused as the count of sightseeing passengers rose from 40 to 45, then 50. Here the count stopped. Somewhere on the way, hopelessly delayed, were two tardy reservation holders. But for this misfortune, Wenkam and Goodman would not have been the first cameramen into the crater.

When they arrived, five of the original dozen fountains were still playing, but some of these soon began to die down. As Goodman said later, "We were afraid the show might be ending. So we decided to go down the trail into the crater a little way.

"Every 50 feet brought us new camera angles. Whenever we stopped to think, we were sure we were too close, but then one of us would say, 'Let's go down a little farther.' The thing was irresistible.

"By fits and starts we worked our way to the rift line. I didn't know we were there



until I realized it had suddenly become much hotter. Then I heard a gurgling below me and looked down into the very throat of a fountain that had been playing lava minutes before.

"I was terrified, but I knew this was a chance that might never come again. And dawn was already breaking.

"Soon we were so close to the main fountain that we couldn't stand the heat for more than seconds. We would dart toward it, make exposures, and run back. Each time our clothes seemed to sear us wherever they touched, and we felt as if we would burst into flames ourselves.

"Finally the sulphur fumes got so bad our throats felt as if we had swallowed gravel. Daylight had come, and we were exhausted. So we worked our way back to the trail, shooting as we retreated. All of a sudden I got really scared. For the first time it occurred to me: Nobody in the world knows we're down here!"

Halfway up the trail they met a Geological Survey team on one of many trips to the crater floor (opposite). Here was new picture material. So back the photographers went, leaving the trail to get to the edge of the lava that had pooled on the floor of the crater during the night. This was a seemingly vertical descent, with crumbled lava providing an uncertain footing and fragile tree fern an unsure handhold. Burdened as they all were with cameras and instruments, it is amazing that no one slipped into the lava below.

Stunned Visitors Look Like Refugees

In midmorning I met the two tired men at the Hilo airport, on their way to Honolulu to process and mail their film. Both wore the drawn, gray look I had last seen on Marines coming out of the line in Korea.

"Did you get it all?" I asked Goodman.

"I got it all. It'll be on the midnight jet to the coast."

The tourist viewpoint of the eruption was on Kilauea Iki's rim, a mile and a half from

Volcano House, which was to be my home at intervals in the weeks ahead. A good road leads from the hotel to the eastern rim of the crater. By the time I arrived on Sunday morning, 16 hours after the eruption broke out, Hawaii National Park employees and servicemen from the near-by Kilauea Military Camp had sightseeing traffic under control. We parked our car half a mile from the rim and hiked the rest of the way (page 312).

We walked through a forest of gaunt, gray-barked ohia rising from an underbrush of ohelo shrub, tree fern, and blackberry brambles. We could hear the roar of the unseen volcano and the crackle of fires as trees along the crater's wall exploded from the heat. These sounds, as of battle, gave me the impression that the crowds of people trudging toward us were evacuees. Parents carried crying children, blankets, and lunch boxes; only cameras and binoculars betrayed them as spectators.

Beauty Masks the Volcano's Danger

Then we came to the eruption. Two fountains thrust torrents of red-hot lava 200 feet into the air, far up toward the crater's rim. Half a mile away, they were like lion cubs, beautiful but potentially dangerous.

Even as one fountain was dying, the other was growing to magnificence. It seemed to pulse and breathe as it played. The lava it blasted upward streamed down to splatter on a shelf, then merge in a molten cascade to the crater floor, 300 feet below (page 305).

The floor was streaked with red rivalets of running lava, and a fiery pool was turning gray here and there where it was already crusting over. There were puffs of smoke around its banks as ohias caught fire.

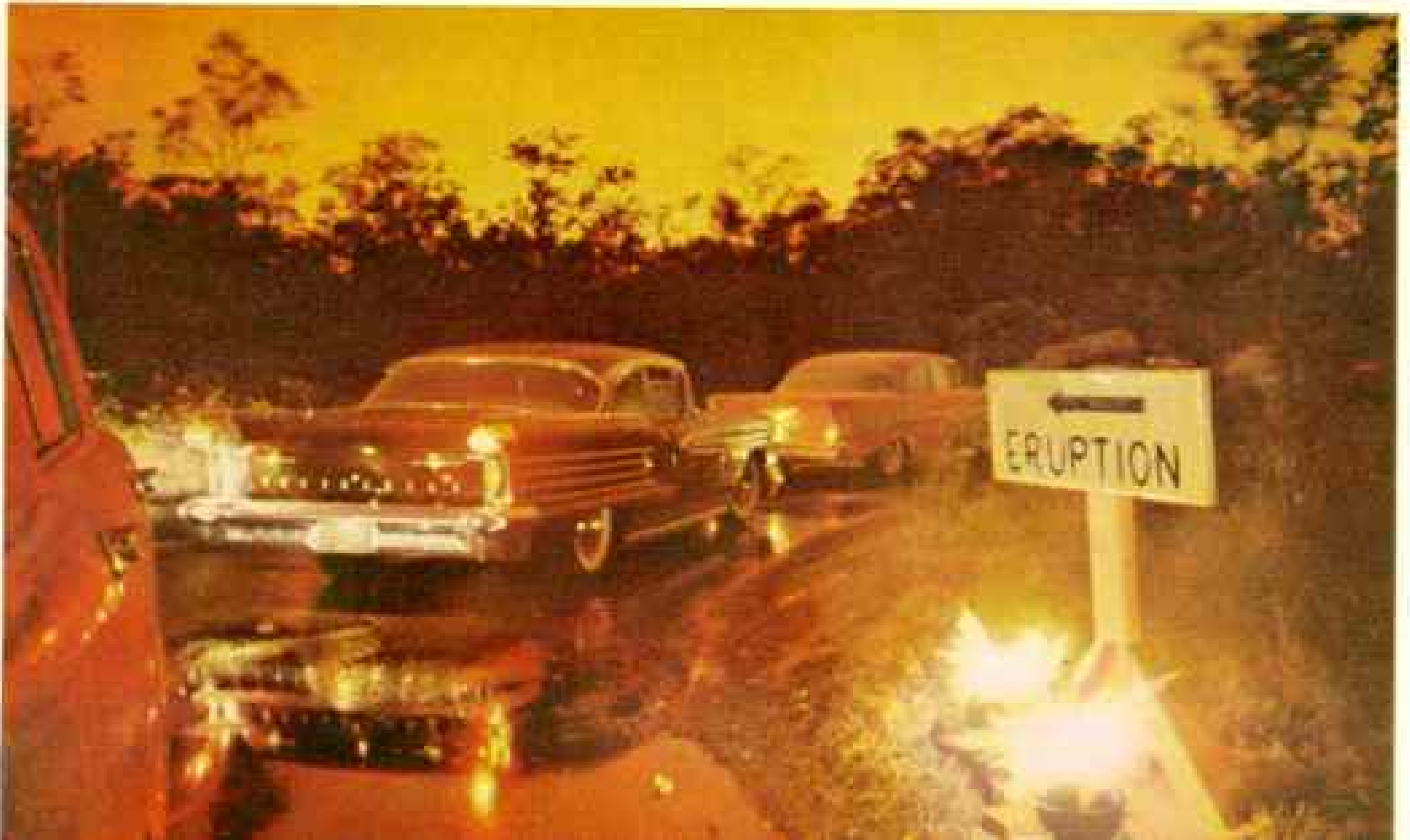
Although the cascading lava lighted the whole sky, it was at that point a modest display as such things go. The surviving fountain was blowing out only about 45,000 cubic yards of lava an hour. As recently as 1950, an eruption not far from here—near the summit of 13,680-foot Mauna Loa—flowed 150 times that fast at its maximum.

Volcano Guardians Brave an Inferno to Take Their Patient's Pulse

Scientists of the U. S. Geological Survey's Hawaiian Volcano Observatory ran daily tests on Kilauea Iki's debris, but never approached flowing lava without a clear line of retreat. Only 100 yards from the blistering spray, this party (see text, above) risks painful lava burn or asphyxiation from a shift in the wind. One man described such exposure as "a little like standing behind a jet plane when the pilot lights his burner." A moment after the picture was taken, the volcano spat a stream of lava at the intruders, forcing them to withdraw to higher ground. Massive flows soon to come (page 319) buried this spot under millions of tons of molten rock.



© 1964





HERBERT S. WILSON, NATIONAL GEOGRAPHIC SOCIETY © N.G.S.

A lava lake is born as molten rock streams from the vent and repaves the crater's old floor. Visitors and a park naturalist (right) on the second day of eruption gaze down on lower slopes that are now forever sealed beneath a basalt slab hundreds of feet thick. Viewers stand on Byron Ledge Overlook. Byron Ledge itself, just beyond the fiery fountain, separates Kilauea Iki from Kilauea Crater (map, pages 322-5).

Winds carried wisps of volcanic glass nearly 50 miles from the fountain.

Midnight sun from the eruption's glare bathes a motorcade of sightseers. So large were crowds at early displays that spectators often waited two hours to take their turn for a 10-minute view. Many cars on leaving the "drive-in" crater rejoined the line immediately.

Yet this eruption had a special appeal from the outset. From the sightseers' point of view, it was almost as accessible as if it had burst forth at home plate in Honolulu Stadium.

The scientists were delighted, too. They could get down to the fountain and pools with relative ease, and their laboratory and equipment were close at hand. There was no rain-fall at first to carry radioactive fallout, still lingering in the atmosphere from bomb tests, and spoil their samples. And the crater cupped the lava like a giant beaker, reducing the chance of contamination. Here was an ideal clinic for their fundamental assignment: To learn how and at what rate a flow of magma adds to or alters the land, sea, and air.

The next day brought my first opportunity to see how it is to look up, rather than down, at a volcano. With seismologist Jerry Eaton and geologist Don Richter of the observatory, I went down to the crater floor. The trail started out through a forest of tree fern so verdant that only the roar of the eruption reminded us that this was more than a pleasant downhill hike. Among the tree fern grew little bunches of strawberries bearing a white fruit sweet to the tongue.

Fumes Kill Unsuspecting Birds

Overhead, the red-and-black apapane and the elepaio sang. These birds, native to the Islands, abound in the volcano district. I thought then that they seemed conditioned by the ages of eruptions, and were taking all this as a matter of course. But later I saw several of them plummet into the lava, overcome by gas. Eventually, when the fountain finally reached its full fury, their bodies dotted the road behind the crater.

Our trail proceeded in switchbacks; to descend the 740-foot cliff took us more than a mile. Of that mile, all but the last 50 feet was a delight.

Then the heat of the lava lake made itself really felt. We began to smell the sulphur gases, and puffs of vapor emerged through the rock and fern.

"Those are danger signals," Eaton cautioned. "They show where pressures may be developing or combustible gases accumulating. Explosions often result."

I counted rapidly and saw a score of explosive possibilities ahead. Farther on, burning trees arched the trail as it disappeared into oozing lava, poinsettia red.

The first mission for Richter and Eaton was to set out bench marks so that they might measure the rise of the lava day by

day. They calculated it had already covered the crater bottom to a depth of 15 feet.

Their second job was to walk across the encrusted lava pond toward the fountain to photograph and inspect the cascading lava. To me this was a daring excursion, but Eaton dismissed it lightly. The fact is that although the lava hardened rapidly, its surface temperature was still more than 200° F., and a few feet below the surface it remained molten at more than 1,500° F. The crust formed like ice on a river, constantly cracking and shifting.

Lava Threatens to Cut Off Retreat

As Richter and Eaton prepared to walk the crusted lake, they observed that my tennis shoes—fine for walking over cold lava—would not stand the heat. I was never so grateful for improper attire.

I went up the trail a way, a cautious distance above the puffs of vapor, and sat in shade where I could watch Eaton and Richter pick their way across the lake. As I sat, I wondered what would happen if those early fountains, now directly over my head, were to

come alive. What if the whole thing blew up? I could see that the surface of the lake had risen a foot in the time I had been there. What if it were to rise faster than I could climb the trail?

Still, I could not leave. For one thing, I wanted to wait for a souvenir to cool—a penny Eaton and Richter had encrusted for me in a blob of molten lava. I was held also by the beauty of the fountain and its hints of how the earth was born. Most of all I had to watch those two men as they made their way over a surface where one misstep could plunge them into annihilation.

It was hunger that finally drew me to my feet and the long, hard climb up the trail.

That night the fountain really began to flourish, and Goodman and Wenkam came back for more pictures. This time they were better prepared, with warmer clothing, flashlights, water—and even a tin hat.

Following a back road to avoid traffic and roadblocks, they drove close to the crater's edge and hiked on through the darkness. For minutes they just sat and looked.



Blazing Batter Explodes Above a Doomed Forest

This remarkable view less than 100 yards from the volcano's throat shows molasseslike blobs that explode as their imprisoned gases expand, producing what one witness called "devil's popcorn." High Speed Ektachrome, a sensitive new film, stops the lava in mid-flight and reveals patches of tranquil blue sky.

Intent faces bear the mark of Kilauea Iki's hypnotic spell. Some 170,000 persons visited the volcano during the first two weeks. "They rarely spoke," says photographer Goodman, "and when they did, it was in cathedral tones."

To veteran watchers Kilauea Iki became "our volcano." One man wept when the fountain seemed to die. This crowd watches from Byron Ledge Overlook, half a mile from the vent.





"It held all the satisfaction, magnified an infinite number of times, of watching a camp-fire," Goodman said. "Finally, we realized why we were there, and we began shooting from the rim. But it was too cold. The heat from the fountain warmed us in front, but our backs froze in the wind and drizzle. Finally, we went down into the crater, as much to get warm as to get pictures.

316 "Once in the crater," Goodman continued, "we felt again the lure to get closer. But

this time the fountain was playing twice as high and seemed twice as hot. We had to hide behind trees and dart out for shots. Then the wind shifted. We could hear the cinder marching toward us as it splattered on the leaves of the trees. We moved to a ledge overlooking the mouth of the fountain. I felt a shaking and first thought it was in my knees. At that point we realized the ledge we were standing on was shaking violently. So we got out of there, and rightly, too—that



GOODMAN © NATIONAL GEOGRAPHIC SOCIETY

ledge just isn't there any more.

"Finally we got all the pictures we wanted. Then we found a warm ledge that wasn't shaking and took a nap—our first in 36 hours."

Sole hotel in the eruption area is Volcano House, and here Goodman and Wenkam went to dry out the next morning. The inn maintains a "perpetual fire" in a fireplace to remind tourists of the

possibility of an eruption—but in all the excitement, it had been allowed to go out.

Central character of Volcano House is "Uncle George" Lycurgus, a sturdy centenarian born in Greece. I observed the old gentleman one day during the eruption greeting guests
(Continued on page 322)

Space-suited Lava Hunter Dips a Sample of Fiery Gruel From the Advancing Tide

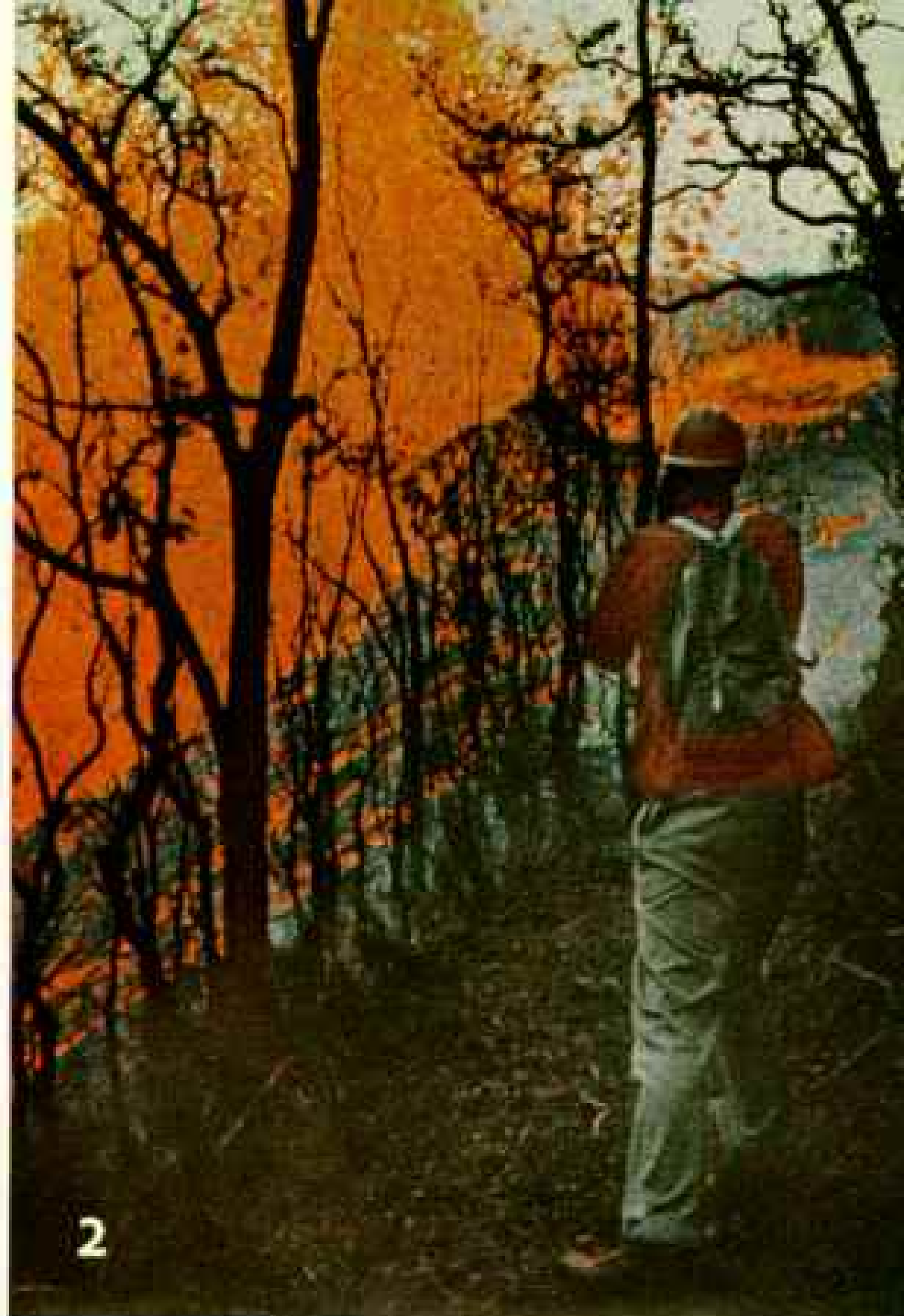
Geochemist Wayne Ault, who tested the aluminum-coated Fiberglas coveralls, found the suit a "portable oven." Its mirrorlike surface effectively reflected heat, but lack of ventilation left him soaked and exhausted within minutes:

Shrubs at right, engulfed by the relentless flow, burst into flame. Far larger trees became charred posts, held upright only by a thin crust of cooled lava. Visitors easily uprooted trunks six inches thick.

Another scientist detaches a still-glowing blob of pahoehoe, a lava that cools with a smooth, porridgelike appearance.

317





BOHNER (1, 2, AND 3) AND WELLS (4, 5, AND 6) © NATIONAL GEOGRAPHIC SOCIETY





Life Cycle of a Fire-breathing Giant: From Gurgling Birth to Thundering Prime

Kilauea Iki began its spectacular career at dark as a chain of cataracts (1) spurting from a 2,500-foot-long rift zone in the old volcano wall and tumbling in an incandescent Niagara.

By morning only two fountains remained (2). Photographer Wenkam snapped their portrait at 50 yards. That night one of the vents died.

The survivor (3), flexing its muscles at dawn on the fifth day, climbed to 700 feet.

Celebrating its first week of life (4), the fountain soared to 1,250 feet, shifted direction, and scattered spectators. Then, having raised the crater floor 335 feet, the monster subsided.

On the twelfth day Kilauea Iki roared again (5), blowing a 1,000-foot fountain and loosing waves of glowing surf across the crater floor.

After resting for a day, the jet reappeared (6), registering 1,600 feet on the National Park Service's homemade height gauge.

Next page

Kilauea Iki's Colossal Torch Sears the Sky

With a climactic burst on November 29, the fountain set a new altitude record for Hawaiian volcanoes. At times it reached 1,700 feet, nearly a third of a mile. Later it soared to even greater record-breaking heights, up to 1,900 feet.

On January 13, 1960, Kīlauea burst forth near Kapoho, some 25 miles to the east, forcing evacuation of two villages.









World's tallest mountains if measured from base to peak, Mauna Loa and Mauna Kea on the island of Hawaii rise more than 30,000 feet from sea bottom. Volcanoes built them, inch by inch, through the ages.

at 8 a.m. and drowsing before the fire at 3 the following morning.

Slender, thin-faced, and mustachioed, Uncle George has been innkeeper for the volcano for 56 years. His fortunes have varied with its activity. This time he had booked a cattlemen's convention for the weekend the eruption broke out. Their leather jackets, silver belt buckles, and high-heeled boots added color to the generally bizarre costumes of the other visitors.

For no one has yet established the proper costume for volcano watching. I've seen women sloshing through the mud in pastel-colored shoes with spike heels. One couple I know dug out the raccoon coats they had worn to college in the twenties. Blankets

322 found favor at night, often shared, poncho-

like, by two or three chilled sightseers.

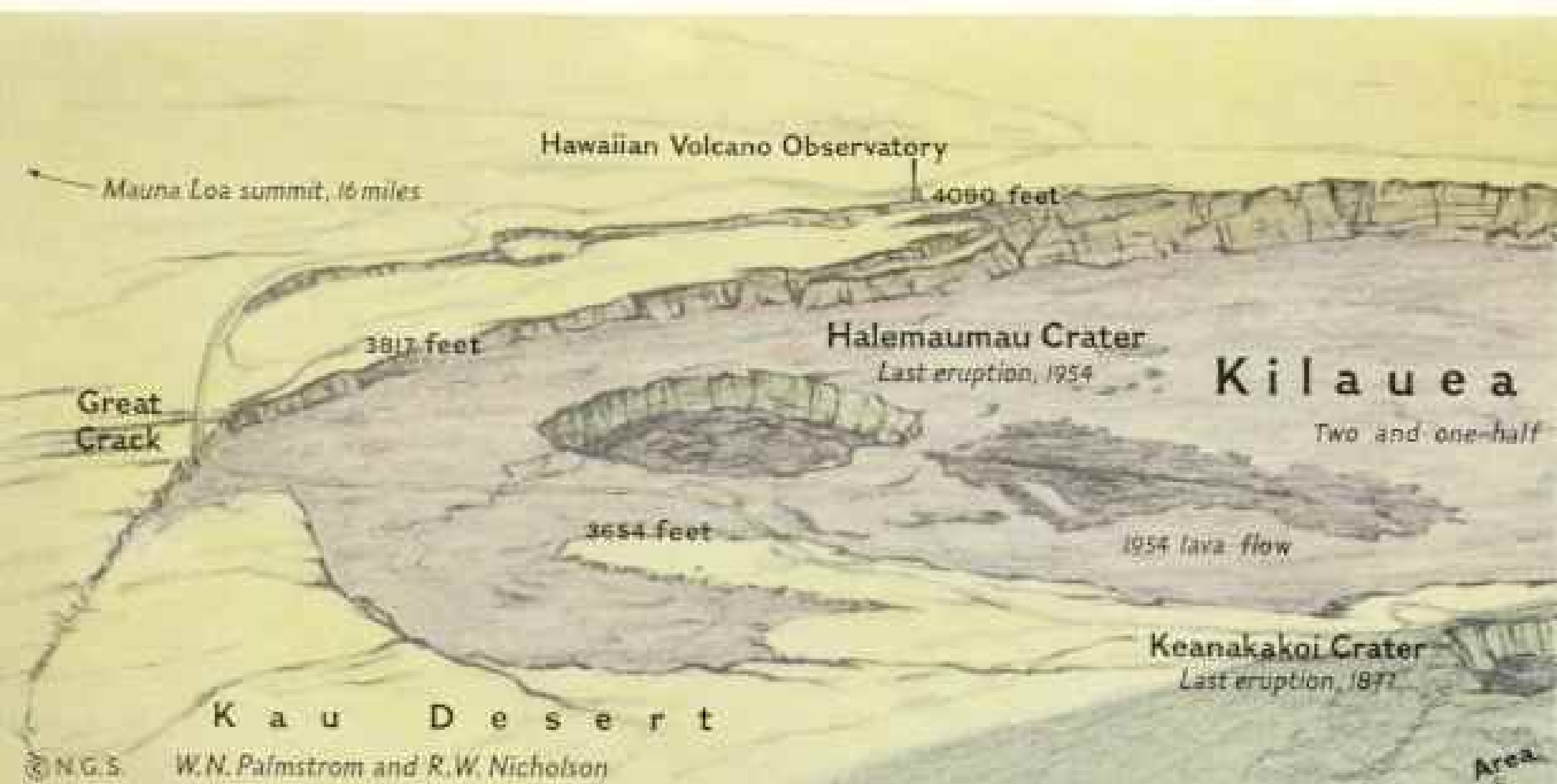
Many craterside scenes remain in my mind: A mother who was trying to teach a little girl to use binoculars and couldn't get her to open her eyes. A ranger, calling stridently through a bull horn, urging the crowd to move because a wind change threatened them with hot cinders. An invalid woman with two canes hobbling in the rain at midnight. And three Hawaiian grandmothers in trailing night-gownlike muumuis watching the fountain in awe and whispering about the goddess Pele.

In the mythology of Hawaii, Pele is the volcano goddess. She is believed to have lived at some time in every crater of the Hawaiian chain. Currently, Halemaumau is thought to be her home. Some islanders still believe in her and even toss offerings into the crater. Traditionally a black pig or berries of the ohelo bush served; today Pele's taste runs more to gin, tobacco, or brandy.

The wife of Mori, the Japanese major-domo at Volcano House, believes in Pele. She says the earthquakes that preceded this eruption were not like the rolling shakes of the past. Rather, they were sharp, like knocks on a door. Thus she knew, before it came to pass, that the flow would not be in Halemaumau, for Pele was knocking at the door of a new home.

Hawaii's two airlines did a rich sightseeing business during the eruption. Their planes flew over from Honolulu in an hour, circled the crater for about half that time, and then returned. In a single weekend 171 such flights were scheduled—enough to carry more than 8,000 passengers (page 308).

These trips were homey affairs; the pilots



reporting the latest data on the eruption; the stewardesses passing pineapple juice. The passengers even played a game of musical chairs, changing sides at the pilot's command to share the view.

The volcano pelted some flights with pumice. Capt. Robert S. Barnes, 13-year veteran with Hawaiian Airlines and a World War II pilot, was circling the volcano on Wednesday night following the eruption.

"I felt something like light hail striking the wings," he told me. "I was sure it was pumice, so I widened my flight pattern. On my last time around—several miles downwind from the fountain—it happened. A big chunk shattered the outer pane of the windshield. I couldn't see a thing. Fortunately, the copilot's windshield wasn't affected."

"Were your passengers upset?"

"No. I told them right away that we'd be making a precautionary landing in Hilo," Barnes answered. "I think they were just pleased that it had held off until the last time around, so they had all their pictures."

He added, "You might ask our purchasing people what one of those windshields costs."

I did: \$642.

Scientists Take Volcano's Pulse

But to scientists of the U. S. Geological Survey, the volcano is much more than a spectacle to be seen and photographed when it blows up. It is a marvelous phenomenon to be studied in dormant periods as well.

Taking the pulse of the mountain with the seismograph, scientists record earth tremors that tell dramatically of movements of magma within the chambers of the earth's crust.

Other instruments that measure the tilting of the earth's surface can detect an inclination of one inch over a span of 75 miles. Roughly speaking, such movements reveal the build-up of magma beneath the surface. Before this eruption started, Eaton said, the tilt was so great it was "off the map."

During an eruption, the scientists take samples of the molten lava and gases to analyze them and learn, among other things, the probable depth of their source.

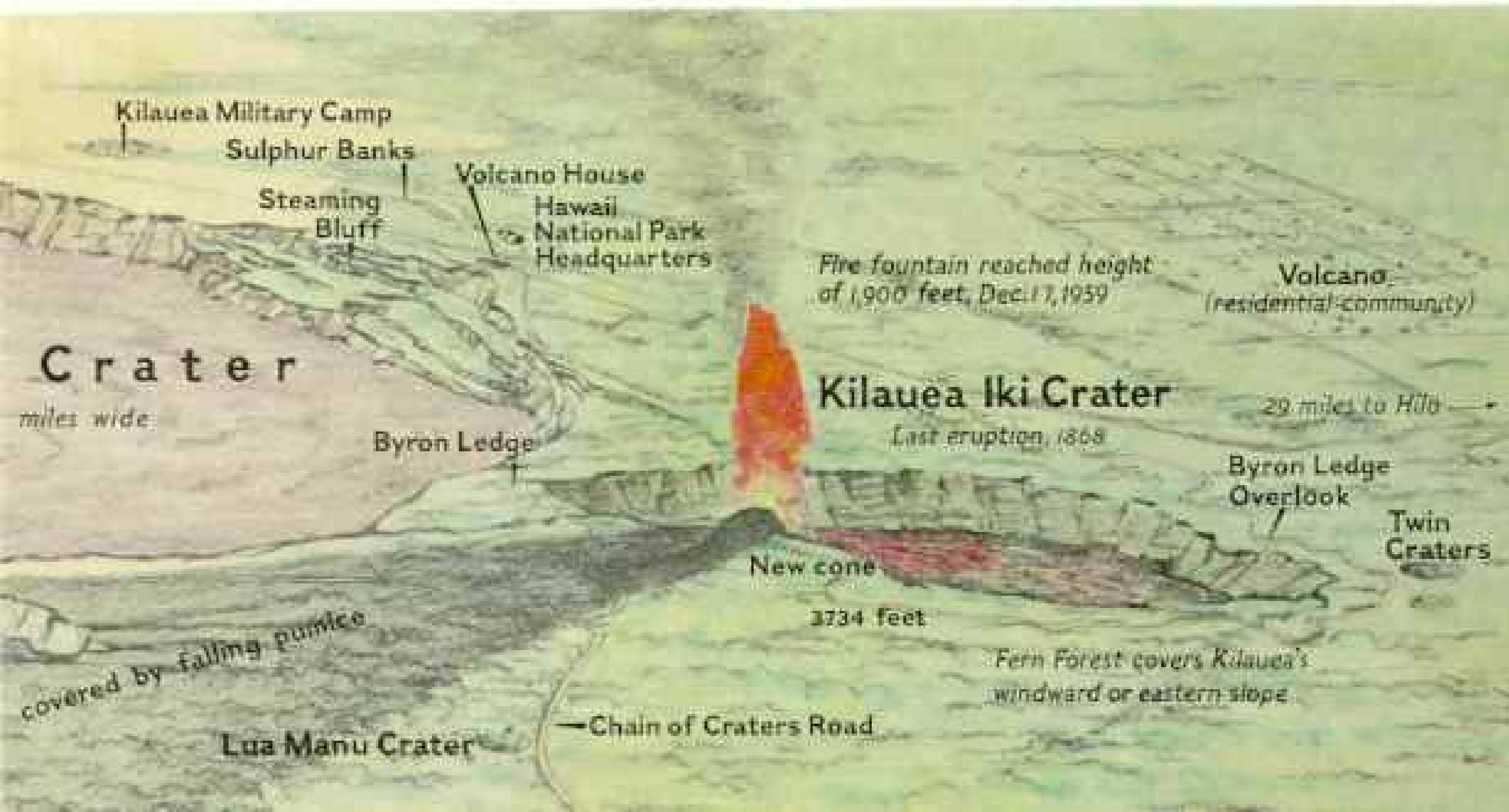
Getting such samples is not as simple as it sounds, and during the first few days Ault and Richter didn't have much luck. Though protected by a Fiberglas-and-aluminum suit that reflected 97 percent of the heat, and working with tubes on the ends of poles, they still got too hot (page 316). When Ault took off the suit after one session, he found he had sweated through his wallet, and the paper money in it was wringing wet.

But a few days later they found what Ault described as "a nice little flow." They devised an effective aluminum shield with slits to see through. And they got the samples they needed.

Twice Ault flew low over the crater in a National Guard plane and captured gas by extending a tube out the window.

"It worked fine," he said, "but the sulphur dioxide made me sick."

Through this first week the fountain was growing—300, then 500, then 800 feet. On Saturday I determined to get as close to the fountain as I could and with my wife drove around behind it. By this time it had built a 200-foot cone of pumice and cinder and had changed from a fountain of cardinal red 323





324
Howling Tornado of Brimstone and Fire
Threatens to Atomize a Reckless Invader

With the roar of a thousand express trains, the
hellish storm seems to sweep directly overhead,
its blazing projectiles changing color during flight



ADDACCHIONE BY WENHAM © NATIONAL GEOGRAPHIC SOCIETY

from incandescent red to charred black. Fallout engulfs road and guard rail beneath a mountain of pumice. A telephoto lens pinches the gap—

some 400 feet—between this news-photographer and the impact area. Even at such a distance heat can affect the film in his camera.



EDUCATION BY WENKAM © NATURAL GEOGRAPHIC SOCIETY

Stripped and blasted by semimolten pumice, the limb of an ohia tree reveals devastation half a mile from the vent. Fiery hail flayed the bark and incinerated the side facing the eruption, leaving the lee section intact. "It was as if some gigantic hand had taken sandpaper and a blowtorch to the forest," said the photographer.

to a curtain of gold, showering particles from nearly 1,000 feet above the crater's rim.

As we approached, the road signs beside us shook from the force of winds caused by the eruption, and the rumble and roar were deafening.

I wanted to retrace the trail I had walked with Eaton and Richter earlier in the week. We were scarcely on our way when we met Richter, with a party coming up behind him.

"We're going down to see where you and I went with Eaton last Monday," I explained.

"Last Monday! Why, that's under 300 feet of lava now!" was the answer. "And be careful down there. The fumes are bad, and there are fires all over the place."

We went ahead, I somewhat bemused, recalling where I had sat that afternoon and watched the two men set out across the pond. I thought: That beautiful spot will never feel air or the sun or be seen by man again. We pushed on, but soon the fumes from the pit did become oppressive. And the smell of smoke from smoldering vegetation hung over everything. On the surface of the lake, fumes

rose from a hundred crevasses. There was still green where we stood, but the wall across from the cone had burned a solid gray. I made this note: "Side where sun strikes is dry, burns first, but shaded side is wet, so fire resistant."

Just then I heard a crackling. Fire was breaking out above us in something that was far from fire resistant. We raced to get up the trail before it cut us off.

That night the volcano lost its vigor. First its golden light turned a dirty blood red. Five minutes later it began to sag and lose its height, and in 40 seconds it was out. The crater, now half filled with lava, appeared left for the scientists and the birds again.

But a week later, as I was putting these observations together—thinking I had seen the end of the story—I got a phone call:

"Kilauea Iki has erupted again!"

So I hurried back. When I got there, I thought at first that I had wasted a trip, for the fountain had already fallen back again. But fire still reddened her throat (somehow I think of her as feminine—perhaps because her beauty disguised her danger), and, though I had no way of knowing it, she was about to put on the most fantastic show yet.

Since I was there, I decided I would inspect the aftermath. The crater floor was now so cracked that by day it seemed to hold a hundred burning campfires. At night the red of a thousand rivulets showed through.

Cinder Plows Clear the Road

I visited the familiar trail again, taking along my family.

All was quiet this time. The fires had died down, and the puffs of vapor had thinned to the vanishing point. The lava, now heavily encrusted, had sagged in spots as much as 25 feet because of shrinkage and the backflow into the vent. Near the banks, strange "vegetation" rose where lava had encased trees and then dropped back.

Bulldozers had cleared the road of cinder, pushing it aside like snow. We saw families shoveling it into sacks to use for mulch in Hilo gardens. Tourists strained it through their hands, looking for the black, shiny beads known as Pele's tears, and semiprecious brown-green stones called olivines.

At the cone we watched steam emerge from the 200-foot mass. I found it incredible that this shape, nearly half as tall as the Washington Monument and heaped with the symmetry

of a giant sand pile, had not been here two weeks before.

On our way back, playing a hunch, I detoured by the observatory. Richter was there.

"I've just come from climbing that trail a final time," I said.

"Are you sure it's the final time?" he asked.

So there was something to the hunch. I turned to the seismograph. Its needle wavered grandly.

"Is this normal?" I asked, hopefully. His reply was cautious: "I've never heard of its acting that way when an eruption didn't follow."

Road Buried Beneath 90 Feet of Cinder

That night we saw the greatest display yet. The eruption had been a thing of beauty before; this was anger. The fountain was dark red—the red of beets—and it hurled into the air massive blocks the size of pianos.

I passed through the barricades and drove again around the crater to see how close we could get. A hundred yards from where we parked, cinder rattled on the pavement. After pointing the car toward safety, I advanced along the road a few paces until I could see where we had searched for olivines so peace-

fully earlier in the day. We learned later that 90 feet of cinder had buried this stretch of road.

Next morning the berserk fountain played ever upward, tossing its body in wild patterns with the abandon of a demented being. To 1,500, then 1,600 feet it towered. I was on the rim as it pumped to 1,700 feet, at that time the record for observed Hawaiian fountains and perhaps for the world.

The slightest shift in the wind threatened to submerge us in cinder. There was no certainty what the volcano would do next and no power known to man to contain her.

Later, looking back from miles down the road to Hilo, I could still see her, tossing her red-and-black mantle above the mountain slope like a pagan goddess in a swirling cape.

I didn't know she was to subside that night, only to return again at frequent intervals for weeks, shattering even her own record. But a remark of Eaton's lingered in my mind.

"People always want to know two things about volcanoes," he said. "If one is erupting: how soon will it stop? If it's dormant: when will it erupt?"

"The answer is the same in both cases. We are one day closer to it."

Pumice Obliterates a Road and Enforces a Stop Sign's Command

No tires whine; no engines hum. Only the occasional crunch of a sightseer's shoe on yard-deep cinder breaks the ghostly silence. Scientists and park employees, harried with emergencies during the eruptions, knew quiet spells like this as "peacetime."

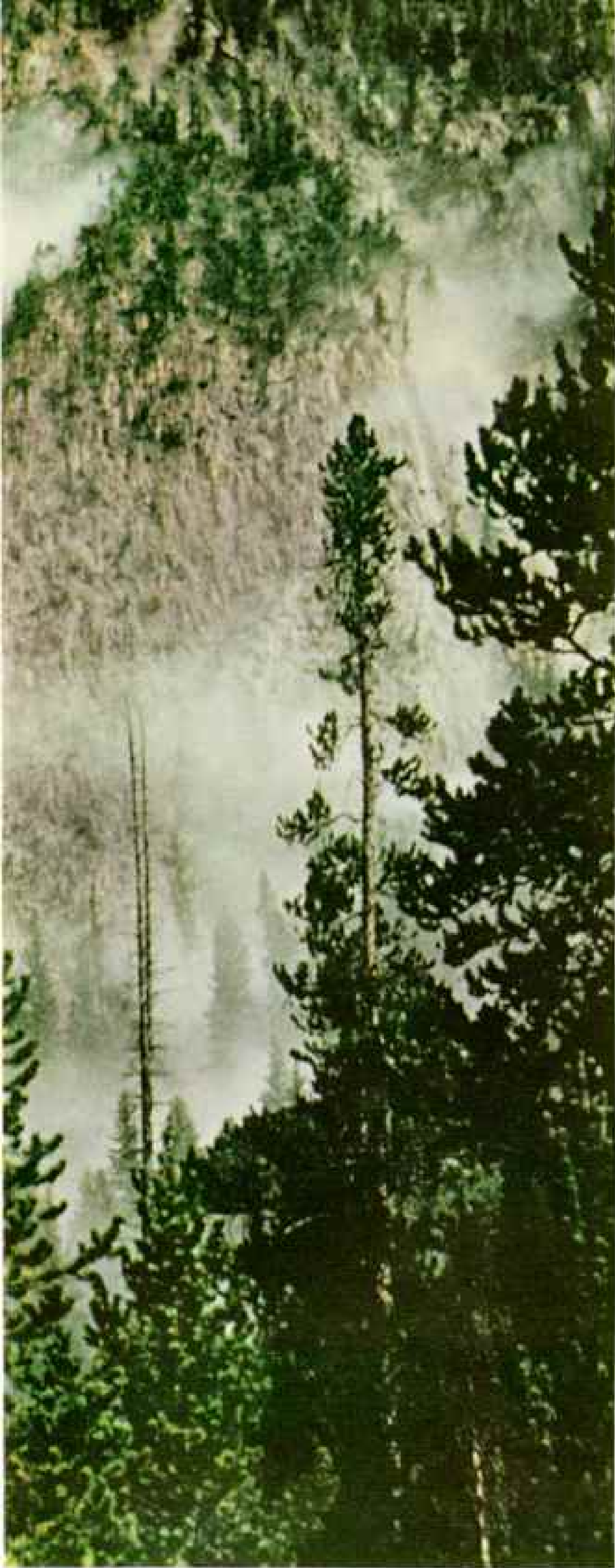
WIKRAM © NATIONAL GEOGRAPHIC SOCIETY





A Mountain Heaves, Rocks Cascade, and Dust Boils Up: an Earthquake in Action

Seismographs recorded 270 aftershocks in the 24 hours following the disastrous Montana earthquake of August 17, 1959. When one shock



YELLOWSTONE NATIONAL PARK RANGER ELLIOTT

jolted Mount Jackson in near-by Yellowstone Park, nine hours after the first quake, an alert-ranger made this extraordinary color photograph.

Montana's historic 1959 earthquake wrenched the Rockies, created a lake, and touched off new geysers in Yellowstone Park

The Night the Mountains Moved

By SAMUEL W. MATTHEWS
National Geographic Senior Staff

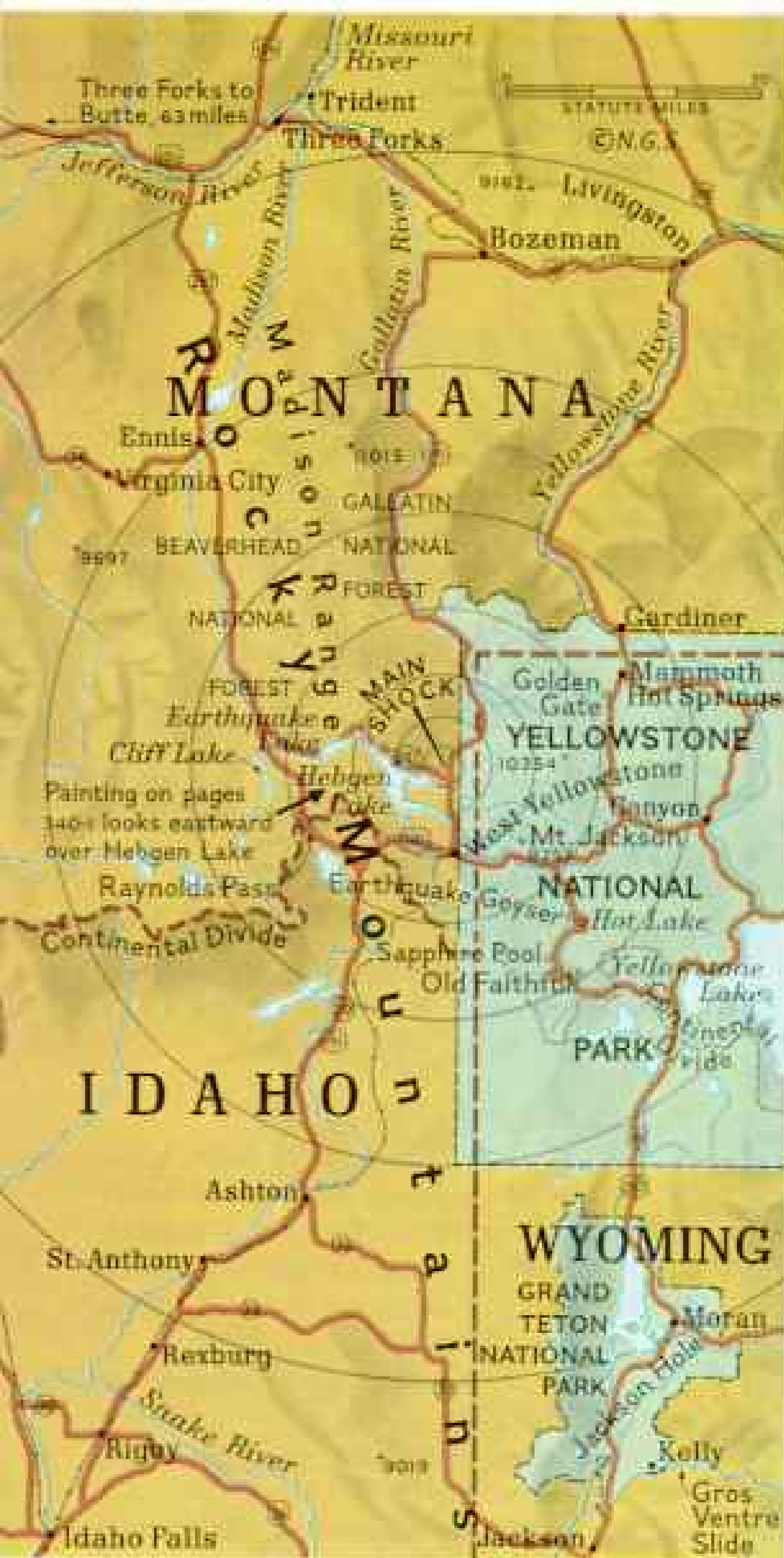
*Kodachromes by National Geographic
Photographer J. BAYLOR ROBERTS*

LATE that clear and gentle night a full moon rode above the tumbled mountainland where Montana, Wyoming, and Idaho meet. Along the mile-high Madison River the air hung cool and still. Monday, August 17, 1959, was nearly over.

Suddenly, 22 minutes and 45 seconds before midnight, an earthquake of historic force wrenched thousands of square miles of the northern Rockies. The earth's crust, warped by unimaginable strain, broke and shifted along several faults, or fractures. A lake in southwestern Montana tilted. Water leaped a dam in racing waves.

Downstream in the Madison's narrow canyon, a mountain face 1,300 feet high and half a mile wide split off and came roaring down on sleeping campers. Eighty million tons of rock and earth smashed into the river and splashed 430 feet high against the facing slope (pages 332-3). Water and terrible blasts of air shot out from under the thundering slide.

In Yellowstone National Park, 20 miles east, the peaks trembled, rockfalls cascaded across roads, and steaming geysers, mud volcanoes, and boiling-hot pools erupted simultaneously in unseen splendor.



Mountain-topping quake pounded Montana, Idaho, and Wyoming. The epicenter, or area on the earth's surface above the earthquake's origin, lay near the eastern end of Hebgen Lake.

Trees teeter along a cliff, or scarp, that suddenly split Cabin Creek Campground in Gallatin National Forest. Exposed soil and gravel trace the Hebgen Fault, a rift in the earth's crust that parallels Hebgen Lake's north shore for eight miles (painting, page 340). A visitor from Salt Lake City, Utah, photographs a fissure that snakes through a shattered fireplace.

Today, months later, earth scientists, naturalists, and engineers are still studying the earthquake region. They have surveyed, plumbed, measured, and mapped. From their work gradually has come a detailed picture of a convulsion of nature that dramatically reshaped an American wonderland.

To report on the earthquake's effects, what caused them, and what they will mean to residents and visitors for years to come, NA-



TIONAL GEOGRAPHIC photographer Joe Roberts and I spent many days exploring the area.

We first saw the Madison Slide on a September day when rain laced with snow slashed through the canyon. Earthquake Lake, the water dammed by the slide, stood 180 feet deep in the gorge, twice the depth of man-made Hebgen Lake six miles upstream.

Water ripped and foamed down the slide's face, into the riverbed below. Bulldozers, half

drowned, labored in the rapids. Joe and I found ourselves atop a wall of shattered rock, hundreds of feet above what once had been a popular camping spot within the Gallatin National Forest in Montana.

Rock Creek Campground had stood beside one of North America's most famous trout-fishing rivers, on the one hand, and a major park-to-park highway, Montana 287, on the other. Now road and river ended abruptly at







this massive barrier, and somewhere beneath rock and water lay the campground (painting, page 340).

That night of August 17, the Bennett family of Coeur d'Alene, Idaho, had been among those camped in the canyon mouth. Eastbound for Yellowstone after a day in the gold-rush atmosphere of Virginia City, Montana, they had decided to sleep under the stars. They pulled their station wagon off the highway into a pleasant turnout beside the river, and settled for the night.

Some 250 other vacationists slept in the canyon that August night. When the earthquake struck, tents, trailers, and cabins lurched and jounced as if shaken by angry bears. Actually, many campers at first thought bears were attacking them.

The Bennetts, oddly, were not greatly alarmed. The four children, in bedrolls on the ground, slept on. In the station wagon their mother and

Where a Mountain Fell: Nature Erects a Dam and Creates a Lake

Jarred loose by the earthquake, 80 million tons of rock slid off a spur of the Madison Range, leaving the naked scar on the left side of the ridge. The avalanche dammed the Madison River and buried Montana State Highway 287 beneath some 400 feet of rubble (center). Water backing up behind the slide formed Earthquake Lake. Bulldozers carved roads and shaped a spillway over the crest of the slide.

The slide threw up a barrier with a base five to eight times thicker than that needed for a man-made rockfill dam of similar height. Its volume, 43.4 million cubic yards, equals a third of the fill required by the Nation's largest earthen structure, the Fort Peck Dam across the Missouri River.

The new lake now stretches five miles upstream and reaches a depth of 130 feet at the toe of the dam.

ILLUSTRATION BY NATIONAL GEOGRAPHIC
PHOTOGRAPHER J. LUTHER ROBERTS AND
CURTIS DEAN. PHOTO © N.G.S.

father awoke, but merely wondered "what the loud noise had been."

Some time later, Mrs. Bennett remembers, they heard another great roar. Hastily they went to check on the children. Mrs. Bennett felt a blast of wind and saw her husband grab a small tree for support. She saw him "lift off his feet, hang for a second like a flag, and let go."

She never saw him alive again. One of her children flew by, and a car rolled over and over past her. Then she lost consciousness.

"The first thing I knew I was in water, rolling and banging into things," 16-year-old Philip Bennett told me (opposite).

When he stopped, he knew his left leg was badly broken. He felt no pain, but he was entirely naked and very cold. The earth trembled, and huge shadows rolled in the sky—dust clouds, he realized later. He crawled crablike into a clump of trees and dug into

the mud to keep warm. All night he stayed awake, sure that more water would come rushing down on him, "preparing for it."

At dawn searchers heard Phil and Mrs. Bennett calling for help, and found them in the dry riverbed on the edge of the slide. Later they found the battered, lifeless bodies of Mr. Bennett and his other three children.

Wind Tears Clothes From Campers

Seven families between the Bennetts and Rock Creek Campground were buried alive by the rock, earth, and trees of the landslide. Other people in the campground proper were picked up by water that backwashed 100 feet up the mountainside, and by the hurricane-velocity gusts shot out as the slide displaced air in its path. Several had their clothes literally torn from their bodies.

Nine, in all, could be counted dead. Nineteen more are still missing to this day, pre-

Survivors await rescue on a slope facing the slide-scarred ridge. Fearing a flood if Hebgen Dam gave way, pajama-clad campers leaped out of bed and fled to high ground.

PAUL F. JEROME AND EBBETT D. HANE





ALBERT WULFVAY (ABOVE) AND NATIONAL GEOGRAPHIC PHOTOGRAPHER J. EATON ROBERTS (© W.E.L.)

Victims Bed Down on Bales of Hay

Rescued by helicopter, the injured lie beside West Yellowstone airfield awaiting evacuation by ambulance plane to Bozeman, Montana.

Some of the 250 campers trapped by the earthquake in Madison Canyon abandoned their cars and scrambled across the slide. An emergency road let others drive to safety. The quake's toll: nine dead, nineteen missing.

Plucky survivor, 16-year-old Philip Bennett of Coeur d'Alene, Idaho, suffered a mangled leg but remained conscious until rescued. His father, brother, and two sisters perished in the slide. Nurse Mona Reid autographs his cast as he leaves the hospital in Emmis, Montana, after 47 days.





JOHN R. STACEY, U. S. GEOLOGICAL SURVEY (LEFT) AND WILLIAM B. HALL

Shattered by the Quake, State Highway 287 Disappears Into Hebgen Lake

Its bed warped, the lake today drowns part of the north shore under nine feet of water and exposes its southeast rim. Four big landslips cut the road.

Cadillac plunges off a zigzag crack across U. S. 191. Alarmed by the quake, the driver and his family were fleeing for West Yellowstone when the car turned turtle. The occupants crawled out of the hole where the windshield had been.

sumed lost beneath hundreds of feet of rock.

"That south wall of the canyon must have been on trigger edge for years," Dr. Jarvis E. Hadley of the U. S. Geological Survey told me—"a mountain slide simply waiting for an earthquake to happen."

Dr. Hadley was one of more than 25 geologists, geophysicists, ground-water experts, and other scientists assigned by the Survey to study the earthquake area. He had felt the quake himself; on the night of the slide he was in the town of Ennis, 45 miles downstream.

"Rock layers in the mountain face tilted

steeply toward the river," the geologist explained. "They were weathered and cracked, relatively soft schists and gneiss mixed with slippery mica, with clay in the old clefts and cracks. These greased the skids when the face came down.

"At the base of the ridge ran a buttress of marblelike dolomite. This ledge broke cleanly, probably in the first quake. It had been holding up the mountain."

The layers above snapped, shifted slightly, much as sheets of glass stacked together might move, then hesitated.



Just how long the mountainside hung, a few minutes or as long as three quarters of an hour, neither geologists nor campers themselves can be sure. But as the earth continued to tremble and rock under repeated aftershocks, the slope suddenly began moving.

"When it moved, most of it came down as one mass, 200 to 400 feet thick, and it came fast," Dr. Hadley said. "The main slide was over in less than a minute."

Slide Builds an 80-million-ton Dam

By studying aerial photographs and contour maps of the slide, Army Engineers and geologists calculated the volume of rock and earth that fell: 43.4 million cubic yards, weighing about 80 million tons.

Hoover Dam on the Colorado, highest in the Western Hemisphere, contains only 4.4 million cubic yards of concrete, or one-tenth as much material. Grand Coulee on the Columbia holds only a quarter the slide's volume. Calculated another way, enough material slid into the Madison Canyon to cover Manhattan Island two feet deep.

"For a dam, it fell in the logical spot in the canyon, with the right types of rock pretty much in the right places," Lt. Col. Walter W. Hogrefe of the U. S. Army Corps of Engineers told me.

The slide blocked the Madison River with nearly a mile of rock, 200 to 400 feet deep along its crest. Within a week, Army flood-control technicians, hydrologists, and hard-helmeted construction men were at work cutting and rock-paving an emergency spillway.

337





"Did you ever hear of the Gros Ventre Slide?" Colonel Hogrefe asked me. "In 1925, about 100 miles from here east of Jackson Hole, a mountain much like this one came down and blocked the Gros Ventre River.

"Nothing was done to stabilize it, and two years later the crest washed out suddenly. Six people were drowned, and the town of Kelly, Wyoming, was swept away in the flood."

Damage that would be caused by a similar flood in the Madison Valley might exceed \$15,000,000, Colonel Hogrefe estimated.

The Engineers, authorized by law to assist State and local officials in flood fighting and rescue operations, had little time. Winter was coming fast in the high Rockies. And an added menace loomed upstream.

Cracked Dam Holds Back a Flood

Hebgen Dam had been gravely damaged by the earthquake. Its concrete core had cracked, and the earth fill on both sides had slumped. Behind it Hebgen Lake, brimful, held enough water to cover a third of a million acres a foot deep (page 354).

Should Hebgen go out, the wave rushing down the Madison would sweep over the slide and on down the valley. It would flood Ennis and many a ranch and resort, and perhaps not be checked until beyond the point where the river meets the Gallatin and the Jefferson to form the mighty Missouri (page 356).

To repair its 44-year-old dam, the Montana Power Company wanted to draw down Hebgen Lake as soon as possible. But the slide across the river below first had to be stabilized.

For two months the Engineers worked \$3,000,000 worth of roaring rock-moving machines around the clock. They cut a notch more than 50 feet deep to lessen the grade of the rapids and permit an added flow of water without risk of sudden washout.

By November 1 the job was done. But severe blizzards a few days later prevented repairing Hebgen Dam before spring.

Joe Roberts and I climbed the back face of the shattered mountain above the Madison. On the torn and fissured ridge, wind whispered eerily through dry grass. We peered down the dizzying slide face, sheer and bare. Below, Earthquake Lake stretched away through the canyon, blue and placid against its forest-dark walls, five miles long.

Serpentine fence along State 287 illustrates the enormous force that squeezed and sheared the earth. Geologists study such details to assess the quake's effects.



The night of the earthquake, as the Madison Range gave its first massive shudder, strange and sudden things happened along the shores of Hebgen Lake, rimmed by summer homes, fishing resorts, and dude ranches, and on the north shore by Highway 287.

At four different places the road broke away and slid into the heaving water (page 336). The lake bottom itself tilted and folded, draining water in from both ends, then sloshing it northwestward toward the dam in a rushing wave, like a full dishpan rocked back and forth.

Near the Yellowstone Park boundary, east and slightly north of the lake, the ground suddenly broke and dropped. An earth cliff, or scarp, appeared where level ground had been a moment before.

The cliff, in places twice as high as a man's head, cleaved the Y-shaped junction of State 287 and U. S. 191, zigzagged uphill through groves of pine and quaking aspen, and curved north and west along the face of steep canyon ridges above the lake (page 352). The great wound ran nearly 20 miles.

Another jagged scarp, closer to the lake shore, followed the slope above Highway 287 northwest past Hebgen Dam. It sheared straight through Cabin Creek Campground in the upper end of Madison Canyon (page 330).

Geologist Finds a "Pot of Gold"

One man was glad to be caught in the quake: geologist Irving J. Witkind of the Geological Survey. He was fast asleep in his field trailer on a hillside above the northeast arm of Hebgen Lake when the earth heaved.

"I thought my trailer was loose and rolling downhill," he recalls. "I came charging out to stop it, though how I expected to do it I'll never know.

"Then I saw trees swaying, without any wind, and knew it was an earthquake. I thought of the ranch houses below me, and started down in my jeep. I almost drove straight over a 14-foot scarp that wasn't there the day before.

"For a geologist to be sitting on top of a fault when it slips is like falling over a pot of gold," Dr. Witkind said with a grin. "In two summers of mapping that region around Hebgen Lake, I had traced what ap-

(Continued on page 347)

Broken center stripe and rifts in the pavement reflect the earthquake's violence. Motorists bypassed this stretch of U. S. 191 by driving on the shoulder.



Red Canyon Fault Scarp

West Fork Fault Scarp

Hebgen Fault Scarp

Boat Mountain

Parts of lower lake
8 to 10 feet deeper

Hebgen Dam

Cabin Creek
Campground

EARTHQUAKE LAKE

Madison Range

Madison Slide buried Rock Creek Campground
and dammed Madison River, forming Quake Lake

MISSOURI FLATS

Ennis, Montana, 42 miles downstream,
evacuated at 3 a.m. in fear
Hebgen Dam had failed

Montana Highway 287

Madison River

HOW THE EARTHQUAKE SCARRED THE ROCKIES AND FORMED A LAKE

Fault scarps exaggerated for clarity

Main shock began at a point 8 to 10 miles beneath earth's surface

Fault cracked U.S. Highway 191

Montana Highway 287 cut in four places

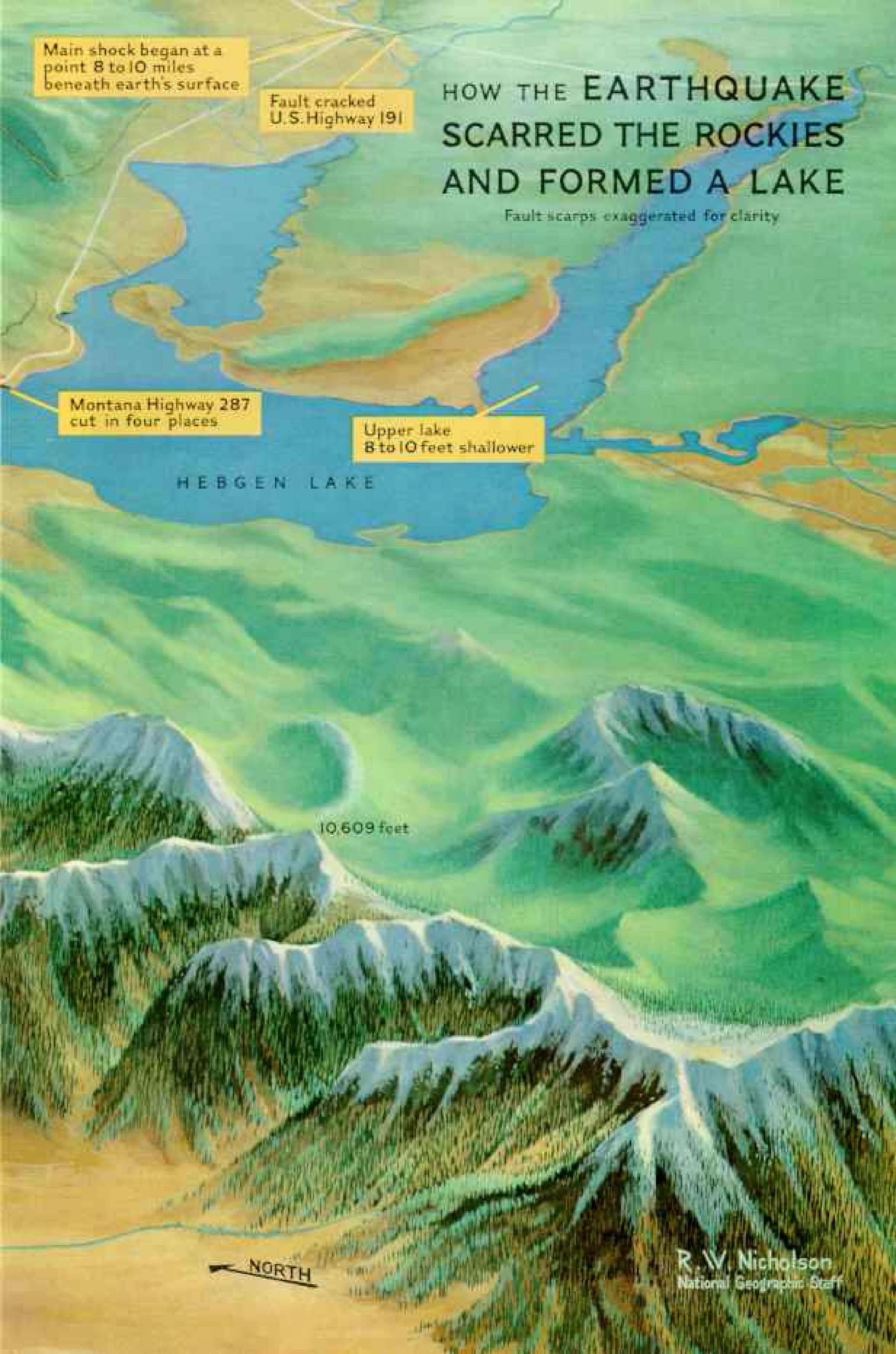
Upper lake 8 to 10 feet shallower

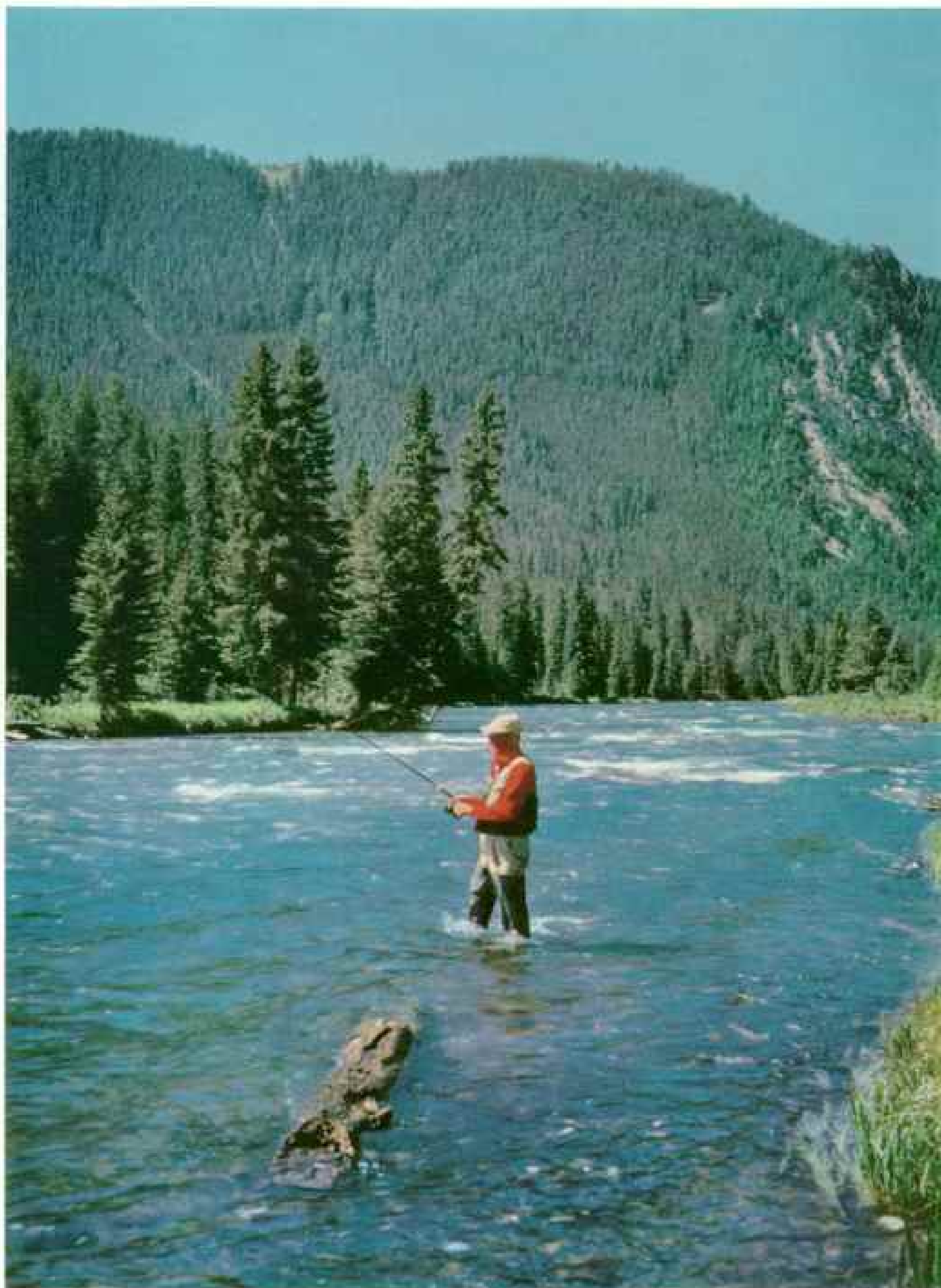
HEBGEN LAKE

10,609 feet

NORTH

R. W. Nicholson
National Geographic Staff





ERNEST PETERSON. COURTESY MONTANA POWER COMPANY © NATIONAL GEOGRAPHIC SOCIETY

Before the Slide: A Fisherman Wades the Madison Where a Dam Now Lies

Blanketed by trees, the canyon wall rose to an elevation of 7,600 feet. This entire section thundered down, damming the river and burying part of Rock Creek Campground, on the near side. Herbert Hoover often has fished the Madison, a famous trout stream.

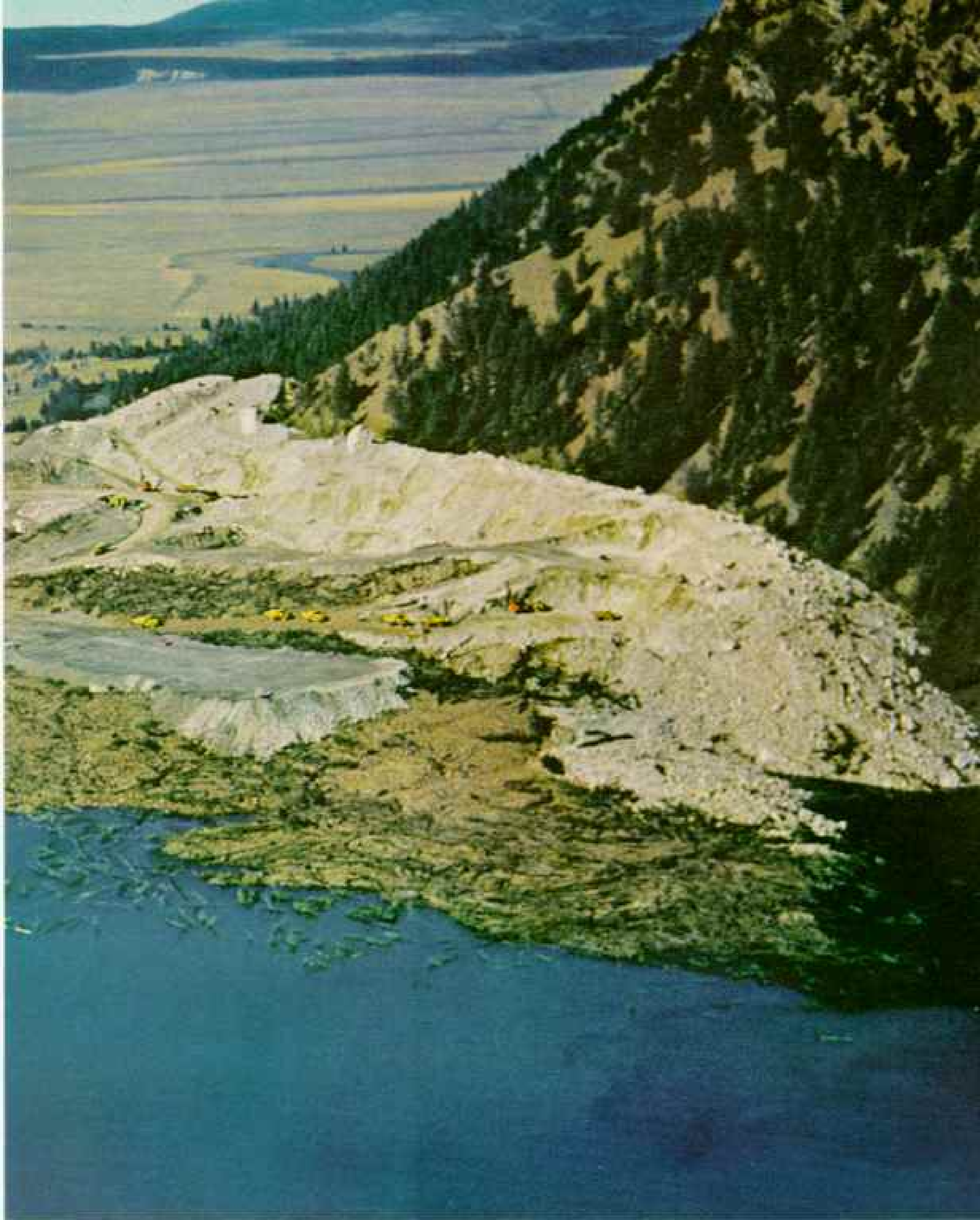
After the Slide: A bulldozer crosses the spillway carved across the barrier's crest, 200 feet above the old riverbed where the fisherman (above) casts for trout. Earth-movers often foundered in the rapids. One truck tumbled down the spillway, but the driver escaped serious injury. Pulverized rock scars the denuded slope.





**Men and Machines Toil Around the Clock
to Shape a Spillway Over the Slide**

Soft rock resting against a wedge of dolomite covered the face of the mountain that fell. When the earthquake snapped the dolomite buttress, a mass of rock up to 400 feet thick plunged down the slope at left and splashed upward against the opposite canyon wall. Water surging from the Madison River flung campers from their beds and



© NATIONAL GEOGRAPHIC SOCIETY

flipped house trailers end over end. Dammed by the slide, the river rose three to six inches an hour. Fearing the overflow would wash out the barrier and send a flash flood coursing downstream, Army Engineers hastily notched the crest to lower the lake, slow the flow of water over the natural dam, and reduce erosion.

Crushed dolomite glistens along the right fringe of the slide. Earthmovers, glinting in the morning sun, crawl over the schist and gneiss that make up the dark bulk of the slide.

Missouri Flats, named for homesteaders from the Midwest, sprawls beyond the canyon mouth. Gallatin National Forest ends below the slide.



peared to be an old fault line. Now I got down on my hands and knees and almost kissed the scarp. It was *mine!*"

Dr. Witkind was indeed on top of the earthquake. Seismic data telegraphed to Washington, D. C., from all across the West fixed the focus of the first great shock eight to ten miles deep in the earth's crust. The epicenter, or surface location directly above the focus, lay just northeast of the geologist's campsite.

For weeks he traced and mapped the jagged breaks through the mountains, on horseback and afoot (page 353). Meanwhile other Survey specialists studied the tilted lake, the broken highways and twisted fences, and the shifted ground.

Quakes Reshape a Land of Wonders

Inside Yellowstone Park, not far to the east, the earthquake struck with a rumble "like a heavy train crossing a trestle," as a Union Pacific man described it. "The ground got right up and shook—like a horse galloping," another visitor said.

Buildings jerked, swayed, and creaked. The

huge log-built Old Faithful Inn echoed with a "Whoom! Whoom!" as if it were a drum.

Rockfalls cascaded through high ravines. Huge boulders bounded and smashed down onto roads, leaving swaths of felled trees in their wake (below).

"We had 18,000 people inside Yellowstone that night," Superintendent Lemuel A. Garrison told me later. "The Lord had His arms around us. Not one person was killed or badly hurt. Think what could have happened if the quake had come during daylight—at Old Faithful Inn, for example, where the chimney fell into the dining room."

Among those in the park was Andrew H. Brown of the NATIONAL GEOGRAPHIC staff, who was gathering material and photographs for a forthcoming article on Yellowstone.

Brought full awake by the "rolling roar" that rocked and bounced his cabin at Canyon, Andy Brown experienced also the aftershocks that jarred the park for days. While roads were still closed and campers trapped between slides were being guided out, he interviewed park officials and saw the many immediate changes in Yellowstone.

Falling Rock Menaces a Road Repair Crew at Yellowstone's Golden Gate

An avalanche spawned by the first quake buried the road, which runs through a notch in northwestern Yellowstone. As men labored to clear the debris early next morning, an aftershock unleashed a second slide. One rock struck the earthmover as the driver backed to safety. The other men fled on foot amid a rain of boulders. Dick Ferguson, a park employee, had his camera ready when the aftershock struck.

Giant boulder blocks the highway a few miles from the park's west entrance. Some rocks bounced all the way to the river. Ranger Bob Perkins surveys shattered trees.



Park Naturalist George D. Marler, who has lived for years with Yellowstone's steaming, spouting thermal features, told him:

"Nature turned a climactic page in her book. It could have taken hundreds of years to bring about what happened here in a few hours."

Shocks Set Off New Geysers

The earthquake unleashed a sudden tremendous surge of thermal energy in the park. Geyser basins exploded into violent activity. Quiet pools and dormant vents erupted with a whishing and a whistling—a weird chorus of sound and fury.

"I only wish I could have seen what happened when the first shock hit," George Marler said wistfully. "Most of the geysers and pools must have erupted simultaneously. The swash marks show how violently they threw water."

Old Faithful seemed just as faithful after the earthquake: its average 61-minute cycle of eruptions slowed only slightly to 65 minutes. But elsewhere Yellowstone both gained and lost a host of geysers and other hot-water features.

Castle, Daisy, and Great Fountain, among many others, speeded

MELVILLE BELL GROSVENOR



Picnic spot on the Madison now lies far under water. Photographed a year before the slide, the scene captures the tumbling river and lofty bluffs that attracted campers to Madison Canyon.

The picnickers, Mr. and Mrs. Sumner Gerard (left) and Mrs. Melville Bell Grosvenor, sit on a bank where fish now feed in Earthquake Lake (above).



NATIONAL GEOGRAPHIC PHOTOGRAPHER J. BAYLOR RESORTS © N.G.S.

Cabins float and trees drown as 'Quake Lake creeps up the walls of Madison Canyon

up their performances. Clepsydra, which had erupted only about every four days, went into a continuous "wild phase," pouring out enough steam to drive most of the heat and power plants in the park.

Cascade Geyser, which had not erupted for 40 years, blew its top. Economic Geyser, still for 25 years, began playing 50 feet high every half hour. The Giantess fountained as high as 200 feet for more than four days of uninterrupted glory.

Grand Geyser, one of the highest performers in the park, quit cold. But, as if in repayment, an entirely new "Earthquake Geyser" began playing 75 and 100 feet high at the end of a steam-spouting rift in the Lower Geyser Basin.

Most dramatically, Sapphire Pool in Biscuit Basin changed from a serene, limpid dispenser of silvery gas bubbles to a seething, soaring giant among geysers (page 358).

Not until three weeks after the first earth-

quake did Sapphire blow up. Then it played, regularly and furiously, for eight days. A sharp after-tremor shut it off. Sixteen days later another jolted it to life again.

Since then, constantly on trigger edge, Sapphire has spewed skyward every half hour to two hours. "Yellowstone has seen nothing like it since Excelsior erupted in the 1880's," George Marler said.

All across Yellowstone's superheated wonderland, naturalists spent the fall and early winter measuring depths, taking temperatures, charting the changes the earthquake produced. Their hooded, steam-shrouded figures startled late-season park visitors. Men with long poles fishing in boiling-hot pools? They must be out of their minds!

"The unique underground plumbing system of Yellowstone offers science a chance to learn more of what happens below the surface dur-

ing an earthquake," Superintendent Garrison told me. "The National Park Service has already begun such a study."

"The Yellowstone region of western Montana will continue to feel earth tremors for months, if not for years, as the earth shakes down to a new equilibrium," forecast Prof. Stephen W. Nile of the Montana School of Mines. A physicist, and Collaborator in Seismology for the U.S. Coast and Geodetic Survey, he ranks as chief earthquake recorder and consultant for his State.

Scientist Shaken by His Subject

The night of August 17, Dr. Nile was vacationing at a dude ranch 30 miles north of West Yellowstone, Montana. Without access to his big seismographs bolted to solid concrete at Butte, the excited professor did what he could to time and record intensities of the

Broken Crockery Litters a Kitchen Floor in West Yellowstone

Temblors ruptured gas lines, toppled chimneys, emptied bookcases, tossed television sets to the floor, and sent groceries flying from shelves. Mrs. Elt Davis (below) retrieved only four cups and three dinner plates from a service for 12.



ELT DAVIS



NATIONAL GEOGRAPHIC PHOTOGRAPHER J. BAYLER ROBERTS © N.G.S.

Children play in the rubble-strewn yard of the West Yellowstone school. Blocks jarred from walls and chimney clutter the playground a month after the quake.

tremors. He used a teaspoon on a string as a pendulum, and a glass of water to detect vertical jolts.

Joe Roberts and I later visited Dr. Nile's office at Butte, jammed with books, instruments, and sheafs of seismograms—the "fingerprints of the jittery earth," as he called them. He showed us tracings of aftershocks that still were being recorded, dozens a day, at the Butte seismograph station.

"Montana's earthquakes," Professor Nile told us, "are direct proof that the Rocky Mountains around us are still growing."

The Madison Range began rising from an ancient sea bed about 50 million years ago, geologists say. The tremendous underground forces that folded and uplifted these mountains still press on them, relentlessly bending and distorting their rock layers.

Finally, when the warped layers can bend no more, they snap along a fault, releasing the terrible energy of an earthquake.

"Try pushing your hand down and away from you as hard as you can on the desk," Professor Nile said. "It will jump suddenly rather than slide smoothly. A fault works the same way; it breaks and rebounds with sudden lurches. In fact, modern earthquake theory speaks of 'elastic rebound.'"

Shock waves from a shifting fault travel outward in all directions through the earth. Seismographs register two main types, P and S waves—primary and secondary, or "push" and "shake."

"The P wave is just like sound in air," Dr. Nile said. "The rock moves to and fro in the direction the wave is moving. That's the fastest wave, and it arrives first—right 351



there." He pointed to a sharp jump on a seismogram.

"The other shakes the rock particles from side to side as it passes, like waves in a clothesline when you waggle it. The S wave came along . . . here!" And he pointed to a second and smaller peak.

"The time interval between them tells us how far away the earthquake took place," the seismologist continued. "With three or more records from different points, we can plot the epicenter.

"It took the Hebgen Lake shock 28 seconds to reach Butte. An earthquake in Japan arrives here in 10 to 12 minutes."

From seismograph records the magnitude of a shock can also be calculated, Dr. Nile told us, using logarithmic scales devised by Drs. Charles F. Richter and Beno Gutenberg of the California Institute of Technology.

Few U. S. Earthquakes More Violent

Caltech's measurements gave the Montana earthquake a magnitude of 7.1, ranking it as one of the six strongest recorded shocks ever to jolt the United States, outside of Alaska.

The famous San Francisco earthquake of 1906, which killed 450 and set fires that consumed the city, had a magnitude of 8.3; Kern County, California, suffered a shock of 7.7 in



Red Canyon Fault Draws a Jagged Line Across the Face of a Wooded Ridge

Just as winding stores energy in a watch spring, a strain within the earth's crust slowly builds up energy in the rock. When the strain grows too great, the rock breaks and takes a new position. Such a movement releases explosive energy, triggering an earthquake.

The scarp above Red Canyon Fault cleaves the hills north of Hebgen Lake.

Scarp furrows the earth above Hebgen Fault. Dr. Irving J. Witkind of the United States Geological Survey examines the cleft, which took shape when the lower face fell away. His assistant, William Quinlivan, takes notes.

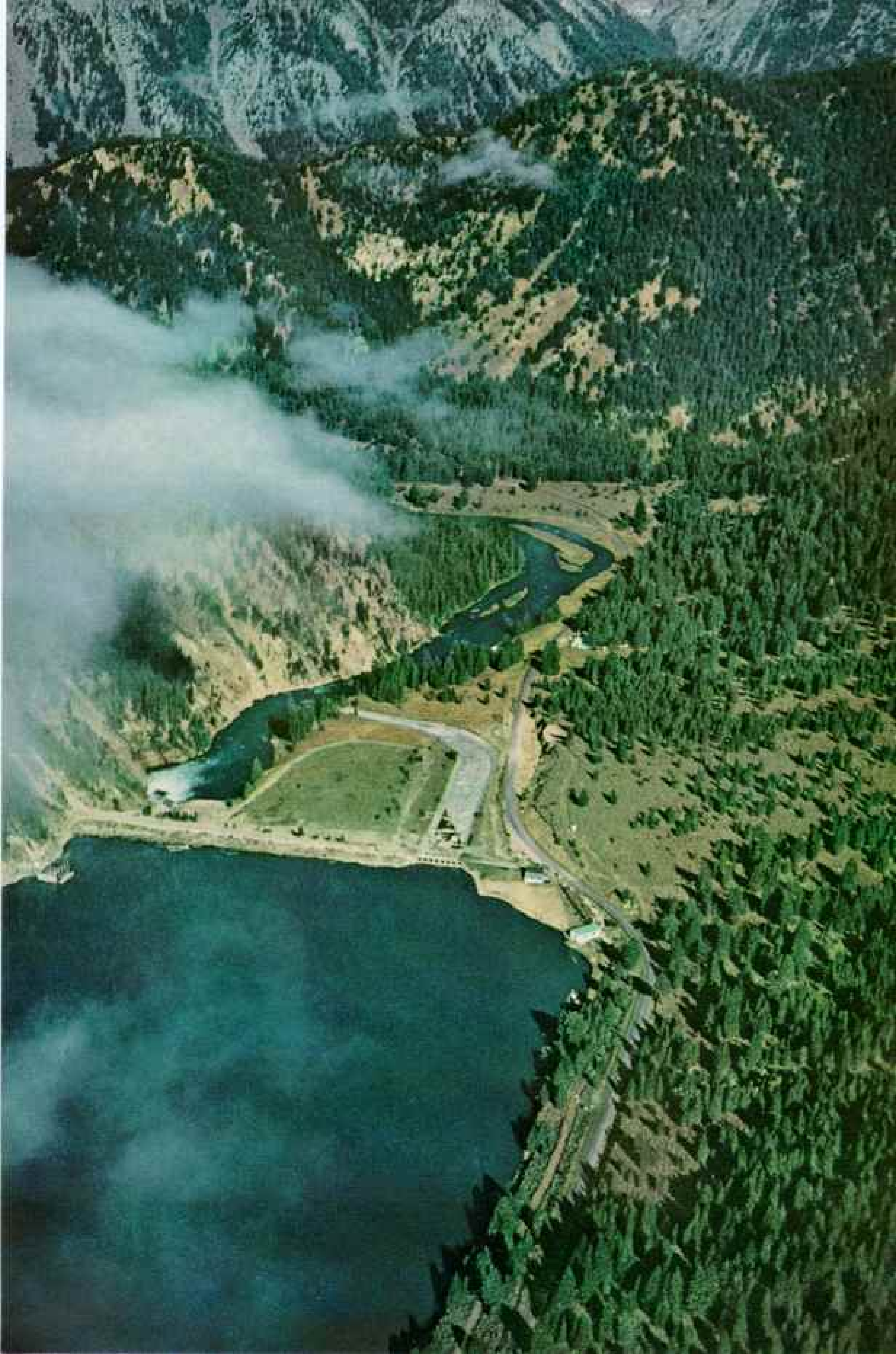


NATIONAL GEOGRAPHIC PHOTOGRAPHER J. BRYLOR ROBERTS © N.G.S.

1952; and earthquakes in sparsely populated regions of Nevada in 1915, 1932, and 1954 registered 7.6, 7.3, and 7.1 respectively.

Probably the greatest earthquakes ever to hit the United States wrenched the Mississippi Valley in 1811 and 1812, long before modern seismographs. Jarring an enormous area, the shocks wrecked the town of New Madrid, Missouri, and created Reelfoot Lake by dropping the northwest corner of Tennessee.

For sheer horror, none surpasses the Japanese earthquake of 1923, which



caused the death of a quarter of a million people and leveled Tokyo and Yokohama. But the worst earthquake year on record was 1906, when cataclysmic shocks hit not only San Francisco, but Colombia and Ecuador, Chile and New Guinea, Formosa and the Aleutian Islands, Japan and Sinkiang in western China.

Newly revised lists give greatest magnitude, 8.9, to the Colombia-Ecuador quake of January 31, 1906, and to a shock off the Japanese coast in 1933. The great Assam-Tibet earthquake of 1950 and at least five others follow with magnitude 8.7.*

Restless Earth Keeps Trembling

Fortunately, such severe shocks are rare, but our planet's crust is never still. More than a million earthquakes occur each year, seismologists estimate. About 700 detectable tremors strike the United States annually.

"Montanans seem to forget it," Dr. Nile said, "but this State gets a perceptible jolt about every two years, and a real wallop once every decade. Since seismograph records have been kept, truly severe earthquakes have hit Montana in 1925, 1935, 1947, and now 1959."

Most earthquakes fall in a few belts of greatest activity. One rings

the Pacific Ocean. Another runs from Burma to the Mediterranean and on into the Atlantic. In the United States the most active regions lie in Alaska and along the 600-mile San Andreas Fault in California.

The San Andreas Fault shifted 21 feet horizontally in 1906. In last year's Montana shocks the movement was chiefly vertical. Precise measurements by geologists and Coast and Geodetic Survey teams found changes in elevation of as much as 19 feet along the northern shore of Hebgen Lake.

Other, more far-reaching effects may have occurred as well. The entire Yellowstone region may have changed its level above the sea. Whether this is so, only future surveys covering hundreds of miles can tell.

Within two weeks of the August earthquake,

* See "Caught in the Assam-Tibet Earthquake," by F. Kingston-Ward, NATIONAL GEOGRAPHIC, March, 1952.

Damaged but Still Standing, Hebgen Dam Corks a Flood

An earthen structure with a concrete core, the dam regulates the flow to downstream reservoirs. Built half a century ago by the Montana Power Company, it stands 87½ feet high and 718 feet long.

The quake cracked the core and shattered the spillway. During repairs water flows through a diversion tunnel.

If Hebgen Dam had given way, a wall of water would have washed over the slide six miles downstream and flooded the Madison Valley.

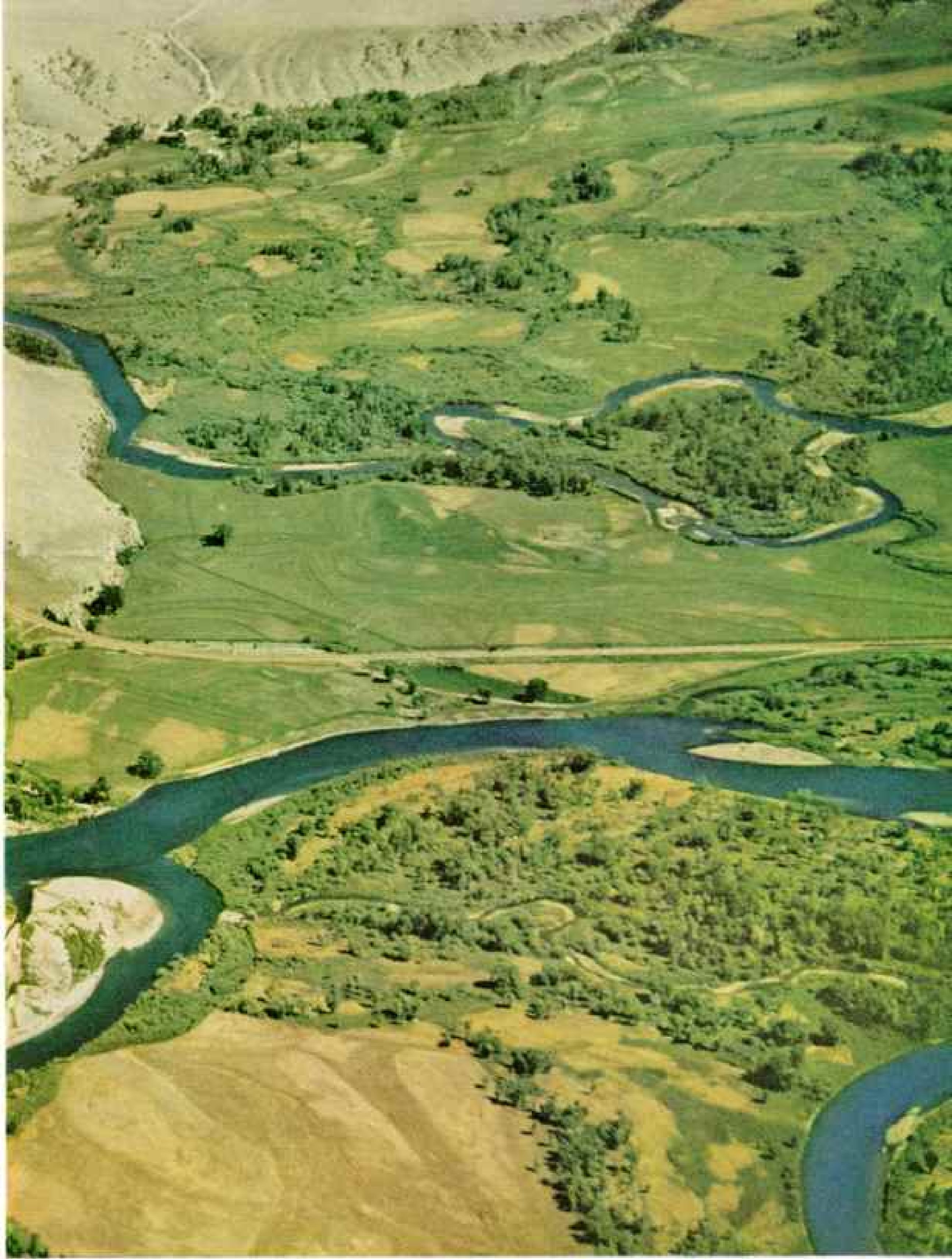
"It was this high." Caretaker George Hungerford describes a wave that swept over the dam. Fresh concrete will be pumped into the crack caused by the quake.





Three Forks of the Missouri Converge
in a Maze of Islets and Twisting Rivers

Lewis and Clark, who camped here in 1805, discovered the parent streams and named them for President Jefferson and two members of his cabinet. The Jefferson (lower left) unites with the Madison (center) and flows between a highway and tracks of the Chicago, Milwaukee, St. Paul



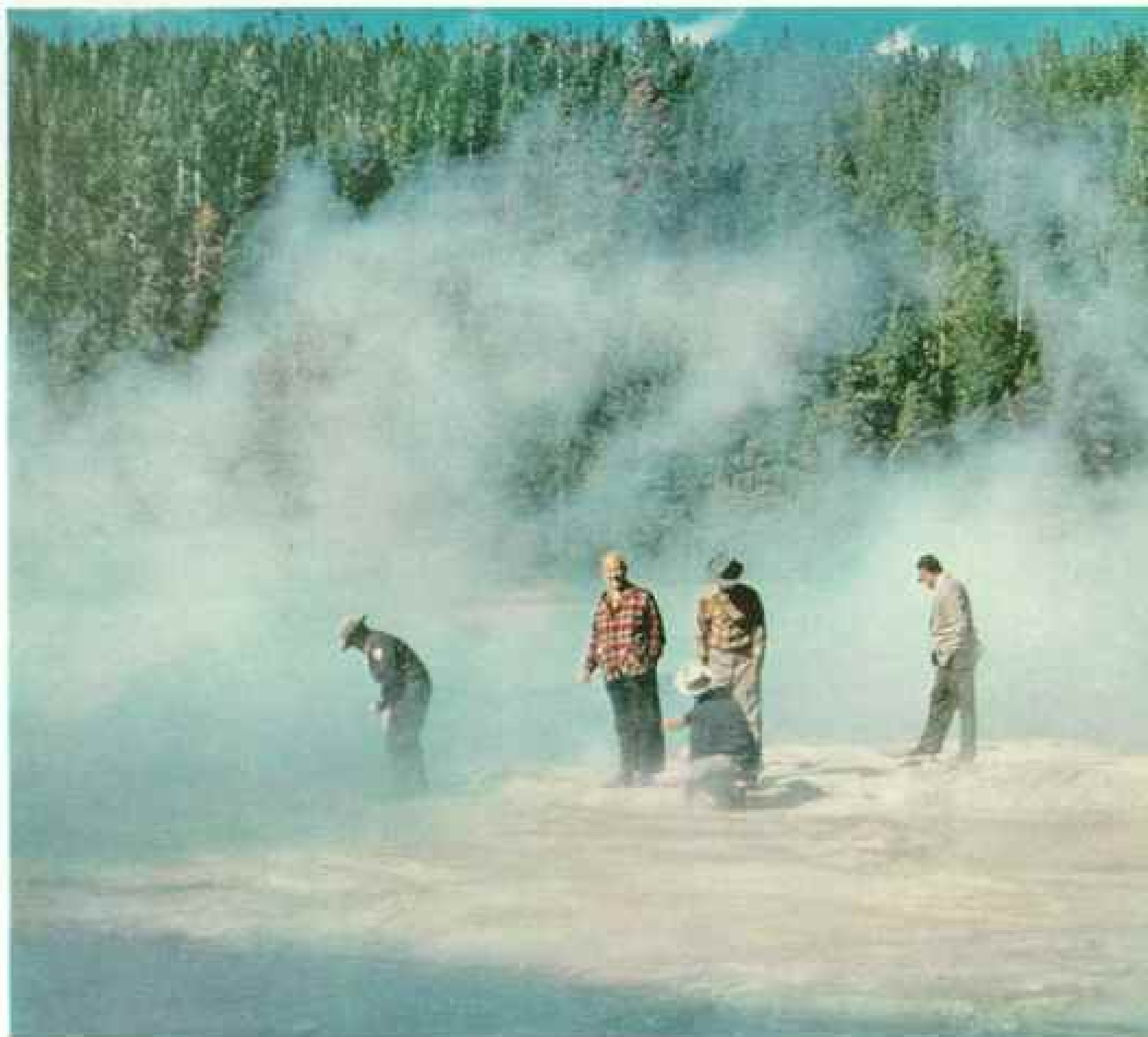
RESEARCHED BY MELVILLE BELL BRIDGEMAN AND DENNIS DENNIS. PHOTO © NATIONAL GEOGRAPHIC SOCIETY

and Pacific. The Gallatin—for Albert Gallatin, Secretary of the Treasury—snakes in at the top, below the Northern Pacific's right of way. Missouri River, highway, and railroads then pass Trident, Montana (upper left), where a plume of dust usually hangs over a cement plant. Dams

along the "Big Muddy's" tributaries curb floods that once plagued the confluence.

Here, 60 miles north of the Madison Slide, abandoned river channels indent farm and forest lands. The town of Three Forks lies between the Madison and Jefferson, just out of the picture.





NATIONAL GEOGRAPHIC PHOTOGRAPHER J. BRUCE ROBERTS (COURTESY) AND ELLIOTT DAVIS © N.G.S.

Steam from Hot Lake in Yellowstone billows above Steady Geyser's mouth. Conrad L. Wirth (second from left), National Park Service Director, inspects cracks in the rim.

Sapphire Pool, a Mouse That Became a Lion, Scalds the Yellowstone Sky

Earth tremors warped the subterranean plumbing that feeds the park's thermal springs. Old geysers changed schedule, new ones exploded, and bubbling springs burst into violent activity. Last September placid Sapphire Pool suddenly became a geyser, blasting 50 to 50 tons of water a hundred feet or more into the air in frequent eruptions.

the U. S. Forest Service had designated the stricken region along the Madison as a special "geologic area." A task force of highway engineers, geologists, and watershed specialists drew plans for its protection.


"We hope to enable people to see just what nature has done," Regional Forester Charles L. Tebbe told me in his headquarters at Missoula.

Montana's able, plain-spoken Governor J. Hugo Aronson expressed the same hope. "The Madison River has always attracted visitors," he told me. "They will keep coming, and they will want to see the effects of Montana's worst earthquake."

To restore highway travel, State and Forest Service engineers are already planning two new roads. One, an entirely new primary highway linking Montana and Idaho, will cross the Continental Divide over Reynolds Pass, a wide, gentle saddle just south of the Madison Canyon. The other, far more difficult to build, will again thread the canyon, running across the giant landslide and along Earthquake Lake.

Access trails and overlooks will enable vacationists to see the devastation produced in a few awesome moments last August—mute testimony to the terrible power of mountains that moved in the dark of night.





*A Swiss makes history's first
geological survey in a mountainous land
where the wheel has little use*

Afoot in Roadless Nepal

By TONI HAGEN, Ph.D.

Kodachromes by the author

IN THE mid-twentieth century, I never expected to find myself risking a breach of contract with Karkotak, Lord of all the Snakes. But this was Nepal, where the improbable becomes the probable, and my house servants were adamant.

Under no circumstances, they declared, must I kill the six-foot-long snake my four-year-old daughter Kathrin had found peacefully asleep on the stairs of our house in the Nepalese capital.

"Katmandu people have agreement with Karkotak," Aila, my Sherpa major-domo, explained. "They not harm the snakes, the snakes not harm them. Simple, sir."

I have a profound distrust of any snake I can't identify, and so my wife Gertrud and I decided that while we couldn't break Karkotak's pact, our perky brown dachshund Fritz was not a party to the agreement. Brought face to face with the invader, our fearless Fritz set up such a ferocious barking that the snake withdrew, discouraged but unharmed, to seek quieter quarters for its nap. Fritz got an extra helping of dinner that eve-

Silvered by eternal snows, Nepal's mountain crown shimmers beyond a heat-brewed haze. Ten miles ahead of the trail-trudging porter, unconquered, unnamed peaks in the Dhaulagiri chain vault more than 25,000 feet. Working for the United Nations, the author hiked up and down such paths and feasted on such vistas for nearly a decade. He was the first European allowed to roam the kingdom freely.

ning, and I was left to ponder yet another of the frequently baffling aspects of life in this almost unknown Himalayan kingdom.

Nepal, home of the world-famed Gurkha soldier, is emerging like a sleepily blinking child from a slumber of centuries into the bright light of the nuclear era. This is a medieval fastness where the royal palace is so modern that it boasts neon and fluorescent lighting. This is the homeland of the weather-beaten old man with whom I stood and watched a Royal Nepal Airline cargo plane discharge a new jeep at Pokhara airport.

"See," the old fellow explained gravely to his grandchildren, watching open-mouthed, "soon the little one will grow large, it will sprout wings, and then it will fly away, just like its mother."

Nepal Mounts a Stairway to the Summit of the Earth

A rectangle 500 miles long and 100 miles wide, Nepal encloses fantastic contrasts. The low-lying Terai steams with jungles, home of tiger and rhinoceros and haunt of deadly fevers. In the midlands rice fields terrace the slopes, and Buddhist and Hindu shrines dot the valleys. At the Tibetan border Himalayan giants bare monstrous fangs of ice, and winds howl in ceaseless anger. Except for the link between Katmandu and the Indian frontier, Nepal is virtually roadless.

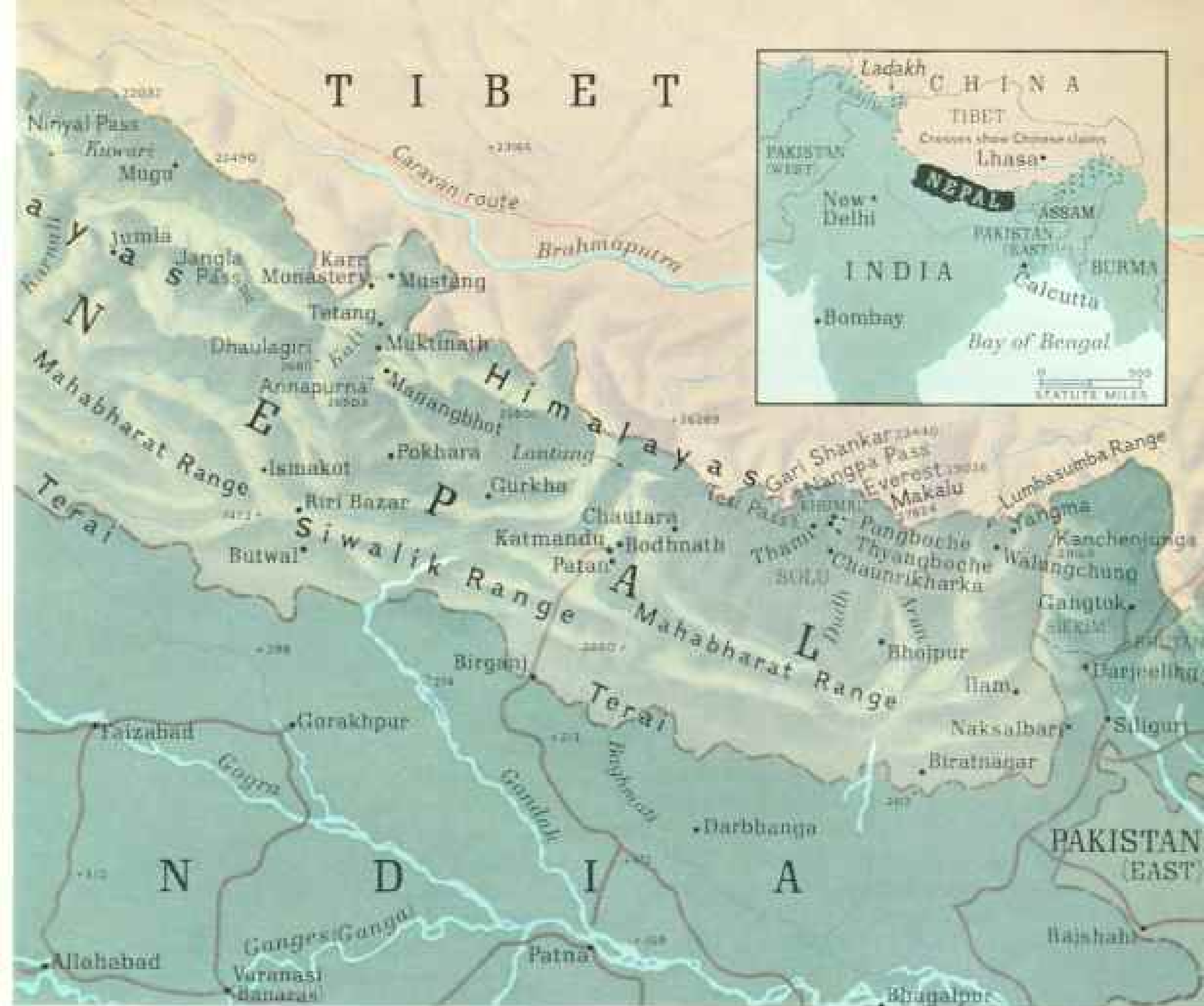
Hatch marks (inset) show areas in Ladakh, Assam, and Bhutan which Chinese Communists have invaded or claimed.

Author and Sherpa Friends Celebrate a Wedding

A peacock-feather emblem in a brass-and-copper jug proclaims friendship for Dr. Hagen (center). Drinking chang, a mild beer, the party waited two days at Chaunrikharka, near the foot of Mount Everest, for the bridegroom to appear. He was delayed by celebrating with friends.

362





Chances are that the children, like many others in Nepal, were seeing their first airplane before they had seen their first bullock cart. The air age is opening up parts of Nepal where wheeled transport until yesterday remained a mystery. In this mountainous land, roads are nearly nonexistent, and few of its trails will accommodate pack animals, not to speak of a wheeled vehicle. Travel is almost entirely by foot.

For the past decade it has been my great good luck to be a part of Nepal's awakening. In 1950 I undertook the job of completing history's first geological survey of this fascinating country.

Were there, as ancient legend had it, rich treasures of gold and precious stones secreted near the thrones of Nepal's many gods and devils in the Himalayan heights? Were there, as certain perpetually burning natural gas jets hinted, vast reserves of petroleum waiting to be tapped to bring the world's wealth pouring into this predominantly agricultural nation? Did Nepal's known veins

of iron and copper merit greater exploitation?

As if these questions were not challenge enough to fire the imagination of any geologist, I knew that my work would take me into regions never seen by European eyes, into areas unfamiliar even to the Nepalese Government. I would journey into frontier zones which will not be seen again by a foreigner until the tensions of international rivalries ease. I would become the first European ever permitted to roam as I chose through the 500-mile-long, 100-mile-wide rectangle that is Nepal.

Himalayas Create a Giant's Staircase

As Nepal's geography once accounted for her long isolation from the world, so today it is a major factor in her awakening. For centuries the country's protection from pillage—and progress—was her mountains. Along her northern frontier with Tibet marches one-third of the 1,500-mile-long Himalaya Range. To the south are the lower but still formidable Mahabharat and Siwalik Ranges.

A rough cross section of Nepal would look

somewhat like a gigantic staircase leading down from the high Tibetan plateau to the Ganges plain. Before invaders from the plain could begin to ascend this staircase, they first had to cross another protective feature of terrain. This was the Terai, a strip of the Ganges plain 12 to 20 miles wide. Barely above sea level, the Terai is hot, swampy, and thick with jungle. The Terai's chief deterrent to an invader—and to any traveler, for that matter—is the deadly *awal*, a malignant malarial fever, swift striking and often fatal.

India's new independence and Chinese domination of Tibet after World War II thrust Nepal rudely into the arena of global political maneuver. Not even the mighty Himalayas or the feverish Terai were now proof against war from the air, and in this new small world, isolation was impossible. To survive, Nepal must catch up with the calendar; that was her government's decision. I was part of the catching-up process.

"What about it, Hagen?" asked my superiors at the Swiss Federal Institute of Technology, where I was a research assistant. "The Nepalese have asked our government to send a technical assistance mission. Want to go?"

Did I? It was the chance of which I'd been dreaming ever since I was 10 years old, when I attended a lantern-slide lecture about the Himalayas and promptly fell in love with them.

Nepal's Hinterland a Mystery

Nowadays, it is no uncommon thing for a planeload of tourists to fly north from India to visit Katmandu, Nepal's capital, set in the loveliest of the midland valleys. But when my family and I arrived in 1950, we learned that only a few hundred Europeans had ever visited the country. Of these, only a handful had ever been allowed outside Katmandu.*

Indeed, not even officials of the Nepalese Government were permitted to leave the capital without the special permission of the prime minister. This quarantine sprang from the canny theory that subordinates are much better kept under observation in Katmandu. Not surprisingly, most of Nepal beyond the capital's mountain-rimmed valley was almost

as much a mystery to the country's central government as it was to foreigners.

I remember especially what a disappointment I was to my new Nepalese associates. Initially they regarded me as a kind of latter-day forty-niner. I was a geologist, and geologists—or so they theorized—are expected to find gold and jewels, particularly in a country legendarily so well endowed with them.

Notes Alone Fill "Treasure Baskets"

"But where are your treasure baskets?" one official, who has since left the government, asked me in dismay when I returned with nothing but notes from my first short field trips. "Have no fears, Hagen Sahib," he added in a tactful whisper, "that you cannot speak freely to me. Just tell me where you have discovered diamonds and gold, and I shall give you a half share."

Eventually, of course, the Nepalese came to understand the real function of my job, even as I came to learn how it should best be done. There was, for example, the business of my first major field trip.

"I, personally, shall attend to the details," the prime minister told me. "You shall lack nothing."

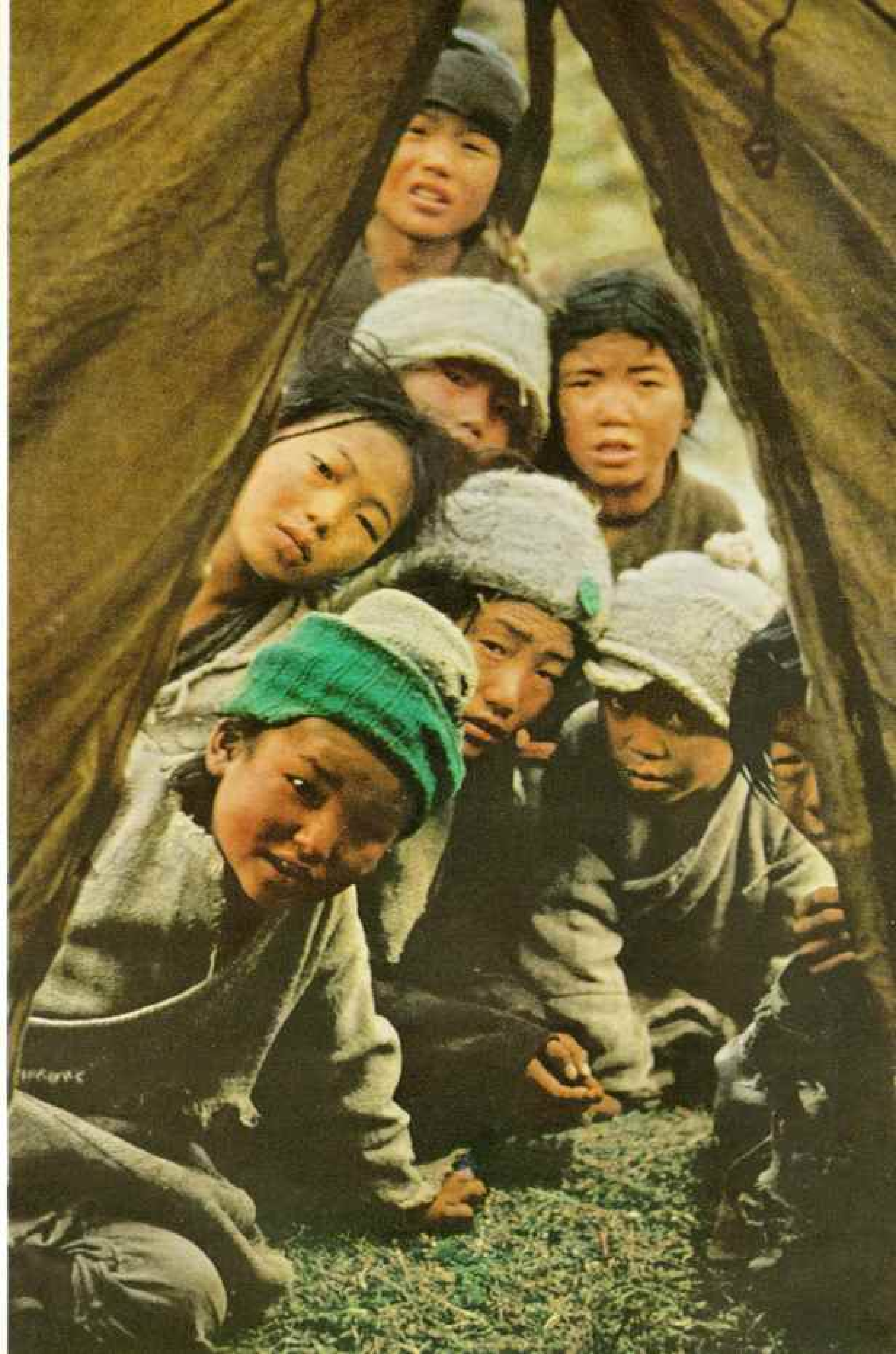
Nor did I, for when I prepared to set out, I found no fewer than 70 porters gathered to accompany me. His Excellency had fitted me out as he was accustomed to equip a royal hunting party, with even a fine china dinner service among the luxuries.

Later on, with the purchase of lightweight mountain equipment in Switzerland and a drastic pruning of nonessentials, my gear needed only a dozen porters. On these subsequent field trips, with my much smaller team of picked men headed by Aila, we were able to move swiftly and efficiently over the worst terrain Nepal has to offer. Each porter became a specialist at his job, and it took us no more than 15 minutes to set up camp, with hot tea ready five minutes later.

* See, in the NATIONAL GEOGRAPHIC: "Coronation in Katmandu," by E. Thomas Gilliard, July, 1957; "Peerless Nepal—a Naturalist's Paradise," by S. Dillon Ripley, January, 1950; and "Nepal, the Sequestered Kingdom," by Penelope Chetwode, March, 1935.

Wonder, Curiosity, and Fear: Children Peep Into the Author's Tent

"A pencil given to these youngsters from Yangma meant wealth and happiness," says Dr. Hagen. "Matches delighted them, since they were accustomed to make fire by striking two stones together. They commented excitedly about my typewriter, but they were upset when they heard their own voices on a wire recorder."





© NATIONAL GEOGRAPHIC SOCIETY

Chris and Fritz Travel in a Basket

The author's son and dog see Nepal from the back of a porter, the common carrier of the kingdom. Such men consider 80 pounds an average load.

Aila was a Himalayan veteran, one of the two Sherpas who had carried the frostbitten French climber, Maurice Herzog, down from Annapurna. Aila took charge of the house-keeping details, leaving me free to work on my notes and sketches. I never heard him complain, although sometimes, when I walked too fast for the heavily laden porters, he might grin and say gently: "Very long feet today, I think, sir."

During my work in the vicinity of Katmandu, Gertrud and our three children, Christopher, then six, Kathrin, four, and Monika, two, sometimes accompanied me into the field. The children rode in baskets carried by sturdy

porters. We fell in love with this beautiful land, and sometimes Gertrud and the children went off camping by themselves, so safe and secure did we feel among the friendly people.

With the completion of my survey of the midlands, I realized that field trips would take longer as I worked farther into the hinterland. Regretfully, the family went back to Lenzerheide, our home village in Switzerland.

Walks Wear Out 40 Pairs of Boots

As I moved up into the mountains, passes and gorges came to figure large in my planning and daily work.

A glance at the map of Nepal (page 362) will show that the country is naturally divided into four regions by its principal rivers: the Karnali, the Kali, and the Arun. All drain into the Ganges. They break through the main range in mighty gorges, creating natural—though difficult—avenues for trade. Similar, though lesser, gorges crack the Mahabharat and Siwalik Ranges to the south.

Most spectacular of these gorges is surely that of the Kali, which rises some 50 miles north of the Annapurna chain and pierces the main range between the lofty peaks of Annapurna (26,503 feet) and Dhaulagiri (26,811 feet), about 18 miles apart, at a depth of only 3,500 feet above sea level.

In all, I completed 19 field trips and walked roughly—in every sense of the word—9,000 miles, at the cost of 40 pairs of tough Swiss-made mountaineering boots. Our campsite was changed at least 1,200 times.

The day's work began at sunrise with a cup of cold tea. Then we walked three or four hours before stopping for breakfast, followed by an hour's rest. Actually, this first meal was more of a brunch, for the Nepalese eat only twice a day.

By 3 o'clock in the afternoon I began looking for a clean campsite with fuel and water.

Supper eaten, two or three hours were left for recording observations and filing rock and fossil samples at my field desk, aptly nicknamed by my porters "little Singha Durbar," after the main government building in Katmandu. On its battered writing surface I completed 96 geological cross sections of Nepal, from the Ganges plain to the Tibetan border; 2,437 geological sketches filling 20 field notebooks; and the field original of the geological survey map of Nepal on the scale of 1:250,000.

Not infrequently, my office chores were in-

errupted by visits from some of the big game with which Nepal abounds. Most often my visitors were leopards, and because of them I had to discontinue bringing the dachshund Fritz into the field. Absolutely fearless, Fritz barked furiously at any visiting leopard. Luckily, those he threatened so vociferously seemed too astonished to do him harm.

Shouting Chased Leopards From Camp

With Fritz back in Katmandu, we got rid of our uninvited guests by a vigorous yelling from everyone in camp, a noise the leopard invaders apparently disliked intensely.

Not that it was all work and no play. Nothing, I found, exceeds Nepalese hospitality in

the mountains. This openhandedness invariably includes generous helpings of chang—pronounced to rhyme with rung—the native beer, which was sometimes as thick as gruel. Made from rice, millet, or other grain, chang has a flavor that is not notably improved by the lumps of often rancid butter smeared on the rim of the cup for good luck.

I recall leaving one especially jovial village by a trail that led straight out across a flat valley, with Aila and the porters weaving gently behind me, all smiling vacantly and having difficulty with their feet.

"Are you all right, Aila?" I called over my shoulder. Back came an unmistakable hiccough, fortissimo.

Modern Drugs and Ritual Sacrifice Vie in Treating an Injured Bearer

On the trail near Annapurna (background), the prostrate man suffered a heat stroke and tumbled down a slope. Here the author administers a stimulant. Ceremonially stripped and bathed, a Thamanng tribal priest prepares to sacrifice the chicken at right. "One treatment was successful," says Dr. Hagen. "But whose?"

© NATIONAL GEOGRAPHIC SOCIETY



"Very steep road, sir," was Aila's reply.

We encountered quite a few steep roads in otherwise level valleys, since it would have been considered the height of rudeness to refuse the chang we were so often offered from hand-carved wooden bottles. Indeed, chang figures in many Buddhist religious rites. Among the Sherpas, whose homeland is just to the south of Mount Everest, it is an important feature of any ceremony.

As I had expected, it was impossible to

confine my survey to geology. With absolute freedom of movement guaranteed by the government, mine was a glorious opportunity to study almost every aspect of Nepalese life.

Countrymen Speak Many Dialects

The country's population, I found, consists of about a dozen tribes and castes, with widely varying dialects, religious practices, architecture, and customs.

The small groups fall into three main divi-



sions. The native Tibeto-Burmese-speaking peoples dwell in the midlands and are probably the aboriginal inhabitants. The Tibetan group is largely found on the Tibetan plateau and in the high valleys of the main Himalayas. The Indo-Aryan-speaking peoples, migrants from the south who originally represented the highest Hindu castes—the priestly Brahmans and the warrior Kshatriyas—make up the third group.

The celebrated Gurkhas belong to this last division. Refugees from the Mohammedan conquest of India in the 14th century, they were a small tribe of fighting

Range stand out like islands in a sea of clouds

© NATURAL GEOGRAPHIC SOCIETY



A smoke breaks the hardship of crossing 17,000-foot Jangla Pass after a heavy snow. Goggled against glare, the porter puffs his cigarette through a straight Nepalese pipe and a cup of fingers. He wears the long hair and topknot of a priest.

men who set up a pint-sized kingdom at Gurkha, northwest of Katmandu. They were content with this domain until the 18th century, when they united a number of equally small neighboring kingdoms, conquered the largest native kingdom centered on Katmandu, and established what is now known as Nepal.

They also established the country's military traditions, most notable of which is that of mercenary service in the armies of Great Britain and India. Such was their prowess that today all Nepalese soldiers serving in these armies are known as Gurkhas. Their commanders, British and Indian, have described them as among the finest warriors in the world.

The Tibetan group includes the Sherpas, who have won international

fame for their mountaineering skills. They are among the friendliest of the Nepalese people, and their friendship is warmly returned by Europeans whose lives have depended upon steadfast Sherpa courage on some Himalayan peak.*

Tribes Live at Different Altitudes

Perhaps the most astonishing aspect of Nepal's immensely varied population of some eight and a half million is its extraordinary distribution according to altitude. The Indo-Aryan group prefers to live in the valleys, rarely higher than 6,500 feet. The aboriginal Tibeto-Burmese group is found between 4,500 and 8,500 feet, while the Tibetans make their homes above the 8,000-foot level. Thus I could almost always tell from my altimeter, fixed to the top of my ever-present camera case, which group I would next encounter.

One curious consequence of this population distribution is a tolerance and a blending of religious faiths. The shrines of Muktimath, in the great gorge of the Kali, are sacred to both Buddhists and Hindus. Hindus living in the valleys often share a temple with their Buddhist neighbors on the higher slopes.

Climate, too, seems to have a definite effect on the people. In the malarial Terai, fever-menaced natives are less energetic, even apathetic. Their houses are little more than crudely thatched huts, raised on logs above the reach of the prowling game for which the Terai is famed. Their villages are usually carelessly planned and decidedly unsanitary.

In the midlands and the mountains, houses are more solidly built, often of whitewashed brick or stone, and towns are neater. I've seen Nepalese mountain villages that reminded me of picture-postcard views of English hamlets. In the higher regions, people seem more cheerful, and life seems much more worth living. It was in the high valleys and the thundering gorges of the Himalayas that I was happiest. But here, too, I felt the loneliest. Loneliest, that is, for the company of a fellow European.

I remember one night in a high and isolated valley where I had my first encounter with Tsumarr. The almanac would call it an eclipse of the moon, but to the Nepalese mountaineer it is the time when the evil beast, Tsumarr, chases the moon across the sky, clutching at it with huge black claws. As the moon began to fade, moans and prayers of the terror-stricken inhabitants swept across

the dark valley. The eerie keening rose to a prolonged howl of despair.

Finally Alla spoke. Even he, whose home is in modern Darjeeling and whose contacts with the twentieth century have been many, was frightened.

"If once Tsumarr catching earth like that," he muttered, gesturing toward the sky, "then I think all finished, sir."

Possibly the only real risk in working alone was that I might break a bone I couldn't splint or set. Neither Alla nor any of the porters had the faintest notion how to treat a fracture. As it turned out, however, my party suffered only one fracture during eight years, and that one happened just a hundred yards from a missionary hospital!

Easily the most pressing of my extracurricular chores was that of medicine man. Like most Europeans, I held the stereotyped concept of the mountain Nepalese as a sturdy, robust chap, flourishing in the clean Himalayan air. A great many Nepalese are sturdy and robust, but at least a quarter of the people are chronically sick. After seeing the work of the native healers, I wondered that so many survived.

Medicines Win Nepalese Friends

While training to become a ski instructor in Switzerland, I had taken advanced first-aid courses, but that was the extent of my "internship," and I was grimly aware of my limitations. It was impossible, however, to withstand the childlike trust of the Nepalese. I was the "Sahib sent by the King," for many the first white man they had ever seen. My scalpel was a safety-razor blade, my clinic two trunks full of medicines and bandages.

My first major medical project was curing the porters of the habit of indiscriminate spitting. This was simple. Whenever I caught a porter spitting in camp, we moved the camp exactly one mile, no matter how far we had marched that day or how tired we were. After a few such moves, the spitting stopped.

Other problems were not so simple, but modern antibiotics worked miracles. I shall never forget the day a young Hindu father came to me with his daughter in his arms.

(Continued on page 375)

* See, in the NATIONAL GEOGRAPHIC: "Beyond Everest," by Sir Edmund Hillary, K.B.E., November, 1955; "Triumph on Everest: I. Siege and Assault," by Brig. Sir John Hunt, C.B.E., D.S.O.; "II. The Conquest of the Summit," by Sir Edmund Hillary, July, 1954.



PHOTOGRAPH BY SEYMOUR JONES © NATURAL GEOGRAPHIC SOCIETY

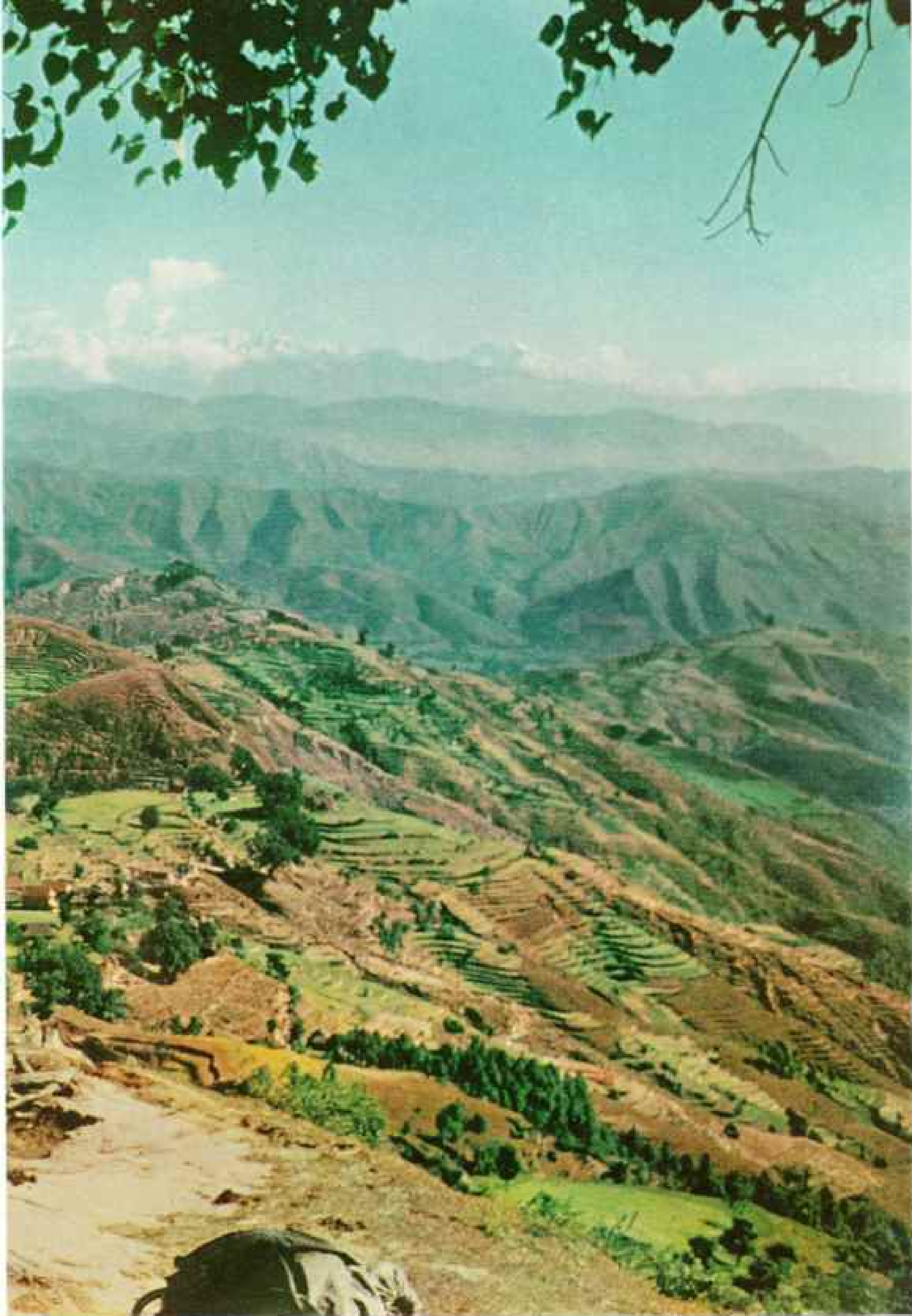
Firewood Travels to Katmandu on the Back of a Sturdy Patriarch

His work began on the evergreen-covered slopes above the Valley of Katmandu. Assisted by his sons, he felled trees and cut them into fireplace-sized sticks. Shouldering two loads, he trotted miles to the city, where he sold the wood for 30 cents.



Bowed by Baskets of Rice, Farmers Start
a Six-day March to Katmandu Market

Here where mountains rise like so many huge
waves frozen at their crests, planters find the price
of life is ceaseless toil. Generations of labor



© NATIONAL GEOGRAPHIC SOCIETY

carved out these staircase rice terraces in eastern Nepal and walled them with stones. Chautara village clings to a ridge because the monsoon

rains flood the valleys. Last fall a Japanese expedition made reconnaissance for an attempt on 23,440-foot Garl Shankar (right).



"Please, please," he said with broken urgency, "you make well, Sahib."

The child's lovely Indian face contorted with pain as her father showed me her foot. It was hideously infected.

Cow dung—regarded by Hindu villagers as a sovereign remedy because the cow is sacred—had been generously applied to what had been a minor cut. While the girl whimpered softly, I cleaned the wound and used massive applications of penicillin. I had little hope of clearing up the infection.

Imagine the depth of my feeling when, more than a year later, I met the girl walking gaily along at her father's side. Who could ask a greater reward than her happy smile when she recognized me?

All too often my patients disregarded my instructions to keep their injuries clean, and a cut I had swabbed and dusted with sulfa powder one day would return the next day plastered with filth. I soon discovered that the solution was psychological.

By the nature of their religion, Hindu or Buddhist, most Nepalese are fatalists. Death holds no terrors for them, for they often regard it as a release from the world's troubles. But when I said: "If you don't keep your wound clean, you will die in terrible agony," my warnings worked. Physical pain was a far worse prospect than death.

Some sort of peak in my amateur medical career was reached during a visit to Mustang, capital of the province of Mustang-bhot, high on the Tibetan border.

Mustangbhot is one of Nepal's forbidden frontier areas, ruled by its own raja and so remote as to be semi-independent. To the best of my knowledge, I was the first European ever to lay eyes on the raja's capital city, in which his mud-walled and glass-windowed four-story palace was the outstanding architectural glory. The last stranger to reach there was an Indian, Hari Ram, of the Survey of India, in 1873.

Chilly Reception in Mustang

Our reception was something less than enthusiastic, but I was hardly prepared to be shown to a shabby stable behind the palace.

Because of the great significance Nepalese attach to military rank, Aila normally introduced me as "Colonel Hagen Sahib" whenever we entered a strange town or village. He was fully equal to this emergency.

"Behold!" he cried, throwing open my field desk to disclose its impressive-looking sheaf of maps and papers to the raja's major-domo. "These are the King's papers. And this is the great and powerful General Hagen Sahib!"

My lightning promotion so impressed the

Improvised Bridge Leaps a Roaring Torrent

Stricken with dysentery at remote Mugu, his money and supplies nearly exhausted, Dr. Hagen began a feverish five-week walk to Pokhara. At the foot of the awesome gorge between the peaks of Dhaulagiri and Annapurna, he found the bridge swept away by monsoon waters. His porters cut trees and stretched a threadlike span across the Kali. Then, nearly fainting from weakness, the author crawled across (page 394).

Carving a wooden pot, workers turn a primitive lathe with a leather belt. Man at left holds the cutting tool, bracing it between his legs.



**Belly Deep in Snow, Struggling Yaks
Carry Precious Salt Through Ninyal Pass**

"Holy ones, in Nepal the ground is nothing but rocks, and it is as humpy as the back of a camel." Thus, according to tradition, did Gautama Buddha characterize the land of his birth 25 centuries ago. "Surely," he said to his followers, who were going to Nepal as monks, "you are not going to enjoy your journey."

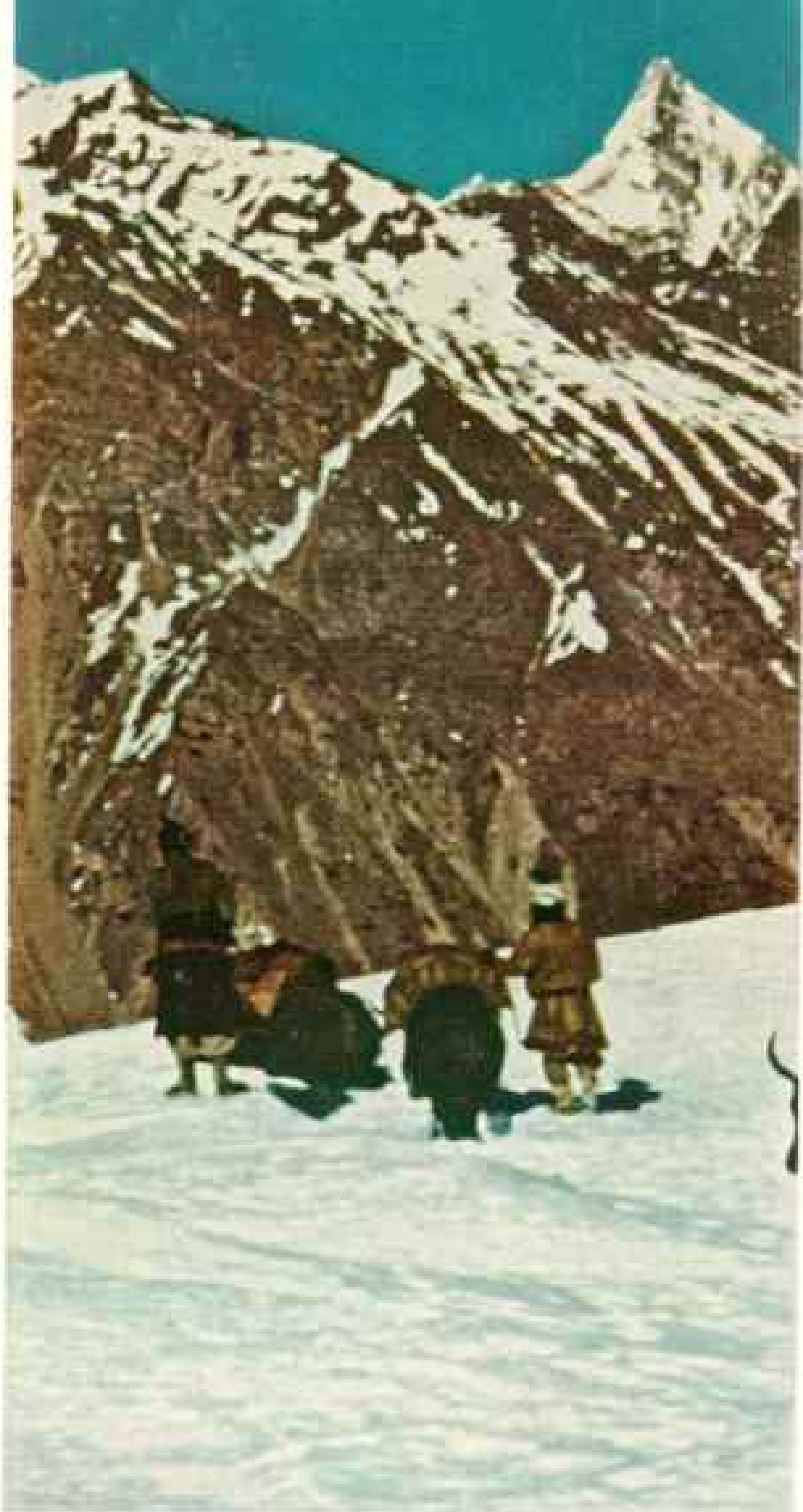
Now, as in the Buddha's time, few Nepalese travel for pleasure; yet a quarter of the population spends one or two months a year on the trail. Man's need for salt provides the goad.

Nepal must import its salt from India or Tibet, and most families have the responsibility of obtaining their own supply. Tibetan salt depots up the gorges of the Himalayas draw a steady stream of Nepalese, who arrive with rice, wheat, and vegetable oil for barter. Trade has decreased because of the recent Tibetan troubles.

Salt-carrying yak trains thread high passes, cross vast glaciers, and cling to cliffside trails. This Nepalese outfit coming out of Tibet crawls beneath jagged peaks in the Zaskar Range, which dips into northwestern Nepal. Never mapped or named, its crests soar 19,000 to 25,000 feet.

Primarily a beast of burden in high altitudes, the yak yields hair for clothing and blankets, milk for butter and cheese, and meat. After it dies, its tail serves as a fly whisk.

**Inflated buffalo skins serve as boats on the
streams of western Nepal. These river men
steer their rafts with paddles.**





© NATIONAL GEOGRAPHIC SOCIETY

major-domo that he got us slightly better quarters, but the raja declined to grant me an audience.

It was, of course, important to my work that we have his support during our stay in his province. So Aila's one-man propaganda department went to work among the palace servants. Did they not realize that not only was I a mighty General Sahib, but a most learned physician and healer as well? That did the trick.

Skin Lotion for a Rani

Barely was my gear unpacked when the raja's prime minister appeared to tell me that the rani desired my help. She had exhausted her supply of a certain marvelous skin balm and was afraid of losing her complexion. I would therefore and forthwith replenish her supply. To my confusion, the prime minister

handed me an empty jar of a well-known English cold cream. It was clear that my reputation must stand or fall on my ability to supply a substitute.

Because sun glare from glacier ice can cause just as painful a burn as a day at the beach, I always carried a stock of sunburn cream. On the broad theory that it could do no harm, I filled the jar with this ointment. Luckily it had a pleasant aroma, and my stock soared. Soon afterward, diplomatic relations with the raja were firmly cemented over cups of Tibetan tea.

Only recently I saw a newspaper dispatch to the effect that His Highness of Mustang-bhot had secured what he believed to be the skin of a *yeti*, or abominable snowman. Having some knowledge of the raja's sense of humor, I'm inclined to believe that he is having innocent fun at the expense of the

credulous lowlanders, after the fashion of mountaineers the world over.

No one who travels the mountains of Nepal can avoid the yeti legend—and legend I believe it to be, for never did I encounter anyone who had actually seen the beast. Always the yeti had been seen by the great-uncle twice removed who has since moved away, or the brother of a second cousin, the one who died just last year. I have been shown alleged yeti tracks, but these uneven depressions in the snow could have been made by a bear or a strayed yak. The famed Sherpa monastery at Thyangboche, near the foot of Mount Everest, even boasts a portrait of a yeti, but it is admittedly based on legend and looks like the crossing of a wolf, tiger, and bear.

Like most Sherpas, Aila believed implicitly in the yeti. Once, when we were working near the top of a high pass, he suddenly pointed to what were undoubtedly tracks in the snow.

"I think, sir, yeti tracks. Now very good season for seeing yeti, sir. Yeti getting hungry now, eating man."

"But Aila," I said, "how can you be sure those are yeti tracks?"

He waved an arm at the vast, empty expanse of snow, ice, and rock. We might have been on the moon. "Nobody else here, sir," he said simply.

Nepal Reminds Author of His Homeland

It would be pleasant to be able to say that Aila was the only one who shot an occasional glance back over his shoulder the rest of the day. After all, we Swiss have a similar legend. Ancient tomes in the libraries of Lucerne attest the presence of a monstrous dragon on the heights of Mount Pilatus.

Indeed, the many similarities between Nepal and Switzerland were a source of continuing surprise and delight to me. One unex-

Porters Inch Across a Bird's-nest Catwalk. Each Step Gambles With Death

The trails between Nepal and Tibet often fly off into space. Here, high above the Arun River, flimsy forked poles support a teetering roadbed of loose sticks. The author saw many broken bridges; he could only guess how many lives had been lost.

Axmen shape a dugout. Flood in the hills swept the log to their Dudh River home





pected aspect of my work was a brief encounter with that Swiss mainstay, the cheese industry, transplanted to the Himalayas.

Far to the north of Katmandu, I had become entranced with the beautiful Lantang Valley and its wonderfully friendly people. It might easily have been a Swiss valley of five centuries ago. Here stood two-storied wooden chalets, their overhanging roofs held down by rocks against mountain gales. Snowy edelweiss and other Alpine flowers carpeted the valley floor, and often I heard the echo of a yodel. Nepalese mountain herdsmen yodel as do my countrymen—to communicate with one another and to guide their herds. But in

the Lantang Valley the herds were not sleek, fat cows, but great shaggy yaks.

What the camel is to the tribes of the desert, what the buffalo was to the American Indian of the plains, this rugged member of the ox family is to the mountain Nepalese (page 376). It is at once a beast of burden and a magnificent provider of food and textiles. Yak meat, freshly butchered or dried, is considered a delicacy, although this is open to debate. Too valuable for their milk and hair to slaughter for food, the animals are butchered only when they are old and tough.

Yak hair forms the basis for much of the homespun clothing worn in the Himalayas. Yak milk is drunk or churned into butter, which is later clarified into ghee. Ghee figures importantly in Buddhist religious rites, and is in constant demand, especially in Tibet.

Cheese Industry Brings Prosperity

When I learned that the Nepalese Government, with the help of Swiss technicians and the Food and Agriculture Organization of the United Nations, planned to establish the nation's first cheese factory, I suggested the Lantang Valley as an ideal site. I was more than happy when my suggestion was adopted. The little stone factory was a fine success—so much so, in fact, that three more such factories have been started.

For the first time in history, Nepal is exporting cheese to India. Yak milk is far richer in butterfat than the milk of even our finest Swiss cows, and the plump, golden wheels of yak cheese have a delicious flavor. I found the taste equal to the very best grade of Swiss, holes and all.

Through the sale of milk to the cheese fac-

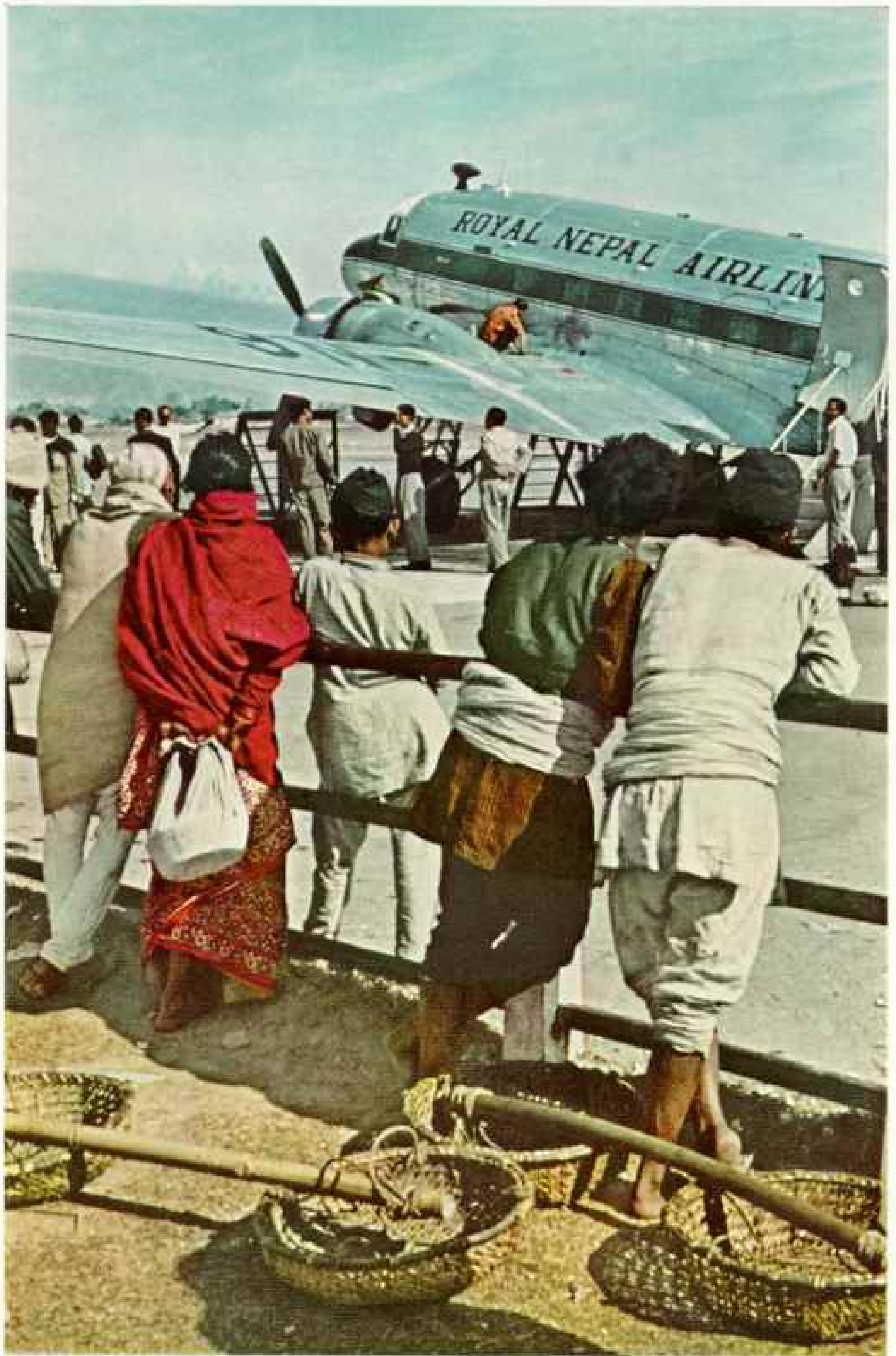
Half a dollar buys this young girl's *Cinnamomum* leaves and rewards her for the seven-day walk from her home in Nepal's midlands to Naksalbari bazaar on the Indian border. The leaves provide an ingredient for the local curry powder.

Katmandu Fruit Vendors Break Winter's Chill With Cotton Quilts

Sidewalk market displays tangerines, guavas, tiny bananas, cashew, papaya (center), peas, and limes. Most of the capital's fruit must be imported from beyond the Katmandu valley.







PHOTOGRAPH BY SCOTT L. JONES © NATIONAL GEOGRAPHIC SOCIETY

Royal Nepal Airline Opens Regions That Never Knew the Wheel

Passengers at Katmandu airport board a DC-3 for Pokhara. In 40 minutes they will cover a hundred miles, a journey that would have cost them 10 to 14 days on foot.

tory, the farmers of Lantang Valley were among the first peasants in all Nepal to escape the grip of the money lenders. Throughout the land, many of the countrymen are in the hands of usurers, paying off debts incurred, oftentimes, for the elaborate weddings Nepalese pride and tradition make important. I suspect that the benefits of a project like the Lantang cheese factory, which cost only a few thousand Nepalese rupees, are far more meaningful to the people than many a vastly more expensive long-range scheme.

Significantly, I once met a party of Tibetan traders on a trail more than 400 miles from Lantang. Their first question was for news of the marvelous cheese factory. Would my countrymen come to Tibet to help build a factory there? So swiftly and far does news travel in the Himalayas.

But, as is so often the case, the best devel-

opments are home-grown. One of the most heartening sights of my travels was the spread of education, and for this Nepal must thank the returned Gurkha soldiers. Their military training in the British and Indian armies has made some of them natural leaders in their villages. And their pensions make them gentlemen of independent wealth, able to indulge in small philanthropies.

Warriors Turn to Teaching

Whenever I found an especially well-kept village or a new school, I usually discovered that a pensioned Gurkha mercenary was in part responsible. Often the teachers themselves were Gurkhas, determined that the young should have a better education than they had known (below).

My pedestrian progress up and down Nepal was certainly not of my own choosing. I

School meets in the open air at Bhojpur. The principal, a pensioned Gurkha soldier (left), confers with his three teachers. Salaries run low. "We could get twice as much in India," said one teacher, "but we consider it our duty to our country to work here." The United States helps support a teacher-training program in Nepal.

© NATIONAL GEOGRAPHIC SOCIETY



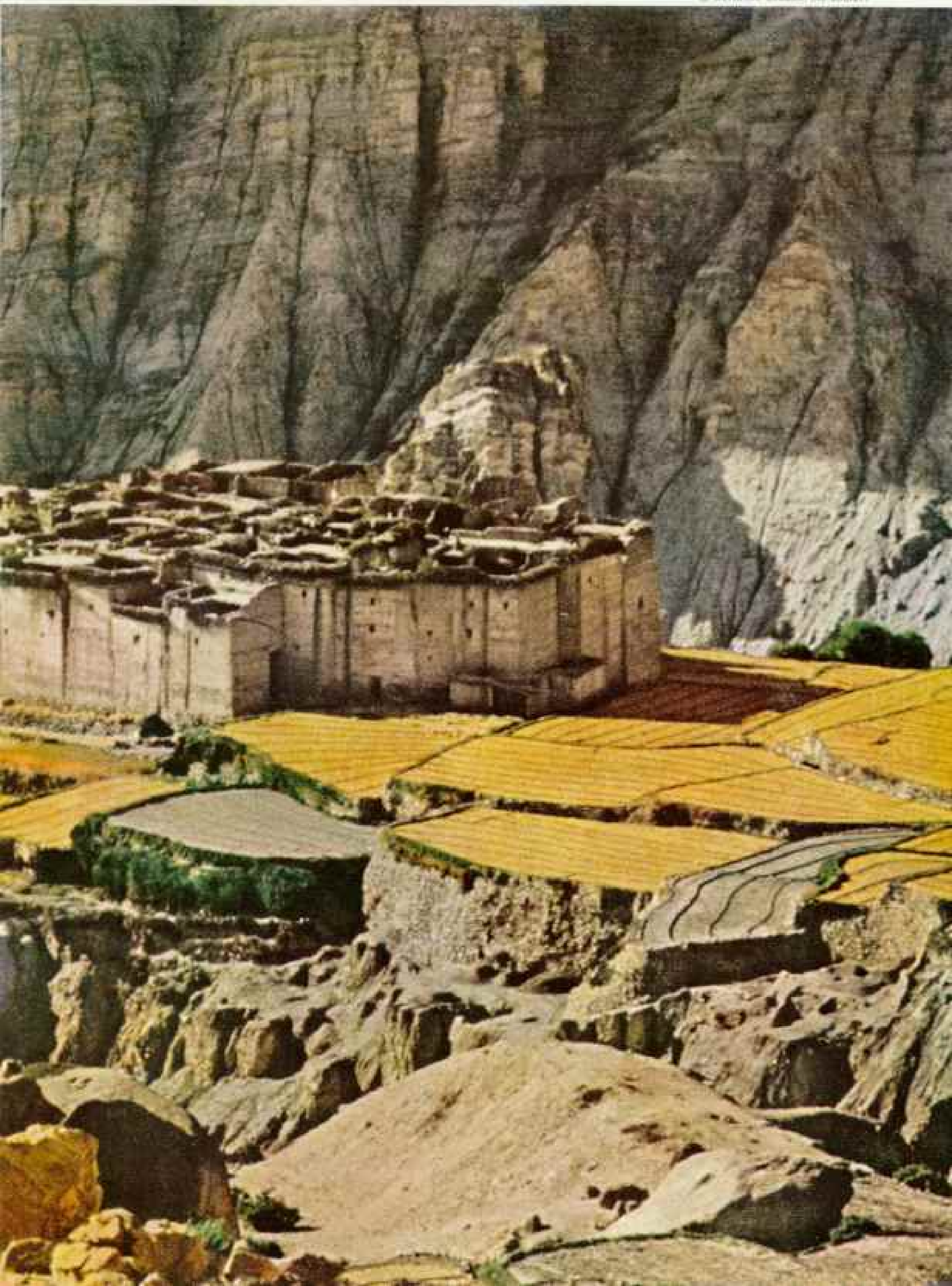
Tetang Hides in a Himalayan Cleft;
Beetling Cliffs Dwarf Its Towering Walls

Built like a medieval fortress, Tetang once protected its citizens against raids from near-by Tibet. Today the town lives off the trade between



Nepal and its northern neighbor. Houses rise several stories. Ground floors serve as stables for yaks, sheep, and mules; upper rooms provide

living quarters and storage for trade goods. Irrigated fields of barley stand ready for harvesters; farmers at the far left begin the cutting.





would have been delighted to ride between rock samples. But beyond a few miles of paved highways in Katmandu's valley there are—with one exception—no roads worthy of the name. The single exception is the recently completed motor road from Katmandu to India. During monsoon, even this thin link with the world is frequently blocked by land- and rockslides. The slides often result from severe soil erosion, which in turn is the product of uncontrolled deforestation.

Otherwise, there are only trails, and what trails! Sometimes they are little more than a frighteningly narrow ledge along a cliff half

a thousand feet above a roaring, glacier-fed river. For a roadbed one often trembles across a few worn logs laid on ancient iron spikes driven into the cliff's sheer wall. These are Nepal's superhighways and main trade routes (page 379).

It is hardly astonishing that the Nepalese have not adapted the principle of their prayer wheels to transport, for there are few places where a wheel can roll. As the Nepalese see it, with their simple, direct logic: What's the point of perfecting something for which there is no possible use?

To complicate travel further, there is only



EDITH HAZEN

one fairly passable east-west trail through the midlands from one end of Nepal to the other. To save time, we frequently had to go south to India, travel east or west by rail, and then head back north into Nepal.

By way of compensation, walking brought me into far more intimate contact with the people. Often my work in the mountains took me far from any trail, and I could understand the terrible fear the lowland Nepalese feels for the snowy heights where, he believes, only gods and demons live. I could see at close range the patient labor of generations

(Continued on page 392)

Shining Copper Bowls Bespeak a Sherpa Family's Prosperity

Resembling a Swiss chalet, the home boasts a plank floor, wood paneling, and thick walls of stone. However, it lacks a chimney, and smoke festoons everything with soot. The room's Stygian atmosphere rarely affects the good spirits of its occupants.

Here a smiling mother, pleased by the arrival of a guest, roasts potatoes on a stone griddle. Long wooden churn in the wall niche at left holds tea flavored with salt and ghee, or clarified butter.

An outdoor kitchen serves a Katmandu valley housewife. Nepalese eat comparatively little meat; their diet leans heavily to cereals and vegetables. This cook prepares turnips.

SCHOTLER, JUNE © NATIONAL GEOGRAPHIC SOCIETY





Flaming sea of tassels engulfs a farmer in the Kowari Valley;



© NATIONAL GEOGRAPHIC SOCIETY

the grain, known as amaranth, is popped like corn or ground into flour





© NATIONAL GEOGRAPHIC SOCIETY

Whirling prayer wheels at Karr Monastery, a Buddhist speeds her petition to the gods. When spun by hand, prayers hammered into the copper cylinders and written on papers stuffed inside go directly to heaven, she believes. Motion blurs the four wheels at right.

Carving a Monument to Faith, Sherpas Write Their Prayers in Granite

Devout workers chisel the face of a cliff overhanging the trail to Thyangboche Monastery, at the foot of Mount Everest. Carving between the letters, they lay bare a white background of unweathered stone. Pilgrims need only to pass by the wall to earn its prayers.

One of the inscriptions is the most famed of Buddhist prayer formulas: *Om mani padme hum*, "O, the jewel in the lotus."

Praying mechanically, a lama from Tibet feels free to laugh and talk during a visit to Thyangboche. On pilgrimage to Nepal's holy places, the priest never ceased to twirl his prayer wheel, the author observed.

Such religious fervor pervades every part of Nepal. Mountain people practice Buddhism; inhabitants of the valleys follow Hinduism. The two faiths live together peacefully; their adherents often share the same temple.



in the neatly stone-walled terraces, rising tier upon fantastic tier up the steep mountainsides (page 372).

Jungle and Glacier Only Hours Apart

Too often, I saw the consequences of this overintensive cultivation of every inch of arable land, coupled with uncontrolled deforestation. Great earth- and rockslides wipe out villages and engulf fields. For the inhabitants, there is the grim choice of abandoning their homes or villages and seeking new land elsewhere, or building all over again.

On foot, too, I could experience more vividly Nepal's wildly varied climate. I have walked shivering from a glacier to stand perspiring, a few hours later and a few thousand feet lower, in a steaming bamboo jungle.

"What I can't understand," I complained to Aila one day after we had managed an especially nasty cliffside path, "is why anybody ever uses these trails. Anybody in his right mind, that is."

"Simple, sir. Salt," was his reply.

So I discovered that the existence of any trails at all is due almost entirely to man's need for salt. Nepal produces little, but both Tibet and India mine deposits. At least a fourth of Nepal's population is on the trail a month or so every year, bent on trading grain or ghee at a salt depot near the Tibetan border or at an Indian bazaar in the south.

Usually the traders from each village travel together, and a picnic atmosphere flavors the expedition. Certainly there seems to be no hurry.

I recall a very narrow trail on which my little party formed only a tiny part of the long file of Nepalese extending far ahead and far behind.

Soliciting alms, a saffron-robed Buddhist carries a lacquered iron bowl. Donors give food and money to support his lamasery at Bodhnath (opposite).

The Lama of Bodhnath Offers 1,000 Gifts to the Buddha

Statues of Buddha mothers adorn the altar above hundreds of pastry cones, cups of clarified butter, and vials of holy water. Presiding from his throne, the ruling lama holds a double drum to attract the deity's attention. In the night-long ceremony held during a full moon, the photographer saw the lighted butter lamps cloud the temple with smoke and heard the eerie music of drum, copper trumpet, and conch shell alternate with chants.

Known as the China Lama after an ancestor who fled to Nepal from China, the prelate speaks several languages, including English.







We had been halted inexplicably, and the delay stretched out endlessly.

"Pass the word," I told Aila. "Find out why we're stopped."

Many minutes later the word came back.

"Fellow ahead having a smoke," Aila explained. "We wait, I think, sir."

The choice being a climb straight up or straight down a cliff, we waited. I heard no outcry against the delay, for the loads my fellow travelers carried were heavy. They were doubtless glad for the rest, leaning their burdens against the T-shaped wooden supports many Nepalese carry on the trail. I was reminded of nothing so much as a group of European race spectators relaxing against their shooting sticks.

If Nepal's trails are bad, her hundreds of bridges are hair-raising. The peasant's idea of bridge building is, to say the least, casual. As with the trails, there was until recently no program for maintenance or new construction. A great many bridges are makeshift structures, built in the sure knowledge that they will be

swept away in the next monsoon's high waters. They are, of course, intended only for the foot traveler, and in many cases a single log, perilously balanced over a roiling, tumbling torrent of glacially cold water, makes up the entire span.

Terror at the Bridge

For sheer horror, one wretched crossing surpasses anything in my memory. Far to the northwest, at Mugu, in the most remote corner of Nepal, I had fallen seriously ill. My supplies were exhausted, and if I was to save my life, I had no choice but to walk back to civilization. It was a dreadful march, an agony of stumbling along between fainting spells.

Finally we reached the Kali River, only to find it roaring in full flood, fed by the heaviest monsoon rains in the memory of the people. The bridge I had hoped to use had long since been swept downstream.

On the other bank, a group of villagers had felled logs to reconstruct the bridge—if I

(Continued on page 399)



Hindus Pray and Feast at an Outdoor Wedding

Here, on a shore of the Kali River, a Brahman priest reads the ritual uniting the couple at center. The bride's father and sister share a straw mat at left. They are descendants of the Kshatriyas, the warrior caste that emigrated from northern India. Remains of the wedding feast—rice, fruits, and water from the holy river—lie on the sand.

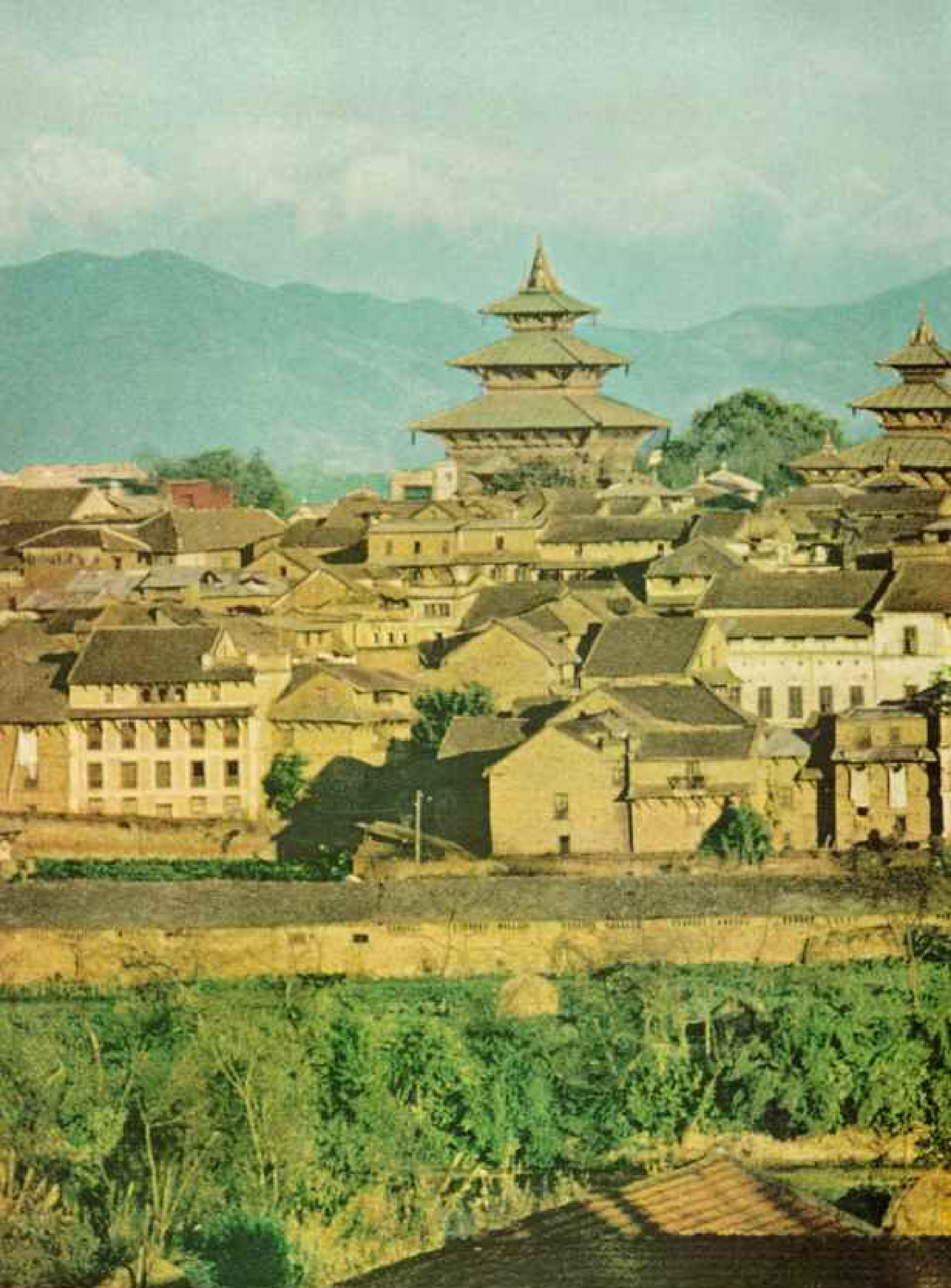
The wedding party paid no heed to another ceremony within view: a cremation with its mourners (below).

Shaved and stripped, members of a bereaved family watch the flames of a funeral pyre on the Kali.

When Nepal's King Tribhuvan died in 1955, many men shaved their heads out of respect.

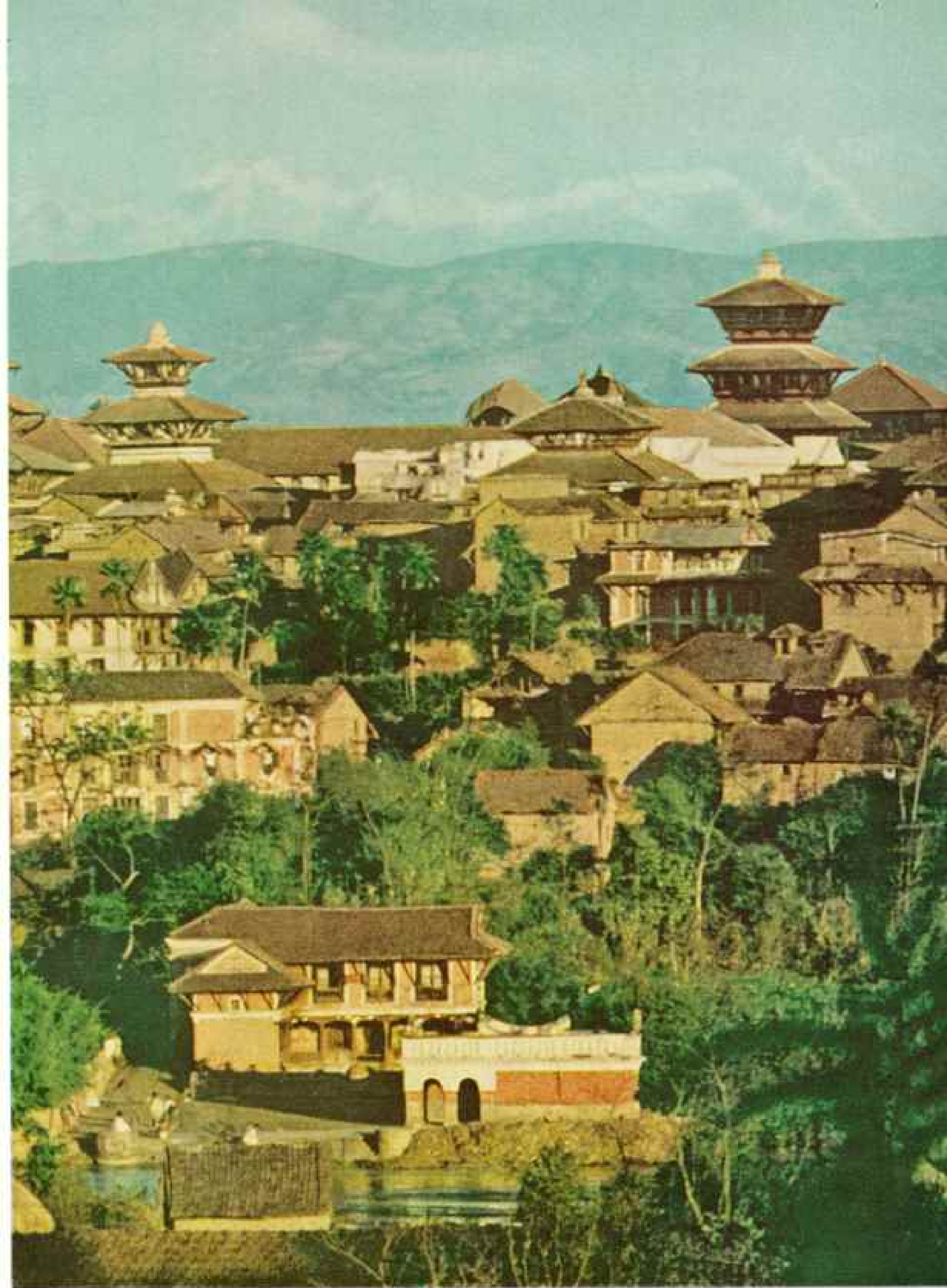
© NATIONAL GEOGRAPHIC SOCIETY





Sunset's Gold Burnishes the Pagodas and Homes of Katmandu, Nepal's Capital

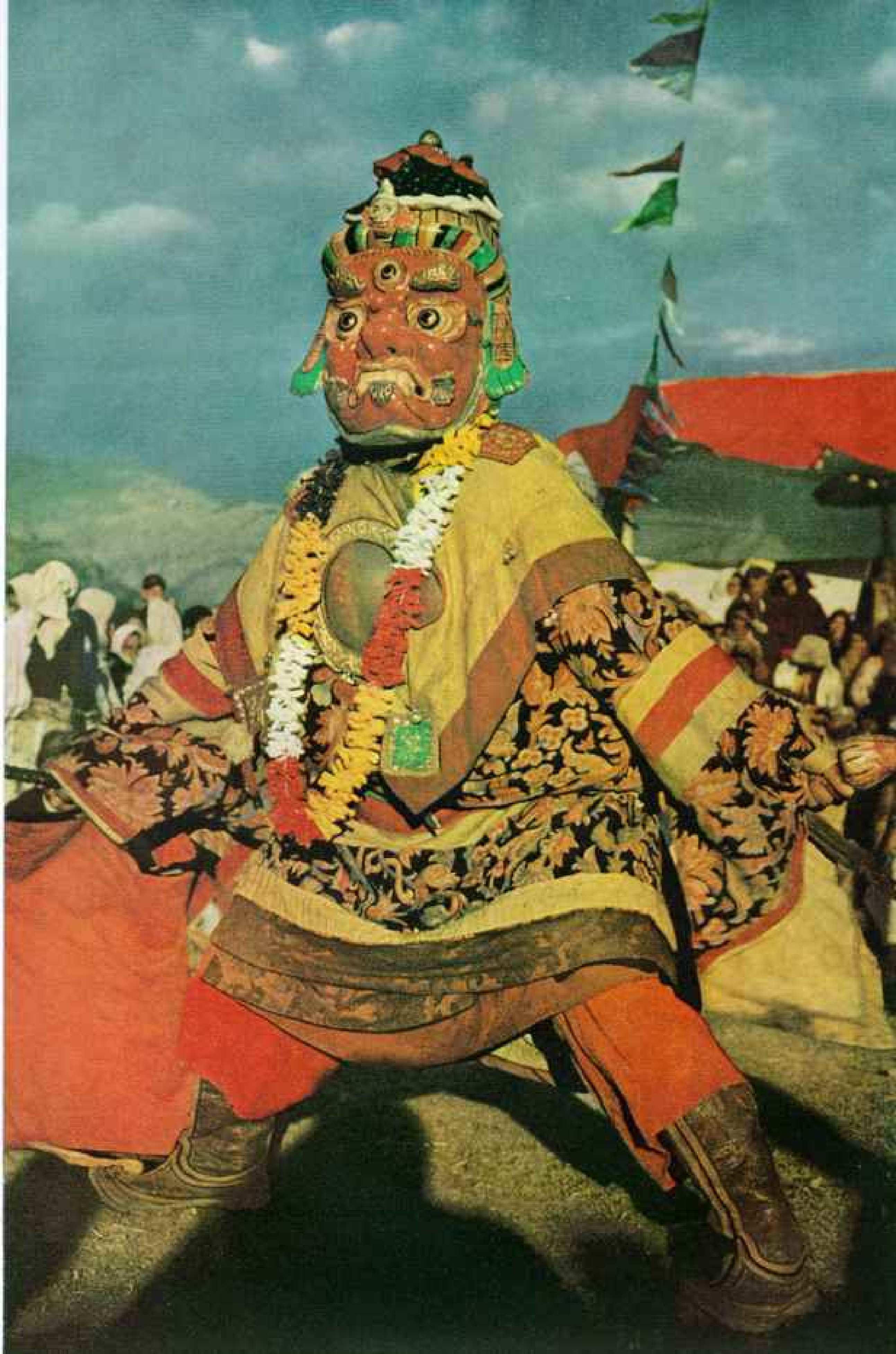
The architectural genius of the Newars, early inhabitants of Katmandu valley, enriched the city with spacious squares, skyscraping shrines, and eye-catching stone gods and goddesses. Some



ESKETCHED BY ANHUTLER 1944 © NATIONAL GEOGRAPHIC SOCIETY

scholars believe the Newars originated the pagoda style of the Orient. Long closed to most travelers, Katmandu so impressed the few European visitors of the 1800's that Kipling penned this

summary: "The wildest dreams of Kew [a London suburb] are the facts of Khatmandu." Women in foreground gather at the Vishnumati River, whose waters, they believe, cleanse the soul.



would pay them to do it. Their price was two rupees. It was impossible to shout over the roar of the waters, and our negotiations were conducted by notes wrapped around rocks and hurled across the flood.

As the Kali rose, so did the price. Encouraged by my prompt agreement to the initial two-rupee fee, the canny farmers kept asking for more. Back and forth sailed the rock-weighted notes, until the price went to ten rupees—and two rupees was all I had.

If the bridge was not built soon, it would be too late. My only hope of reaching Pokhara and medical aid would be gone. By now I had developed a kind of beriberi, my fingernails had dropped out, and I kept myself going only by massive injections of aureomycin and other medicines.

In this extremity, my own porters came through. Somehow, they located trees long enough to span the gap; somehow they managed to extend them across the roaring Kali. And somehow we all managed to get across this matchstick

structure (page 374). It was an experience I have no wish to repeat.

Some of Nepal's more ancient bridges are of the chain-suspension type, the links hand-forged by native smiths from Nepalese iron, but even these give the traveler no great feeling of safety. In former days, I was told, certain bridges were so terrifying that travelers were blindfolded, strapped to boards, and maneuvered across by means of cables slung to the chains.

Where the rivers are broader and the primitive bridges are unable to span them, dugout canoes, manned by a distinct caste of ferry-

REPRODUCED BY SCHULTEK JONES © NATIONAL GEOGRAPHIC SOCIETY



A Demon God Dances With Spear and Lotus Jewel

Last year priests from Himalayan lamaseries made a pilgrimage to Pokhara, where their ceremonies coincided with King Mahendra's visit (following page).

This lama wears the fearsome mask and brocaded dress of a mountain deity. Flaming lotus bud in the left hand symbolizes the riches stored on the god's sacred peaks.

Some awed, some apprehensive, women and children watch the sacred drama. Once the almond-shaped marks on the foreheads of two spectators at center would have identified them as Hindu followers of the god Vishnu; nowadays women wear such marks for beauty only.





men, provide the crossings. If possible, these narrow-beamed, top-heavy craft are more dangerous than the bridges.

Even the normally fearless Aila took a dim view of the dugouts, although, as the property of the Hindu river gods, they were as sacred as temples and could only be entered barefoot. A Buddhist, Aila took no stock in the ability of the river gods to keep a dugout from capsizing.

Icy River Preferable to Canoes

When a canoe looked particularly unsafe, I used a bone-chilling solution. I simply strapped my notebooks and camera on top of my inflated air mattress and swam the river, pushing my mattress raft ahead of me.

In northernmost Nepal, where the influence of Tibetan traders has been strong, trails are better kept and bridges more stoutly built. Thus northern Nepal, because of poor contact with the central government at Katmandu, has been commercially oriented to Tibet. Cultural ties have also been strong because of the influence of religion.

The problem of roads, I firmly believe, is the real drama of Nepal, and upon its outcome will depend the country's future. In my own reports to the Nepal Government, I put the strongest possible emphasis on the immediate need for a comprehensive program of trail improvement and bridge building.

Happily for my hopes, I once had the opportunity to present a slide lecture to His Majesty, King Mahendra Bir Bikram Shaha Deva, and other members of the royal family. I'm afraid they were spared nothing, for I was careful to include photographs of some of the worst trails and bridges I'd ever encountered.

At the end of the lecture, the bespectacled young king looked thoughtful.

"Yes," he said finally. "It is time I saw my country."

Not long afterward His Majesty personally led some 300 government officials, many of whom had never before left the capital, into the field to see at firsthand the country's condition and needs. It must have been a heartening journey, for the loyalty

Trumpets and Drums Hail King Mahendra as He Mixes With His People in Pokhara

Once Nepal's rulers never ventured beyond Katmandu. But in 1956 young King Mahendra and 300 officials made a triumphal four-month tour of the country after seeing Nepalese scenes photographed by the author. Here, on a 1959 visit, His Majesty walks a red carpet beneath an umbrella signifying royalty. Officials leading the way hold their hands in gestures of greeting.



Homemade, hand-powered Ferris wheel amuses villagers during the fall festival of the Hindu goddess Durga. Adults find the contraption so

entertaining that children rarely have a chance to ride. Patrons queue up to await their turn. Two men at the wheel's hub turn the spokes.



REARRANGED BY SCHUYLER LOREN (ABOVE) AND TONY HADEN © N. S. S.

Gold-embroidered fur hat and heavy necklaces comprise the finery of a Sherpa woman. Her costume is Tibetan.

of the provincial peasants to the monarchy is tremendous. The king's inspection tour lasted four months and was the first such survey ever made.

Water Power—Nepal's Brightest Hope

It is still too early to assess the results of my geological survey, but I can say that Nepal's mineral resources are not on the highest mountains, as its ancient legends claimed. There are a number of extremely primitive iron and copper workings which would probably repay exploiting on a limited scale. Small smithies and factories might profitably produce iron plowshares or bridge chains, but until Nepal improves her transportation, she cannot hope to compete with India in steel or copper.

As for petroleum, there seem to be some possibilities that prospecting might prove worthwhile.

More important for Nepal, it seems to me, are the potentials of her agriculture and forestry. Scientific irrigation would increase farm production in many areas. And the stability of the government since the country's first elections in 1959 seems to assure promising developments in farming and irrigation, as well as in the building of roads and bridges.

Perhaps Nepal's greatest resource is her abundant potential for hydroelectric power, needing in most cases no expensive dams. Her rivers offer many a hairpin curve where



a tunnel from one level of the stream bed to the next would suffice for power production. In time, Nepal might be able to supply power for most of northern India.

Such abundant and cheap electric power, used to extract nitrogen from the air, could also provide nitrogen fertilizer for Nepal and much of Southeast Asia as well.

As for all those diamonds, rubies, emeralds, and other precious stones supposedly abounding among the high thrones of the gods—well, I never did find them. But, faced with the threat of bandits, I did discover a seemingly inexhaustible supply of another kind of Himalayan “jewel.”

Eight Bullets for Eight Bandits

On one of my northern trips, I saw that my route would carry me through Manangbhot, principal town of the region north of Annapurna. As always, my porters were alert to pick up any gossip concerning trail conditions ahead. Now Aila came up to me as we rested after our brunch.

“Porters much frightened, sir,” he told me gravely. “Very bad place ahead, sir. I think many bandits there.”

“But it’s marked on the map as just a tiny village,” I protested. Aila remained firm.

All my experience of Nepal had been that violence and banditry are almost unknown among the fundamentally decent and honest mountain people. I carried a Swiss Army pistol, but normally it rode in the bottom of my luggage. Now, I decided, was the time for a little applied psychology.

Some time before, in what must have been one of the most unfair competitions in history, I had demonstrated my prowess with a pistol by shooting at rock targets against a friendly Tibetan trader. His antique muzzle-loader took him 10 minutes to load and had to be fired from a support. The muzzle-loader boomed like a cannon when he fired it, but at 60 feet its accuracy was no match for my modern pistol. I felt exceedingly unsporting, but the competition had the desired effect of making my porters regard me as a Himalayan Deadeye Dick.

Now I made a great show of unpacking my

pistol and counting my cartridges. I had a dozen rounds of ammunition.

“Just how many bandits are there?” I asked Aila.

“I think, sir, eight bandits.”

“Excellent,” I said briskly. “I shall shoot all eight, and we will still have four cartridges to spare.”

Vastly reassured, my porters cheerfully followed their bold and fearless leader, who was wondering nervously just what he would do if eight bandits actually did turn up. Or what he would have done if Aila had reported 13 bandits.

We met no bandits, but Manangbhot came as a surprise. Much more than a village, it was a large and prosperous town. Many of the townsmen had traveled abroad and were familiar with airplanes, railroads, and even steamships.

Our somewhat cool reception was explained when I found that the residents had mistaken me for a government customs officer, for we had stumbled on a kind of illicit Shangri-La. The city’s principal business was smuggling! And the bandit report we’d heard down trail was a carefully nurtured propaganda effort to keep prying strangers clear.

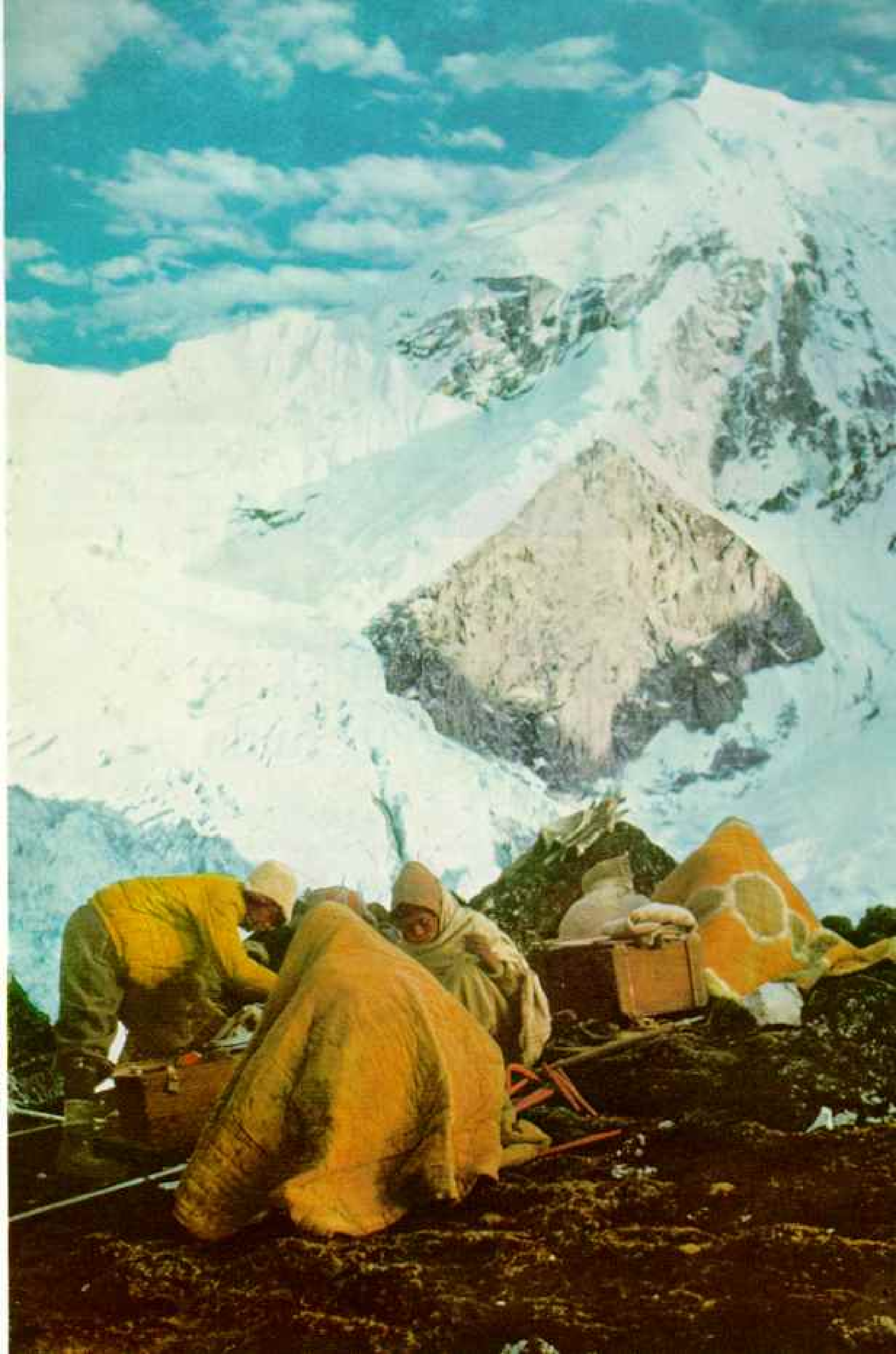
“Gems” From Europe’s Glass Factories

The main commerce was in those legendary “jewels from the thrones of the gods.” “Straight from the Himalayas,” as they unquestionably were, they fetched a handsome price from the unsuspecting but deeply religious peasants of lower Nepal and India. The only trouble was that they had originated not in the Himalayas but in the glass factories of Czechoslovakia.

My work in Nepal is not yet finished, for there remain a number of technical chores to be completed. Perhaps it will be necessary for Aila, “little Singha Durbar,” and me to journey once again to the snowy heights behind Kanchenjunga and Makalu, Annapurna and Dhaulagiri. Once again Aila and I may sit before a yak dung fire and share a cup of chang in some mountaineer’s smoky, cheerful home, while outside the wind howls down from high Tibet.

Blanketed Porters Huddle Under the Frosty Eaves of Mount Everest

At sunset the November temperature stood above freezing. Two hours later the author sat in his tent drinking hot tea; within minutes the liquid froze. Soaring 29,028 feet, Everest lies 28 air miles from this 19,000-foot camp at Tesi Lapcha.





Indian parishioner, his richly illustrated Bible held aloft, recites the Easter story to a Holy Week audience at the church of Santa María de Jesús, near Antigua. In some villages, lay members lead ceremonies and mix Christian and Maya rituals.

Rain-soaked women wearing the distinctive *huipiles* of Santa María wait at dusk to bear lighted candles into the church. Folded cloths on heads often serve as slings for carrying infants.

Easter Week in Indian Guatemala

By JOHN SCOFIELD

Assistant Editor, National Geographic

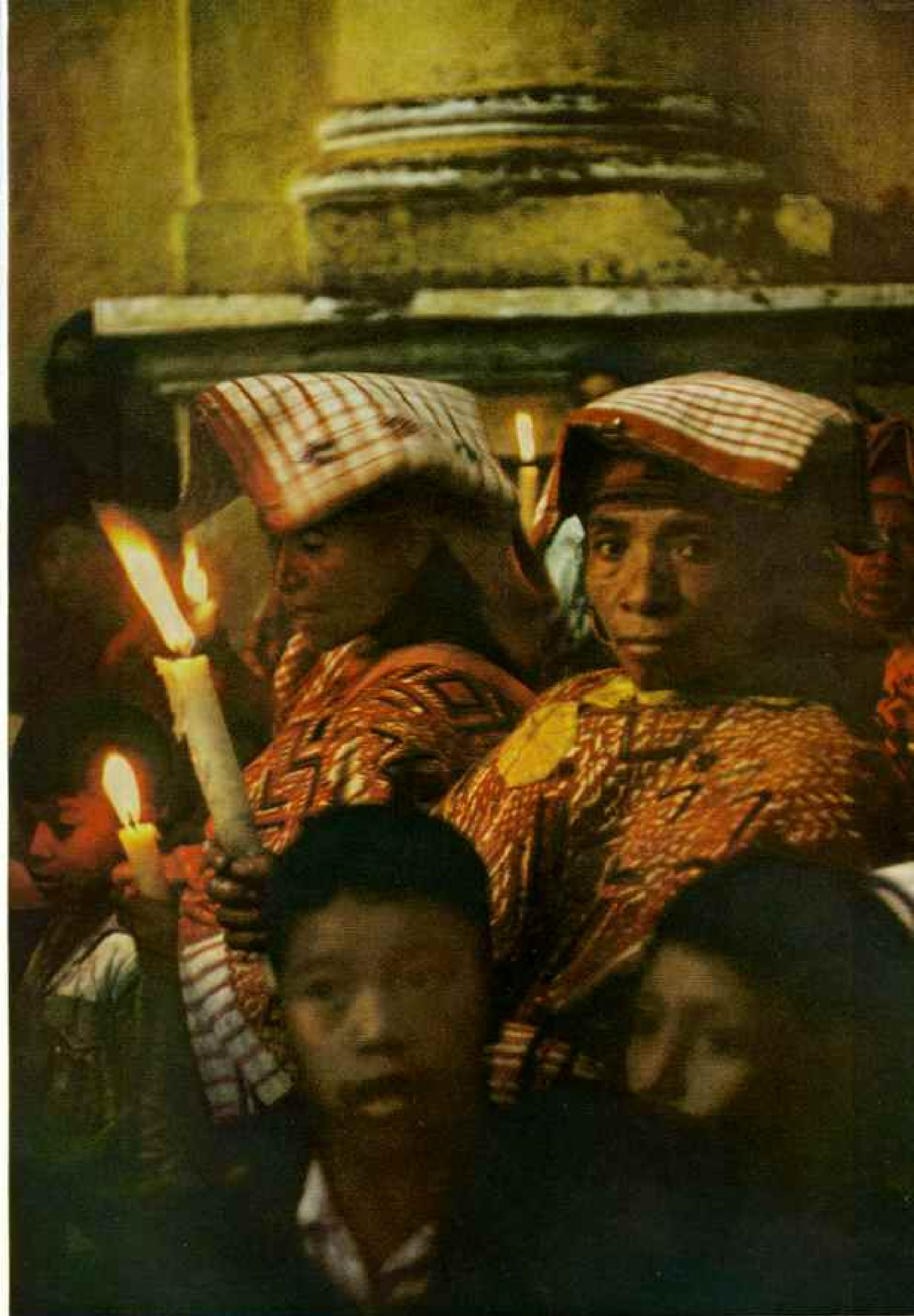
Kodachromes by the author

“GO TO ANTIGUA,” a friend in Guatemala City told me. “There you will find the best processions in the country.”

I had come to this northernmost of Central America's six colorful republics to see the rites of Easter Week—ceremonies, I had been told, that rival those of Spain in brilliance and fervor. But even this advance notice hardly prepared me for the Good Friday splendor of Guatemala's onetime colonial capital.

Before the façade of venerable La Merced church, newly painted in lemon and white, stood ranks of Indian and Ladino parishioners robed in vivid purple. Behind them were others, mounted and on foot, armored and helmeted to represent the Roman soldiers of Pontius Pilate. Ringing these costumed ranks, thousands of Antiguans waited in holiday dress for the ceremony to begin.

On La Merced's roof, shirt-sleeved men cranked a six-foot-high wooden rattle, adding a sense of mounting excitement to the scene. Then, as the sound of the noisemaker rose to a deafening din, a ball of gray smoke puffed from the entrance of the church.





Villagers bear a swaying red-robed Christ past coffee trees to a carpet of flowers



and dyed sawdust; band and smoking censers herald Antigua's Good Friday procession

A knot of robed figures stood for a moment in the doorway, swinging silver censers in which fragrant incense smoldered. Behind them twin files of men walked slowly into the sunlight, bearing on their shoulders a massive mahogany platform. On it, clothed in scarlet and carrying a huge cross, towered a life-sized figure of Christ.

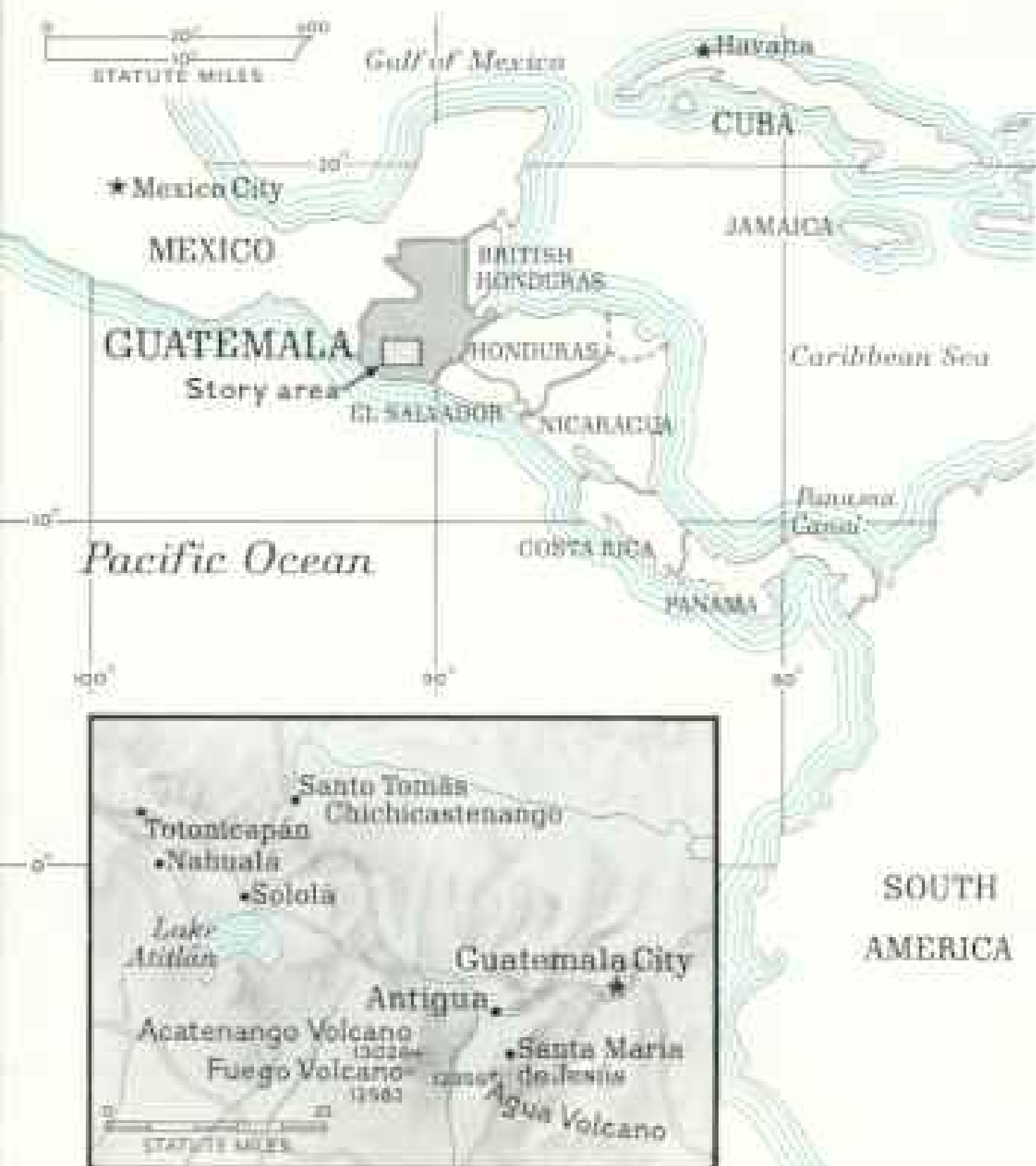
A brass band played a dirge. The figure, rising ten feet above the heads of the onlookers, inched slowly into the crowd, swaying gently as the bearers adjusted their steps to the music (page 409).

Along a twisting route through Antigua's cobbled streets, families had worked for days before their homes, fashioning elaborate car-

Fairgoers in Sololá Bargain for Salt Fish, an Imported Treat

The fair coincides with Passion Week, when vendors offer items that are scarce at other times: mountain woolens, honey, and Mexican fish. Young couple buying fish wear costumes of neighboring Nahuatlá.

Map locates the volcano-studded highlands, where Indians preserve the customs of their pre-Columbian forebears.



ENLARGEMENT OF STORY AREA







© NATIONAL GEOGRAPHIC SOCIETY

Tortilla Maker Grinds Corn in the Way of Her Ancestors Centuries Ago

Ancient Americans domesticated maize, which no longer exists in its wild form. Carvings in their ruined temples show them planting the grain with sticks. Archeologists digging into their civilization's very beginnings find the indestructible mano and metate, identical to the grinding stones used by this housewife of Santo Tomás Chichicastenango. To loosen hulls, she soaks kernels in a pot of limestone and water.

pets of pine needles, sand, dyed sawdust, and flower petals (page 408). Now, as the procession entered the city, householders ran anxiously to smooth away an inadvertent footprint or to moisten a border of blossoms with a watering can to keep the breeze from disarranging its feathery petals.

Then, as the figure was carried over the first of these rich mosaics, the bearers paused for a moment, shuffling from one foot to the other before moving on, leaving the carpet's crisp outlines blurred and shadowy, as if the colors had run during a sudden thundershower.

For nearly seven hours the procession wound its way slowly through the city. Every few blocks weary bearers relinquished the heavy platform to fresh contingents of purple-

robed, white-gloved men, so that all who wished to do so could express their piety by taking an active part in the colorful rite.

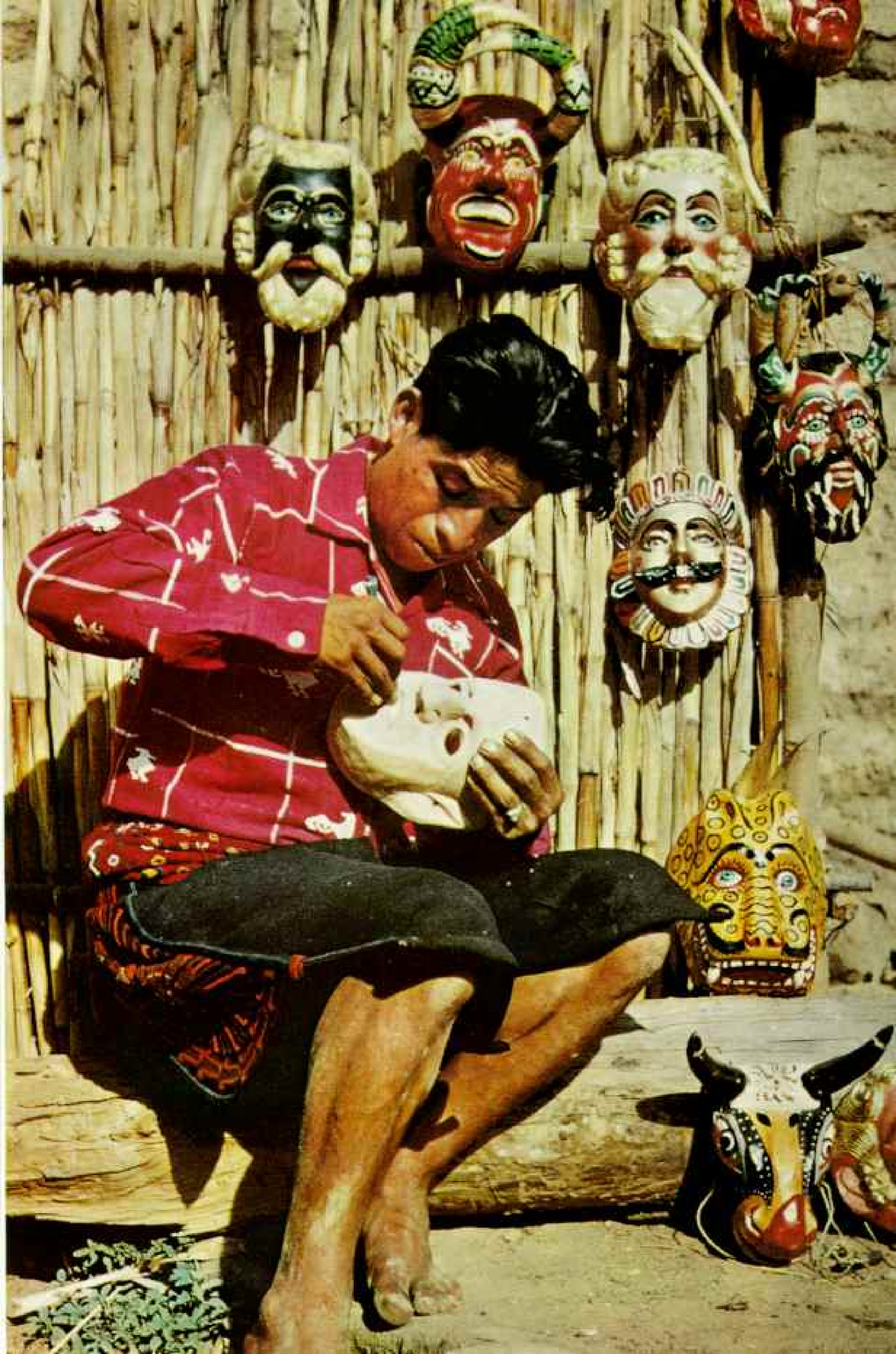
Indians Rap on Brother Pedro's Coffin

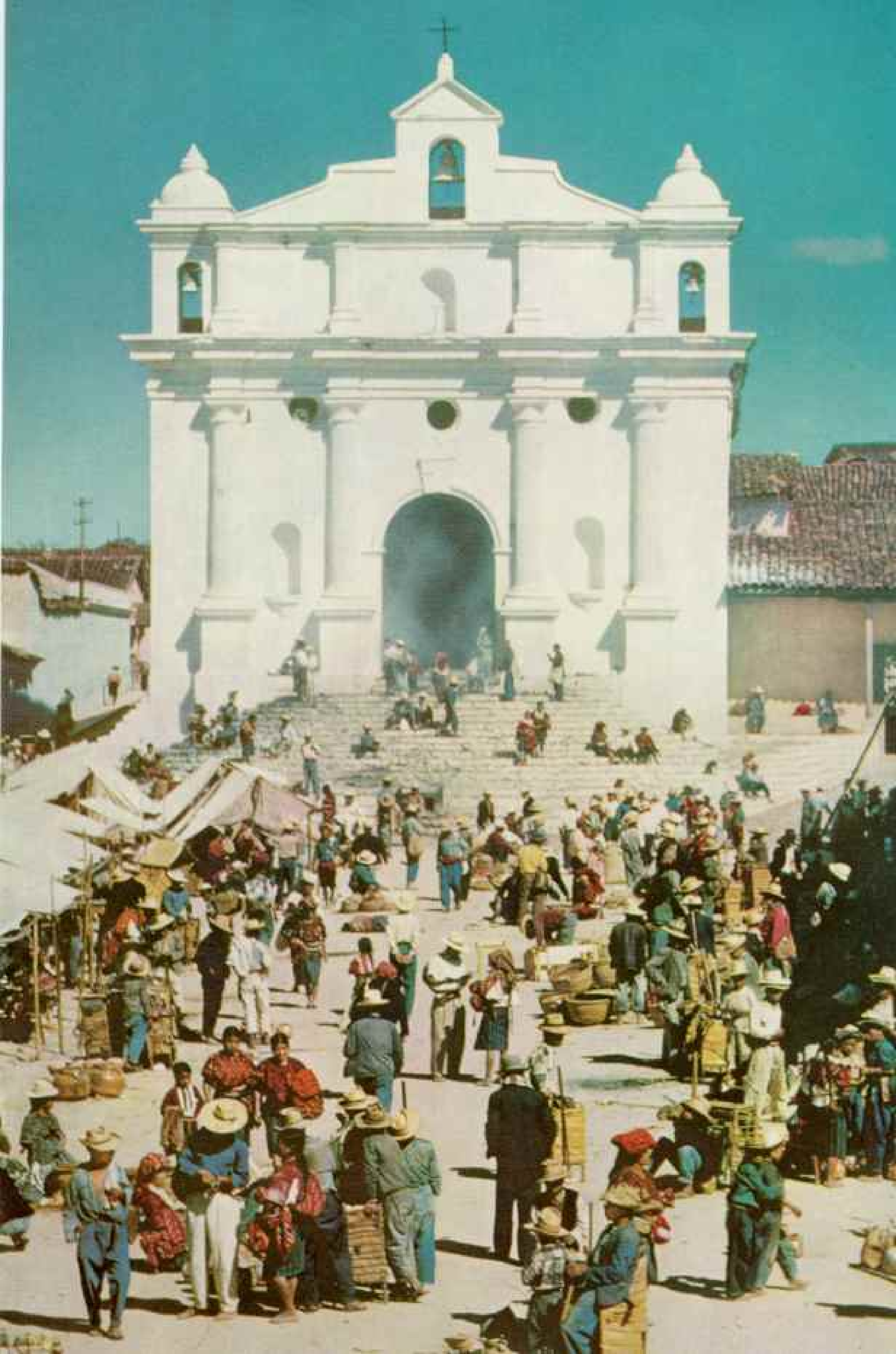
On my last morning in Antigua, after having watched five of these rich spectacles in four days, I stopped for a moment by the imposing ruins of San Francisco, begun in 1543 and crumpled with the rest of the city when a disastrous earthquake struck in 1773. From the roofless cathedral-like nave I wandered toward a chapel which, alone of the splendors of this ornate church and convent, survived the catastrophe intact.

Inside, candles glowed warmly, and carpets
(Continued on page 417)

Mask Maker, Like His Father and Grandfather, Practices an Honored Craft

Bearded, blue-eyed face above the Chichicastenango carver represents Pedro de Alvarado, conqueror of the area 437 years ago. The haughty Spaniard, teamed with his enemy, the last Quiché king, stars in the Dance of the Conquistadors, which Indians frequently stage on saints' days. Horned masks on the fence depict devils.







Church and market dominate life in Chichicastenango. Indians on the steps of Santo Tomás send a haze of copal incense skyward as a vehicle for their prayers. Others in the plaza shop for food, coffins, candy, pottery, and skyrockets.

Pathway of flame created by myriad candles leads to the altar in Santo Tomás. Prayers of the supplicants, kneeling beside the flickering beacons of their faith, fill the old church with an insistent buzzing.



of pine needles clothed the stone floor. In a corner a group of worshipers knelt before the tomb of Pedro de Betancourt, who during his lifetime befriended the Indians of this highland area.

Now, to thank Brother Pedro for favors granted, descendants of those same Indians tied queer little effigies of wax to the grill protecting his last resting place, while others rapped imperiously on his coffin with coins to make sure he would hear their prayers.

As I walked slowly back toward my hotel, the whole city was fragrant with smoke. Antiguans were tidying up their streets and burning the tons of pine needles that had carpeted the processional routes.

Above me, Antigua's three volcanoes loomed closer than ever in the clear morning air: stately 12,356-foot Agua, that seemed always to be peering over my shoulder; green Acate-nango; and smoldering Fuego, whose belchings have so often twisted the fate of this venerable city, with its wisp of smoke rising from hidden fires.

Farmers Bring Seed Corn to Church

Guatemala's colonial capital is not the only place in this richly flavored land where elaborate ceremonies herald the coming of spring.* A week earlier, in Santo Tomás Chichicastenango, I had seen Easter observances so mixed with the paganism of the ancient Maya that I could hardly tell where one ended and the other began.

Inside the parish church of Santo Tomás, thousands of candles flared and smoked in a pathway of shimmering flame (page 415). I watched as a strikingly costumed Indian knelt in prayer over parti-colored ears of seed corn (opposite).

How logical, I thought—this linking in an Indian's mind of an ancient ceremony at planting time with the story of a god from across the sea whose resurrection anniversary coincides with the appearance of the first hopeful buds of spring.

I was struck by the proud bearing of Chichicastenango's Indians. Pointedly ignoring a party of tourists brought in that morning by bus, they prayed forcefully and directly, as if they stood face to face with the Almighty.

Candles Flaming Amid Rose Petals Ask Blessing on an Indian's Seed Corn

His forebears staged elaborate rituals in which they beseeched the Maya gods of maize and rain for bountiful crops; he attends a mass at Santo Tomás for the benediction of the seed. After setting the candles, he will pray to both Christian and pagan deities and depart confident that he has won favor for his fields.

"Are they praying to the Christian God, or their own?" I asked my Quiché-speaking guide.

"Who knows!" he said. "Perhaps both."

Beside us a richly dressed descendant of the ancient Maya shook his finger at the empty air.

"Last week I brought you a candle," my guide translated as the old man spoke. "And yesterday one. But the donkey is still sick."

The Indian held the wick of a new candle above the light of another until it burst into flame, and then warmed its base so the wax took on a molten sheen. Quickly he set the glowing taper on the stone floor of the church, where it stood upright among thousands of others. Then he sifted a handful of rose petals onto the floor around it.

"This is the last candle," the old man said firmly, "until the animal is well."

Rockets Launched From Indians' Hands

Outside, on the steps of the whitewashed church, other worshipers swung crude censers of fragrantly smoking copal incense and knelt, foreheads cradled in hands, to pray.

Periodically, rockets streaked up from the busy street below, carrying the prayers of worshipers skyward. The Indians often hold these homemade rockets in their hands until they literally tear themselves from their fingers and soar into the blue, trailing six-foot tails of cane, to end in loud pops and puffs of black-powder smoke.

When I left Chichicastenango late that afternoon, the market place had taken on the sad, stripped look of a circus lot two hours after the final show. A few merchants stubbornly offered the last of their wares rather than carry them home, and here and there an Indian lay face up in the yellow sunlight, sleeping off the effects of a day-long celebration.

On the steps of Santo Tomás a lone worshiper finished a prayer and rose to his feet; then, as my bus turned onto a cobbled side street, I heard the characteristic who-o-o-o-ooosh-BANG of a homemade rocket bearing a request to the gods.

* See, in the NATIONAL GEOGRAPHIC: "Guatemala Revisited," October, 1947; and "To Market in Guatemala," July, 1945, both by Luis Marden.



*From Alleghenies to tidewater,
the old canal along the Potomac offers
serene beauty to those who roam its
restored towpath*

Waterway to Washington

THE C & O CANAL

By JAY JOHNSTON

National Geographic Editorial Staff

ONE WARM EVENING last summer I climbed aboard a barge in Washington, D. C., and let a team of mules pull me into a bygone era. With each plodding tug, as the glassy canal water rippled below, the neon-lighted world of the Capital slipped farther behind.

I was riding aboard the *Canal Clipper*, a homely, flat-bottomed craft that carries sightseers up a short stretch of a famous waterway, the Chesapeake and Ohio Canal. George Washington himself fathered the first canal here along the Potomac. In its heyday, nearly a century ago, the C & O floated millions of tons of coal, grain, lumber, and flour from Cumberland, Maryland, in the Alleghenies, to the tidewater port of Georgetown on the fringe of the Capital (map, page 424).

Today, for most of its 185 meandering miles, the once-proud queen of commerce is dry, weed choked, and tree grown. Abandoned since 1924, the old locks that echoed to the shouts of bargemen are sagging and deserted.

Towing a sightseeing barge, mules wade a spillway that drains the Chesapeake and Ohio Canal's overflow into the Potomac at Georgetown, in Washington, D. C. A bill pending in Congress would make the waterway the Nation's newest national historical park.





The lilacs grown wild and the decaying lockhouses recall the less hurried life of an earlier-day America.

But now new life looms for the derelict canal. As these words are written, legislation pending in the 86th Congress would preserve the waterway as a full-fledged national historical park. The National Park Service would restore many of the lockhouses, rewater additional portions of the canal, and build campgrounds and picnic areas along its length.

"It is a refuge, a place of retreat, a long stretch of quiet and peace at the Capitol's back door—a wilderness area where man can be alone with his thoughts, a sanctuary where he can commune with God and with nature, a place not yet marred by the roar of wheels and the sound of horns."

Thus did a distinguished American, Associate Justice William O. Douglas of the United States Supreme Court, describe the C & O Canal a few years ago. And the pleasures he had found in many a walk along these quiet banks—solitude and serenity and sylvan beauty—are still there in abundance.

Wildlife Thrives on Canal Banks

Strolling the towpath amid fern-clothed cliffs, in the depths of a dark wood, or beside a sun-drenched pasture, one captures the feel of a vanished age.

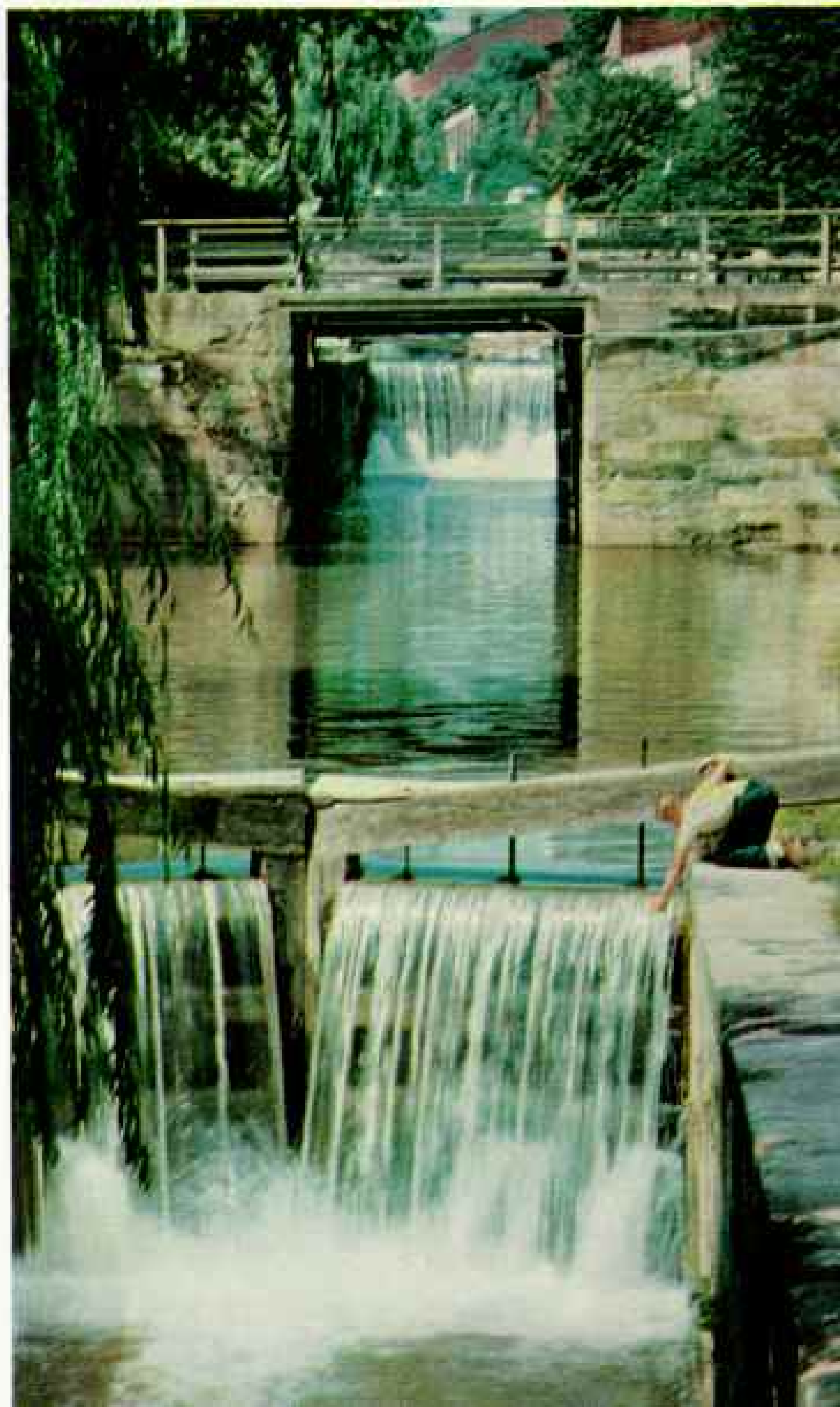
When the birds in the gaunt pines and towering tulip trees cease their chatter, a haunting silence reigns. Then the wind song rustles the treetops. Winged seeds spiral toward earth and tick like sleet on the dried-



Canal Clipper Passes Georgetown, the Waterway's Tidewater Terminus

Eighty-five years ago, in the canal's golden age, the strip kept 700 mule-powered barges busy. Today a 23-mile stretch running northwest from the Capital City again brims with water, but elsewhere weeds and trees choke abandoned sections. Though the canal has carried no freight in 36 years, it still has one commercial customer in Georgetown—a flour mill uses its water for power. Here fashionable homes and apartments line its bank.

Man-made waterfalls gush over the locks in Georgetown. Seventy-four lift locks enabled barges to make the climb from Washington to mountainous western Maryland.



NATIONAL GEOGRAPHIC PHOTOGRAPHER THOMAS BOBBLE © N.G.S.

leaf floor. A gray squirrel scolds from a sycamore. A turtle plunges off his log solarium into a rain-water pool.

And you think: This is how it was on a soft spring day a century ago.

Barges and boatmen are gone now, but imagination works wonders. Around a distant bend come plodding mules. A barge glides into view. On its bow the skipper cups hands to lips for a singsong cry, the locktender's cue to open the gates.

"Hey-y-y-y-y lock!"

The mental image turns back time to a year when this waterway



teemed with the traffic of some 700 boats.

Their dimensions were standard: 92 feet long, 14½ feet wide, and a draft of 5½ feet when loaded. Cargo capacity ranged from 100 to 120 tons.

They were alike as boxcars, yet each was a captain's pride. The squat, sluggish boats bore loving names—*Belle*, *Katie Darling*, *Jenny Lind*, *Nanny McGraw*, *Scow Lion*, *Cock Robin*, *Morning Star*.

Extra Mules Rode on Boats

The captain and his family, or his hired hands, lived aft in the cabin. In a stable forward rode the relief mules, heads craning through tiny windows.

On sunny days the family wash fluttered from lines strung abovedeck. Children, tethered lest they fall overboard, played about

the cabin. Dogs and cats dozed on the warm planking as the mules plodded along at a speedy two miles an hour between the west and Washington.

What was life like on the canal during its halcyon days?

I asked this question of many people who dwell on the banks or in the near-by villages. For most, memories are secondhand, tales told and retold by their elders. But the old-timers, men who lived and worked on the stream, vividly recall the vanished era. And their number, if not legion, is surprisingly large.

One was O. P. Matthews, who managed a hotel where I stopped near Cumberland. He grew up on a farm in western Maryland. From his bedroom window he could see the canal, twisting in hairpin turns through the

NATIONAL GEOGRAPHIC PHOTOGRAPHER THOMAS REEB III © N.G.S.



Paralleling the Potomac, the C & O flows along the edge of Washington. Naked stone piers once supported Aqueduct Bridge, which linked the C & O with a canal to Alexandria, Virginia.

Summer Sunday outing on the canal bank above Key Bridge entertains a family. Hikers as well as cyclists patronize the towpath. Placid waters harbor catfish and large carp.

bright-boughed hills and pine-tufted crags.

"I'd lie abed at night," he told me, "and watch the barges inch their way up and down. The light from their bow lamps shone on the water and flashed in the trees. I could hear the music of fiddles, and people singing and laughing in the cabins."

Raleigh S. Bender of Sharpsburg, Maryland, may well have been one of the canallers whom Mr. Matthews watched from his window half a century ago.

"Call me Cap," he directed. "Everybody does; and besides, I like it."

Reminiscing in the cool quiet of his spacious home on Main Street, Cap Bender conjured up a tableau of lazy waters and slow-moving boats, set against a background of bustling coal docks, blacksmiths and boatbuilders, teamsters and wharf workers.

"Thirty-six years I worked on the boats. They were the hardest, and happiest, days of my life.



"All day long you'd be trying to make time, beat someone else's record for the trip downstream or up. Come dark, you'd put the feed trough out on the banks and let the mules graze and doze. You'd sit around for a spell, smoking and talking, then hit the hay to be up with the dawn for an early start. Sometimes you'd drive the mules through the night."

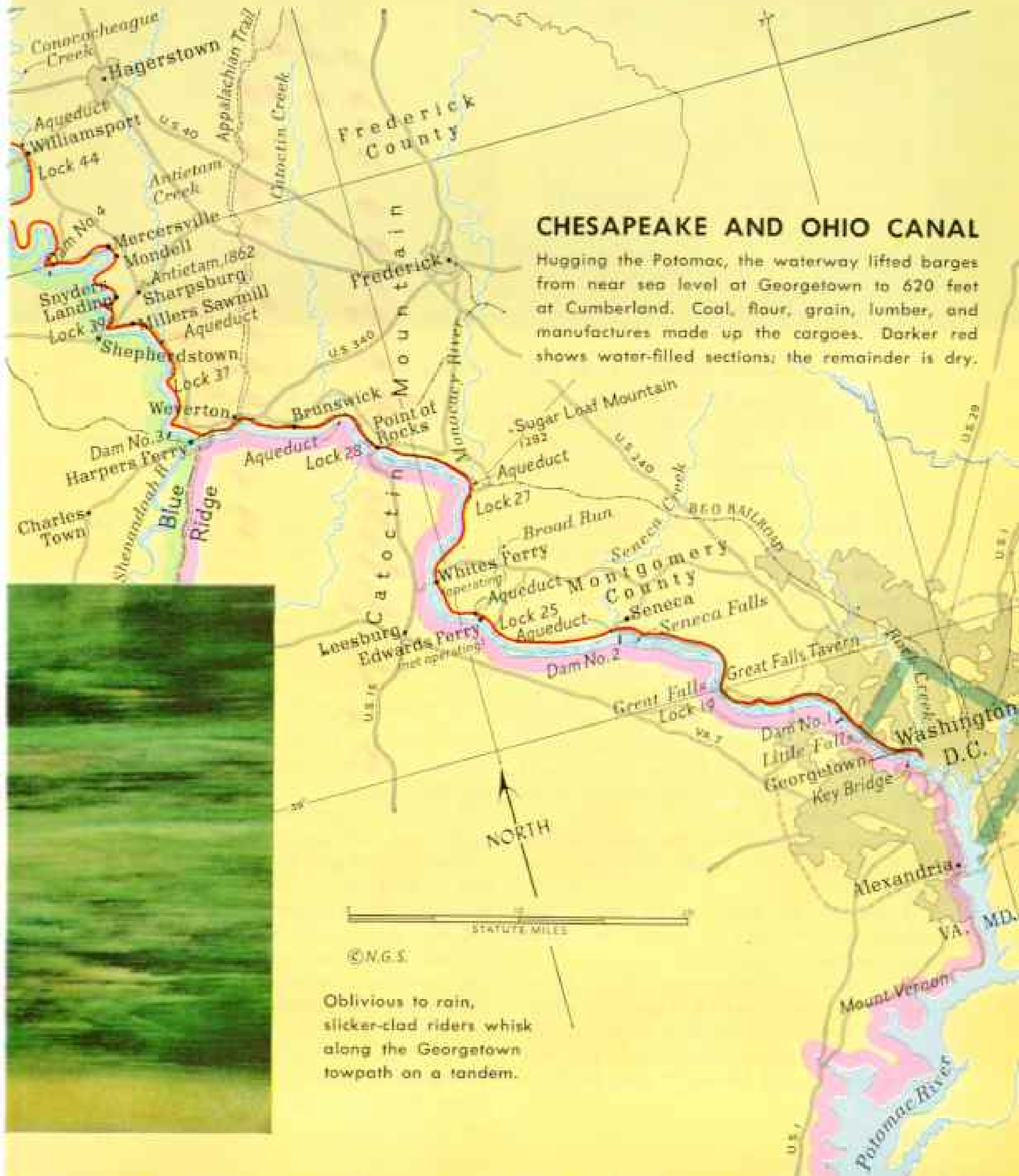
He lifted a wooden model from the top of a chest and dusted it carefully.

"This is a model of the last boat I skippered,

And these were my mules—Jack, Kate, and Rock. No one ever saw a better three mules on the strip."

He joined boat and mules with a simulated towline of thin cord. His eyes shone with remembrance (page 435).

"This is the way they'd work. Just like this when we made the record 62-hour run from Georgetown to Cumberland. And when I towed the last load of coal down to Washington in 1923.



CHESAPEAKE AND OHIO CANAL

Hugging the Potomac, the waterway lifted barges from near sea level at Georgetown to 620 feet at Cumberland. Coal, flour, grain, lumber, and manufactures made up the cargoes. Darker red shows water-filled sections; the remainder is dry.



Oblivious to rain, slicker-clad riders whisk along the Georgetown towpath on a tandem.



JAY JOHNSON, NATIONAL GEOGRAPHIC STAFF

Canalside Residents Greet Justice Douglas With a Poster Barrage

In 1954 William O. Douglas, Associate Justice of the United States Supreme Court, led a hike the length of the waterway in protest against the proposal to build a motor road along its bed. Here, on a recent visit to Williamsport, Maryland, he meets proponents of a plan to convert the right of way into a national historical park.

"For years the railroad had been running circles around us; business got so poor there were only 60 boats left.

"Then the '24 flood wrecked the canal, and no one bothered to repair it. It just wasn't a paying proposition any longer."

He sat back and the rush of words slowed.

"So that was the end. For me and all the other canalmen. I came home for good and settled down here with my wife and seven youngsters. I've been mighty content and comfortable here, but I'll never forget those old canal days."

Sunday outings along the canal provide much pleasure to Cap Bender, still robust and active at 87.

Frequently he gets together with canal cronies, and the talk is hearty and spiced with affectionate insults.

"We were a rough-and-ready lot," he recalls, "and there were a lot of practical jokers.

"One of my mates used to tickle my face with a straw every morning to wake me. One day when I wasn't feeling so good, he did it once too often.

"I grabbed him by the seat of his pants and pitched him off the boat, right into the middle of the canal.

"'I can't swim! I can't swim!' he yelled. And turned out he couldn't. Had an awful time making it to the bank, and I nearly fell over the side laughing."

Washington Built Early Waterway

This was the canal of yesteryear, a busy, boisterous highway linking the tidewater and the Alleghenies.

But for one man—George Washington—it might never have been.

Washington's plan for a water avenue from east to west merits the first chapter in any history of the Chesapeake and Ohio Canal.

Below the city of Washington the broad Potomac River flows sedately over clay, sand, and gravel as it passes Mount Vernon and gently laps the corn and tobacco fields of tidewater Virginia and Maryland. This part of the river is navigable for seagoing ships that steam up from Chesapeake Bay.

But above the Capital the Potomac runs

swiftly over hard crystalline rocks, the eroded remnants of ancient mountains. Its shores change from rolling hills to steep palisades.

At Great Falls, 10 miles above the city, the river is a wild creature, crashing through rugged gorges, roaring over masses of rock (page 433). No boat can navigate these furious waters.

Washington's idea was to bypass such dangerous stretches with canals and open up a new water route to the west. In 1785 the Potomack Company was formed, with Washington as president.

A year later 200 men were at work on a system of improvements, building canals around major obstacles and dredging in the Potomac to make the river navigable. The squire of Mount Vernon made numerous trips up from his home to supervise the project.

Writing to Thomas Jefferson in 1788, he reported: "The labourers employed by the Potomack Company have made very great progress in removing the obstructions at the Shenandoah, Seneca and Great Falls. . . . This will become the great avenue into the Western Country; a country which is now settg.

[settling] in an extraordinarily rapid manner, under uncommonly favorable circumstances, and which promises to afford a capacious asylum for the poor and persecuted of the Earth."

In 1798 the ex-President, back home in Mount Vernon, reaffirmed his belief in the Potomac's potential. Concerning "the many and great advantages which will accrue from completing the navigation of the Potomack," he wrote to a friend, "I have every day additional reason for supporting my former opinion, and new proof of its advantages. . . ."

First Canal Filled With Danger

But boatmen who ventured downstream on the "improved" river route in the early 1800's found it a harrowing experience. The swift current, treacherous rapids, whirlpools, and shoals challenged even the most skilled navigator. The crude locks around Great Falls were usable only when the river was high enough to fill them.

If a craft survived the journey—and many did not—it was a rare owner who attempted the even more difficult upstream run. Usually

Even in Winter Canoeists Paddle the Canal, and Hikers Explore Its Banks

Prolonged cold spells often convert this section into a skating rink. Here, near Seneca, Maryland, only the 12-foot towpath separates the C & O from the flooded river.

FRANK CRAGG/LEAS





ILLUSTRATED BY NATIONAL GEOGRAPHIC PHOTOGRAPHERS THOMAS WEDDIE (BOAT) AND VOLKMAR WENTZEL © N. G. P.

he broke up his raftlike boat, sold it for lumber, and walked home.

The hiker today, tramping the Virginia shore, can see the ruins of locks built by the Potowmack Company. After more than a century and a half and many floods, the huge hand-cut blocks of stone still stand in trim alignment, reflecting the precision with which the walls were built.

President Adams Sheds His Coat

The Potowmack Company failed, but the idea of a route between the Atlantic and the Ohio River remained alive.* The year 1828 witnessed its emphatic revival when the newly organized Chesapeake and Ohio Canal Company began to build a canal from Washington all the way to Pittsburgh and the Ohio.

Appropriately, the directors chose the Fourth of July as the day to start work. They invited President John Quincy Adams to turn the first spadeful of earth near Little Falls.

During his address, President Adams took up a spade and attempted to drive it into the sod. It struck a root. Undaunted, he tried again, with no success. He threw down the spade, peeled off his coat, and, on the third try, pierced the ground. The assemblage roared approval.

Was the root an ill omen? Perhaps, for on that same day—40 miles away, at Baltimore—another group was laying the foundation stone for the Baltimore & Ohio Railroad.

This enterprise was destined to plague the

* See "Potomac, River of Destiny," by Albert W. Atwood, NATIONAL GEOGRAPHIC, July, 1945.



canal throughout its operation. But the waterway's enthusiastic promoters casually dismissed the rail line as a competitive threat. It would, they reasoned, carry only passengers and light freight in horse-drawn cars.

Within a few months the Potomac Valley hummed with activity as hundreds of laborers, using axes and stump pullers, scrapers and gunpowder, wagons and wheelbarrows, dug the big ditch. Stonemasons started construction of locks and lockhouses.

Yet progress was slow. Legal clashes with property owners brought delays; so did struggles with the railroad over right of way.

Flying Fists Settle Workmen's Feuds

But from first lock to last, the major problem was the labor force. The tremendous demand for workmen on the many public works under way in the East precipitated a labor shortage. And the workmen corralled by the C & O, while competent, were temperamental.

So intense was the animosity between Irish and German immigrants, who performed the bulk of the work, that it was necessary to employ them in separate crews.

Rival factions of Irish battled among themselves. Brawls between Corkmen and Longfordmen turned shanty towns into armed camps.

Each payday witnessed violent fights. Whiskey sold freely, and was undoubtedly a factor, but the meager wages of \$10 a month, long hours, poor housing, and worse food were the major causes of dissension.

Indian summer lures Washingtonians to the canal at their back door. City hubbub seems far away to those who come here for boating, hiking, bird watching, or reading.

Passing canoeists skim by tree-shaded banks near Georgetown; a young angler wets a hook. 429



Every summer there was a noticeable slackening of work and a marked exodus of workmen. This was the annual "sickly season" in the valley. From July until late September men fell victim to aches and fevers, attributed by them to droughts that lowered the river level, leaving stagnant pools along the banks. In September, 1832, a cholera epidemic swept through the camps.

Yet the canal moved westward. Georgetown saw the tidewater terminal take shape. Past Little Falls and Great Falls, Seneca, and Whites Ferry crept the ditch and its locks.

With only the first segment in use, a 23-mile portion between Georgetown and Seneca, the cost of transporting flour dropped from \$1 to 30 cents a barrel. In the first ten days of operation some 30,000 barrels were shipped downstream.

Rural communities like Point of Rocks, Weverton, and Harpers Ferry blossomed under the influence of railroad and canal. The villages of Snyders Landing and Williamsport took on fresh life, for as the canal advanced, it brought trade and prosperity.

By 1839 the canal had pushed 135 miles, to a point above Hancock.

There today, just east of the town, the battered hulk of a canal barge lies stranded in the waterless ditch. When spring floods lap its rotting timbers, youngsters swarm over the old relic and "sail" it downstream once more (page 434).

Tunnel Grows at Snail's Pace

Farther on above Hancock, across the river from Paw Paw, West Virginia, canal engineers cut a mountain tunnel to save seven miles. Using hand tools and black powder, crews painfully hacked through shale at the rate of 10 to 12 feet a week.*

The tunnel, 3,118 feet long, 24 feet wide, and 17 feet high from water surface to crown, ranks as an engineering masterpiece of its day.

I shall always remember the first time I walked through the cool, dark tube. I snapped off my flashlight in the center of the bore. Except for pinpoints of light at each end, it was like a moonless midnight. Water from

springs in the mountain overhead dripped through the six layers of brick that line walls and ceiling.

This dark tunnel witnessed many a fight between brawling boatmen. Lacking room for barges to pass inside, boats backed up at the entrances like cars waiting to board a ferry. Fists often decided the right of way.

An old-timer told me of two boatmen, coming from opposite ends, who met in the middle of the tunnel. When neither would give way, they tied up traffic for two days until the superintendent could come up from Georgetown to settle the issue.

Ditch Cost \$60,000 a Mile

In 1850 the waterway touched Cumberland, and the eastern section—the only part ever completed—was formally opened to trade.

Amid salvos of artillery and the blare of brass bands, five barges laden with coal for eastern markets slipped into the locks at Cumberland and headed toward Washington.

Stretching ahead, along the northern bank of the Potomac, ran a waterway six to eight feet deep, ranging in width from 30 to 80 feet, with a towpath 12 feet wide along the river side.

Included in its works were 74 stone locks 100 feet long, 15 feet wide, and 15 feet deep, with a lift averaging eight feet; the half-mile-long Paw Paw tunnel; a dozen aqueducts over northern tributaries of the Potomac; scores of culverts to carry smaller streams under the ditch; and seven rubble and masonry dams in the bed of the river to back up its waters and turn them into the canal.

The project had cost \$11,000,000, or about \$60,000 a mile, a sum staggeringly higher than the backers had estimated.

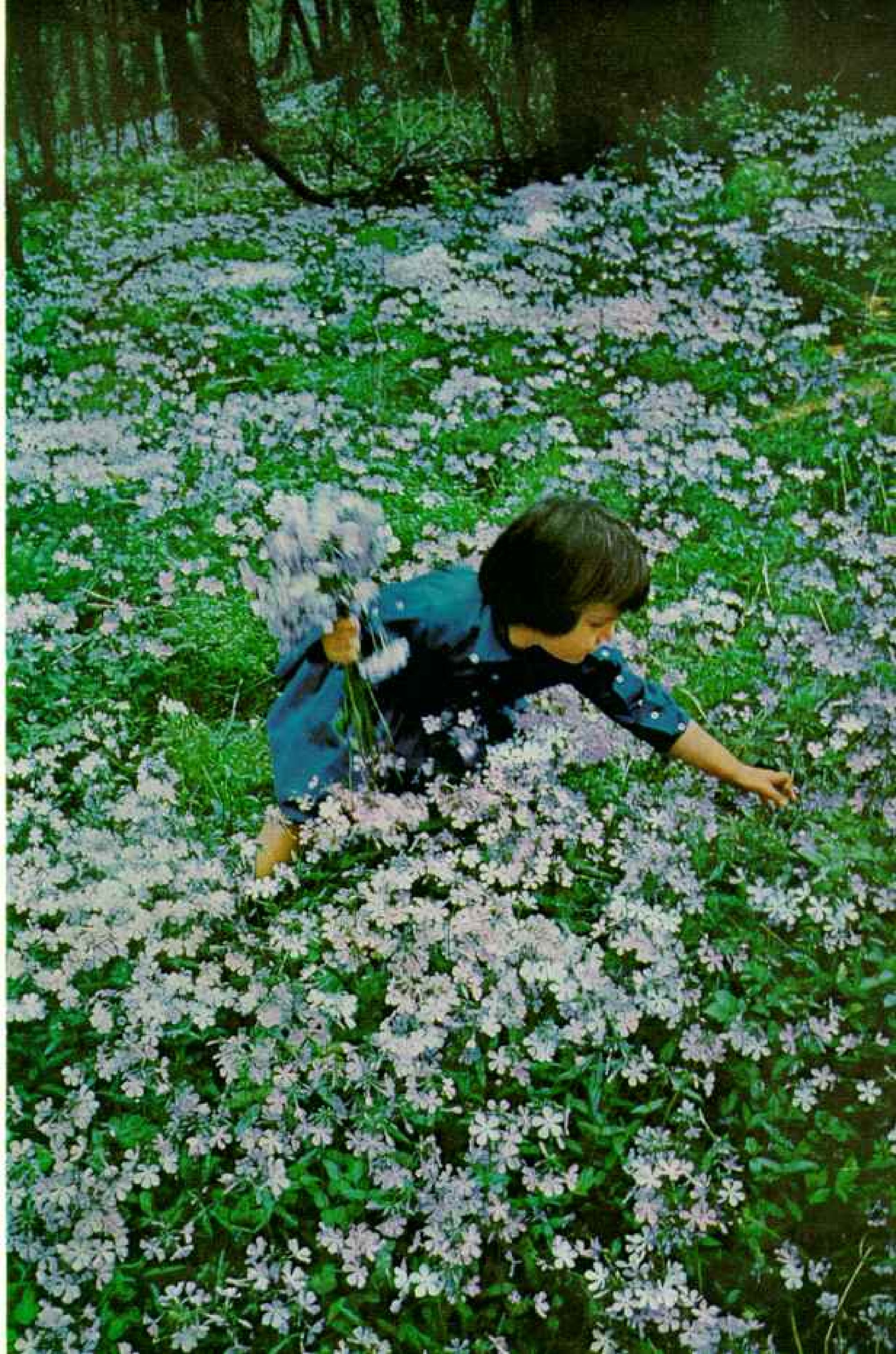
The proposed connection of the Atlantic seaboard and the Ohio Valley was never achieved. The ambitious central and western sections, requiring several hundred additional locks and a four-mile tunnel, failed to advance beyond the planning stage.

George "Hooper" Wolfe, a Williamsport

* See "Down the Potomac by Canoe," by Ralph Gray, NATIONAL GEOGRAPHIC, August, 1948.

A Child Wades Knee-deep in a Sea of Sweetwilliam Phlox

Spring sees the river valley blanketed with bloom. As days grow longer and the sun stronger, spring beauty, periwinkle, violet, buttercup, and jack-in-the-pulpit give way to trout lily, Dutchman's-breeches, and elephant's-foot.







ACCOMMODATED BY NATIONAL GEOGRAPHIC PHOTOGRAPHERS THOMAS WEBB (OPPOSITE) AND BATES LITTLEDALES © N.G.S.

Great Falls, 10 miles above Washington, turns the peaceful Potomac into a roaring cataract. At maximum flood the rapids completely cover the jutting rocks, and the flow surpasses Niagara's. These visitors enjoy the spectacle from a Virginia cliff.

Great Falls Tavern, historic Maryland hostelry converted into a museum, attracts thousands of visitors every year. Aerial view looking downstream shows three of six locks that lifted barges over a 41-foot rise in the falls region. Footbridge at upper right leads sightseers across Potomac rapids to the main cataract (above).

merchant, knows the canal's history almost as well as he knows his customers.

A charter member of the Williamsport C & O Canal Club, he has worked ardently toward the restoration of the waterway and its development into a full-fledged national park.

"You know, I love that old gulch," he told me.

"It's a funny thing, but the older I grow, the closer it gets to my heart. As a boy I drove the mule teams four years, off and on, but the canal never meant much to me then. Maybe that's just human nature.

"But now I'd give anything to see it as it was in its heyday. And I'd like my children and my grandchildren to be able to see it as I knew it."

Over mugs of steaming coffee in his general store, Mr. Wolfe showed me a treasured album of photographs of 19th-century canal life. While I scanned it, he recounted the canal's triumphs and disasters.

"The Civil War caused hit-and-run damage. Lee's invasions and raids by Early, Mosby, and Stuart broke down the banks and knocked out some of the locks.



NATIONAL GEOGRAPHIC PHOTOGRAPHER THOMAS J. BEERENHOUT © N.G.S.

"At Antietam Creek, within cannon range of the canal, Union and Confederate armies fought the bloodiest single day of battle in Civil War history."

The Battle of Antietam on September 17, 1862, climaxed the first of two attempts by General Lee to carry the war into Northern territory. His 41,000 troops clashed with a Federal force of 87,000 led by Gen. George B. McClellan. The Union suffered 12,410 casualties; the Confederacy, 10,700.

Neither side could claim a clear-cut victory, but the battle was highly significant. Lee's failure cost the Confederacy the recognition of Great Britain and gave Lincoln an opportunity to issue the Emancipation Proclamation. Had McClellan won a decisive victory, on the other hand, the war might have ended in a few months, instead of dragging on for another two and a half years.

"Did you know," Wolfe continued, "that three times the Federals commandeered barges and held them in Georgetown? If a Confederate fleet had steamed up the river toward Washington, the Union planned to load the boats with rock and sink them in the channel of the Potomac below the city. Fortunately, it never happened."

When the war finally ended, the canal's coal trade boomed. In 1875 more than a million tons rode downstream. A single lock saw more than 100 boats pass through in a day.

At long last, the company began to earn some income. But the canal never really made any money for its owners: It was always too far in debt.

I asked Mr. Wolfe if it was true that steamboats once sailed the canal.

"Yes," he said, "they tried steam power for a dozen or so years on some of the barges,



WILLIAM D. HARTWELL



Old-time canalboat skipper Raleigh S. Bender displays a model of his barge and mules—Jack, Kate, and Rock. "Best team on the strip," he fondly recalls.

Like a ghost ship, the remains of old No. 57 crumble near Hancock, Maryland. Boys teeter on the timbers; spring rains flood the canal bed. The barge was built about 1909.

Portrait of yesteryear: A barge heads down the canal half a century ago. A stable for the mules occupies the blunt-nosed bow; the stern holds living quarters. Taut line at left leads to a team on the towpath.



WILLIAM D. HARTWELL



Stone aqueduct carried canal barges across Seneca Creek at its confluence with the Potomac. This family starts a day of boating.

Grass Lines the Bed of Monocacy Aqueduct

Largest of 12 spans that transported the canal across Potomac tributaries, the conduit is built of stone from Sugar Leaf Mountain.

The span has defied time more successfully than has the waterway. Trees choking the canal's dry bed make tracing its course from the air difficult.

The Monocacy River merges with the Potomac at left.



and they also tested tractors for a while. But neither steam nor tractor proved as cheap or as dependable as the mule.

"The canal company even built its own telephone network in 1879. At that time it was claimed to be the longest single phone circuit in the world.

"In the eighties, earnings started dipping," he continued. "Many of the Allegheny coal operators had begun shipping by railroad.

"In May and June of 1889 the famous downpour that flooded Johnstown, Pennsylvania, also overwhelmed the upper Potomac."

He passed me a yellowed clipping. A reporter for the *Cumberland Daily Times* observed on June 5, 1889: "It is the opinion of nearly everyone living along the river that the canal has been irreparably injured."

Hooper smiled. "That just proves you shouldn't believe everything you read in the papers. Actually, the canal's bondholders refused to quit. They dredged up another \$400,000, repaired the damage, and kept it operating for 30-odd more years.

"But then came the flood of 1924, and canal operations suspended for the last time."

Government Buys \$2,000,000 Bargain

By one of those ironic twists, the canal in 1907 passed into the hands of its arch rival, the Baltimore & Ohio Railroad.

Hard hit by the depression of the early thirties, the railroad applied to the Federal Government for aid. Harold L. Ickes, then Public Works Administrator, offered to buy the canal, and in 1937 secured the 185-mile-long ditch for \$2,000,000. He acquired a right-of-way from 30 to 900 feet wide containing 5,254 acres.

Many critics spoke their contempt for the purchase. "A century-old white elephant," some deemed it. But others, perhaps more farsighted, suggested that "it may turn out to be the biggest bargain since Alaska."

Since acquiring the canal, the National Park Service has restored the 23-mile segment between Washington and Seneca as part of the National Capital Parks system. Gliding out of Georgetown, the mule-drawn *Canal Clipper* carries sightseers along a five-mile stretch (page 418) during summer months.

Great Falls Tavern, historic hostelry and lockkeeper's home, has been refurbished and converted into a museum where thousands of visitors each year view exhibits tracing the history of both the canal and the Potomac Valley (page 432).

In Georgetown, eastern terminus of the

canal, apartments and homes today crowd the bank beside the lift locks (page 420). A flour mill still uses the flow for power.

Maj. Ernest W. Brown, a retired chief of police, remembers the port town as an exciting place at the turn of the century. Barges laden with coal from the Alleghenies and farm produce from fertile Appalachian valleys sometimes lined up for nearly a mile waiting to unload at the terminal. Draymen streamed between the docks and the big wholesale houses on old Bridge Street (now M Street).

Boatmen Kept Busy, Avoided Trouble

"My first beat in 1896," Major Brown told me, "was the waterfront, and my first arrest, on a bitter winter night, was a man assaulting a canaller.

"Those canal people were a good lot," the major added. "They were honest and worked hard. They stayed to themselves and generally kept out of trouble. I came to know many of the families who lived on the boats, and I liked them.

"Sometimes they would get caught in the freeze-up and have to winter over in Georgetown. They could hardly wait—father, mother, and especially the kids in school—for the spring thaw, so they could get back on that canal."

In 1954 a dedicated trek focused nationwide attention on the C & O Canal.

A motor parkway had been proposed along the towpath, and, in some places, along the bed of the canal itself. In protest against possible destruction of the waterway's scenic and historic values, Justice William O. Douglas led 36 conservationists and newsmen on an 8-day march down the canal.

The much-publicized hike helped defeat the highway proposal. Soon afterward the Park Service recommended that the canal property be preserved as a national historical park.

Each spring members of the 1954 hike hold a two-day reunion on the banks of the canal and retrace a portion of their long march.

Stagecoach Trade Paused at Hancock

Last spring I walked alone on the canal's westernmost reaches.

I began my trek at Hancock, a quiet mountainside town on the old Cumberland Road. Lying within a two-mile-wide strip known as Maryland's Neck, Hancock is the market center of an apple-growing and sand-mining region. Its history is tightly interwoven with that of the canal. Here stood warehouses and shops that serviced the waterway.

Long before canal days Hancock was a busy stopover point for the stagecoach trade. A host of taverns with intriguing names—Sign of the Cross Keys, Sign of the Seven Stars, Sign of the Green Tree—catered to travelers en route from Baltimore to Cumberland, Wheeling, and Indianapolis.

A few minutes west of Hancock I passed the site of Fort Tonoloway, where early settlers had built a blockhouse for refuge against Indian attack.

Here the dry bed of the C & O follows the tortuous bends of its neighbor, the Potomac, as it winds through the mountains.

Spring is a season of rare beauty in this bosky region. Each tree in blossom or tender leaf has its own pastel shade, contrasting with the dark greens of pine and cedar.

With the hardwoods sprouting pale green on the ridgetops and redbud splashing color across slopes white with dogwood, it was easy to succumb to the quiet, whispering lure of the land. The stillness was broken now and again by the symphony of birds singing their delight at the sight of the sun after a three-day rain, or by the wail of a train.

Paw Paw Tunnel Pierces a Mountain

Ducks flapped and wheeled away over the river. I had flushed them with the snap of a dead twig. A cottontail hopped across the trail and vanished amid clumps of bird's-foot violets, their bowing heads as big as half dollars.

As I strolled on, picking my way through the towpath's molasses mud, the thought occurred that I was now following in the footsteps of the "level walkers." These were canal company employees who walked allotted sections, searching for breaks in the banks or the towpath. Defects were repaired immediately, lest barges be delayed or thrown off schedule.

I approached the downstream mouth of the Paw Paw tunnel through a spectacular man-made gorge. The canal courses between great wedges of rock 100 feet high. I saw spikes embedded in the walls to prevent enormous slabs of shale from flaking off and crashing down on the mule teams below.

Westward toward Cumberland, houses grew more numerous. Then, as I passed the mouth of Town Creek, I encountered a five-mile

Junior Fishermen Line the Canal for Oldtown's Angling Rodeo

Residents around Oldtown, 20 miles below Cumberland, have restored a five-mile section. An all-day fishing contest each August attracts thousands. Mom and dad may try their luck, but only the small fry get prizes.

EXTRACHROME BY NATIONAL GEOGRAPHIC PHOTOGRAPHY
BATES LITTLEHALES © N.G.S.

stretch where the civic-minded people of Oldtown have cleared the canal and the State has stocked it with pan fish.

"You must come back in August for our fish rodeo," Judge George Henderson told me.

"Hundreds of kids drop in their lines," he said, "and when the fish aren't biting the kids are—on hot dogs and fried chicken and all the other picnic makings. It's Oldtown's big day of the year" (opposite).

Today only a few vestiges of the canal are evident in Cumberland, the rail and manufacturing center at the confluence of the Potomac River and Wills Creek.

A gap in the Allegheny Mountains rising close by provided a gateway for early pioneers who streamed through here on their way west. Old Fort Cumberland served as headquarters for British Gen. Edward Braddock during the French and Indian War.

Cumberland houses shops and yards of the Baltimore & Ohio Railroad, and day and night its streets echo the whistling of locomotives and the clank of freight-car wheels. Millions of tons of coal have been mined in the neighboring mountains.

Floods have often ravaged this industrial city. Army Engineers, seeking to safeguard it, have deepened the river and turned the canal into a levee for about half a mile.

The face-lifting project, vital though it was, saddened many an observer. But the canal has known and survived countless misfortunes, and always its admirers have refused to let it slip into oblivion. Converting the canal into a national historical park would win hundreds of thousands of new friends for the old strip.

Tomorrow's generations will never see the barge traffic that once graced the lovely canal, but they may follow the old C & O from beginning to end and relive its days of glory.

INDEX FOR JULY-DECEMBER, 1959, VOLUME READY

Index for Volume CXVI (July-December, 1959) of the NATIONAL GEOGRAPHIC will be mailed upon request to members who bind their copies as works of reference.



Colleague of the Golden Years: John Oliver La Gorce

By GILBERT GROSVENOR

Chairman of the Board of Trustees, National Geographic Society

RECENTLY, with heavy heart, I spread out upon my desk many of the treasured mementos—letters from faraway places, brief personal notes—that I had received through more than half a century from my beloved friend and colleague, John Oliver La Gorce. One note in particular, penned in his characteristically strong, copperplate hand, moved me deeply, for its warm message closed with this bit of old verse:

*The span o' life's not long enough
Nor deep enough the sea
Or broad enough this weary world
To part my friend from me.*

But inexorable time has compelled that parting of friends which world-wide travel and grave, mutually shared problems could never bring about. John Oliver La Gorce, Vice Chairman of the National Geographic Society's Board of Trustees, passed away on December 23, 1959, ending 54 years of devoted service. He had been President of The Society and Editor of its magazine from May, 1954, to January, 1957, succeeding me in those positions.

Worked as a Unique Team

It has been said that our half a century of association in the direction of The Society and the editing of its magazine was unique in educational and publishing history. Certainly no two men ever worked together more closely or more harmoniously.

I remember 1905 as the most exciting year in my life with the National Geographic Society. In January, I was elected a member of the Board. At last I had made the NATIONAL GEOGRAPHIC MAGAZINE attractive. In that year the members increased from 3,256 to 11,479—a gain of 253 percent in 12 months. The increased receipts enabled me to advise my father-in-law, Alexander Graham Bell, that he could discontinue his annual subscription of \$1,200 to aid the magazine.

On an autumn day of that year, young "Jack" La Gorce, hearing that I needed an assistant secretary, walked into my office in Hubbard Hall and asked for the job. He got it in 10 minutes. We made no contract; I

asked for no reference. Here, I knew instinctively, was a man who shared my deep, unquenchable faith in The Society's destiny.

So it proved. I am proud and grateful that Dr. La Gorce was happy to continue to assist me until I retired as President and Editor 49 years later.

Honors Reflect Global Interests

In recognition of his distinguished contributions to science and education, Dr. La Gorce was awarded honorary degrees by five universities. He served as a U. S. delegate to the 1925 Pan American Scientific Congress. In 1948 the Geographical Society of Philadelphia presented him its Henry Grier Bryant Medal for outstanding service to geography.

Columbia University in 1955 chose him as one of five leading journalists to receive its Maria Moors Cabot Award for promoting understanding among nations of the Americas.

He was a Director of Riggs National Bank and Trustee of the Corcoran Gallery of Art.

A mountain and a glacier in Alaska are named for him. La Gorce Arch—a fantastic rock formation in Utah—bears his name.

In Antarctica's white wilderness rise La Gorce Mountains and La Gorce Peak. When Admiral Byrd led his first South Polar expedition in 1928-30, he set up the La Gorce Meteorological Station. On the Admiral's 1933 expedition, Dr. La Gorce was appointed honorary postmaster of Little America.

Though he never accompanied Byrd, Dr. La Gorce was no stay-at-home. He traveled extensively and wrote many articles for the NATIONAL GEOGRAPHIC, on subjects as diverse as Puerto Rico and Pennsylvania, aquariums and Romania. Others dealt with fishing, an art in which he was highly proficient. He personally edited all editions of The Society's comprehensive *Book of Fishes*.

He wrote for the NATIONAL GEOGRAPHIC one of the most dramatic accounts I have ever read, the capture of a giant devilfish.* The monster measured 22 feet across and 17 feet, 1 inch long, still a world record.

* See "Devil-Fishing in the Gulf Stream," by John Oliver La Gorce, NATIONAL GEOGRAPHIC, June, 1919.



1879 JOHN OLIVER LA GORCE 1959

Joining the National Geographic staff in 1905 as Assistant Secretary, Dr. La Gorce became Assistant Editor, Advertising Director, Associate Editor, and Vice President. In May, 1954, he succeeded Gilbert Grosvenor as President and Editor. From his retirement in 1957 to his death he served as Vice Chairman of the Board of Trustees.

Less well known are his pioneering contributions to the development of Miami Beach, where he was a winter resident for 40 years. He aided his friend Carl Fisher in planning the community, and for more than 30 years he was a leader of the Committee of One Hundred, a strong force for civic good in the beautiful resort city. Many years ago friends gave his name to one of Miami Beach's show places, the La Gorce Country Club.

In an editorial tribute the *Miami News* said: "But more than the name lives on—the memory of a far-sighted man who helped make a patch of swamp into a glittering metropolis known the world over."

Dr. La Gorce was deeply interested in education, as evidenced by long service on the University of Miami's Board of Trustees and important associations with his alma mater, Georgetown University. To both institutions he gave generous support.

Five years ago, as his Golden Anniversary with The Society neared, congratulations poured into Washington headquarters from well-wishers and leaders in varied fields everywhere. Wrote President Eisenhower: "You have contributed much to the expansion of knowledge and the increase of interest in your field, in our country and abroad."

Grosvenor Medal Awarded on Anniversary

A host of memories from those shared years must have come, sudden and fleeting, to Dr. La Gorce, as they did to me, when I presented him the Grosvenor Medal during the anniversary celebration. Created by the Board of Trustees for my own 50th anniversary in 1949, the medal bore a phrase familiar to National Geographic members as the original and perpetual aim of their Society—"the increase and diffusion of geographic knowledge." It was given him by the Board for outstanding service to that aim.

Another trophy he treasured—a gold telegraph key—had been given him by his colleagues. It was an appropriate gift, for a telegrapher's key opened the door to his Geographic career.

The son of Colonel and Mrs. Gabriel H. de La Gorce, John Oliver was born at Scranton, Pennsylvania, on September 22, 1879.





NATIONAL GEOGRAPHIC PHOTOGRAPHER CLIFTON ADAMS

An enthusiastic collector of arms and armor, Dr. La Gorce points to favorites picked up in his global travels. Crusader sword, commando daggers, bows, arrows, and elephant's foot decorated his office.

Surrounded by his family, Dr. La Gorce inspects his portrait—the Board of Trustees' gift to The Society at their dinner honoring Dr. La Gorce on his 50th anniversary. Mrs. Harold Paul, Jr., his granddaughter, stands at his right. Others are Louise La Gorce, his daughter-in-law; Gilbert Grosvenor La Gorce, his son; Mrs. John Oliver La Gorce; Harold Paul, Jr.; and John Oliver La Gorce II, his grandson.

Son Gilbert died February 20, 1959. He, too, had an outstanding National Geographic career. Starting in 1932 with editorial and film work, he rose to the post of Advertising Director.

While still a youngster, he learned the Morse dot-and-dash code from his mother, who had been a pioneering girl telegrapher.

In those days press telegraphy was often a training ground for men of talent and ambition who went on to become leading journalists. Young La Gorce took such a path. It led to Washington, where he became chief of Western Union telegraphers at the Capitol.

He was 25, a splendid-looking, husky fellow, when a kind fate brought him to me that day in 1905. As I write these words, I am looking at the first salary voucher he signed, retrieved from old files. It seems I gave him a beginning wage of \$75 a month—probably less than he made as a telegrapher.

When Dr. La Gorce died at 80 at his Washington home, the nonprofit organization to which he devoted his great talents and energy had some 1,000 employees and a world-wide membership of 2,500,000.

He served with distinction in many capacities: Assistant Secretary, Advertising Director, Assistant Editor, and Associate Editor. The Board of Trustees elected him to its membership in 1920 and made him

Vice President in 1922. In 1954, on my retirement to become Chairman of the Board, he ably filled the offices of President and Editor.

J. O. L., as he was affectionately known to the staff, combined the power of prompt decision with a courtly manner, innate courtesy and kindness, and a talent for judging men. To each new editorial employee he conveyed the great conception of The Society's mission that motivated his own professional life.

Often these private talks concluded with a comradely tour of Dr. La Gorce's big paneled office, lined with books and mementos—from tribal clubs and commando daggers to sea chests and medieval armor.

Many who worked under his leadership treasure a note in sympathy, praise, or encouragement, penned in warm and often humorous style.

This gracious, considerate man became the Geographic mentor and confidant of my son, Dr. Melville Bell Grosvenor, who succeeded Dr. La Gorce as President and Editor in 1957. Years ago, when Melville expressed a strong desire to join the staff, I sought my old colleague's opinion, and in April, 1924, I received from him this note:

"I want Melville in the Geographic family for a number of reasons—the first because I feel he will bring to the work intelligence, adaptability, and loyalty; secondly, because I am very fond of him and feel that he will make good in any work we intrust to him."

When his benefactor died, Melville Grosvenor said in part: "He was my teacher at National Geographic for 35 years. I can never fully express the warmth in my heart for the friendship and loyalty and devotion to The Society that bound us together."

Last year the sympathy of all his colleagues went out to Dr. La Gorce on the sudden death of his only son, Gilbert Grosvenor La Gorce, 48. Like his father, he had become the magazine's able Director of Advertising.

Let me close this tribute with one last revealing glimpse of my friend. I was in China in 1928 while artisans labored to finish my Maryland home, Wild Acres. When I returned, a large stone, beautifully engraved with the Grosvenor family coat of arms, had been set in the arch above my front door—the gift of John Oliver La Gorce.

A keystone, fitting symbol indeed for the relationship we so long enjoyed.

Five sheep in an ocean of rice—a meal for 300—are set before the Editor and his party at an Arab feast in Trans-Jordan in 1935. Dr. La Gorce (third from left) often recalled a sheep's eye that stared at him mournfully. He sits between his world-tour companions, Mr. and Mrs. Gene Tunney. Mrs. La Gorce is at Tunney's left.



NATIONAL GEOGRAPHIC Society

16th & M Streets N.W.

Washington 6, D. C.



National Geographic Magazine

ORGANIZED IN 1888 "FOR THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

The National Geographic Society is chartered in Washington, D. C., in accordance with the laws of the United States as a nonprofit scientific and educational organization for increasing and diffusing geographic knowledge and promoting research and exploration.

The Society has conducted more than 160 major expeditions and scientific projects. It disseminates knowledge to millions through its world-famous National Geographic Magazine, its 17 million color maps a year, its books, monographs, bulletins for schools, its information service for press, radio, and television.

MELVILLE BELL GROSVENOR, President and Editor
THOMAS W. MCKNEW, Executive Vice President and Secretary
ROBERT V. FLEMING, Vice President and Treasurer
MELVIN M. PAYNE, Vice President and Associate Secretary
FREDERICK G. VOSBURGH, Vice President
ROBERT E. DOYLE, Associate Secretary

Committee for Research and Exploration

LEONARD CARMICHAEL, Chairman

LYMAN J. BRIGGS Chairman Emeritus	ALEXANDER WETMORE Vice Chairman
Rear Adm. L. O. COLBERT	Vice Adm. EMORY S. LAND
HUGH L. DRYDEN	MATTHEW W. STIRLING Research Associate Smithsonian Institution
A. REMINGTON KELLOGG Director, U. S. National Museum	WILLIAM E. WRATHER

and the Senior Officers of The Society

Board of Trustees

GILBERT GROSVENOR, Chairman of the Board, formerly President, National Geographic Society, and Editor of its magazine (1899-1954)

LYMAN J. BRIGGS Director Emeritus, National Bureau of Standards	BENJAMIN M. MCKELWAY Editor, the Washington Star President, Associated Press
LEONARD CARMICHAEL Secretary, Smithsonian Institution	THOMAS W. MCKNEW Executive Vice President National Geographic Society
L. O. COLBERT Rear Admiral, U. S. Coast and Geodetic Survey, Retired	MELVIN M. PAYNE Vice President National Geographic Society
HUGH L. DRYDEN Deputy Administrator, National Aeronautics & Space Administration	LAURANCE S. ROCKEFELLER President, Rockefeller Brothers, Inc., and Jackson Hole Preserve
ROBERT V. FLEMING Chairman of the Board First National Bank	JUAN T. TRIPPE President, Pan American World Airways
CRAWFORD H. GREENWALT President, E. I. du Pont de Nemours & Company	EARL WARRIN Chief Justice of the United States
MELVILLE BELL GROSVENOR Editor, The National Geographic	ALEXANDER WETMORE Research Associate Smithsonian Institution
ELISHA HANSON General Counsel National Geographic Society	LLOYD B. WILSON Honorary Board Chairman, Chesapeake & Potomac Telephone Co.
EMORY S. LAND Vice Admiral, U. S. Navy, Retired, formerly President Air Transport Association	CONRAD L. WIRTH Director, National Park Service U. S. Department of the Interior
CURTIS E. LEMAY Vice Chief of Staff, U. S. Air Force	WILLIAM E. WRATHER Director, U. S. Geological Survey, Retired
H. RANDOLPH MADDIX Vice President (Ret.), American Telephone & Telegraph Company	

Assistant Secretaries: VERNON H. BREWSTER, THOMAS M. BEERS, WILLIAM T. BELL, HERBERT T. HENDERSON, C. VERNON SANDERS; Assistant Treasurers: HILLEGARY F. HOSKINSON, WILLIAM H. MCCAULEY

Herman J. A. C. Arens, Executive Assistant, and Gail H. Carroll, Secretary to the President and Editor; Lenora Williams, Secretary to the Executive Vice President; Sibel Peck, Assistant to Chairman of the Board; Leon J. Casova, Administrative Assistant

Copyright © 1989 National Geographic Society. All rights reserved. Reproduction in any form or by any means without written permission is prohibited. Printed in U. S. A. Second-class postage paid at Washington, D. C., and at additional mailing offices. Cover design and title provided by International Publishers. Articles and photographs are donated. For material used, generous acknowledgment is made.

MELVILLE BELL GROSVENOR, Editor
THOMAS W. MCKNEW, Executive Vice President
FREDERICK G. VOSBURGH, Associate Editor

EDITORIAL STAFF

Senior Assistant Editor: Franc Short
Assistant Editors: Robert L. Conry, Allen C. Fisher, Jr., John Seyfried, Mason Sutherland
Line Editor: Kenneth F. Weaver
Junior Staff: Andrew H. Brown, Nathaniel T. Kenney, Luis Marden, Samuel W. Matthews, Paul A. Zahl (Natural Sciences)
Foreign Staff: W. Robert Moxley (Chief); Thomas J. Abercrombie, David S. Boyer, Walter Meyers Edwards, Howell Walker, M. Woodbridge Williams
Editorial Staff: Robert T. Cochran, Jr., William P. E. Graves, Jacob Hay, John R. Hoopes, Jay Johnston, Stuart E. Jones, Howard LaFay, Edward J. Lindeau, Bart McDowell, Carolyn Bennett Peterson, Peter T. White, Rose T. MacBryde, Winifred M. Myers (Asia); Dorothy M. Corson (Indonesia)
Editorial Counsel: Howard E. Payne
School Services: Ralph Gray (Chief); Katherine Crapone, Arthur P. Miller, Jr., Frank Sarrwell
News Service: Windsor P. Booth (Chief); Lonelle Akman, Edward Cornish, Matt C. McDade
Book Service: Mette Severy (Chief); Paul Jensen, Edwards Park
Editorial Research: Margaret G. Blincoe (Chief); Ann K. Holcomb (Asst.); Werner Jenner, Levrina Luder, Patricia Middlemas, Patricia Rosenberg
Geographic Research: George Cressette (Chief); Louise F. Abhoff, Newton V. Blakester
Library: Esther Ann Mason (Librarian); Virginia Carter Hills (Asst.); Katharine P. O'Donnell

ILLUSTRATIONS STAFF

Illustrations Editor: Herbert S. Wilburn, Jr.
Art Editor: Andrew Progenpsold
Art Director: Robert L. Beaman, W. E. Garrett, Robert E. Gilka, Leonard J. Grant, Mary S. Griswold, Gilbert M. Grosvenor, Kip Rice, Thomas R. Smith, Charles Allmon (Incoming Photographs); Periodical Research: Geraldine Linder, Cary Stillwell (Librarian)
Artist & Naturalist: Walter A. Weber
Director of Photography: James M. Godbold
Photographers: B. Anthony Stewart (Chief); Bates Littlehales, Thomas Nebha, Kathleen Revis, Joseph Baylor Roberts, Robert F. Simon, W. D. Vaughn, Volkmar Wentzel
Photo Lab: Edwin L. Wisberg (Chief); Richard H. Stewart (Asst.); John E. Flecher, Milton Ford, Donald McHain, Guy Stading; Film Editor: Joseph M. Kidecott
Engraving & Printing: Dee J. Andella, Joe M. Barlett

CARTOGRAPHIC STAFF

Chief Cartographer: James M. Darley
Assistant Chief Cartographers: Newman Bunstead, Ralph E. McAleer
Cartographers: John J. Babin, Wellman Chamberlin, Richard Darley, Athos D. Graziano, Apphia Hubbard, Victor J. Kelley, Walter K. Morrison, William T. Peck, Charles L. Stern, Catherine Hart (Asst.)
Cartographic Artists: Irvin T. Allenau, William Palmstrom

SECRETARY'S STAFF

Administration: Sheldon Cary, Owen E. Anderson, Thomas L. Hartman, M.D., Raymond T. McMillan, Jr., Stan Jennings, Charles F. Althoff, John S. Danneron; Accounting: F. Charles Brown, George F. Fogle, Martha K. Allen; Cashier: Frank S. Deik; Statistics: Ernest C. Brown; Gene Segment: C. Elliott; Procurement: Charles P. Bissel (Director); John P. M. Johnston, Payroll: Esther M. Lohrer, Marie S. Edwards; Membership Enrollment: Roy J. Kluckenbank; Awards Records: Della M. Hart

EUROPEAN OFFICE

W. E. Roscher (Director)
Hulton House, Fleet Street, London E. C. 4, England

ADVERTISING

Division: John P. Country; Regional Offices—New York: Harley L. McDeyert; Chicago: Leslie E. Gage; San Francisco: Donald F. Mikkelsen; Los Angeles: Jack V. Sheehan

COVER: Ringed by forest fire and gushing lava, a photographer defies a Hawaiian volcano (page 303).



No guesswork! The electric eye sets the exposure—*automatically!*

GREAT SHOT...EVERY SHOT!

New Kodak Automatic 35 Camera sets itself for you!

Now you can get picture-perfect exposure every shot—dawn to sundown, summer or winter—*automatically.*

The electric eye of this new Kodak Automatic 35 Camera measures the light for you, sets the exposure *automatically.* Shoot in sunshine, the lens "squints" as your eyes do. Shoot in shade, the lens opens up automatically—to $f/2.8$ if needed! And when light's too dim, or shade is too deep, an *automatic* signal tells you to use flash.

For unusual subjects, where you have a choice of exposures—just meter the areas of chief interest, lock the exposure for the effect you want, and shoot. *No reason ever to miss a picture!*

And there's much more. Quick "zone focus" for groups, scenes, close-ups. "Drop-in" film

loading. Rapid one-stroke film winding. No double exposures. And you can use all popular 35mm films—for color slides, color snaps, and black-and-whites.

Let your dealer show you. The Kodak Automatic 35 Camera is only \$89.50, or as little as \$9 down. Many dealers will be glad to take your old camera in trade.

Prices are list, include Federal tax, and are subject to change without notice. Many dealers offer terms as low as 10% down.

Automatic projector changes slides for you!



You turn it on, it does the rest. Kodak Cavalcade Projector treats you like a guest. Only \$124.50, as little as \$12.50 down.

EASTMAN KODAK COMPANY, Rochester 4, N.Y.

SEE KODAK'S "THE ED SULLIVAN SHOW" AND "OZZIE AND HARRIET"

Kodak
TRADEMARK

New **GO-FARTHER** formula
GOLDEN VIGORO



A LAWN IS TO LIVE ON

THE FOOLPROOF LAWN FOOD NOW GOES 3 TIMES AS FAR

Covers 5,000 sq. ft. of lawn per bag.

- **NOW** matches the feeding habits of grass—gives your lawn a complete, balanced diet of everything it needs except sun, air and water... puts back everything your grass takes out of the soil... maintains soil fertility and lawn beauty, year after year.
- **NOW** easier to use—made in a new, golden particle form for easy, smooth, dust-free spreading.

It's the foolproof way to have a lovely lawn made right for family

living. Thick, springy turf... deep, vigorous roots... and the fresh-green look of springtime all summer long. For the best lawn in the neighborhood try Golden Vigoro this spring.

For California dichondra lawns, use special Golden Vigoro Dichondra Food.

Look for the handy handle bag that pours like a pitcher. At garden stores and supermarkets.

GUARANTEED
Will Not Burn

My, how things grow with

VIG...VIG...VIGORO

Registered trademark of Bechtel Co.

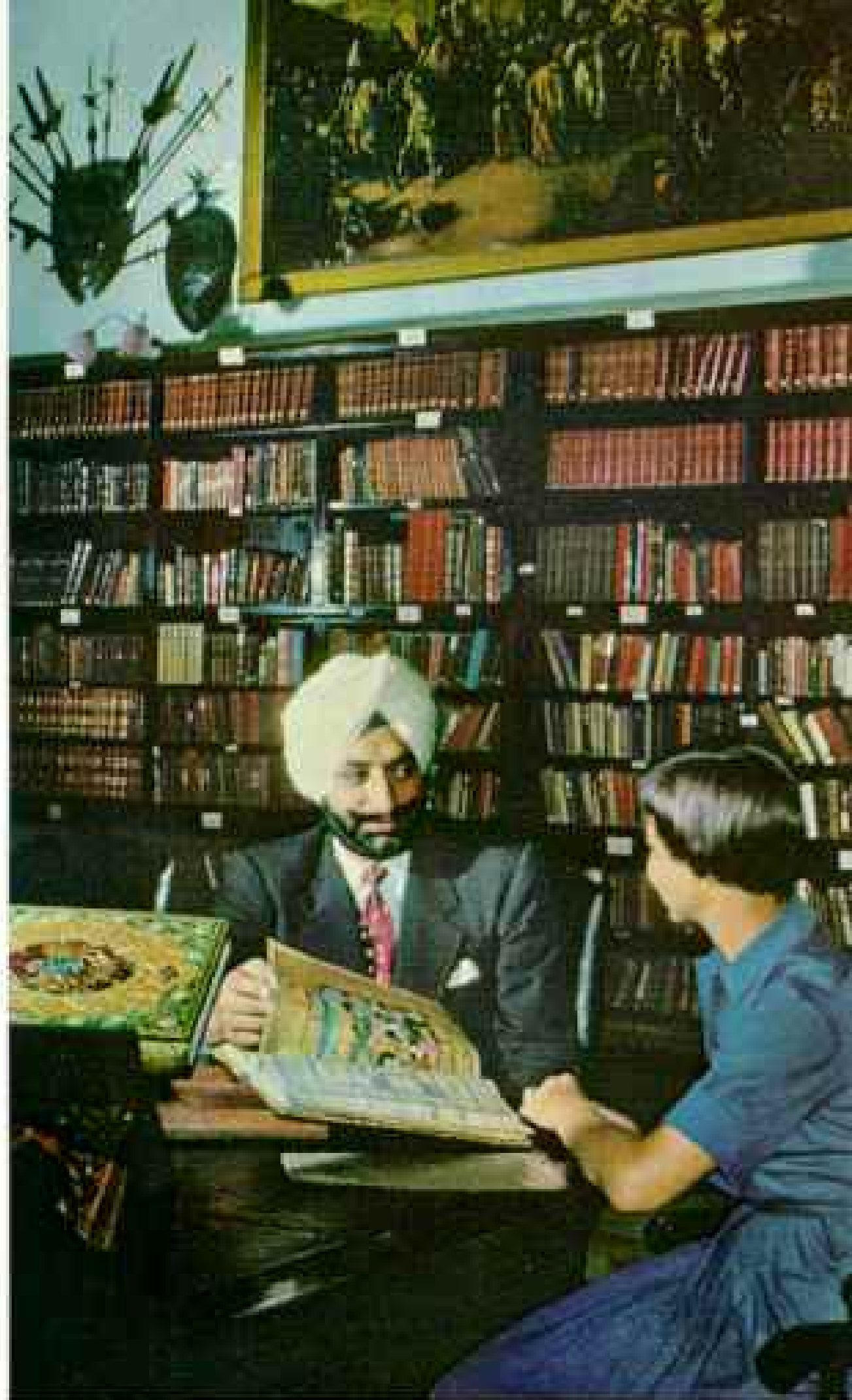
RAJA PRESERVES HIS GEOGRAPHICS AMONG RARE GEM-STUDED BOOKS

His Highness Sir Yadavindra Singh, Maharaja of Patiala, is a man who appreciates literary treasures. In his library he has dozens of rare books—and a whole shelf devoted to bound volumes of NATIONAL GEOGRAPHIC.

"I have been a member of The Society for many years," the Maharaja said as he pointed to his collection of red-bound GEOGRAPHICS when Frank and Helen Schreider visited his palace in Patiala, Punjab State. The Schreiders' fascinating story of their trip by amphibious jeep along the Ganges, India's sacred river, is one of the pleasures in store for members in future issues.

Here the Maharaja shows Mrs. Schreider some of his rare books while her husband takes photographs. Open on Sir Yadavindra's desk lies a 17th-century volume containing works of the celebrated Persian poet Sa'di. The closed volume, its binding studded with diamonds and rubies, is one of two known hand-lettered copies of a work by Thomas Moore. The volumes are valued at more than \$15,000 each.

The Society's world-wide membership of 2,500,000 includes members of almost every profession on earth. All help support a vast program of exploration and education through their modest dues. And all share the enviable privilege of naming others to join The Society's distinguished membership and to share in its treasured reading.



RECOMMENDATION FOR ...AND INQUIRY ABOUT

Membership

CHECK
ONE
▼

Members of The Society roam the world through the pages of their official journal, the NATIONAL GEOGRAPHIC. Annual dues of **\$6.50** include subscription to the magazine, and bring frequent map supplements. Members' enthusiastic nomination of friends for membership explains the National Geographic Society's phenomenal growth.

Nonmembers who are interested in joining The Society—but who do not know a member—should inquire (right).

Members and others may make gifts or bequests of money, securities, or other property to The Society for "the increase and diffusion of geographic knowledge." Such gifts are deductible for tax purposes.

• THE SECRETARY
• NATIONAL GEOGRAPHIC SOCIETY
• WASHINGTON 6, D. C.

Please print form & mail to

I NOMINATE for Society membership the persons named below. (Use separate sheet for additional nominations.)

(GIFT MEMBERSHIP) I nominate and enclose \$ _____ for dues of the persons named below. Send gift card

I DESIRE INFORMATION concerning membership and the NATIONAL GEOGRAPHIC. (Fill in below.)

DUES for calendar year: \$6.50 rate applies in United States, U.S. Possessions, and Canada. Elsewhere, \$8. (Determined by postage differentials.) Life membership, \$150 U.S. funds. Make remittances payable to and send direct to the National Geographic Society.

3-60

MEMBER'S

NAME _____

STREET _____

CITY, ZONE, STATE _____

CANDIDATE'S

NAME _____

STREET _____

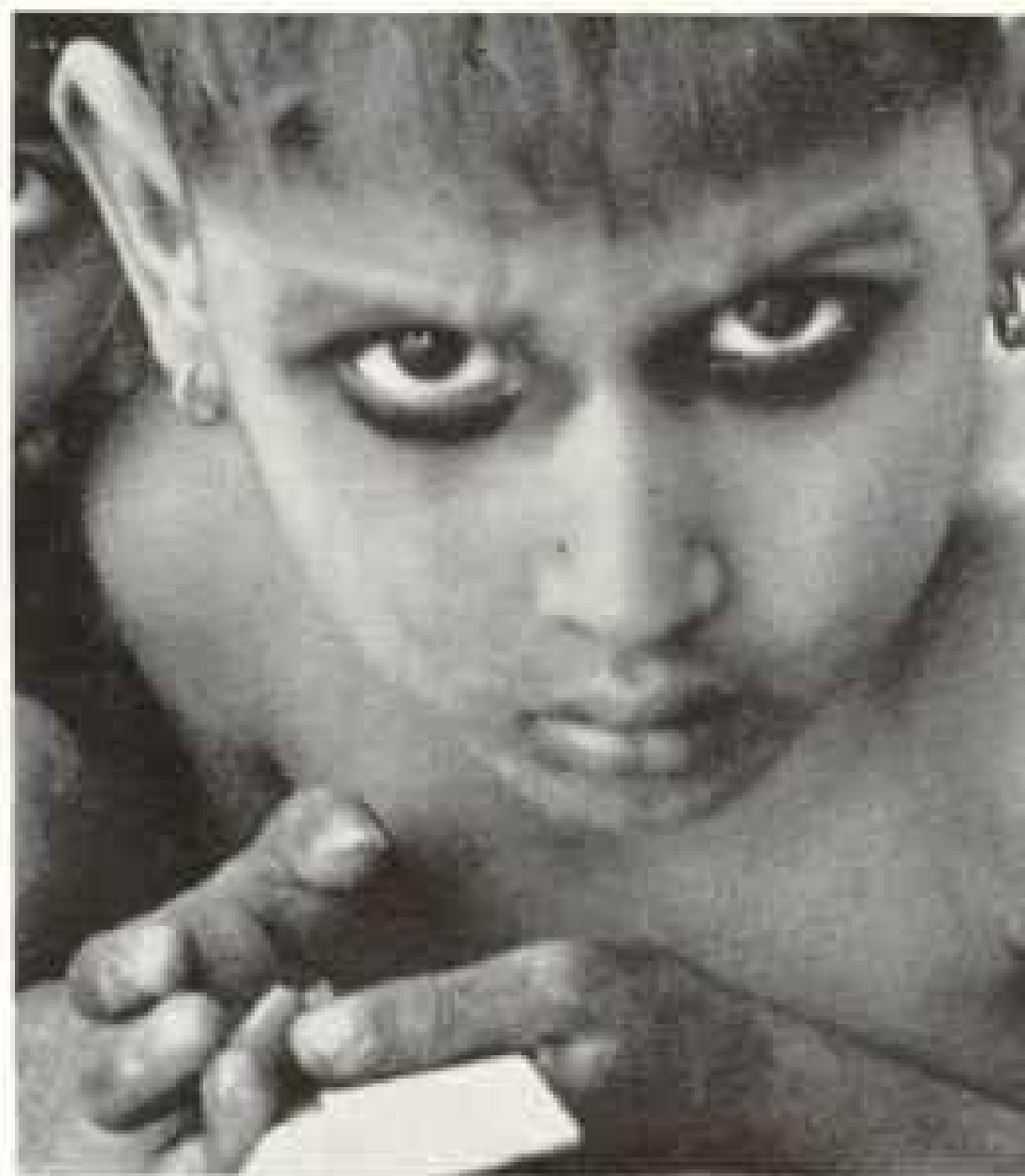
CITY, ZONE, STATE _____

vision / avenir

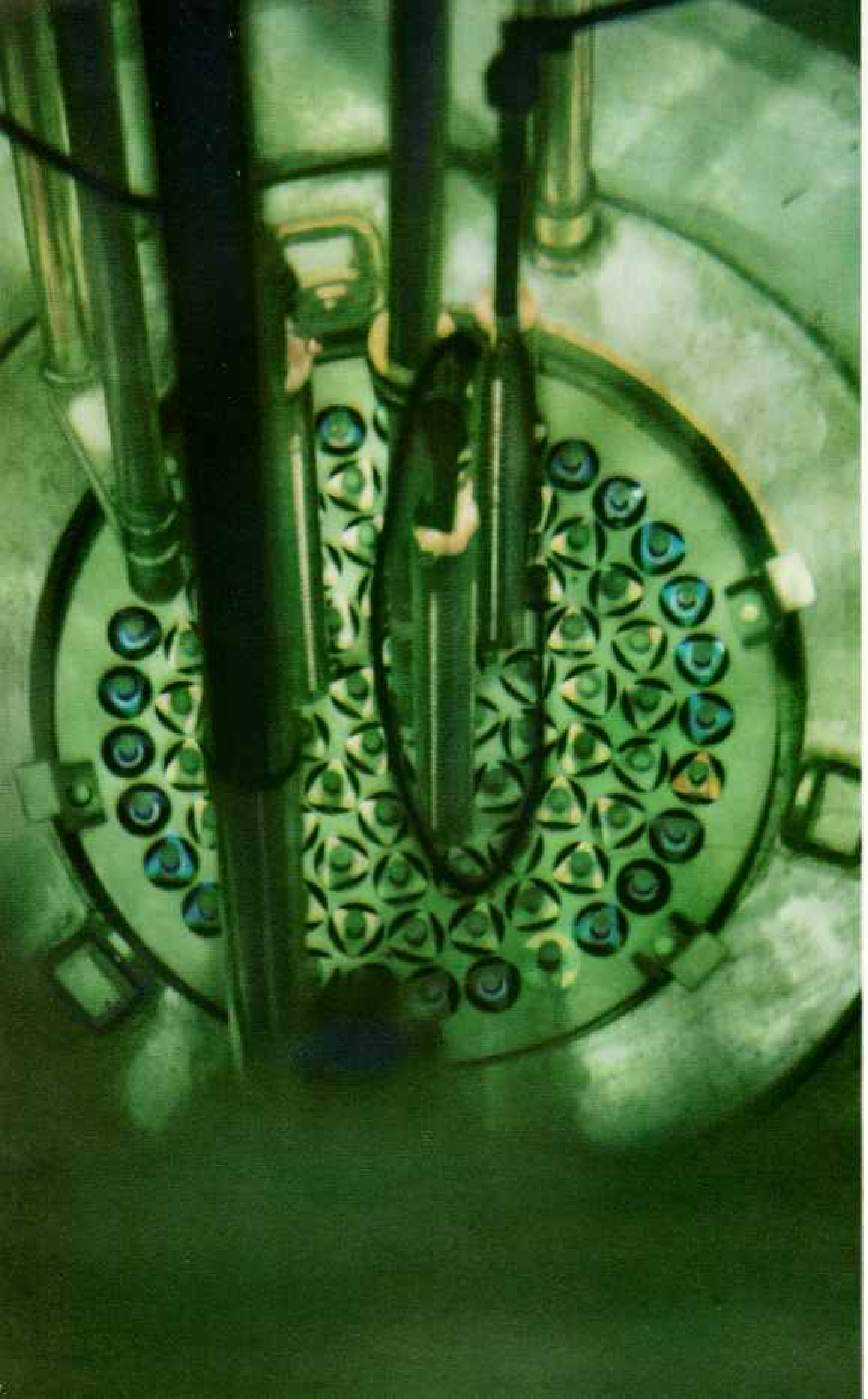
"Gandhi said: 'To the millions who have to go without two meals a day the only acceptable form in which God dare appear is food.' Creative uses of atomic radiation in agriculture can help give more and better food to all peoples, everywhere. Atomic contributions to the agricultural development of undernourished nations, with 'no strings attached,' will offer new proof to the world that we practice the brotherhood we preach."

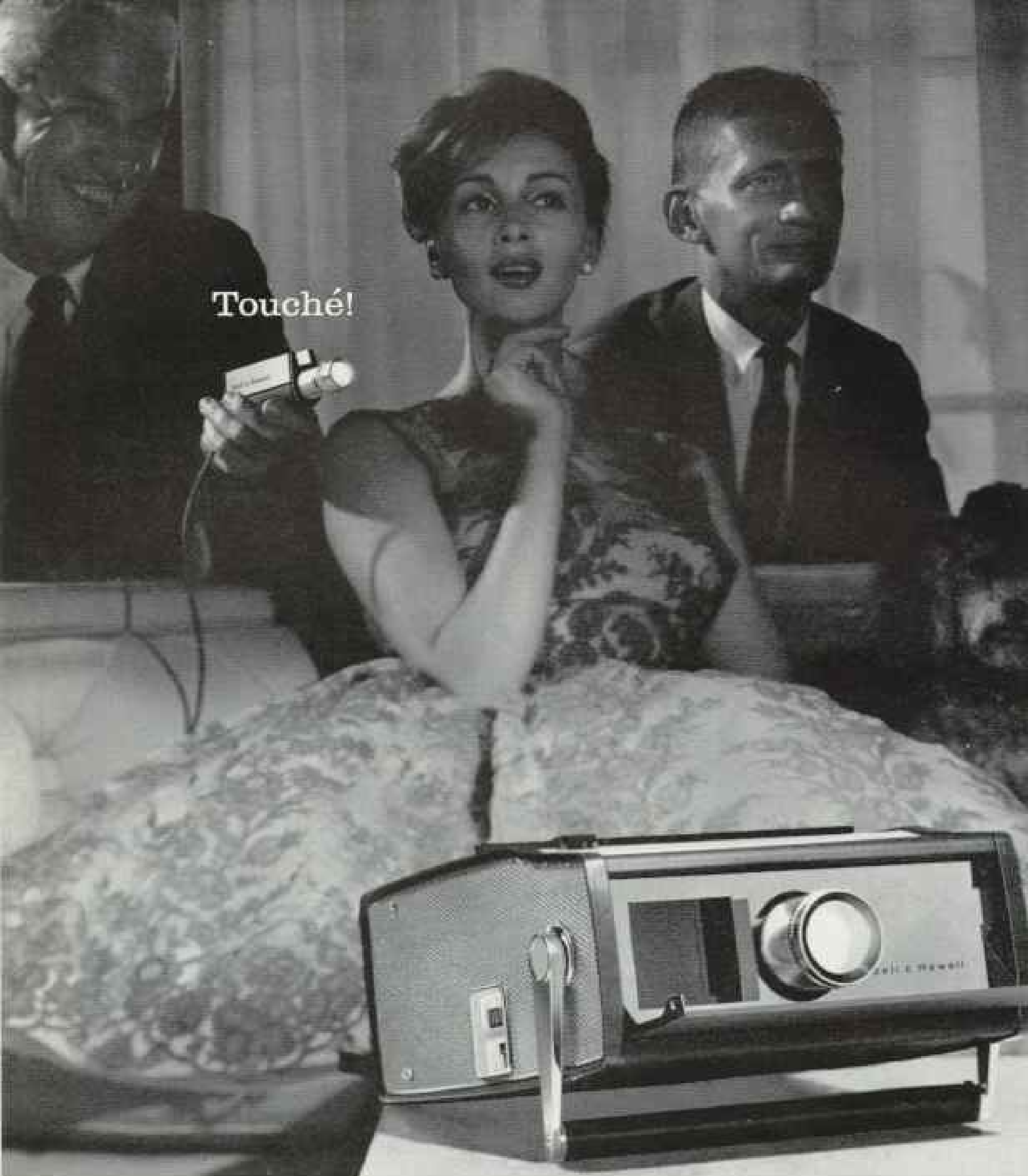
reality / réalité


TRIGA, the inherently safe research, training and isotope-producing reactor, conceived, designed and produced by General Dynamics Corporation's Atomic Division, is now in use or soon will be in operation on five of the six continents. *India:* cooperative research and experiments at the World Agriculture Fair in New Delhi; *Belgian Congo:* research in bone growth and bone disease; *Republic of Korea:* studies of genetic mutations in plants; *Brazil:* training of engineers; *Republic of Vietnam:* investigation of tropical diseases; *Japan:* technical training and biological research; *Austria:* programs in nuclear physics, isotopic chemistry; *Italy:* research in neutron physics; *United States:* training research in plant growth, irradiation of seeds, cancer diagnosis and research in human metabolism.



CONVAIR
ELECTRIC BOAT
GENERAL ATOMIC
GENERAL DYNAMICS
CANADAIR LIMITED
ELECTRO DYNAMIC
STROMBERG-CARLSON
LIQUID CARBONIC





A lively new personality comes to your slide shows! Now you can point out details on the screen with a pencil of light...make slides go forward or back from across the room...all with Bell & Howell's new Point-A-Ray Remote Control. Only the "Explorer" projector gives you this extra fun, and can be set to run flawlessly all by itself. Fast Filmovara lens zooms to fill the screen at short range. You'll find something extra in everything Bell & Howell makes! *FINER PRODUCTS THROUGH IMAGINATION*  **Bell & Howell**



H. M. Life Guards—a glimpse at London's daily pageantry

How to spend two weeks in Britain for less than \$670—transatlantic fare included

Learn how amazingly economical a vacation in Britain can be. Read these facts and figures—then clip coupon for your free, illustrated “British Travel Kit.” It will open your eyes!

PLANNING your trip to Britain is as easy as arranging an ordinary vacation at home. And it needn't cost you any more.

Here are a few suggestions, just to start you off on the right foot.

1. How to get there and back for under \$463. Ask your travel agent about the economy fares. You can now fly round-trip from New York for only \$462.60—or go both ways by ship for less than \$400.

2. How much does it cost when you get to Britain? \$100 per person per week is more than enough for the time of your life.

For example, you can stay at most country inns for under \$3.50 a night—breakfast included.

3. What are the best seasons for touring Britain? The Fall and the Spring have definite advantages. The weather is just right for sightseeing. Roads and inns are

uncrowded—and car-rental runs about 25% cheaper.

Go in Fall for the State Opening of Parliament, the Highland Games, the Lord Mayor's Show and London's most scintillating theater season.

Travel in Spring for the Flower Shows, the Grand National Steeplechase and the opening of the nine-month festival of Shakespeare plays at Stratford-upon-Avon.

4. How much does it cost to get around in Britain? Train travel costs as little as 3¢ a mile. Bus travel about 2¢ a mile.

A drive-yourself car works out about 3¢ a mile per passenger seat, including gas, oil—everything!

5. How to start planning your trip to Britain. The best man to see is your travel agent. He can work miracles with your budget.

Also, clip coupon for your free, illustrated “British Travel Kit.”

The important thing is to start planning now. The sooner you start the easier it is to get exactly what you want.

CLIP COUPON NOW!

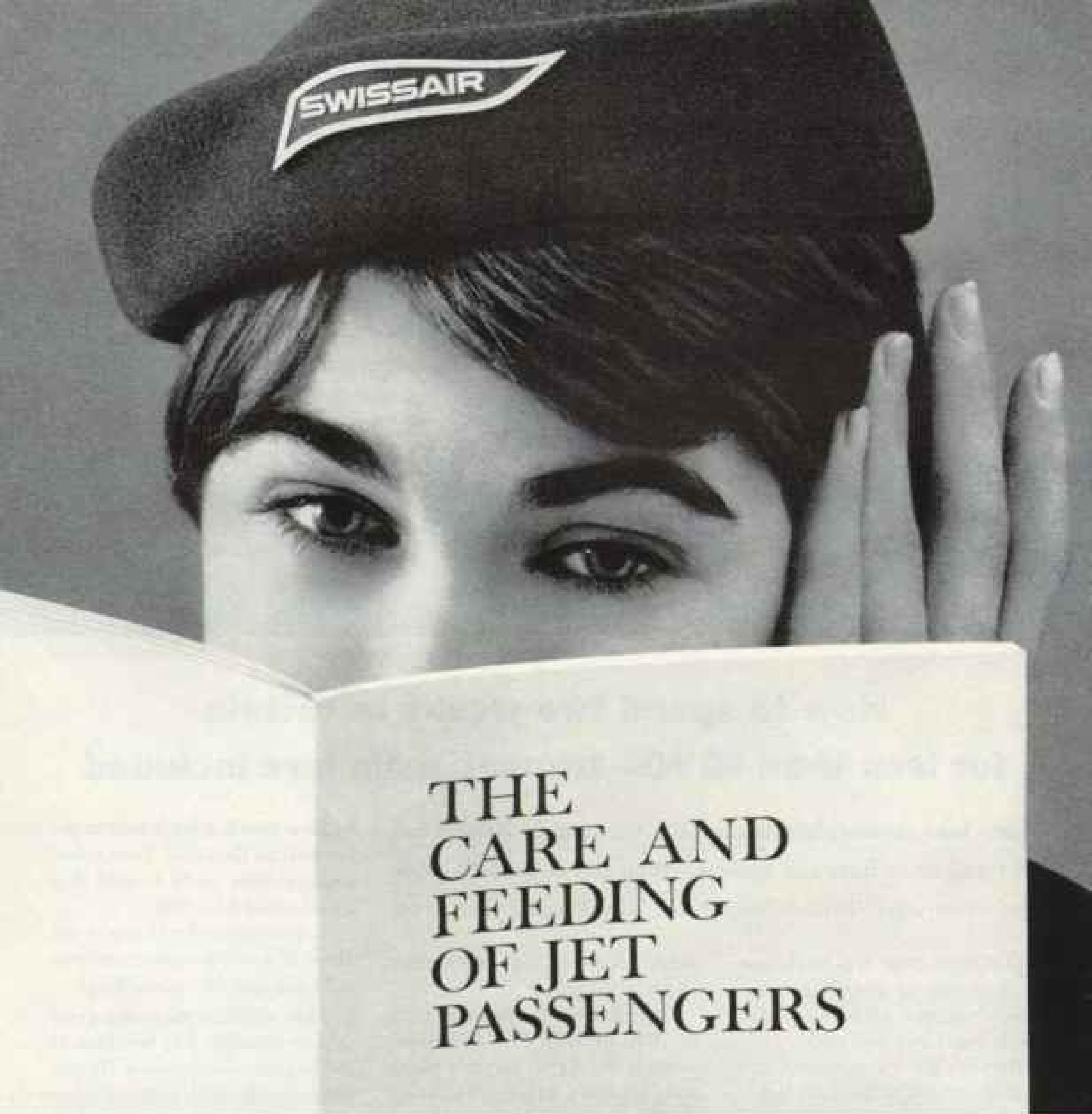
British Travel Association, Box 182
680 Fifth Avenue, New York 19, N.Y.

Send me my free “British Travel Kit” and illustrated literature on Britain.

Name _____

Street _____

City _____ State _____



THE CARE AND FEEDING OF JET PASSENGERS

Before we start flying our new jets in June, we'd like to assure all our friends (including you we have yet to meet) of this: the manner in which we have served you in the past will not change one little bit.

We'll still be serving up generous portions of our Swiss culinary art. And we're still going to offer our first-class transatlantic passengers a special 3-foot menu that spills over with 29 mouth-watering delicacies (we present it days before flight time so you can make your selections, leisurely, at home). Our host-

esses right now are back in school preparing themselves to provide these and the numerable other unhurried little services that will make your Swissair jet flight a most memorable one.

And as all this is going on, gigantic new Swissair jet hangars are nearing completion in Zurich. Their counterparts already have been completed in New York. Here, we will have the facilities to service our aircraft with the care of a watchmaker. As, in fact, many of our maintenance people actually are.

These are but a few of the un-

seen efforts that go into the care and feeding of Swissair jet passengers. We call it SWISSCARE. You'll know what we mean the moment you board your first Swissair jet flight. *From New York, beginning in June, we'll be flying big new Swissair Douglas DC-8 Jetliners right to the heart of Europe. From there (with increasing frequency during the summer) we will have swift new Swissair Caravelle jets to speed you on to key cities in Europe and the Mid East. Just call your travel agent or local Swissair office.*



SWISSCARE SWISSAIR WORLDWIDE

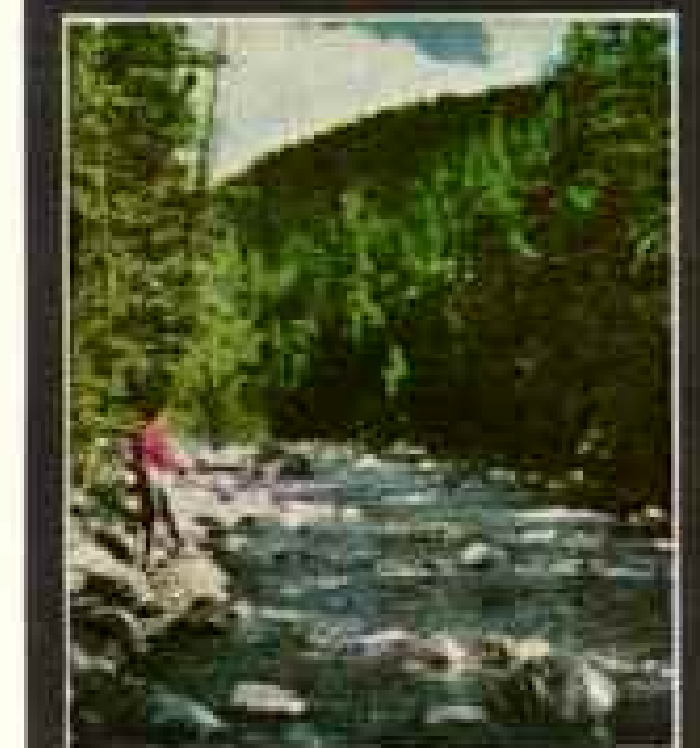
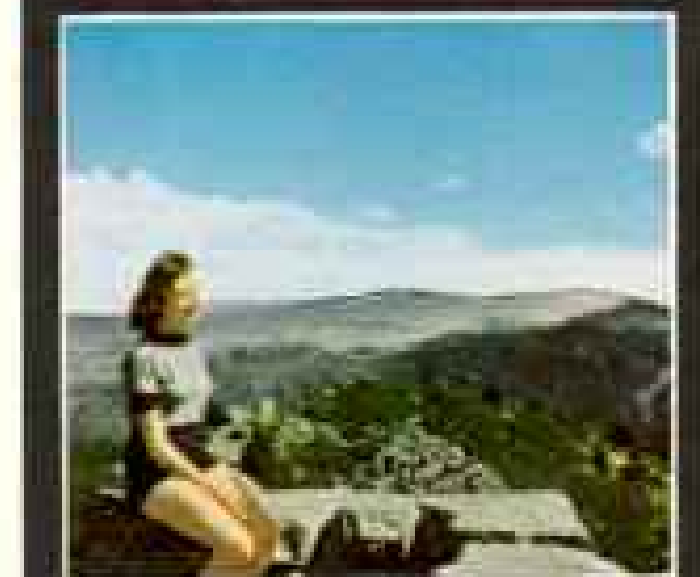
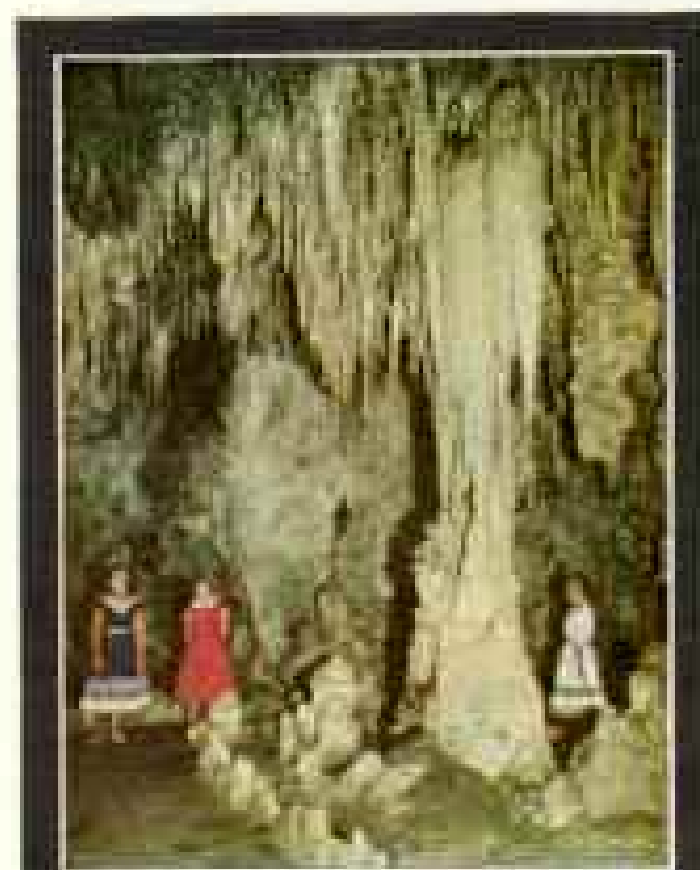
Non-Stop Douglas DC-8 Jetliners New York to Cologne, Geneva, and direct to Zurich



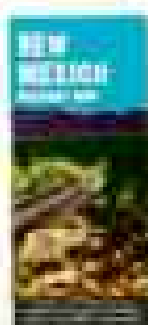
Vacation in

New Mexico The Land of Enchantment

Here in this Land of Enchantment you will find many things to make a vacation both memorable and a family affair. For action there is the pulsing rhythm of the tom-tom heralding an age-old Indian ceremonial. For romance there is the soft resonance of the Spanish language, still the native tongue in quaint mountain villages, or the lingering traces of a gracious Spanish culture and a rollicking, robust Old West. For color there are limitless horizons, hemmed in only by mountain ranges towering in turquoise skies, where nature has run riot with her paint brush, splashing the landscape with vivid hues. To these, add the majestic beauty of Carlsbad Caverns National Park, the historic import and interest of nine National Monuments, the feeling of peace that descends when the magnificent and changing panorama of sunset colors parades in breath-taking beauty...and you have more than enough to make a vacation completely unforgettable.



MAIL COUPON
and we'll send you
free, colorful maps
and folders



For information about industrial opportunity use your company letterhead.

Department of Development
Room 6047 State Capitol
Santa Fe, New Mexico
Please send free literature to

Name _____

Address _____

City _____ Zone _____ State _____

PLEASE PRINT



How to save money on meals...in Britain

YOUR trip through the United Kingdom... days of delight in delving into history... the dream you've budgeted for!

Let the British Railways help you see more and spend less!

Not only are rail fares low but the food in the "restaurant cars" is so good and so reasonable. The same is true at the buffets and snack-bars in the railway stations.

No matter where you go... and the railways take you everywhere in Britain... eating is a succession of pleasant surprises, to your palate and your pocket-book. Example: Fruit cup or soup, filet of sole, roast lamb

with 2 kinds of potatoes, creamed carrots, peas, hot marmalade pudding or cheese with cress... all for ten shillings and sixpence or \$1.50. Big meal, small bill.

Another way to keep within your budget in Britain... equip yourself before you start, with a book or two of British Railways Thrift Coupons. (Not sold overseas.) Up to a 1000 miles of travel for only \$34.50 (First Class) \$23.00 (Second Class). Rates vary in Canada. Also good on Irish cross-channel and MacBrayne's steamers.

All you want to see in Britain you can reach by British Railways.



Any Travel Agent can get you British Railway Thrift Coupons.

Want "planning" literature? Write
British Railways, Dept. DG, 3
630 Fifth Avenue, New York 20, N. Y.

BRITISH RAILWAYS

OFFICES IN NEW YORK • CHICAGO • LOS ANGELES • TORONTO



Mention the National Geographic—It identifies you



take time
for fascinating

San Francisco

Come and let this happy-hearted city show you how it lives, for the ways of San Francisco are a wonderful way of life. Stroll through an **ART SHOW IN NORTH BEACH**, the Latin Quarter of painters, poets, beatniks and coffee houses . . . you'll marvel that the *spirit* breathes so freely in this creative city. . . . Ride a rollicking cable car up Nob or Russian Hill to another San Francisco, regal upon towered hilltops . . . from a "sky room" take command of unforgettable views—the world's greatest bridges, Alcatraz, ships that recall earlier seafaring days and the Gold Rush. . . . Get a close-up of **TEEMING, COLORFUL FISHERMEN'S WHARF** from your restaurant window table—the food in San Francisco is famous, yet there is no "best" place because so many reach perfection in their different cuisines. . . . Go at night to a play, a symphony concert, perhaps the opera . . . dance to a name band, lend an ear in a jazz bistro—it's a gay, all-friends-together city after dark, and the sparkle of bridge lights on the Bay will also be

in you. . . . Go often to the chic downtown area of **FAMOUS STORES AND SHOPS**, glamorous hotel-restaurants, sidewalk flower stands and America's best-dressed women. Only a short walk distant, pagodas and bazaars of the largest Chinatown outside Asia. . . . Around the city, visit three top art museums, Golden Gate Park and Ocean Beach, a Maritime Museum, many other places. To tell you more about it all, we'd like to send you our illustrated folder, *Your Guide to San Francisco and Its Nearby Vacationlands*. It describes the Redwood Empire, historic Monterey, Carmel, popular Santa Cruz, Yosemite National Park, the Shasta-Cascade Wonderland and other places you'll want to see during your San Francisco vacation.

Write for your free folder today to: CALIFORNIANS INC.
Dept. F 6 · 703 Market Street, San Francisco 3, California

CALIFORNIANS INC.





Care to hunt cat's eyes... cowrie shells...
countless ocean surprises on every South
Sea strand? This Matson message is for you!

Take a Beachcomber's Holiday with Matson through all the South Seas!

The seas, as every beachcomber knows, are full of surprises, and the South Seas more than most! Fulfilling this promise are 2 stately ships, Matson's ss Mariposa and ss Monterey. Each is all First-Class, completely air-conditioned, gyrofin-stabilized—with a guest list limited to 365.

You're in for happy surprises the moment you step aboard. First, your stateroom—with hi-fi, private bath, individual temperature control, ample storage space...here's beachcombing in luxury!

Food? Matson cuisine is the handiwork of the world's greatest chefs. And people! They're friends almost on sight—to share all the fun of the ship, and of course, the beachcombing ashore.

Tahiti—a Matson beachcomber's heaven! Enjoy the red-roofed town or board "le truck" for a distant beach. Care to join an

with herbs and cooked for dinner! Today you'll watch the spear dance with no such fear; trade with turbaned Indians—see a cricket match!

Pago-Pago (say Pang-go Pang-go) is a name that throbs like a tribal drum through the annals of South Seas adventure! Its enchanted harbor is legendary; its people pure Polynesian; its memory will be with you always!

No beachcomber's voyage would be complete without Hawaii—more fun than ever as the 50th state! Hawaii's haunting farewell is the perfect note for journey's end; it's more melody than word, more benediction than goodbye... "Aloha!"

These 42-day Matson sea-hunts through Paradise leave every 3 weeks from San Francisco and Los Angeles. See your travel agent or Matson Lines office.



The famous bridge at Sydney



Fiji—isle of sun and magic



Friendly people greet you in Tahiti



New Zealand's thermal regions



Feasting and Sun, Pago Pago

islander in fishing? A friendly "hou-jour" will get you an invitation!

The Maoris—wisest of ancient explorers, chose lovely New Zealand as home. Their descendants will give you a ceremonious welcome—to fishing, hunting, skiing, sight-seeing unlimited!

Land ho... Australia! You've been scouring tidepools for minnows, and suddenly here's a whale! The blue immensity of Sydney's harbor, the grand beaches, the vast reach of the "Outback" dwarf any imagination.

Beachcombers of old, lured by the magic of Fiji, were often spiced

SAIL Matson
The voyage is a vacation... the port a place.

MATSON LINES, THE OCEANIC STEAMSHIP COMPANY
New York, Washington, D.C., Chicago, Dallas,
San Diego, Los Angeles, San Francisco, Port-
land, Seattle, Vancouver, B.C.

SPECIAL THIS SPRING!

4 Cruises to all the South Seas featuring 25% reductions from one-way fares... savings up to \$745 round-trip. Only the fare has been reduced.

ss MARIPOSA ss MONTEREY
March 30 April 17
May 15 June 1

Sailing from San Francisco, following day from Los Angeles



El Dorado of beaches: Waikiki



**THERE'S
NOTHING
LIKE A
NEW CAR**

*Nothing else offers your family so much
in so many ways as a new car. That's
the case with any make, though we
believe you'll find special rewards in
one of our fine, new General Motors cars.*

FOR FAMILIES WHO'D



Bona Raton Hotel and Club is the place, Cadillac Sixty-Ten Convertible is the car, elegant is the word.

Don't dream—drive! That's what a new car seems to urge. Put your travel folder away and get out your suitcases. And what better way to travel than the make-your-own-schedule way in a brand-new car? You won't be on the road long before you realize again that nothing for the money can offer so much to the whole family in comfort, convenience, pleasure and safety as a new car. Any new car—though we believe you'll find more satisfaction in one of our eye-catching 1960 General Motors cars.

What a selection you have! Sizes from the Cadillac to the Corvair by Chevrolet; models from sleek sedans to snappy convertibles. There's one, beautifully made and advance-engineered, that's sure to fit your family perfectly.

Visit your GM dealer soon. You'll sit a little taller with your shoulders a little straighter in a new car. And you'll stay that way for many days to come, whether you're driving just around town or clear across the country.

**GENERAL
MOTORS**

GO GM FOR '60

CHEVROLET • PONTIAC • OLDSMOBILE
BUICK • CADILLAC

All with Body by Fisher

RATHER DO THAN DREAM

NEW IDEA for BUSY FAMILIES!



THE UNDERWOOD "HOME OFFICE"

It's efficient! It's versatile! It puts the whole family in business!

Newest member of the modern family . . . the handiest work-saver ever! It's the new decorator-styled Underwood "Home Office" . . . the Portable Typewriter teamed with the Add-Mate, the phone-size all-electric adding-subtracting machine!

Look below—see how an Underwood "Home Office" benefits the entire family . . . is used by Dad, Mom, and Junior in so many different ways! Then see your Underwood Dealer for his Easy Terms to put one in *your* home . . . now!

underwood 

NGB

Underwood Corporation
1 Park Avenue, New York 16, N.Y.

Please send me literature giving range of decorator colors and feature-by-feature description of Underwood Portable Typewriters and the Underwood Add-Mate.

Name _____

Address _____

City _____ Zone _____ State _____



FOR DAD, LESS NIGHT WORK at the office—He can finish up details at home. Add-Mate adds, subtracts, multiplies, subtracts and totals! Dad's figures are right every time!



MOM'S A TOP MANAGER—Add-Mate helps keep tabs on bills, bank statements, check stubs, household accounts. (Income taxes, too!) And it's as easy to use as a phone!



STUDENT'S GRADES GO UP—with a dependable Underwood Portable. Newest office machine features . . . fast, easy action. Makes more time for extra activities.



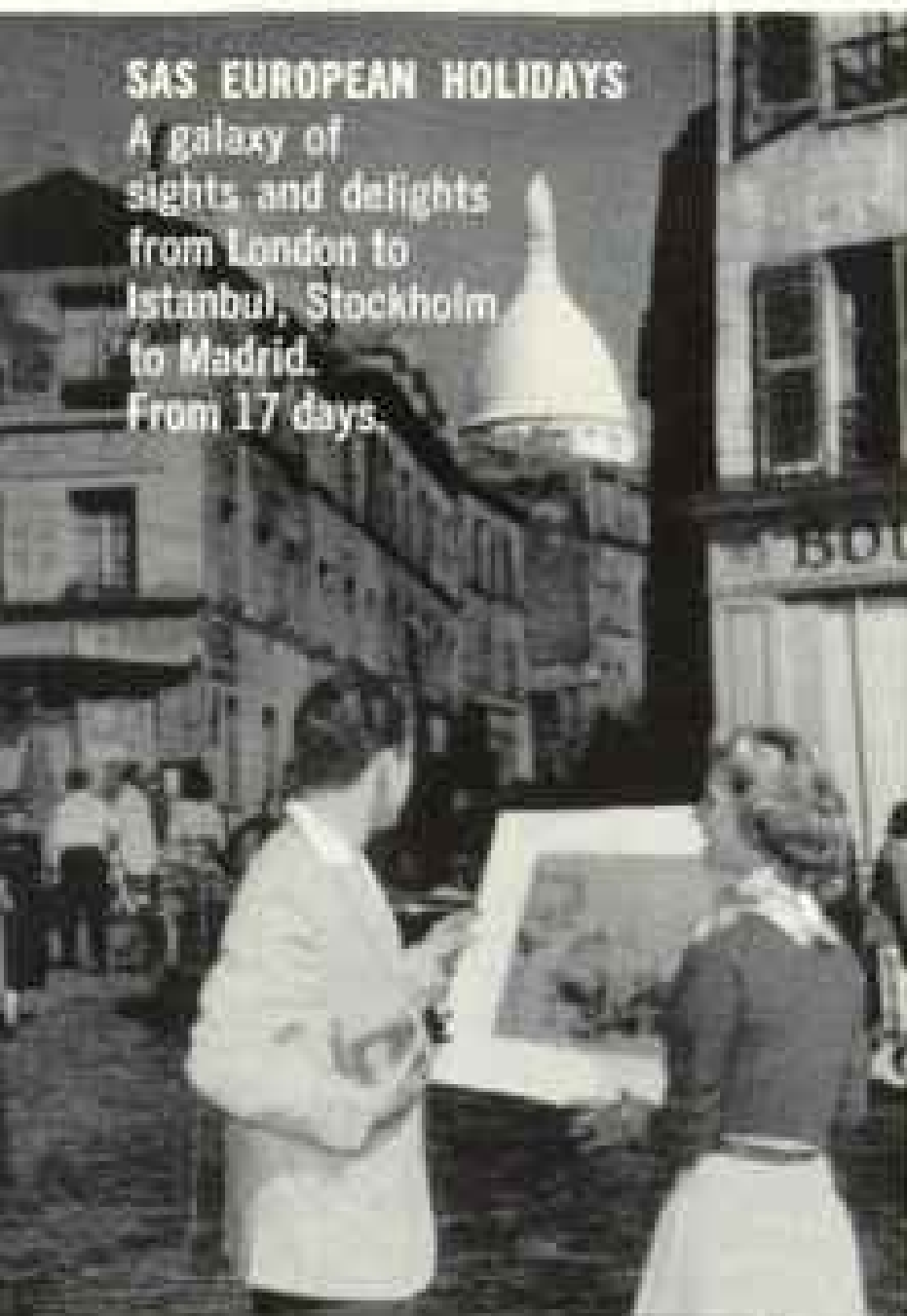
NEW FOR 1960!

SAS AND THE "TREASURE CHEST OF WORLD TRAVEL"... HAPPIEST COMBINATION IN THE JET AGE



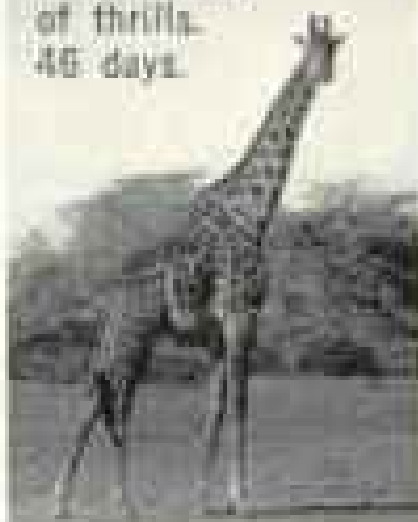
SAS EUROPEAN HOLIDAYS

A galaxy of sights and delights from London to Istanbul, Stockholm to Madrid. From 17 days.



Add golden days and a wealth of foreign lands to your next vacation. SAS shows you how in a stunning brochure, the "Treasure Chest of World Travel." Then SAS whisks you there with jet age speed and splendor. Pay later, if you like, from only \$1 a day! But send the coupon now for joyous planning — or visit your SAS agent soon.

SAS
AFRICAN SAFARI
Giraffes and
grants, pyramids
and pygmies...
a continent
of thrills.
46 days.



SAS DC-8 PURE JETS

transatlantic and transpolar in the spring...
joining the SAS Caravelle Pure Jet
now flying through Europe and Middle East.



SAS SCANDINAVIAN HOLIDAYS

Sparkling lands of modern design,
fjords and medieval villages.
12 exciting tours, 17 days and up.



SCANDINAVIAN AIRLINES SYSTEM

SAS AROUND
THE WORLD...
Europe, the Bible
lands, Far East...
the king of travel
adventures!
40 unforgettable
days — or more.



FREE!



SAS,
Scandinavian Airlines System
636 Fifth Avenue,
New York 20, N. Y.

Make this my Happy Travel Year with your
"TREASURE CHEST OF WORLD TRAVEL."

Name _____

Address _____

City _____ State _____

My SAS Agent is _____
G-240



the nicest things happen to people who carry

FIRST NATIONAL CITY BANK TRAVELERS CHECKS



First National City Bank Travelers Checks are safe and spendable anywhere. Promptly refunded if lost or stolen. The cost is only \$1.00 for \$100 worth. Ask for First National City Bank Travelers Checks by name at your bank.

**BACKED BY THE BANK THAT'S
FIRST IN WORLD WIDE BANKING**

**THE FIRST NATIONAL CITY BANK
OF NEW YORK**

Member Federal Deposit Insurance Corporation



MOMMY!...

MOMM

MOMMY!...

MOMMY!...

MOTHER DIDN'T HEAR! She was listening but Mother was hard of hearing and had not yet learned about the benefits of an ACOUSTICON. This same situation is experienced by hundreds of thousands of mothers, fathers and grandparents who are losing the rewards of a normal social and economic life simply because they don't know about the new, inconspicuous, comfortable ACOUSTICON hearing aids.

A world renowned physician has just published an interesting book titled, "HEARING, A HANDBOOK FOR LAYMEN." ACOUSTICON has received permission to provide you with excerpts of this wonderful book, free. Included with other revealing information is a factual quotation from the government study of 2500 hard-of-hearing people who increased their incomes by an average of 253% within one year after hearing loss correction. Send coupon for a free copy for you or a loved one. It will be delivered privately and confidentially.



ACOUSTICON INTERNATIONAL,
Dept. N-3 95-25 149th St., Jamaica 35, N. Y.
Please send me my free copy of excerpts
from the book, HEARING, A HANDBOOK FOR LAYMEN.

Name _____

Address _____

City _____

Also Manufacturers of World-Famous Dictograph
Internal Communications Systems

DA 7



NOW—RACE THE SUN TO HAWAII ON UNITED AIR LINES DC-8 JET!

You can slesh through snow in the morning and romp on the warm sands of Waikiki the same afternoon. For United Air Lines has extended its coast-to-coast jet service to Hawaii. Now you can fly to the islands on a newer, faster, more powerful DC-8 Jet. And almost before the snow on your shoes melts, you're there!

But speed is not the only dramatic difference. High over the Pacific, you relax in the most improved seat in air travel. Your DC-8

features a Red Carpet® Lounge, biggest in the sky, plus a spacious Coach Lounge. And . . . you enjoy United's famous *extra care* with its superb food and luxurious Hawaiian service.

United offers excellent jet connections in both Los Angeles and San Francisco, a choice of Red Carpet or Custom Coach accommodations, and a variety of special Hawaii Vacations at surprisingly low cost. For reservations on the Best of the Jets, see your Travel Agent or call United Air Lines.





YOUR FIRST TASTE OF PARIS – 3000 MILES FROM FRANCE! Bon appétit! Imagine that you're dining in De Luxe Class on Air France—surrounded by fabulous French delicacies, attentive French stewards and French atmosphere that would rival a plush Parisian restaurant. You can hardly believe you're still 3000 miles (only 6 jet hours) from France. But that's exactly what happens when you fly Air France's new Boeing 707 Intercontinental—world's fastest, largest, longest-range jetliner. Daily non-stop service from New York puts you in Paris in 6¾ hours! Make your reservations now. All flights feature De Luxe and Economy Class. Round-trip Economy Fare between New York and Paris only \$532.20. Fly now—pay later. See your Travel Agent or call Air France. Offices in 28 key cities.

POLAR SERVICE TO PARIS DIRECT FROM LOS ANGELES STARTS THE BEGINNING OF APRIL; DIRECT SERVICE FROM CHICAGO THE MIDDLE OF APRIL.

AIR  FRANCE JET

WORLD'S FASTEST JETLINER / WORLD'S LARGEST AIRLINE



See your Travel Agent, or call your nearest Air France ticket office

Atlanta	Jackson 5-6817
Beverly Hills	MAdison 5-7171
Boston	HUbbard 2-4890
Buffalo	MAdison 9270/1/2
Chicago	STate 2-1250/1/2/3
Cleveland	PRospect 1-5000
Dallas	Riverside 1-1541
Denver	MAin 3-4359
Detroit	WOodward 1-1755
Hartford	JACKson 2-7258
Havana	PhOnE A-7094
Houston	CAPitol 8-6613
Indianapolis	MElrose 9-5511
Kansas City	HARRison 1-8366
Los Angeles	MAdison 5-7171
Mexico City	TEL: 46-91-40
Miami	FRanklin 4-2626
Milwaukee	BRoadway 2-1484/5
Minneapolis/St. Paul	FEDeral 5-2151
Montreal	UNiversity 1-9001
New York	OLympia 6-6000
Newark	MArket 4-7007
Philadelphia	PEnnypacker 5-9100
Pittsburgh	COURt 1-1800
Portland	CAPital 6-7621
St. Louis	CHestnut 1-8844
San Diego	BElmont 3-8146
San Francisco	YUKon 2-7151
San Juan, P. R.	TEL: 2-1596/7
Seattle	MUtual 2-2763/4
Toronto	EMpire 4-0101
Vancouver	MUtual 1-4151
Washington, D. C.	STERling 3-8833



Mention the National Geographic—It identifies you

An Important Message

for men who want to
be better providers

You may be like many a family man who would like to have a second income from stocks and bonds, but you don't know how to go about it.

Here's a booklet that's packed with information about what to do. "DIVIDENDS OVER THE YEARS" tells you about the risk of owning securities. Prices go down as well as up. It points out the importance of investing only on facts—never merely tips or rumors—and suggests how you can readily get information and advice from a Member Firm of the New York Stock Exchange. It advises you to invest only with money you've put aside for the purpose, not with money needed for living expenses or emergencies.

Among other things you'll find:

- The records of more than 400 stocks that have paid a cash dividend every year from 25 to 112 years.
- Which stocks are most favored by financial institutions.
- How to acquire stock in famous companies by investing with as little as \$40 every three months.

More than 12 million Americans are stock owners. They know that stock in a well-managed progressive company may give them a second income now and may grow in value, helping to build family security as the years go by.

Let "DIVIDENDS OVER THE YEARS" help you start. Just send the coupon and we'll be glad to mail you a copy free.

Own your share of American business

Members New York Stock Exchange

For offices of Members nearest you, look under New York Stock Exchange in the stock broker section of the "Yellow Pages."

SEND FOR FREE BOOKLET. Mail to a Member Firm of the Stock Exchange, or to the New York Stock Exchange, Dept. A-120, P. O. Box 1070, New York 1, N. Y.

Please send me, free, "DIVIDENDS OVER THE YEARS, a basic guide for common stock investment."

Name _____

Address _____

Broker, if any _____

Get More Done - Have More Fun



on new, speedy, sporty
Wheel Horse
SUBURBAN TRACTOR

22 attaching yard and garden tools include rotary mower, snow plow, rotary tiller, all-purpose dump trailer, 4-ft. trailing lawn rake, and 3-gang reel mower that cuts 5-ft. swath... all for...



year 'round tractor - fun!

Breeze thru yard jobs in the snappy, happy way... on Wheel Horse Suburban Tractor. Mowing lawn, plowing garden, clearing snow... every job's easy to do... easier on YOU. You sit soft, turn sharp, shift smooth. Exclusive all-gear drive... 4 gear selections... speeds to 6 mph. High horsepower with unmatched gear reduction develops power to spare. Tractor-type tires provide safe, sure traction. Fun-work Wheel Horse NOW!

**Take a
Test-Drive
at your
Home!**

To test-drive Wheel Horse, with no obligation, call your Wheel Horse dealer. Write TODAY for his name and free, complete literature.

WHEEL HORSE PRODUCTS
51474 U. S. 31,
South Bend 17, Indiana

SUBURBAN
Wheel Horse
YARD and GARDEN
TRACTOR



Denmark • Finland • Norway • Sweden

Scandinavia

**Four vacations
in one!**

Easy-to-reach Scandinavia is a fascinating vacation buy. Visit all four countries... See fairy-tale towns, folklore provinces, fabulous lakes, majestic fjords. Go above the Arctic Circle; see Lapland and the North Cape.

Choose May-June for the SCANDINAVIAN FESTIVAL or September to shop for the latest home furnishings during the DESIGN CAVALCADE.



**Lands of
Sunlit Nights**
See A Travel Agent.
Write:
**Scandinavian
Travel Commission**

Dept. D2, Box 260,
New York 17, N.Y.

Color and Contrast in **UTAH**

Travel the world over, there's no single area so rewarding to the visitor as Utah. You'll thrill to Utah's high mountain wilderness retreats... the gorges of its three major rushing rivers... the challenge of its red-rocks country... the quiet beauty of its national and state parks... the charm of its cities and towns... its perfect year-around climate... NATURE'S FABULOUS SHOW!

MAIL THE COUPON...

We'll send you a full kit on Utah... including highway map, scenic areas, information on National and State Parks and Monuments, full pictorial guide.

Utah Tourist & Publicity Council
Dept. T61, Utah State Capital
Salt Lake City, Utah

1960

UTAH KIT

Name _____

Address _____

City _____

State _____



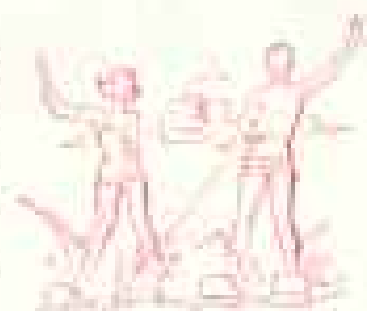


← Early meeting of *The Order of the Good Time* in Port Royal, a favorite stop for visitors to Nova Scotia.

NOVA SCOTIA

People have a good time in Nova Scotia. That tradition started in 1606, when the New World was wilderness and French explorers were founding Port Royal in Nova Scotia. They organized *L'Ordre de Bon Temps*—The Order of the Good Time—which has members all over the world today. Every summer, as Nova Scotians welcome half a million visitors in pursuit of happiness, the tradition is born anew. We believe you, too, will enjoy the sunny beaches, panoramic highways, invigorating sport and colorful folklore of modern Nova Scotia, Canada's Ocean Playground, home of The Order of the Good Time.

Free! New, colorfully-illustrated brochure; highway map; "Where to Stay," with rates—plus an invitation to join *The Order of the Good Time*.



NOVA SCOTIA TRAVEL BUREAU
 BOX 130, HALIFAX, NOVA SCOTIA
 (or 247 Park Ave., New York 17, N. Y.)

NG-3-60

I'm interested, please send free literature to:

Name

.....

.....

A MAN HAS TO BE WATCHFUL *and* WARY



Nothing—absolutely nothing shall mar or damage your first new car. It's a good way to feel, not only about what you own now, but also about other major possessions you'll accumulate in life: home, furnishings, and savings. You'll want to guard them well and protect yourself against their loss right from the start. The best and surest way to do this is through insurance.

To be sure that your protection *fits* properly, you need a competent insurance man to advise you. He is the America Fore Loyalty agent right in your neighborhood. Make him your **PARTNER IN SECURITY** now and you'll be worry-free in the days ahead. For his name call Western Union by number and ask for Operator 25.



**America Fore
Loyalty Group**

THE CONTINENTAL INSURANCE COMPANY • FIDELITY-PHENIX INSURANCE COMPANY
FIREMEN'S INSURANCE COMPANY OF NEWARK, N. J. • NIAGARA FIRE INSURANCE COMPANY
THE FIDELITY AND CASUALTY COMPANY OF N. Y. • NATIONAL-BEN FRANKLIN INSURANCE COMPANY
COMMERCIAL INSURANCE COMPANY OF NEWARK • MILWAUKEE INSURANCE COMPANY
ROYAL GENERAL INSURANCE COMPANY OF CANADA • THE YORKSHIRE INSURANCE COMPANY OF N. Y.
SEABOARD FIRE & MARINE INSURANCE COMPANY

ONLY FROM ZENITH! SPACE COMMAND TV TUNING IN NEW 23" PICTURE WINDOW TV!

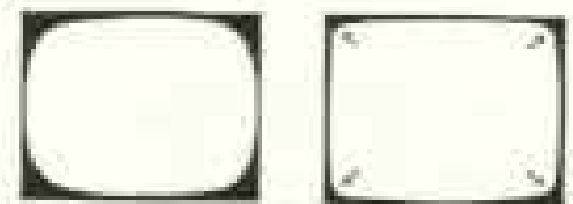
New larger picture shape! World's most convenient remote TV tuning!



282 square inches of rectangular viewing area
—23" overall diagonal measurement

DON'T GET UP! ZENITH SPACE COMMAND TUNES TV FROM YOUR EASY CHAIR WITH SILENT SOUND! Just touch a button on the control unit you hold in your hand. Space Command remote control TV tuning turns TV on and off, changes channels, adjusts volume, shuts off sound while the picture stays on. No cords, no wires, no batteries. Not an extra-cost accessory—it's built right in. And only Zenith has it!

SEE THE PICTURE EVEN IN THE CORNERS! Now you can see more of the picture—Zenith's new larger picture tube gives you 282 square inches of rectangular viewing area, 23" overall diagonal measurement. Zenith's exclusive Sunshine® picture tube gives you better high light brightness. Zenith's exclusive Cine Lens® gives you better picture contrast—and it's bonded to the tube face to seal out dust for life!



Above is the Zenith Premier, in new contemporary slim-line cabinetry. Model E3356, in grained mahogany color \$429.95*. In grained cherry color or grained blond oak color, \$439.95*.

Zenith ZENITH RADIO CORPORATION, CHICAGO 39, ILLINOIS, IN CANADA: ZENITH RADIO CORPORATION OF CANADA LTD., TORONTO, ONT. Excellence of television, stereophonic high fidelity instruments, phonographs, radios and hearing aids. 41 years of leadership in radio and television.

ZENITH

*The quality goes in
before the name goes on*

*Manufacturer's suggested retail price. Slightly higher in the Southwest and West Coast. Prices and specifications subject to change without notice.

Mention the National Geographic—It identifies you

**WARM
DRY
SUNNY**

plus
MAGNIFICENT SCENERY

This is living in
TUCSON
ARIZONA

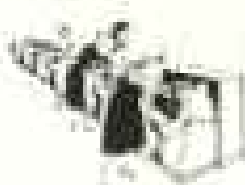
Heart of the Scenic Southwest

free colorful booklet—
where to stay . . . what to see and do—
write: Tucson Sunshine Climate Club
5904-F Pueblo, Tucson, Arizona

western gateway to Mexico

BE YOUR OWN BOSS!

Own Your Own Licensed Unattended



Westinghouse Laundromat

Half-Hour Laundry Store

NET \$5,000-\$10,000

ANNUALLY IN YOUR SPARE TIME!

Enjoy a substantial second income in your spare time while maintaining your present business, profession or job. Prestige Westinghouse Laundromat laundry stores have made thousands of alert people like you financially independent. Because all equipment is coin-metered and easily operated by customers without need of attendants, many stores are open 24 hours a day, 7 days a week. No labor problems or inventories. Receive assistance on locations, training and promotional help from the international organization that has planned over 9300 profitable laundry stores, has the years of experience and the service facilities essential to the greatest profits on your investment. **NO EXPERIENCE NECESSARY.** We finance up to 90% of your total purchase—offer you lowest terms. Write or phone today for full information.

ALD, Inc. 7055 N. Western Ave., Chicago 43

Detroit • St. Louis • Cincinnati • Cleveland • Minneapolis • Dallas
Kenneb. Co. • Jacksonville • Los Angeles • Buttingame, Calif. • Seattle
ALD NEW YORK, Inc., Long Island City, N.Y. • Malvern, Pa.
• Timonium, Md. • Pittsburgh • Norick, Mass.

ALD CANADA, Ltd., 54 Advance Rd., Toronto © Ald, Inc. 1960

HIGH... *lofty peaks . . . Rainier, Baker, St. Helens, Adams*

WIDE... *the longest stretch of unbroken beach in the world . . . the horizon-bounded expanses of the fertile Columbia Basin*

HANDSOME... *Come enjoy our hotels, resort motels, guest ranches, state parks*

and then some - WASHINGTON STATE

Snowballs in July at Mt. Rainier



Want to come where there's most fun per mile in any direction? Let us show you. Send today for our brand new, full-color, 36-page travel booklet . . . just mail the coupon below.



Washington State Dept. of Commerce
Gen'l Administration Bldg.,
Olympia, Washington GEO-1
Please send your **FREE** vacation folders to:

Name _____

Address _____

City _____ State _____

(PLEASE PRINT CLEARLY)

Mention the National Geographic—It identifies you

Thermo-Fax

COPYING MACHINES

give you dry copies

...4 seconds **FAST**

You're hurrying to get to that meeting . . . suddenly you need extra copies. That's no problem with a "Thermo-Fax" Copying Machine in your office. In just seconds you have dry copies in your brief case.

Using no chemicals these machines turn out a perfectly dry, clean copy in just 4 seconds—electrically. And copies can be made on white, bond-weight paper—or on any of 6 other distinctive colors.

"Thermo-Fax" Copying Machines copy just about everything, quickly and easily. Such routines as billing, accounting and addressing are speeded. To see one of these time-savers at work, call your dealer now. Or mail the coupon.

*Only "Thermo-Fax" Copying Machines
do so many jobs...so quickly,
so easily, for such low cost!*



**MINNESOTA MINING AND
MANUFACTURING COMPANY**

...WHERE RESEARCH IS THE KEY TO TOMORROW

THE TERM "THERMO-FAX" IS A REGISTERED
TRADEMARK OF MINNESOTA MINING AND
MANUFACTURING COMPANY

Minnesota Mining and Manufacturing Company
Dept. DCE-30, St. Paul 6, Minnesota

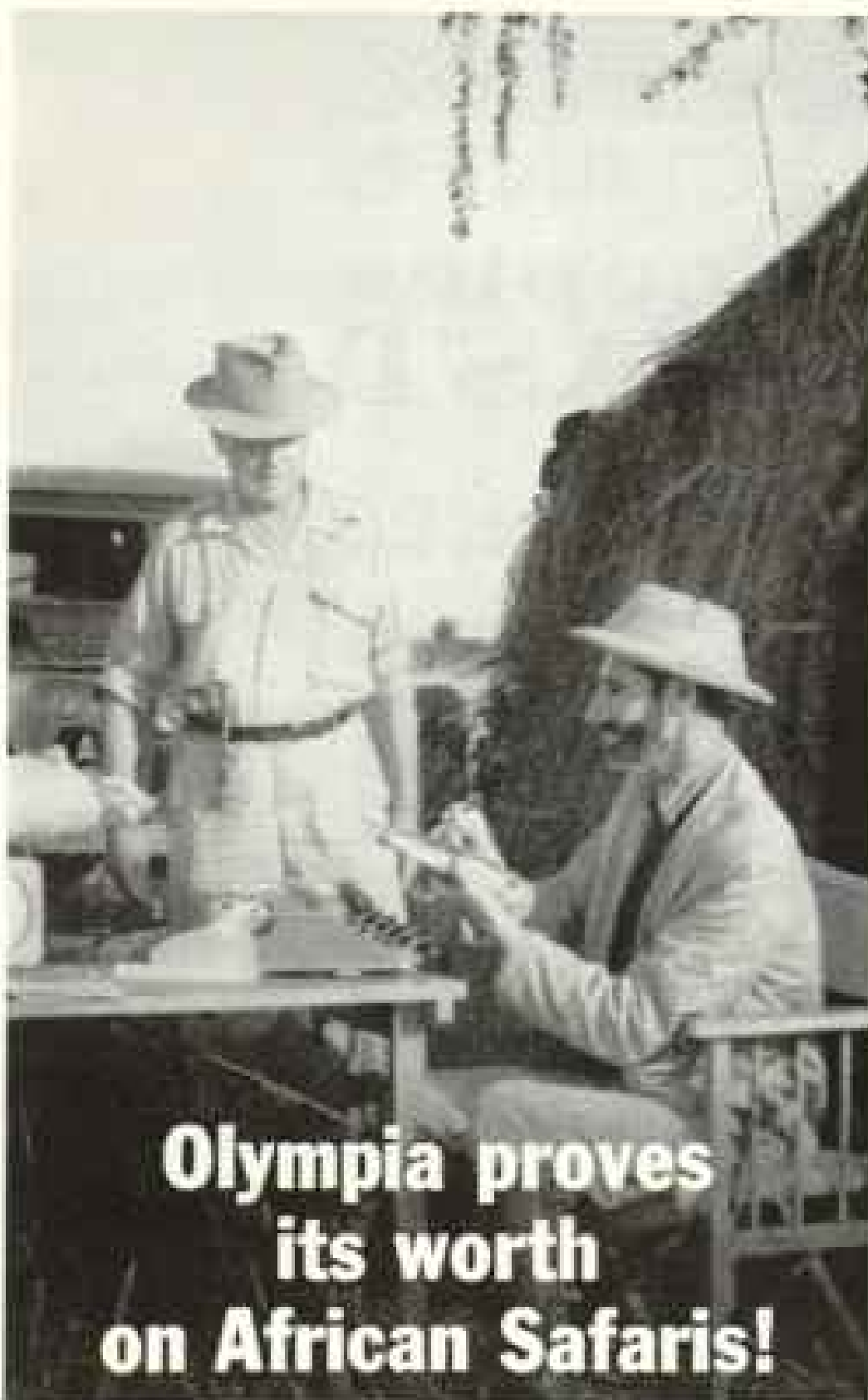
Name _____

Company _____

Address _____

City: _____ Zone _____ State _____

Mention the National Geographic—It identifies you



**Olympia proves
its worth
on African Safaris!**

Here's a real test of quality. For years, Dr. A. V. Nagy has taken an Olympia Precision Portable on his scientific expeditions into the interior of Africa. The Olympia sturdily endured thousands of miles of travel—by ship, truck and bearers—through unbelievably rugged terrain. Severe "machine-disabling" extremes in temperature and humidity, too—from the steaming heat of North Kenya to the freezing heights of the Meruforest in Tanganyika. Through it all the Olympia performed flawlessly. Dramatic proof that an Olympia writes best of all—because it's built best of all! See-test-compare this magnificent German-made portable before you decide on any other typewriter.

OLYMPIA DIVISION Inter-Continental Trading Corp.
30 West Street, New York 6, New York



Olympia

Mention the National Geographic—It identifies you



FREE
*Nine-Region Guide
to Florida*

ALL NEW 1960 EDITION

You will find this handy guide book an invaluable aid in planning a holiday in Florida.

All nine of the state's vacation regions are described, each resort city is discussed in its hundred informative pages. What to see and do, where to visit, how to get there. Tips on costs, climate, what to wear. Plus scores of full-color photographs and regional maps.

It's the revised, 1960 edition—up-to-date and factual. The most helpful Florida guide ever published. And it's yours absolutely free. Just mail the coupon for your free copy.

*Convenient, 5" x 7" pocket-size
for handy reference*

MAIL TODAY!

State of Florida • Room 1906-B
Commission Building, Tallahassee, Florida

I'm planning a Florida trip. Please send me the
FREE Guide to Florida Vacations.

Name _____

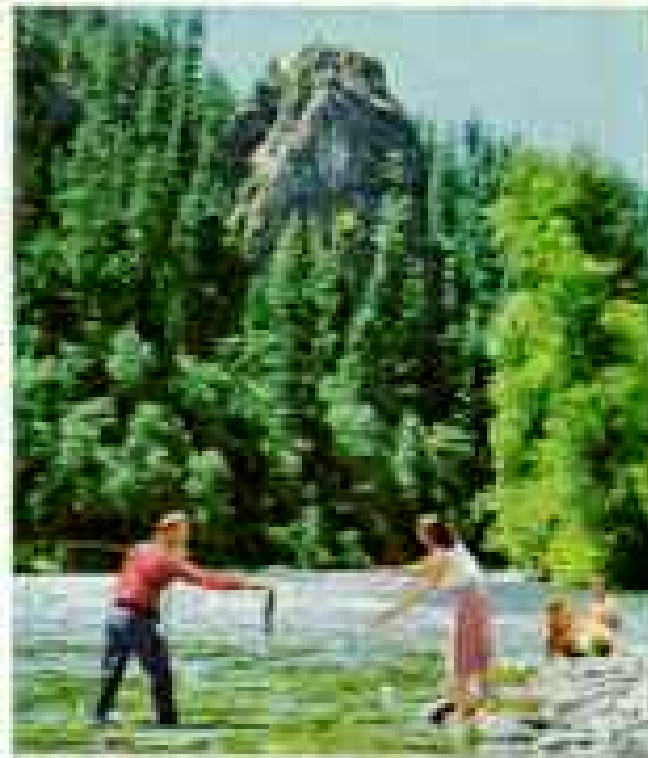
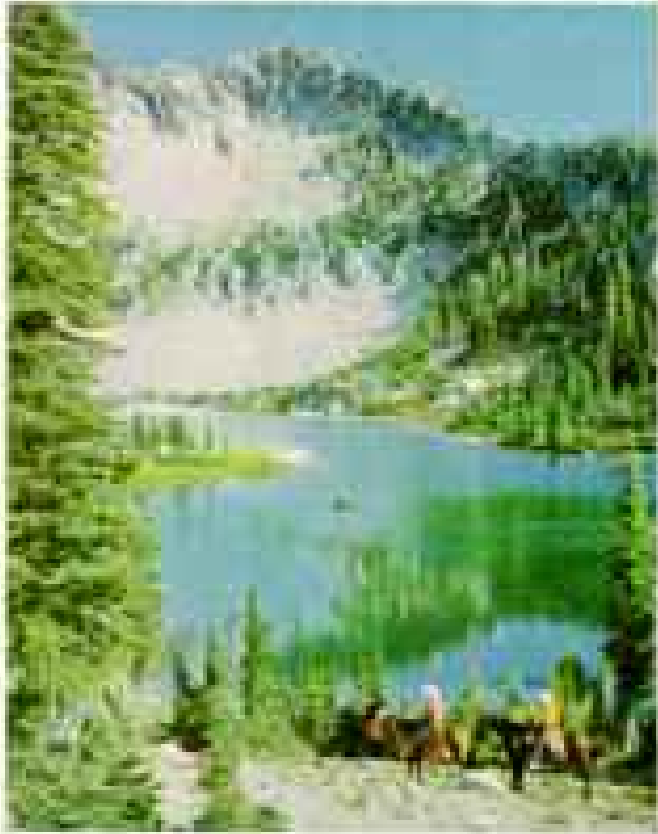
Address _____

City _____ Zone _____ State _____

Whether you're a "looker" or a "doer," Oregon's Pacific Wonderland offers you the vacation of a lifetime! Unsurpassed scenic beauty is yours for sightseeing; contrasting recreational areas of many types are yours for active sports. Fine modern highways will whisk you smoothly from one play-area to the next . . . less travel-time, more fun-time. Relax and play in America's most exciting vacationland . . . make this your Oregon adventure year!

*Relax in a state
of excitement.*

OREGON!



Famed for both angling and scenic loveliness is Oregon's McKenzie River. This inviting spot is on U.S. 126, east of Eugene near Vida. Many such Oregon streams are favorite vacation destinations for summertime fun-seekers.

Oregon abounds in spectacularly beautiful mountain lakes. This one, Bear Lake (left), nestles jewel-like in the rugged Willamette Mountains of Northeastern Oregon.

Below—Ecola State Park, just off U.S. 101 near Cannon Beach, presents the famed varied beauty of Oregon's ruggedly picturesque Pacific Ocean coast. Rocky headlands, golden-sunny beaches, wildflower-carpeted hillsides and interesting rock formations alternate along the 400-mile coastline.



For helpful directions and information about what to see and do in Oregon, inquire at the nearest Chamber of Commerce or other source of reliable information as soon as you enter the state.



TRAVEL INFORMATION DIVISION, Room 40
Highway Department, Salem, Oregon

Please send free booklet, "Oregon, Cool Green Vacationland!"

Name _____

Address _____

City _____

Zone _____ State _____

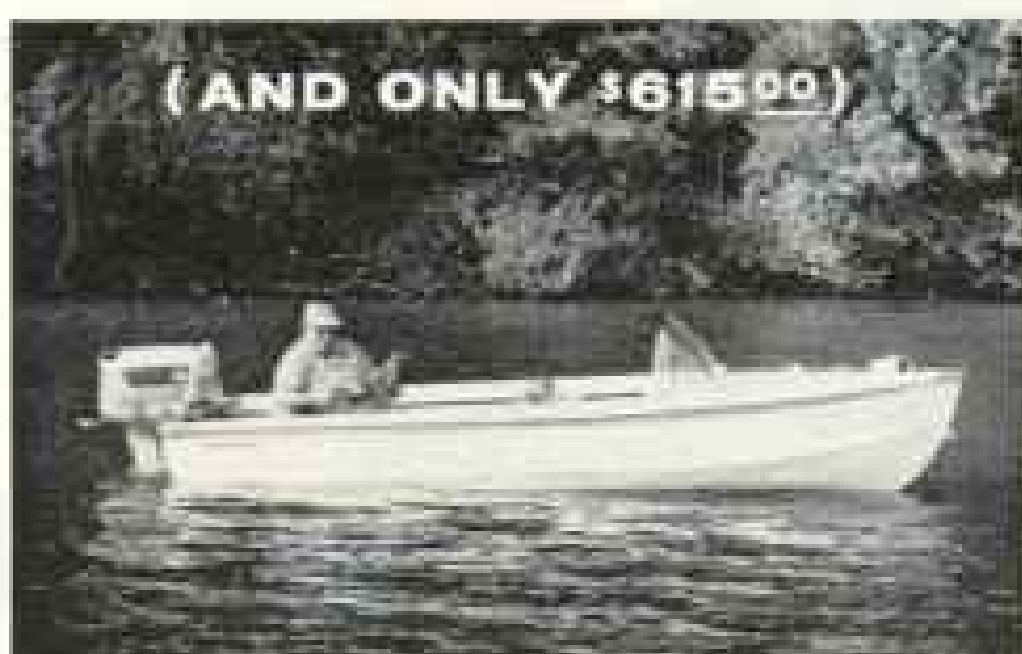
you haven't seen Europe if you haven't seen Switzerland

and you haven't seen Switzerland if you haven't seen it all

Everything in one place! Snow-capped mountains and perennial palm trees. Modern cities and pre-Roman settlements. Superb cuisine. Incomparable shopping at tempting prices. Resorts, spas, hotels in spectacular settings. Riotous nature and peace everywhere.

Your travel agent has the best answers. See him for free information, maps and folders, or write: Dept. E-4, Swiss National Tourist Office, 10 West Forty-Ninth Street, New York 20, or 661 Market Street, San Francisco 5, California

Lapstrake Hull of Aluminum



(AND ONLY \$61500)

Biggest value in the boating industry lavishly equipped and guaranteed 15 years!

Get magnificent performance from the Jet "15" lapstrake-hull runabout. A rugged beauty, lavishly equipped, almost no maintenance. And it's guaranteed 15 years! Write for free catalog, name of nearest dealer.

STARCRAFT

STARCRAFT BOAT CO. Dept. NG-3, Goshen, Ind.



Relaxed
Pace...
Reasonable
Rates...

FLORIDA'S

DAYTONA BEACH RESORT AREA

Come to the "World's Most Famous Beach"
23 miles of FREE beach playground.

Write for color brochures

DAYTONA BEACH RESORT AREA
P.O. BOX 169, ROOM NG3
DAYTONA BEACH, FLORIDA

ORMOND BEACH - HOLLY HILL - PORT ORANGE - S. DAYTONA

MAINE

... with thousands of beautiful lakes, miles of famous seacoast, mountains, streams, historic sites and scenic splendor; Maine with a choice of every type of accommodation, offers you a . . .

VARIETY for

... remembered vacations to suit the entire family. You can fish, hike, canoe, sail, cruise, golf. See fairs, horse racing, Broadway plays at summer theatres. Enjoy fabulous Down East food, warm days and cool nights. Send *now* for your illustrated guide to a Maine vacation, excitement and . . .

FAMILY FUN

FREE MAINE VACATION GUIDE

Maine Vacation, 1149 Gateway Circle, Portland, Me.
Please send free Vacation Variety Guide

Name _____

Address _____

City _____ State _____

MAINE DEPARTMENT OF ECONOMIC DEVELOPMENT

Look! no hands!

Now, no other small-size copying machine makes copying so fast, easy, and economical! With Bruning's great new Model 120, you make copies in a single pass through the machine. No manual separation of original and copy after exposure. No reinsertion of copy for development. The Model 120 automatically separates copies and originals and stacks them. And you get the copies in seconds for only 1¢ each for materials for letter size. See for yourself how this one-and-only multi-purpose copying machine can slash clerical time and work, save you in countless ways for general office copying. Use the coupon below for fast action.



BRUNING

Lowest Cost Copying in the World

Copyflex

Charles Bruning Co., Inc. Dept. 3-F
1807 Central Road, Mt. Prospect, Ill.
Offices in Principal U.S. Cities
In Canada: 100 Church St., Toronto 1, Ontario

- Please send me information on your new Model 120.
- Please arrange for a Bruning Man to contact me about a demonstration.

Name _____ Title _____

Company _____

Address _____

City _____ County _____ State _____

Canada...



St. John's, the oldest city in North America, now capital of Canada's youngest province—Newfoundland

Canada's 1st Guards Regiment parades for the traditional "Trooping the Colours" on Parliament Hill, Ottawa



*...the wonderful
world at
your doorstep!*

HISTORY, pageantry and a royal good time—that's what Canadian vacations are made of. Wherever you go in this fascinating land, you'll discover the enchanting differences that will make your Canadian visit a rewarding travel experience.

Amid spectacular scenic beauty, Canada's distinctive resort playgrounds provide superb accommodation, every facility for familiar summer pastimes and—to the delight of all—a climate that's a triumph of sunny moderation. Plan a Canadian-style vacation this summer! For further information, please fill out and mail the coupon below.



*One of the many attractive
holiday resorts in the
Canadian Rockies*

Free!
Canadian
Vacation
Package



T-1-07-03
CANADIAN GOVERNMENT TRAVEL BUREAU,
OTTAWA, CANADA

Please send the Canadian Vacation Package to:

NAME _____ PLEASE PRINT

ADDRESS _____

STATE _____



Stick this coupon on any postcard or enclose in envelope

THE NEW WAY TO SEE

Europe



EURAILPASS

"IT'S JUST THE TICKET"

FOR TRAVELING IN EUROPE

Austria • Belgium • Denmark • France
Germany • Holland • Italy • Luxembourg
Norway • Portugal • Spain • Sweden
Switzerland

EURAILPASS

gives you unlimited travel on the railroads of 13 countries.

So convenient — one ticket instead of dozens — the comfort of 1st class travel — no extra fares even on crack trains!

SEE MORE —
SPEND LESS

Only \$125 for
2 months

This special Eurail-pass sold exclusively in North and South America... Buy it through your travel agent.

Eurailpass, P.O. Box 191, Madison Square Station, N.Y. 10, N.Y.

Please send illustrated folder in full color... "EURAILPASS—the master Key to Europe." Dept. G2

Name.....
Address.....
City.....State.....

GRAVELY



makes Tough Jobs EASY!

EASY
PAY
PLAN

6.6 HP

UNMATCHED
PERFORMANCE!

Rotary Mower attachment mows-mulches the finest lawns or roughest weeds *faster, easier, better!*

Just one of 30 year-round, job-proved tools. Gravely, with *more* power . . . *more* performance . . . *more* tools, does the jobs others can't!

All-Gear Drive, Power Reverse, Optional Electric Starter, Riding or Steering Sulky.

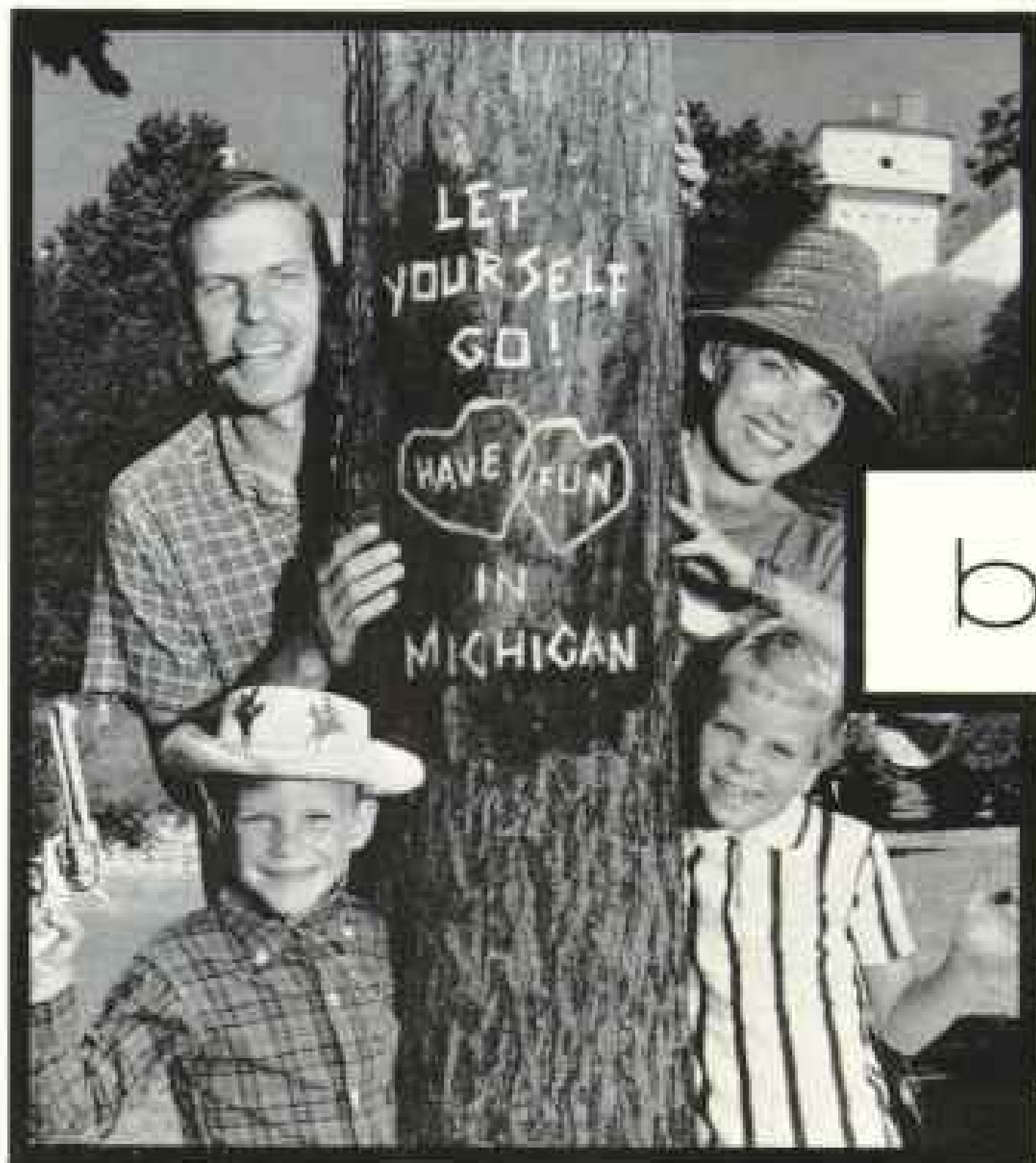


Write for FREE 24-page "Power vs. Drudgery" Booklet TODAY!

GRAVELY TRACTORS, INC.

BOX 817-C DUNBAR, W. VA.

FIELD-TESTED SINCE 1922



Discover the quaint charm of "deep sea" fishing villages and harbors.



become



Taste the cosmopolitan life in Dynamic Detroit, towering motor city.

Mention the National Geographic — It identifies you

Explorer VI
is a
Space
Laboratory
Now
Orbiting
the
Earth



Space Technology Laboratories carried out the Able III program which put Explorer VI in space . . . one of a series of advanced scientific experiments conducted by STL in conjunction with the Air Force on behalf of NASA.

STL's leadership in military applications of space technology is illustrated by its successful accomplishments as the contractor responsible for over-all systems engineering and technical direction of the Atlas, Titan, Thor, and Minuteman programs. Scientists and engineers with outstanding capabilities relating to these activities, are invited to investigate positions at STL.

SPACE TECHNOLOGY
LABORATORIES, INC.

P.O. Box 95004, Los Angeles 45, California



NEW
granulated
Sugar
Substitute
sprinkles,
sweetens,
exactly
like
sugar.



DIETING?

If you are watching calories you really should try Adolph's Granulated Sugar Substitute — it's the perfect replacement for sugar. Adolph's not only sweetens, but sprinkles *evenly* on all foods. It's so much like sugar, you'll never know the difference. A godsend for diabetics. Buy . . .



ADOLPH'S SUGAR SUBSTITUTE

AT YOUR GROCER'S TODAY



Drive across the great Mackinac Bridge — world's longest suspension bridge.

Visit majestic Miners Castle in the land of "Hiawatha".



Find old-world enchantment and new fun in festive Holland, Michigan.

a michigan explorer!

Cruise the beautiful 85-mile Inland Water Route from Cheboygan to Conway.



Free
Vacation Fun-Pak
has everything you need to plan an exciting explorer's trip to Michigan! Send for it today!

Please drive safely.

This vacation be adventurous! Safari off to Michigan where there's so much more to explore! Your basic explorer's kit? Camera, binoculars, a "Fun-Pak" and plenty of wanderlust. Michigan will provide everything else!

MICHIGAN TOURIST COUNCIL
Room 11, Motor Bldg., Lansing 26, Michigan

1-60

Do it quick! Mail me my free Vacation Fun-Pak!

NAME _____

ADDRESS _____

CITY & ZONE _____ STATE _____

What's wrong with your stocks?

That may seem like a strange question for us to ask, but it's one no investor can afford to ignore.

Because the bad things about a stock you own can be just as important as the good things—at times even more important.

Look at it this way: Before you buy a stock you check both the good and the bad, make as sure as you can that it really is the best you can buy for your purposes.

But once you've bought it, the emphasis sometimes shifts. Like a lot of people we know, you may tend to forget the bad things—just keep looking for all the evidence you can find to support your original judgment—to prove that you made a good buy.

That's only human, we admit.

But it can be dangerous—especially if it blinds you to change.

Because investment values *do* change, and if new facts should develop that make one of your stocks far less desirable—well, the sooner you know about it the better.

That's why our account executives get so many calls from experienced investors... why these investors keep checking on the current status of their holdings to make sure that nothing's gone wrong.

If you're not sure about the stocks you own, you might find it helpful to discuss your portfolio with one of our account executives yourself. You can reach one by phone if you like, or talk to one in person anytime you care to visit—

Merrill Lynch, Pierce, Fenner & Smith

INCORPORATED

Members New York Stock Exchange
and all other Principal Exchanges

70 PINE STREET, NEW YORK 5, N. Y.

Offices in 112 Cities



Ride up
and
down stairs

SHEPARD HOME ELEVATORS

Easily, quickly installed without major alterations. Completely safe, low-cost operation.

Write for literature

Shepard Elevator Co., 5081 Brotherton, Cincinnati 9, Ohio



Glorious Vacationland

MOUNTAINS • LAKES • HISTORY

You'll ride highways into the sky in the Great Smoky Mountains National Park. Enjoy Tennessee's 22 Great Lakes and TVA dams, with wonderful fishing, boating, and swimming. You'll see historic battlefields, homes of three presidents, the Atomic Energy Museum at Oak Ridge, and scores of attractions your whole family will enjoy. Plus good food, plenty to see and do, and modern roads and accommodations.

MAIL COUPON FOR FREE BOOKLET



40 Pages
116 Pictures
41 in Color

TENNESSEE DIVISION OF INFORMATION
2118 Cordell Hull Building, Nashville, Tenn.

Please send Free Vacation Guide

NAME _____

ADDRESS _____

CITY & STATE _____

Germany?



NO... NEW YORK STATE

Boldt Castle in the Thousand Islands

Is your heart set on high adventure this summer? Then come visit a mysterious castle . . . right out of a medieval romance from the valley of the Rhine. It's no farther away than New York State . . . towering above the pines on one of the famed Thousand Islands in the St. Lawrence. You'll also thrill to the unforgettable "50-Mile Ramble" through *all* the islands, which total more than 1,700.

For contrast, journey southward through the majestic Adirondacks and gay Catskills to incom-

parable New York City with its thousands of sights and things to do . . . then relax on one of Long Island's world-famous beaches. Wherever you go in New York State, you'll travel with ease over one of America's finest networks of highways and byways . . . and find choice selections of places to stay overnight, a week or as long as you like. **SEND FOR YOUR FREE 196-PAGE VACATION GUIDE.** New York State Dept. of Commerce, Room 185, 112 State Street, Albany 7, New York.

You'll find a world of fun in New York State

A Time for High Tea



Photo by Ewing Kralin

The time for High Tea in India is a mood. It arrives leisurely on the marbled courtyards of elegant hotels, amid medieval terraces of palace gardens; it arrives on a 'shikara' built for two, or in a houseboat, on a Kashmir lake miles above the sea . . .

After a tennis final it comes, or a polo match, a day at the races. The time for it is a *soirée* of dance-drama. The mood comes upon you languidly when the shadows are long and the evening breeze carries the perfume of jasmine and queen-of-the-night. The time for High Tea in India is a time to meet, and to admire.

This year, seek the mood that is India.

For further information,
see your travel agent, or write dept. NG

India

GOVERNMENT TOURIST OFFICE

19 East 49th St., New York 17, N. Y. MUrray Hill 8-2245
685 Market St., San Francisco 5, Calif. EXbrook 7-0066

Incomparable ALBERTA CANADA the Sunshine Province



JASPER
NATIONAL
PARK



BANFF
NATIONAL
PARK



WATERTON
LAKES
NATIONAL
PARK

FOR A WONDERFUL VACATION!

See Alaska, U. S. A.
Visit Alberta on the way!

Paved highways take you deep within
the heart of the Canadian Rockies to
bring the finest landscapes within easy
reach of your camera.

SEND COUPON TODAY



ALBERTA TRAVEL BUREAU
Legislative Bldg.
Edmonton, Alberta, Canada

Please send: TRAVEL INFORMATION to:

Name

Address



C A N A D A

U. S. A.



BERMUDA . . . lovely and serene,

squanders her happy hours on you. Here's tennis, golf, fishing, sailing, skin diving, in the sunniest hours imaginable. Fairest nights for dancing. Pink sandy beaches for loafing. Take a refreshing dip in the clear blue water. Then picnic in your special cove.

Unhurried is the word for this Island life. Bermuda is only 24 miles long, so you can see the sights leisurely. Shop for duty-free goods. Colourful ceremonies remind you that Bermuda is a member of the British Commonwealth. English customs are followed, like the simple pleasure of afternoon tea. Nowhere will you find a life so pleasant, and so easy-going. Your travel agent knows all about Bermuda, how to get there, and where you'll enjoy staying. The Bermuda Trade Development Board, 629 Fifth Avenue, New York 20, N.Y.



Light and Distance in One Eye!



CONTAFLEX *Super*

Just as your eye adjusts itself to light, the Contaflex *Super* avoids over- or under-exposure with an automatic exposure needle indicator, which you see as you sight.

This great advance in automation (built-in exposure meter coupled to lens diaphragm) with rapid-wind lever assure far faster and better pictures. Contaflex *Super* \$199. Same without light meter (Contaflex *Rapid*) \$169.

New accessories for both these advanced cameras are Pro-Tessar M 1:1 component lens for same size slides, and 8x30 B Monocular 400mm attachment for long-distance telephoto work.

Various models in the 35mm eye-level Contaflex line, with accessories and supplementary lenses, meet your every photographic need, including closeups, magnification, copying, wide-angle. Characteristic is the brilliantly clear ground glass and split-image focusing, through the great Zeiss $f/2.8$ lens. At leading dealers.

Send for free booklet CN-40.



CARL ZEISS INC. 485 Fifth Ave., New York 17

World Famous. Zeiss Ikon Cameras are Precision-made in West Germany

Only Eclipse Mowers



RIDING MODELS

Make lawn mowing almost fun! The Eclipse Deluxe "Ranger" mows up to 5½ acres a day. It's ruggedly built with auto-type tubular steel frame. Has two forward speeds and reverse. Big canvas "Sun-Brella" is an optional accessory... fits on to tow-bar pin at rear of mower. Try it soon at your Eclipse dealer.



REEL-TYPE

Preferred by many who take special pride in their lawns... Eclipse precision reel-type mowers—18" to 25" models—give a smooth shearing action that's ideal for Bermuda, Zoysia, and St. Augustine, as well as blue grasses.

**SEE THE BIG "E" LINE
AT YOUR DEALERS SOON...**

Mention the National Geographic—It identifies you

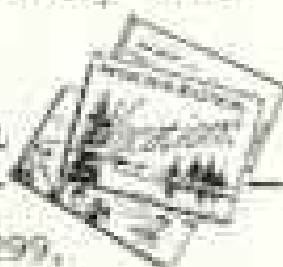
MINNESOTA

The Family Vacation State

This year treat yourself and your family to a relaxing, wholesome vacation in Minnesota—and enjoy the treasure of nature's own vacationland.

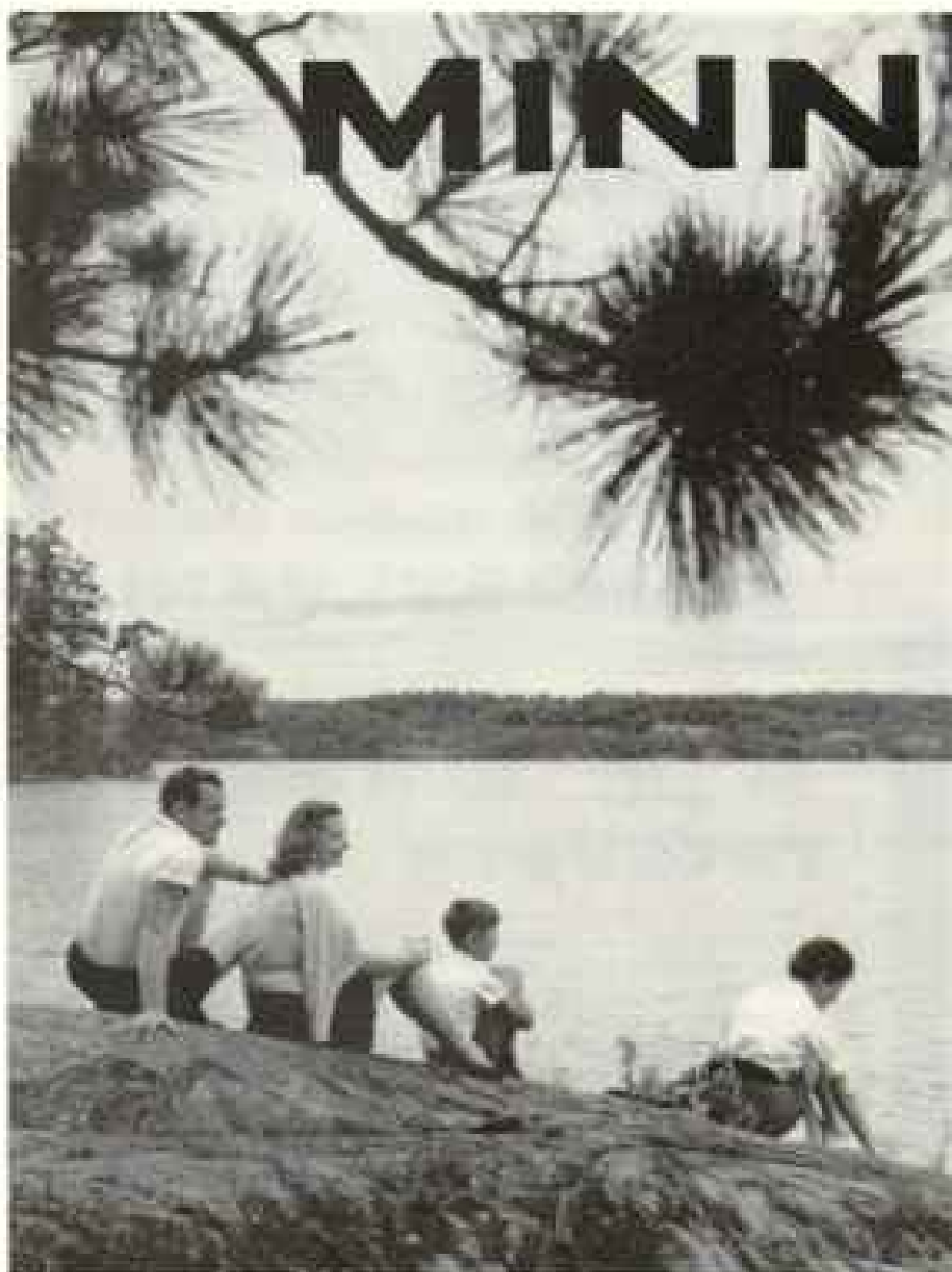
Golf, canoe, sight-see, and enjoy the many fine, outdoor recreations you'll find at Minnesota's thousands of friendly resorts. Let your work-worn nerves relax and faded appetites be rejuvenated as you play and sleep in Minnesota's invigorating, cool, fresh air. Explore via 11,000 miles of modern highway the deep forests, the hidden lakes, and magnificent scenery.

Send for free
Vacation Kit



Write: VACATIONS
Minnesota State Capitol, Dept. 299,
St. Paul 1, Minnesota
Send FREE Vacation Kit on Minnesota Vacations.

Name _____
Address _____
City _____ Zone _____ State _____



give you MOW-ABILITY*

ROTARIES

You get power to spare with 4-cycle Briggs & Stratton engines on all Eclipse mowers. Your Eclipse dealer will be glad to show you all the new features that make an Eclipse mower your best buy in the long run. New wind-up starter is furnished on W-20 and W-22 Duo-Masters.

GRASS CATCHER (Optional extra)

Collects clippings so they leave discharge chute. Easily attached. Fits all Eclipse walking rotary models.

EASY CUTTING HEIGHT ADJUSTMENT



It's brand new and exclusively Eclipse! A simple twist of one control adjusts all four wheels simultaneously. Select any cutting height between 1 1/2" and 3 1/2"—even while mower is operating.



13 MODELS PRICED FROM \$69.95

- * DESIGN AND CONSTRUCTION TO OUTPERFORM ALL ORDINARY MOWERS YEAR AFTER YEAR—FOR THE LOWEST ANNUAL OPERATING COST

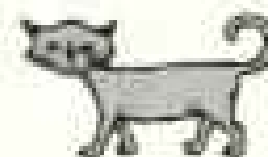
RUGGED AS A RHINO

Inside and out—from stem to stem—Eclipse mowers are built to "take it." Many Eclipse mowers 20, 30, or even 50 years old are still on the job and cutting efficiently.



DURABLE AS A CAT

Eclipse mowers seem to have "9 lives"—just don't die easily. To assure long life, repair parts are available for many years after the expected life of the average mower.



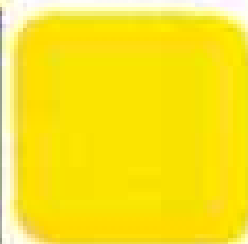
POWERFUL AS A BULL

Equipped with job-matched 4-cycle engines, Eclipse gives you a bonus of reserve power. You can operate your mower at safer, quieter and more economical half speed.



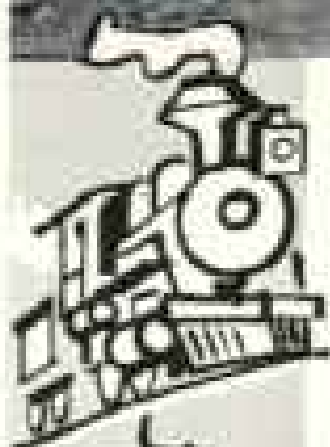
THE ECLIPSE LAWN MOWER CO.
Div. of Buffalo-Eclipse Corporation
3002 Railroad St., Prophetstown, Illinois

ECLIPSE



Mention the National Geographic—It identifies you

America's Greatest VARIETY... OF VACATION PLEASURES



EX(SIGHT)ING! Playland

A real vacation is the perfect combination of a beautiful setting and a variety of activities. This country excels! A HAPPY VACATIONLAND! Mountain chair-lift, narrow gauge railroad, live theatre, rodeos, pageants. This year make it a real vacation, where there's something for every member of the family!

IN SOUTH DAKOTA'S BLACK HILLS



WRITE FOR BROCHURE



Public Director
SOUTH DAKOTA
DEPARTMENT OF HIGHWAYS
Pierre 1, South Dakota

Name _____
Address _____
City _____
State _____

Week-end Vacations

FREE!
BIG COLOR BROCHURE
Tour Kit

Write 159 Dept. of Commerce • Harrisburg
PENNSYLVANIA

A "Lift" to a rapid recovery

People of all ages often need to be spared the strain of climbing stairs when recovering from an illness or even when they are again leading a normal life. That is why so many lifts are being installed in homes today. Inclinators (illustrated) carry two persons up and down the staircase. Elevator is a vertical lift carrying three persons.

Send for folder
"Step Climbing Stairs"

INCLINATOR CO. OF AMERICA

2228 Paxton Blvd., Harrisburg, Pa.
Originators of Home Passenger Lifts



fun for all on the MISSISSIPPI

Gulf Coast

BY DAY—28 mile long beach—5 golf courses—fishing, swimming, sailing and water skiing in fresh or salt water—5000 beachfront hotel and motel rooms—historic homes and landmarks—magnificent gardens

BY NIGHT—five restaurants featuring continental cuisine—smart night clubs—fashion shows—beach parties—romantic Old South setting—amusement parks—beautiful view



MAIL THIS COUPON NOW!

Paste on post card and mail to the Chamber of Commerce of one of the Mississippi Gulf Coast cities listed below.

Name _____
Address _____
City _____
State _____

BILOXI
GULFPORT
LONG BEACH
PASS CHRISTIAN

HC60-ND-1



An urgent message to parents about...

POLIO

Take a long hard look at this picture.

Though next summer's polio season may seem a long way off, remember it takes months to build up a child's resistance to polio.

If "shots" are started now, you may spare yourself needless worry later on. If your child has had no "shots," go to your physician or clinic as soon as possible.

Any time around three months of age, the first of these essential polio injections can be given. The second injection is given a month later—and the third one, about seven months after the second injection.

And if you have a youngster who has had all three "shots," ask his physician when a fourth, or booster dose, should be given.

This protection can be given alone or in a combined vaccine which protects against polio, whooping cough, tetanus and diphtheria.

What about your own polio protection? You, too, should be vaccinated. When polio does strike an adult, it is usually severe.

Vaccine is plentiful. And it's the only defense we have against paralytic polio.

Strike your blow against polio today!

Metropolitan Life

INSURANCE COMPANY®

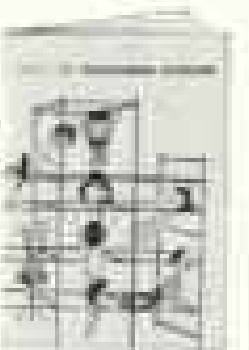
A MUTUAL COMPANY

THE LIGHT
THAT
NEVER FAILS



COUPON MAY BE PARTED ON POSTCARD

Metropolitan Life (Dept. A)
1 Madison Ave., New York 10, N.Y.
Please send me the free booklet,
"ABC's of Childhood Disease,"
3-00-N.



Name _____

(PLEASE PRINT)

Street _____

City & Zone _____ State _____



IMPERIAL CROWN FOUR-DOOR SOUTHAMPTON

PROUDEST ACHIEVEMENT OF CHRYSLER CORPORATION

A rather special kind of luxury

In building the Imperial of 1960, we've allowed ourselves a luxury usually denied our hurried industry.

That luxury is . . . time. Our automobile receives more personal attention, more hand-crafting than other cars. And these patient skills can't be hurried.

More than six hundred tests and inspections are performed on every car we build. Not one of them is a mere "quick-once-over." Each is a careful, deliberate search . . . and each takes time.

When you see your Imperial, you'll be delighted with its immaculate appearance, its completely *finished* look. You'll appreciate its roominess and easy comfort.

All this luxury of style and competence is there in Imperial of 1960 only because we allowed ourselves the rare luxury of *time*.

Compare Imperial with other cars . . . any of them. It's remarkable how great a difference time can make:



the exclusive
IMPERIAL
OF 19**60**

AMERICA'S MOST CAREFULLY BUILT CAR

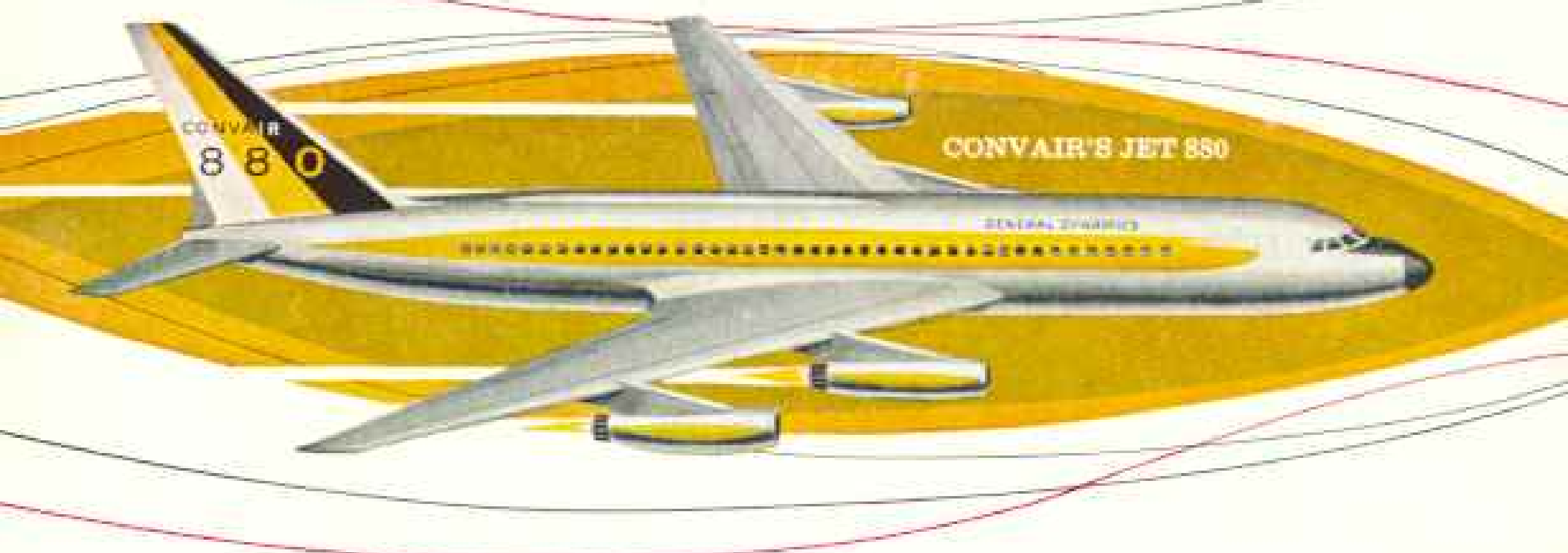




CONVAIR'S F-106 DELTA "DART"



CONVAIR'S B-58 "HUSTLER"



CONVAIR'S JET 880

The world's fastest all-weather
interceptor, bomber, and jet passenger
plane, have **SOMETHING IN COMMON**
-they're all built by Convair!

CONVAIR

A DIVISION OF

GENERAL DYNAMICS CORPORATION



The 1960 Bonneville Convertible

Why ladies like the security of Wide-Track driving

A wider track is a wider stance. A wider stance is stability, safety, balance, less lean and sway, easier maneuvering, better control, more confidence and security at the wheel. Pontiac has a wider stance than any other car. A very pleasant demonstration of Wide-Track driving is yours for the asking. See or call one of our fine dealers this week.



PONTIAC THE ONLY CAR WITH WIDE-TRACK WHEELS

sights you'll never forget
MONTANA



Land
of the shining
mountains . . .
top-of-the-world
freshness . . .
unforgettable
scenic gems,
Montana . . .
perfect vacation
for you and
your family.

STICK THIS COUPON ON A POSTCARD OR
MAIL IT IN AN ENVELOPE

Advertising Director, Dept. 60-5
Montana Highway Commission, Helena, Mont.
Please send me the free, colorfully-illustrated 16-page
Montana booklet.

NAME _____

ADDRESS _____

CITY _____

See Montana between Glacier and Yellowstone parks



IXTAPAN?

A FOUNTAIN OF HEALTH
IN A MODERN SHANGRI-LA



IXTAPAN, Mexico's world famous medicinal hot springs are remarkably beneficial for arthritis, rheumatism, gout, high blood pressure and related ailments. Ixtapan's 20 open lined Private pools are positively the most lavishly appointed in the world . . . plus Olympic and 3 other large pools.



Luxurious Hotel Ixtapan offers 200 outside rooms and suites. Superb cuisine. Scientific Beauty Clinic. Own water purifying plant. Semitropical everblooming gardens. Golf, riding, movies and all other recreations. Only 90 miles from Mexico City. Year round dry climate in the 70's.



SEE YOUR TRAVEL AGENT OR WRITE DIRECT TO

IXTAPAN

132 REFORMA BLVD.

MEXICO CITY

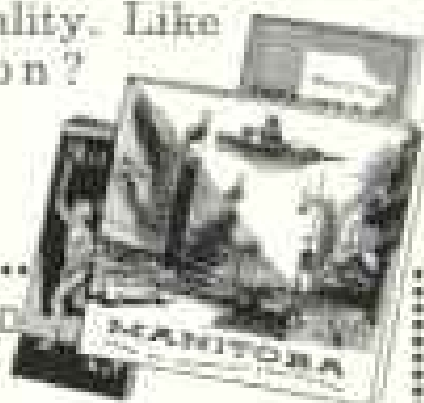
Manitoba!

**IN THE HEART
OF CANADA'S
VACATIONLAND**



Stick this coupon on any postcard or enclose in envelope ▶

FISHERMAN, golfer, boating enthusiast—or family vacationer—you'll enjoy the scenic beauty and the wide range of outdoor activities so readily available in magnificent Manitoba. Added to your vacation pleasures are Manitoba's moderate, sunny climate and friendly hospitality. Like more information? Please mail the coupon below.



Free ILLUSTRATED LITERATURE

BUREAU OF TRAVEL AND PUBLICITY
612 Legislative Building
Winnipeg, Manitoba, Canada
Mail this coupon for **FREE** information:

NAME _____

PLEASE PRINT

ADDRESS _____

STATE _____

ADVENTURE IN ARKANSAS



More and more families every year are discovering America's new family vacation wonderland. Hunt for real diamonds at the world-famed Crater of Diamonds (finders keepers). Enjoy the best in water sports (including the world's greatest fishing). Visit fascinating historical restorations (like Arkla Village, pictured here). Sun, fun and diamonds: this is Arkansas—one of the greatest adventures your family will ever have!

Send the coupon below for your free souvenir replica of the diamonds you can find—and keep—when you come to Arkansas...



Arkansas Publicity and Parks Commission
Dept. 230 State Capitol Little Rock
Please send my free Arkansas "diamond"...

Name _____

Address _____

City & State _____





First—have your lovely trees sprayed...by Davey

Before you even start to clean up your outdoor living room this spring—protect your precious trees! Spray!

Right now, before the leaf buds burst, good spraying can protect your trees from the ravages of scale insects. If Dutch Elm disease is in your area, spraying right now—before the buds burst—is most important. When you're basking in the lush, full foliage of summer shade, you'll be glad you had Davey tree care *early*. So many ailments can be avoided if treated in time by experts trained the Davey way.

No better time than right now to have Davey give your trees an early spring-tonic treatment: feeding, pruning, and spraying.

Start your happy summer memories now with Davey t.l.c., tree-loving care—look up DAVEY TREE SERVICE in your phone book or write

DAVEY TREE

EXPERT CO.

Kent 11, Ohio

MARTIN L. DAVEY, JR.

President

THE OLDEST AND LARGEST TREE
SAVING SERVICE IN THE WORLD



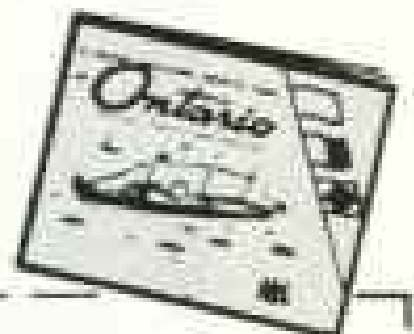
match your
vacation mood in

ONTARIO



This is Canada's variety vacationland, where you can choose a restful or zestful time at a lake to match your mood. 250,000 lakes, sandy beaches, rich woodland and varied resort facilities give you a sweeping choice of vacation fun. You'll shop for fine clothes, woolens, exclusive dinnerware in excellent stores. Ontario's warm days and cool nights wait just across the Great Lakes—and border crossing formalities take only minutes!

Mail this coupon for your free copy of "Royal Welcome," your key to Ontario vacation adventure.



Province of Ontario, Department of Travel and Publicity, Room 1075 Parliament Buildings, Toronto 2.

Please send me your new, full-colour book of vacation ideas, "Royal Welcome."

NAME.....

ADDRESS.....

CITY.....STATE.....



Glorious even in ruin, the Roman Forum is a symbol of civilization. Nothing takes the place of *being* there . . . nothing *takes* you there like Pan Am.

Only your dreams get you there faster...

Fly the fastest Jets to Rome - 9½ hours on Pan Am!

This is Rome . . . the Rome where Caesars were crowned; the Rome of ancient sun-drenched villas; magnificent city of centuries.

All Rome is yours—in 9 hours and 25 minutes from New York by *Intercontinental Jets—fastest commercial*

airliners in the skies. On these Pan Am Jet Clippers® you fly under the U.S. flag, in the hands of the world's most experienced airline, and you're filled with a sense of peace and comfort.

Choose either deluxe or low-cost

Economy fare on every Pan Am flight. Already more than 250,000 passengers have flown to Europe on Pan Am Jets. Isn't 1960 *your* year to go abroad? Call your Travel Agent—or any of Pan Am's 66 offices in the U.S. or Canada.

®Trade-Mark, Reg. U.S. Pat. Off.

WORLD'S MOST

EXPERIENCED AIRLINE



for just easy tilling...



Ariens-JET

rotary tiller
with
optional
reverse
drive

Enjoy a bigger, better, more productive garden — save hours of work — tilling with an easy-to-use 3 h.p. Ariens JET! All-steel tines till 8" to 20" wide. Free-swinging steel depth bar. Optional tine reverse drive. Fingertip controls. Engineered for long, dependable service — Just Easy Tilling.

Ariens / Another Gard-N-Yard tool sold and serviced only by selected independent dealers

Mail Coupon today to:

ARIENS CO. 259 Calumet St., Brillion, Wis.

- Send free Gard-N-Yard literature
 25¢ Enclosed for "Power Gardening" book (cash, money order or stamps)

Name _____

Address _____

City & Zone _____ State _____

In Hospitable

KENTUCKY



**DO MORE!
SEE MORE!**

Let us tell you about what to see, where to go, and the exciting things to do in romantic Kentucky!

Kentucky Dept. of Public Relations NG30
 Capital Annex Building
 Frankfort, Kentucky

Please send me your FREE color literature on Kentucky.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

MISSISSIPPI



*So rich in
history, romance
and adventure*

*Unique observation
tower in Vicksburg's
National Military Park*



STEAMER SPRAGUE, Vicksburg

There's still high adventure to be found along every vacation trail in Mississippi, the Hospitality State. This year plan your trip so that you can come or go through Mississippi.

Come see the rich Delta plantation country, historic Holly Springs, Columbus, Port Gibson and colorful Natchez. Visit Vicksburg, the famed Civil War City with its National Military Park and Showboat Sprague . . . enjoy a stay in Jackson, Mississippi's Capital City and truly the crossroads of the South. Top off your trip with sun and fun on the fabulous Gulf Coast. You can't see it all in one brief visit, but you'll see enough to make you want to come back again and again.



Miss Hospitality NG-30
 Travel Dept., State of Mississippi
 Room 1504-G, State Office Building
 Jackson, Mississippi

Please send full color vacation booklet.

Name _____

Address _____

City _____ State _____

THE HOSPITALITY STATE

GET SET FOR THE LONG, FUN MONTHS AHEAD!

See your **Johnson** dealer's **ALL-FAMILY BOAT SHOW**

NEW BOATS ... **NEW** WATER SPORTS GEAR ... **NEW** MOTORS

MARCH 4 — MARCH 13

Not long, now, before that first sun-sparkling spring weekend when you'll be wishing you were out on the water. Get your season off to a good start at your Johnson dealer's All-Family Boat Show. Here you'll see sleek, new boats, intriguing new water sports gear and the most exciting outboard motor in many a year—the Sea-Horse V-75. Here's a full, O.B.C. certified 75 hp—muscle enough to make even a family loaded cruiser feel as frisky as a runabout. This is the fastest moving Sea-Horse ever launched—loaded with new features, from the crown of its *balanced-firing* V-engine head to the tip of its blade-thin, high-speed lower unit. See it—and six other new Sea-Horse models for 1960, priced from \$160 f.o.b. factory, subject to change. Your Johnson dealer is listed under "Outboard Motors" in the Yellow Pages.

*New Sea-Horse V-75, \$895, electric starting included.
The fastest moving Sea-Horse ever launched!*



War Surplus American-Made 7x50 Binoculars

Big savings! Brand new! Crystal clear viewing — 7 power. Every optical element is coated. An excellent night glass—the size recommended for wildlife viewing. Individual eye focus. Best night view. Adjust. Field of 1,000 yds. in 27m. P.C. Carrying case included. American 7x50's usually cost \$175. Our war surplus price saves you real money.

Stock No. 1833-D Only \$65.00 postd.
(Tax included)



BARGAIN! 3" ASTRONOMICAL TELESCOPE

See the stars, moon, planets close up! 60x or 120 power—Dunn 3". Polaris Reflector type. Upward flared. Equipped with Kirschner optical. Easy telescope, hardened tripod. Includes FLEET—“FAT-B. GREAT” 212-page “HANDBOOK OF REVENUE” —“HOW TO USE YOUR TELESCOPE” BOOK.
Stock No. 88,050-D \$25.95 postd.

Order by Stock No.—Send Check or M.O.—Satisfaction or money back!

SEND FOR 128-PAGE FREE CATALOG—D

We are Astronomical Telescope Headquarters! Huge selection of Microscopes, Binoculars, Satellite Receivers, Magnifiers, Spectrometers, Lasers, Prisms, optical parts and accessories; also much more! Write:

EDMUND SCIENTIFIC CO., Barrington, New Jersey



in
IDAHO

Fun for everyone . . . real western adventure in the Gem State's endless reaches of forests, alpine mountains and upland plateaus, sparkling blue lakes and clear water streams. You'll find superb fishing for over a score of fighting game fish species including the world's largest variety of Rainbow Trout (see photo), fabulous big game and bird hunting, boating, swimming, skiing and magnificent year-around sightseeing . . . all the magic ingredients to make your holiday in Idaho the most memorable vacation of your life. Bring the entire family. They'll love it!

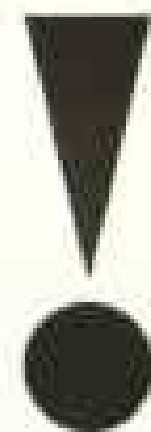


SEND FOR FREE COLORFUL FOLDER

Department of Commerce and Development
Room 601, Capitol Bldg., Boise, Idaho

Name _____
Address _____
City _____ Zone _____ State _____

**WHY
SMART
PEOPLE
GO
TO
EUROPE
IN
SPRING**



- ▷ People in the know visit Europe *before* summer tourists because Springtime there is an intoxicating experience — and less crowded, too!
- ▷ You have your choice of hotels and restaurants; deluxe accommodations are easier to come by.
- ▷ Shop-hounds can get first pick of treasures at shops.
- ▷ Gourmets savor delicacies in unhurried, uncrowded luxury.

● See your travel agent to plan *your* festive Spring trip, while this gayest of seasons is in full swing. For further information about any country below, write: National Tourist Office (Name of Country), Box 258, Dept. 73, New York 17, New York.

EUROPEAN TRAVEL COMMISSION

AUSTRIA • BELGIUM • DENMARK • FINLAND • FRANCE • GERMANY
GREAT BRITAIN • GREECE • ICELAND • IRELAND • ITALY
LUXEMBOURG • MONACO • NETHERLANDS • NORWAY • PORTUGAL
SPAIN • SWEDEN • SWITZERLAND • TURKEY • YUGOSLAVIA

for **FAMILY FUN**... Vacation in

COLORFUL

COLORADO!



For **TRAVEL PLEASURE**...

BURLINGTON'S Vista-Dome
DENVER ZEPHYR

CHICAGO • DENVER • COLORADO SPRINGS

• Vacation thrills await the whole family in Colorful Colorado—mile-high Denver . . . Rocky Mountain National Park . . . Lookout Mountain . . . Mount Evans . . . Colorado Springs . . . Pikes Peak . . . Garden of the Gods. World-famed resorts . . . authentic dude ranches . . . surrounded by scenes of snow-capped splendor.

Your Colorado vacation fun begins aboard the **Vista-Dome Denver Zephyr**, the exciting train that speeds you from Chicago to Colorado just overnight. If you'd like a car in Colorado, ask your ticket or travel agent to reserve one for you.

Escorted Tours • Enjoy a week or more of congenial companionship and carefree travel in Colorful Colorado with a friendly tour party.

For helpful information on Escorted Tours or independent travel, see your Burlington representative (or your travel or ticket agent) . . . or mail the coupon today.



Burlington Family Fares stretch vacation budgets

Take Your Choice... aboard **THE DENVER ZEPHYR**



Varied Pullman accommodations . . . for de-luxe travel

The Slumbercoach . . . room privacy, bargain prices



Reserved reclining coach seats . . . no extra fare!

BURLINGTON TRAVEL HEADQUARTERS
547 West Jackson Blvd., Dept. 407, Chicago 6, Illinois



Colorful Free Booklets!

Mail Coupon Today!

Print Name _____

Address _____

City _____ Zone _____

State _____ Phone _____

Check here for information about Dude Ranches Escorted Tours

Mention the National Geographic—It identifies you

FAMILY FUN IN SCENIC
WEST VIRGINIA



Your family will enjoy rest and play the West Virginia way. Scenic wonders abound . . . historic landmarks too! All sports . . . fishing, boating, hiking, golf, swimming, playgrounds for "little folks" . . . great fun for everyone. 22 State Parks, among the nation's finest, provide comfortable rustic cabins, completely equipped, plus modern lodges, all at modest rates. This year treat your family to a mountain vacation in friendly West Virginia!

West Virginia Industrial and Publicity Commission
State Capitol Bldg., Room NG-1 Charleston 5, West Virginia
Send FREE vacation information.

Name _____
Address _____
City _____ State _____

Vacation Adventure
IN
Wonderful
WYOMING
FISHING · HUNTING · RODEOS · SCENERY



FOR FREE VACATION-PLAN KIT, WRITE:
W.T.C., ROOM 5, CAPITOL BLDG., CHEYENNE, WYO.

508 Different STAMPS
CATALOG VALUE \$15 *Yours* FOR ONLY 35¢



Two fabulous offers are made to win new friends for Littleton. 508 different stamps — from all over the world — for only 35¢! Standard catalog value guaranteed to be at least \$15. Imagine the excitement of owning exotic stamps from Nationalist China, the United Arab Republic (shown here), Morocco, Indonesia, Pakistan, and many other legendary lands! Yes, you get a really generous assortment from every continent — for only 35¢ with approval. (Offer open to adults only.) Simply rush your name and address, and only 35¢ to: LITTLETON STAMP CO., Dept. NG-8, Littleton, N.H.

GLACIER

NATIONAL PARK IN THE MONTANA ROCKIES

Next summer when it's hot in town—cool off in Glacier Park. A million acres of America's most spectacular scenery: towering peaks, sparkling lakes, ancient glaciers. Fine hotels, superb food. Adventure, relaxation, fun!

It's Glacier's Golden Anniversary Year

GO DIRECT—GREAT NORTHERN'S STREAMLINED WESTERN STAR



For information, write:
P. G. HOLMES, Passenger
Traffic Manager, Dept.
N-30, Great Northern
Ry., St. Paul 1, Minn.



in St. Petersburg

Fun comes easy!

. . . and no wonder: no matter where you stay, you're never more than minutes away from year round golf, fishing, swimming, boating. Right now enjoy dog-horse racing; Jai Alai; baseball. Make your plans to get in on the fun at



SUN-NATIONAL ST. PETERSBURG
Outdoor Sports Center of Florida

FREE COLOR FOLDER

Vacation Accommodation Information

G. G. DAVENPORT, Manager, Chamber of Commerce
St. Petersburg, Florida

THE YEAR'S BIGGEST
VACATION SHOW!



SOUTHERN CALIFORNIA: SPECTACULAR '60

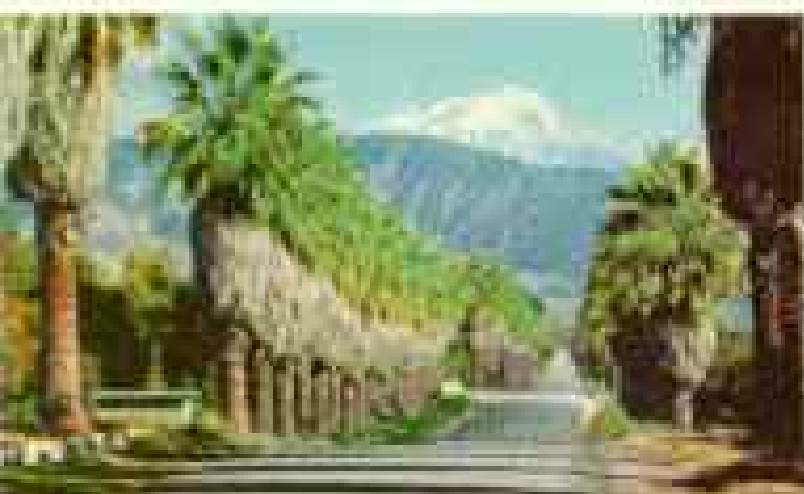
COME ANY TIME!
THE FUN LASTS ALL YEAR.
ENJOY ALL OUR FAMOUS
ATTRACTIONS... PLUS
DOZENS OF COLORFUL,
EXCITING EVENTS.
FIND HUNDREDS OF NEW
VACATION EXPERIENCES
ALL AROUND YOU.



RODEO SEASON starts in spring, attracts many top cowboy stars.
FLYING FISH RETURN. The world's biggest. See them skim above Avalon Bay, April.



"THE STACK"—our freeways meet here at Los Angeles interchange.



PALMS AND SNOW—Mt. San Bernardino towers over orange groves.



SOUTHERN CALIFORNIA SYMBOLS—a sun-warmed pool, azaleas in bloom.



HOLLYWOOD BOWL Symphonies Under the Stars, July-August. In 38 years performances stopped by weather only twice.
BIG LEAGUE BASEBALL. See champ Dodgers play, April.

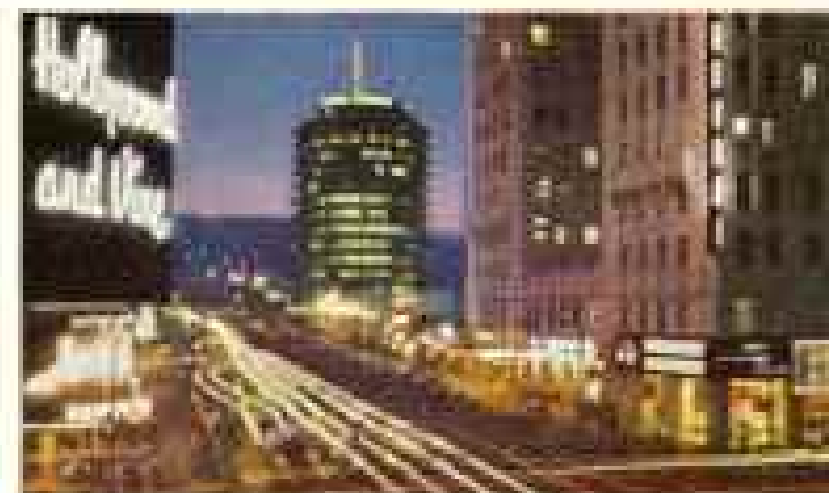


TURTLE RACES—June. Favorite sport at desert towns.

GRUNION RUNS. Certain nights they flop up on beaches, are caught for fish fries, June-August.



BEVERLY HILLS—typical scene at one of our many beautiful residential areas.



HOLLYWOOD AND VINE—where the stars come out at night.



CATAMARANS on a quiet Pacific bay. Sailing is year round sport.

IN 1960... find a new world of sunny scenes, plus a bonus of exciting special events! Come out any time—the big Southern California Spectacular '60 celebration is on right now and lasts all year.

On arrival visit the All-Year Club free Information Center, 628 W. 6th St., Los Angeles. Get official information on attractions and events, with helpful directions. You're Welcome!

FREE: Color Sight-seeing Map of Los Angeles County, all Southern California. Locates 645 sights, 100 stars' homes. Write All-Year Club, Div. D-1, 628 W. 6th St., Los Angeles 17, Calif.

ALL-YEAR CLUB OF SOUTHERN CALIFORNIA
This advertisement sponsored by the Los Angeles County Board of Supervisors for the citizens of Glendale, Hollywood, Inglewood, Long Beach, Los Angeles, Pasadena, Pomona, Santa Monica, Torrance and 181 other communities.

have
you
seen
it yet?



THE HEILAND PENTAX H-2

ANOTHER IN  HONEYWELL'S DIAMOND JUBILEE
PARADE OF PRODUCTS

Here, in a classic design of elegant simplicity, is the lightest, trimmest camera in the single lens reflex field. No unnecessary, complicated gadgets—just precision controls that help you get the best pictures you've ever taken—

- ... the brightest of all pentaprism viewfinders makes it easy to keep the life-size image constantly in focus. You look through the lens—get exactly what you see!
- ... the instant-return mirror gives you uninterrupted, follow-through viewing
- ... the automatic diaphragm operates only when you want it to
- ... the single, non-rotating speed dial has speeds from 1 sec. to 1/500 sec., plus Time and Bulb.
- ... the razor-sharp 55mm f/2.0 Auto-Takumar lens is the fastest available for the price

With this lens the Heiland-Pentax H-2 is only \$179.50 (less case) at your photo dealer's. 11 additional interchangeable lenses and a complete line of accessories are available. Ask for a demonstration, or write

Honeywell

 Heiland Photo Products

5206 E. Evans Ave., Denver 22, Colo.

PICTURE IT NOW... SEE IT FOREVER

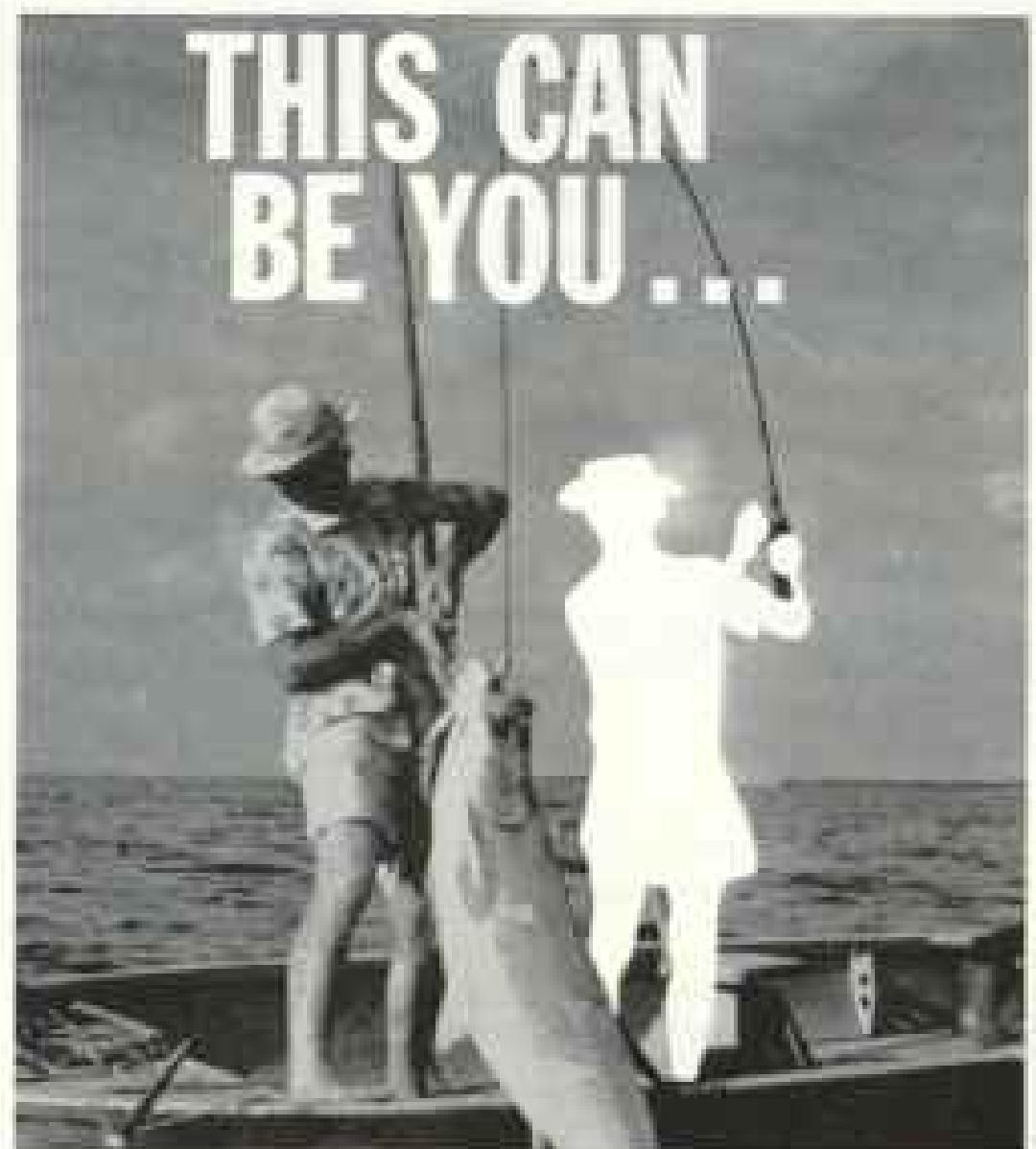
HOW WOULD YOU INVEST

\$6,000?

Let's say you have the problem of finding the best way to invest \$6,000 (nice problem)! How would you do it? Perhaps you would like the safety of bonds, or perhaps you feel that you have enough knowledge of the market to try common stocks. Then again, your choice might be a small (very small) piece of real estate. Think it over . . . it isn't easy to decide, especially if you really could use the extra income from your investment.

If you ever do have such a problem, we'd like to show you how hundreds of businessmen from coast to coast have invested \$6,000 cash and have experienced an average return of over \$100 A WEEK on their investment. No gimmicks . . . just a sound business investment in a neighborhood coin-operated ECON-O-WASH laundry. An unattended franchised ECON-O-WASH laundry, takes up so little of your time that there's no thought of leaving your present job, so that \$100.00 a week is extra income. With no obligation, send for our free booklet. It gives the fascinating ECON-O-WASH story in greater detail, and may show you the way to the most solid investment you will ever make. Write for:

**BOOKLET N-360, SMALL EQUIPMENT CO.,
DIV. OF AMERICAN LAUNDRY MACHINERY CO.,
CINCINNATI 12, OHIO.**



THIS CAN BE YOU...

in Metropolitan MIAMI

For
additional
information,
write:

METROPOLITAN MIAMI, Dept. W1
120 N.E. 5th St., Miami 32, Florida

NAME _____

ADDRESS _____

CITY _____

STATE _____



*You see
where you'll
going... you
remember
where you've
been!*

...when you travel

Domeliner

To really see the unforgettable West—in living color—there's no better vantage point than a Union Pacific dome car. Yes, the "eyes have it," when you go by Domeliner.

Distinctive Lounge and Club cars offer refreshments and deep-cushioned relaxation. Pullman and Coach equipment is the finest.

Adding to your travel pleasure are the marvelous meals, freshly prepared by our culinary experts. And, on the "City of Los Angeles" and "City of Portland," are the only Dome Dining cars on any railroad—a special treat.

On your next trip through the West, see for yourself what a joy travel can be—by Union Pacific.

Domeliners

"CITY OF LOS ANGELES"

between Chicago-Salt Lake City-Los Vegas-Los Angeles

"CITY OF PORTLAND"

between Chicago-Denver-and Portland (Tacoma-Seattle)

"CITY OF ST. LOUIS"

between St. Louis-Kansas City-Denver-Los Angeles

Streamliner "CITY OF SAN FRANCISCO"

between Chicago and San Francisco

UNION PACIFIC

Railroad

Omaha 2, Nebr.

Dependable Freight and Passenger Transportation

For husband and wife or family groups our Family Fares save travel dollars.

Camps

BEENADEWIN On Lake Fairlee, Vermont, Girls 5-17. A Farmstead, happy camp 2 waterfronts, Riding, Sailing, Trips, Dramatics, Crafts, Water Skiing, All sports, Tutoring, Cabins on 1/2 mi. lake frontage. CIT Program. 6th yr. Catalog, Mr. & Mrs. L. N. Dundon, 15 Shelley Rd., Short Hills, N. J.

BRUSH RANCH CAMP Ages 8-18, Daily Riding, Art, Dance, Speech, Music, Hunted Pool, Scenic & Pack trips. Modern cabins. Experienced Staff. Warm, Cool climate in Mts. nr. Santa Fe, N.M. Winter address: Box 1384, Burger, Texas, Newcomb N. Rice.



8 HAPPY WEEKS OF CULVER TRAINING

SUMMER SCHOOLS BY LAKE MANHOSKOPF

In NAVAL and HORSEMANSHIP SCHOOLS (ages 14-18) and WOODCRAFT CAMP (boys 9 1/2-14). Regular Academy personnel. Exceptional housing, dining and health facilities. 1300-acre wooded campus. Emphasis on correct posture, initiative, courtesy, self-reliance. Optional tutoring. All land and water sports. Moderate cost. Catalog for each camp, 39 Lake Shore Drive, Culver, Indiana

FARRAGUT NAVAL CAMPS

Scenes of adventure on Toms River for boys 8-18. Trips on 10-foot flagship. 42 land and water activities. Modern buildings, 2 gyms, 1 athletic field. Approved summer school program available. Catalog, Farragut Naval Camps, Box LC, Toms River, N.J.

CAMP LUPTON On the Shenandoah. A carefully supervised camp for desirable boys ages 8 to 18. Excellent equipment & location on Shenandoah River in foot-hills of Blue Ridge Mts. All appropriate sports, shops & crafts. Own meals, riding master & instruction. Catalog, The Director, Box 44, Woodstock, Va.

OGONTZ White Mountain Camp, For girls. On private lake near Sugar Hill, N.H. Water skiing, swimming, sailing, golf, riding, tennis, Crafts, nature, dancing, music. Out-door cooking. Mt. trips, Tutoring, Canteen. Excellent food, 750 acres, 38th year. Abby A. Sutherland, Box G, Ogontz Center, Pennsylvania

SHAKER VILLAGE For teenagers wanting to discover responsibilities & satisfactions of work, make better use of leisure, explore art of getting along with people. A new kind of education in work, leisure, community relations. Pittsfield, Mass.

SUMMER CAMP AFLOAT Boys 12-16. Bahamas Islands our camp site. Daily trips on 45-ton cruiser. Piloting & Navigation, Electronics, Marine Biology, Skin Diving, Water Skiing, Tennis, Salt, sail, Travel, Diving, 3 age groups. A. N. Emerson, 87 Summit Ave., Bronxville, N.Y.

VALLEY FORGE

MILITARY ACADEMY SUMMER CAMPS

A summer of fun and recreation in heart of America's National Shrine. Ranger Camp (13-14), Pioneer Camp (9-12). Specialized training in leadership and social courtesy. Aggressive! Separate Band Camp (13-18) under renowned musical Director. Individual instrument instruction. Box N3, Warne, Pa.

Home Study

CALVERT SCHOOL If you plan to live abroad, you can educate your child with accredited Calvert home-study courses. Kindergarten—8th grade. Easy-to-follow teaching manual. Used by thousands. Ideal for superior child. Non-profit. 4th year. Catalog, 13 W. Tuscany Road, Baltimore 28, Md.

SPEEDWRITING Shortened in 6 weeks. 100 wpm. No symbols; no machines; uses ABC's. Learn at home. Speedily prepares you for a better job. Lowest cost. Used in business and Civil Service. Booklet free. 67th year. School of Speedwriting, Dept. 8883, 55 W. 42 St., New York 36, N.Y.

Coed Schools

ELGIN ACADEMY Coeducational preparatory. Civil, grades 7-12. Small classes. Individual PAR goals through personalized guidance. Balanced activities. Sports, gym, pool, music, drama. Art gallery. Modern dorms. Endowed. Est. 1884. Write for catalog. J. M. Thompson, 117 Academy Pl., Elgin, Ill.

JUDSON SCHOOL Coed Ranch School, Grades 1 to 12. College preparatory. Healthful, warm climate, near Phoenix. Small classes. Accredited. Riding and polo included in tuition. Tennis, swimming, pack trips, fishing, ribby music. 2nd yr. Catalog, David N. Wick, Hdm., Scottsdale, Ariz.

WAYLAND ACADEMY N. O. A. Milwaukee, Chicago. Coed. College prep., grades 8-12. Accred. Small classes. Christian environment. Drama, music, speech. Athletics. 2 gyms, pool, Winter sports. Dorms. Est. 1886. Catalog, R. A. Patterson, Headmaster, Box 71, Beaver Dam, Wisconsin

WESTTOWN A Farmstead school. Prepares boys and girls for college under the moral and spiritual standards of Quaker education. Grades 8-12. Apply now for Sept. 1966. Graduates to over 100 colleges. Established 1709. Catalog, J. Kirk Russell, Dir. of Admissions, Box 553, Westtown, Pa. (near Philadelphia).

Junior College

LEICESTER Two-Year College for Men. A. in Administration prepares for success in management levels. Majors in Accounting, Adv. Management, Merchandising, Lib. Arts. Transfer or terminal. Vocational guidance. Suburban campus. All sports. Paul N. Swan, Pres., Leicester, Mass.

College for Women

MARYWOOD COLLEGE Accredited Catholic college for women. Liberal arts, librarianship, vocational home ec., teaching (elem., sec.), music, art, drama, sci., med., technical, psych., business, special education. B.A., B.S., B.M., M.S. degs. Catalog: Box E, Scranton, Pa.

Vocational

BRYANT COLLEGE BACHELOR'S DEGREE IN 2 OR 3 YEARS

Business Administration: majors in Acctg., Management, Marketing. Executive Secretarial: majors in Admin., Legal, Acctg., Medical. Business Teacher-Education: 4 years. Also 1-yr. Sec'y Diplomas. Coed. Campus life, 27 bldgs. Dorms. Yet open 97th yr. Register early, Sept. Feb. minimum. Professional training for business leadership. For catalog write: ENROLLMENT DIRECTOR, BRYANT COLLEGE, Providence 6, Rhode Island

INDIANA TECHNICAL COLLEGE 2 mo. B.S. Engineering degree in Aero., Chem., Civil Elec., Mech., Electronics. B.E. (8 mo.); Aero., Chem., Civil, Elec., Mech., Metal. B.S. (24 mo.); Math., Chem., Physics, Earth (4 yr.). 5.1. 1966. Campus. Host quarterly. Catalog, 133 E. Washington Blvd., Ft. Wayne 2, Indiana

KATHARINE GIBBS OUTSTANDING secretarial training for high school, private school graduates. Special course for college women. Resident facilities. Catalog: Asst. Dean, 21 Marlborough St., Boston 16, Mass.; 230 Park Avenue, New York 17; Montclair, N.J.; 155 Angell St., Providence 6.

LEWIS HOTEL TRAINING SCHOOL Hotels call for trained men & women. Qualify for fine positions in the hotel, motel and hospitality field. Nationwide opportunities. Train at home or through resident classes in Washington. Free Placement Service. Free book, Desk FC-149-12, Washington 7, D. C.

TRI-STATE COLLEGE B. S. Degree in 37 months in Elec., Mech., Civil, Chem., Aero., Radio (TV) Eng. In 36 months in Bus. Adm. (Gen. Bus., Acctg., Mkt. Tr. Mgt.). Well-equipped labs. Modest costs. Grade successful. Enter July, Sept., Jan., Mar. Free Catalog, 1430 College Ave., Angola, Indiana

Girls' School

FAIRFAX HALL An old Virginia school for girls in famous Shenandoah Valley. Accredited 4 years high school. College prep., general courses, Secretarial, music, art, dramatics, Sports, gym, indoor pool, Riding rings, stable. Catalog, Wm. S. Gates, Jr., Pres., Box N-663, Park Station, Waynesboro, Va.

Boys' Schools

AUGUSTA MILITARY ACADEMY "The Friendly School." Distinguished ROTC school in Shenandoah Valley. Jr. & Sr. Divisions. Boys 8-12. Accredited. Graduates in leading colleges. All sports; pool, gym. Organized IFC. Rate \$125. Catalog, Col. C. S. Keller, Box N, Ft. Defiance, Va.

BAYLOR SCHOOL FOR BOYS 67th year. College prep. Accredited scholarship. Boys 12-18. Semi-military. Endowed awards. Ideal location; New gym. Championship athletics. Non-sectarian religious guidance. Summer camp, boys 8-12. Catalog, 189 Cherokee, Chattanooga, Tenn.

BORDENTOWN MILITARY Accredited. College preparatory. General courses. Grades 8-12. Outstanding record of college entrance. ROTC. Boys taught how to study. Small classes. All sports 7th yr. Summer session. Catalog, Registrar, Box 853, Bordentown, N.J.

BOLLES OF FLORIDA

Fully accredited. Sound basic academic preparation. Grades 7-12. Customized-type classrooms. Varsity and intramural sports for all. Year-round golf, tennis, sailing, outdoor swimming pool. Military or naval training. Write for illus. outline: Registrar, Box 5037-N, Jacksonville 7, Florida.



THE BULLIS SCHOOL

4 miles from the White House. Wm. F. Bullis, U.S.N.A., 24, Pres. At Silver Spring, Md. Box N. Address: Registrar

ANNAPOLIS WEST POINT

COLLEGE PREPARATORY Accredited. Write for catalog. Modern brick-and-concrete buildings. Rates moderate. Summer term—June 29.

CARSON LONG

Military School. Educates the whole boy—physically, mentally, spiritually. How to learn, how to labor, how to live. Prepares for college and life. Grades 7-12. 124th year of character building. Overall charges \$1400.00. Box 21, New Bloomfield, Pa.

CASTLE HEIGHTS MILITARY Highest Standards

Accredited. Preparation for College and Government Academies. Junior School in separate plant. Boys taught to study and directed to excel. Guidance program. ROTC. 17 trophies. Every boy in athletics. Outdoor sports year-round. Non-profit. Suburban pool, golf, tennis. Summer school and camp. For "22 Points" and mailing address, Col. H. M. Armstrong, Pres., Lebanon, Tenn. (Near Nashville)

COLUMBIA MILITARY ACADEMY

Postwar school. Prepares for College and Gov't Academies. 16 buildings, 9 built by U.S. Gov't; 2 gyms, pool, ROTC. Weekly reports. Jr. School. All sports. Band, Orchestra. Summer School. Write for catalog and "47 Features." Dept. N, Columbia, Tenn.

COLUMBIAN "THE SERVICE-ACADEMY PREP"

Intensive, individualized preparation for West Point, Annapolis, Air Force Academy, etc., and all civilian colleges. How to study training. Est. 1889. Summer school. Columbian Preparatory School, 1854 Biltmore St., N.W., Washington 9, D.C.

ULVER

FOUNDATIONS FOR MANHOOD

Prepares boys, grades 8-12, for leading colleges and adult life. Provides character, courtesy, leadership. Outstanding faculty and facilities. Fully accredited. All sports. ROTC. Artillery. Cadets. Infantry. Band. 1300-acre campus on Lake Manahock. Catalog, 39 Pershing Drive, Culver, Ind.

FARRAGUT College Preparatory—Naval Training

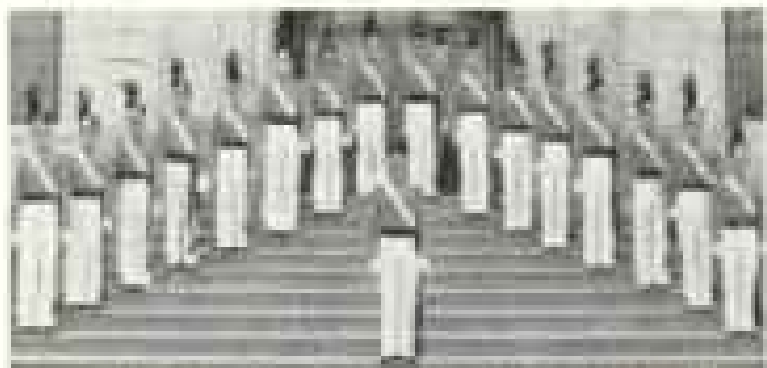
Two separate schools: Toms River, N.J., Ft. Pinnerburg, Fla. Accredited. Preparation for all colleges, gov't academies. Separate Junior Schools. Guidance for college & career. Sports, boats, bands. Summer camp & school. Specify catalog. Admital Farragut Academy, Box L, Toms River, N.J.

FISHBURNE MILITARY A distinguished military school for the young man seriously concerned with adequate preparation for college. Accredited since 1867. Grades 9-12. Highest ROTC rating. Summer school. Catalog, Col. E. P. Childs, Jr., Supt., Box N, Waynesboro, Virginia.

GEORGIA MILITARY ACADEMY Quality education for boys of ability, character and good conduct planning for college. Military. Highest rating. Social, athletic, religious activities. New enrollment limited to Grades 9 thru 11. Registrar, Box 113M, College Park, Ga.

GREENBRIER MILITARY SCHOOL 107th yr. The School of Achievement. 7th & 8th grades and H.S. and P. G. Dept. ROTC. White Sulphur Springs golf and swim pool. Athletics for all. New 18th range & gym. Catalog, write D. T. Moore, Box M 383, Lewisburg 3, W. Va.

FORK UNION MILITARY ACADEMY



Our ONE SUBJECT PLAN of study in Upper School (grades 9-12) has increased honor roll 30%. Develops concentration. Fully accredited. ROTC highest rating. 17 modern bldgs., 2 completely equipped gyms, 2 indoor pools, beautiful environment, excellent health resort. Junior School (grades 4-8) has separate buildings, gym, pool, Homecomings, 82nd yr. For ONE SUBJECT PLAN booklet and catalog write:

Dr. J. C. Wicker, Box 303, Fork Union, Va.

HARGRAVE MILITARY ACADEMY

Fully accredited. College preparatory, general courses. Grades 9-12. How-to-study training; remedial and developmental reading. Separate Jr. School. All sports, Summer School, Est. 1889. Catalog, Col. Jos. H. Cosby, Box N, Chatham, Va.

HOWE MILITARY SCHOOL

Advanced training in spiritual environment. Accredited prep, business. Potential Achievement Rating gives each boy a goal. Jr. School. Est. ROTC. New dorms and pool. Episcopal, Summer Camp, Caddo. B. B. Bouton, 538 Academy Pl., Howe, Ind.

KEMPER

North Grade through Jr. College. 110 years of education for leadership. Fully accredited. College preparatory. Liberal arts, sciences, Christian orientation. ROTC honor military school. Study training, personal counseling program. Varied sports activities. Kemper Adm. Office, 483 Third St. Boonville, Missouri.

KENTUCKY MILITARY INSTITUTE



A School with a winter home in Florida

PREPARATION for college under ideal climatic conditions all year. Oldest private Military School in America. ROTC. For illustrated catalog and "Why Florida" folder, address:

Col. C. B. Richmond, Pres., Box N, Lyndon, Ky.

MANLIUS

Founded 1881. For boys. Accredited. Grades 7-12. Complete college preparation. ROTC. Highest U.S. Army rating for over 30 years. 185-acre campus. Developmental reading. Individual assistance. Sports. Band. Summer session. Catalog, Robert N. Weekes, The Manlius School, Manlius, New York.

MARION INSTITUTE

110th year. Fully accredited Junior College. 4-year College Preparatory in heart of Deep South. Special preparation for Army, Navy, Air Force Academies. Five ROTC. Small classes. Honor System. Sports. Catalog, Dir. of Adm., Marion Institute, Box N, Marion, Ala.

MASSANUTTEN MILITARY ACADEMY

60th year. Accredited. New Dormitories and classrooms. Thorough College preparation. In beautiful Sun- andah Valley. Small classes. ROTC. All sports. Gym. Pool. Band. Rifle Team. Riding. Grades 9-12. For catalog, address: Col. R. J. Benchoff, Woodstock 1, Virginia.

McDONOUGH

A LEADING prep. school for boys. Grades 7-12. Fully accredited. Semi-military. Outstanding preparation for all colleges, service academies. Music. Sports. 80 horses; 2 gyms, indoor pool. 800-acre country campus near Baltimore. Est. 1872. Catalog, R. L. Lamborn, Ed.D., Box 109, McDonough, Md.

MIAMI MILITARY ACADEMY

Develops leadership, character. Fully accredited. College prep. H.S., Junior School. Small classes. NDA Honor School. Sports; pool. 80 acres. Moderate fee. Catalog, Col. F. R. Williams, 10407 Biscayne Boulevard, Miami 38C, Florida.

MISSOURI MILITARY ACADEMY

Separate Junior School, 7th yr. Grades 7-12. Fully accredited. ROTC. Friendly, inspiring teachers. Essentially college prep. Small classes. Personal guidance program. All sports. 40-acre lake. 4 athletic fields. 225-acre campus. Catalog, Col. C. R. Strubling, 930 Main St., Mexico, Mo.

NEW YORK MILITARY ACADEMY

Develops today's Youth for tomorrow's world by building mind, body, character, leadership. ROTC. Grades, all colleges. Infantry, Aeronautics, Artillery. Band scholarships. Grades 7-12. Est. 1889. Cur. 22 Acad. Ave., Cornwall-on-Hudson, N. Y.

NORTHWESTERN MILITARY AND NAVAL ACADEMY

College prep. Est. 1888. Accredited. 25 mi. north of Chicago. Average class 18. Fireproof buildings. New 2-story gym. 8-acre lake. ROTC Honor. All sports; sailing. Summer Camp. Catalog, 53 So. Lake Shore Road, Lake Geneva, Wis.

OAK RIDGE MILITARY INSTITUTE

100th year. High school, Junior college. Enrollment 200. Balanced program. Small classes, supervised study. Reading development. Sports. Band. U. S. Army ROTC. Address: Col. T. O. Wright, Supt., Box N, Oak Ridge, N.C.

EDUCATIONAL TROUBLE SHOOTERS

Individualized Plan—Each Student a Class

For those with educational problems—successful college preparation and general education. Our tests discover causes of difficulties and we (1) develop individualized program to overcome difficulties; (2) make up lost time; (3) assist in college; (4) teach the art of concentration; and (5) arrange of study. Faculty 14. Retiree 20. 44 years' experience. Write Edward R. Knight, Ph.D., Headmaster, 3500 University Ave., Princeton, N.J.

OXFORD ACADEMY

Box G-35, Pleasantville, New Jersey

PEDDIE

Where Christian influence prevails and the development of character is combined with high scholastic attainment. A college preparatory school for boys, grades 7-12. Fully accredited. All sports. Just off N. J. Turnpike (Exit 8). Write: Dr. C. O. Merang, Headmaster, Box 1-N, Hightstown, New Jersey.

PEEKSKILL

★ MEETS TODAY'S EDUCATIONAL CHALLENGE

College Preparation, including Plan for Advanced Studies starting 8th, 9th or 10th grades for boys of good or above average ability.

Boys taught fundamental subjects early including Sciences, Mathematics, English Composition and Foreign Language in small classes by men teachers. Students advance in each subject according to their ability under flexible grouping.

Military training develops leadership, self discipline and systematic habits. Sports for all under expert coaching. Championship Teams, Pool, Gym, Band, Glee Club, Camera Club, Rifle team. Social life, College Guidance.

127th yr. Superior achievement records in College and Life. College guidance. For Illustrated Catalog, Write:

Box 303, PEEKSKILL MILITARY ACADEMY, Peekskill-on-Hudson 3, N. Y.

PENNINGTON

Christian college preparation. Fully accredited. Grades 7-12. Thorough preparation in small classes. Developmental reading. Individual guidance. Spacious campus, attractive bldgs. Moderate fee. Endowed. Est. 1888. Catalog, Charles R. Smyth, D.D., Box 20, Pennington, N.J.

PERKIOMEN

Boys taught how to study. Graduates in leading colleges. Homelike atmosphere. Grades 9-12. Sports, activities for all. Modern dorms. Near New York City, Philadelphia. 8th year. Summer school. Write for catalog, Dr. Stephen N. Roberts, Headmaster, Pennsburg, Pennsylvania.

SAINT THOMAS MIL. ACAD.

COLLEGE PREPARATORY training in Catholic environment. Accredited. Attention to each boy. ROTC. Sports; golf, pool, gym. Band. Chapel. 40-acre campus. 7th year. Catalog, Box 2, Rev. Leo White, St. Thomas M.A., St. Paul, Minn.

RIVERSIDE

Health and interest assured by Spring and Fall in Georgia Mts., not in Florida Home, Winter of 1960--3 complete school plants, all facilities. Outdoor sports year round.

Fully accredited college prep. Also Post Graduate Dept. Constant association with selected teachers who live and eat with cadets. Weekly reports. ROTC. Progress GUARANTEED. Reasonable all-inclusive fee. Athletics for all. Boys from 37 states. Grades 9 thru 12, and P.G.

For illustrated catalog, address: GENERAL SANDY BEAVER, President, Box 103-N, Gainesville 3, Georgia.

FALL & SPRING IN BLUE RIDGE MOUNTAINS

ST. JOHN'S

MILITARY ACADEMY

When boys become self-confident men. Liberal college preparation under tutelage of John's System. Grades 7-12. Trained teachers, small classes. Reading Clinic. ROTC. Fireproof dorms. Sports. Summer camp. 20th year. Catalog.

Dir. of Admissions, Box 1119, DeKalb, Wisconsin.

SEWANE MILITARY ACAD.

Division Univ. of the South. Fully accredited. Grades 9-12. Boys Taught to Study. ROTC. Highest Rating. Sports, total 10,000-acre mountain domain. Episcopal. 8th year. Catalog, Col. Craig Alderman, Supt., Box N, Sewanee, Tenn.

SHATTUCK SCHOOL

Boys. Grades 9-12. Balanced educational, religious, military. Accredited college prep. General courses. Small classes. ROTC. Sports. Gym. pool, golf. Episcopal. Est. 1878. Sunnyside School. Catalog, Dir. of Admissions, 485 Shumway Hall, Faribault, Minn.

STAUNTON MILITARY ACADEMY

In beautiful Shenandoah Valley. Thorough college preparation. Fully accredited. Individualized instruction. Band. All sports. 3 gyms. Pool. Fine health record. Fireproof buildings. Separate Junior School. This Catalog write Dept. S.M.A., Box 100, Staunton, Va. BASIC COURSE ROTC BY U. S. ARMY INSTRUCTORS. Founded 1880.

SULLIVAN SCHOOL

Effective and thorough preparation for Annapolis, West Point, Coast Guard and Air Force Academies, and all colleges. Catalog, Wendell E. Bailey, U.S.N.A., 1924, Principal, Box D, 2197 Wyoming Avenue, N.W., Washington 5, D. C.

TENNESSEE MILITARY INSTITUTE

Boys planning to attend engineering schools and leading colleges need thorough preparation. Over 90% of graduates enter colleges. Grades 9-12. Summer School. 8th yr. Catalog, Col. C. R. Endsley, Jr., Box 147, Sweetwater, Tenn.

VALLEY FORGE MILITARY ACADEMY

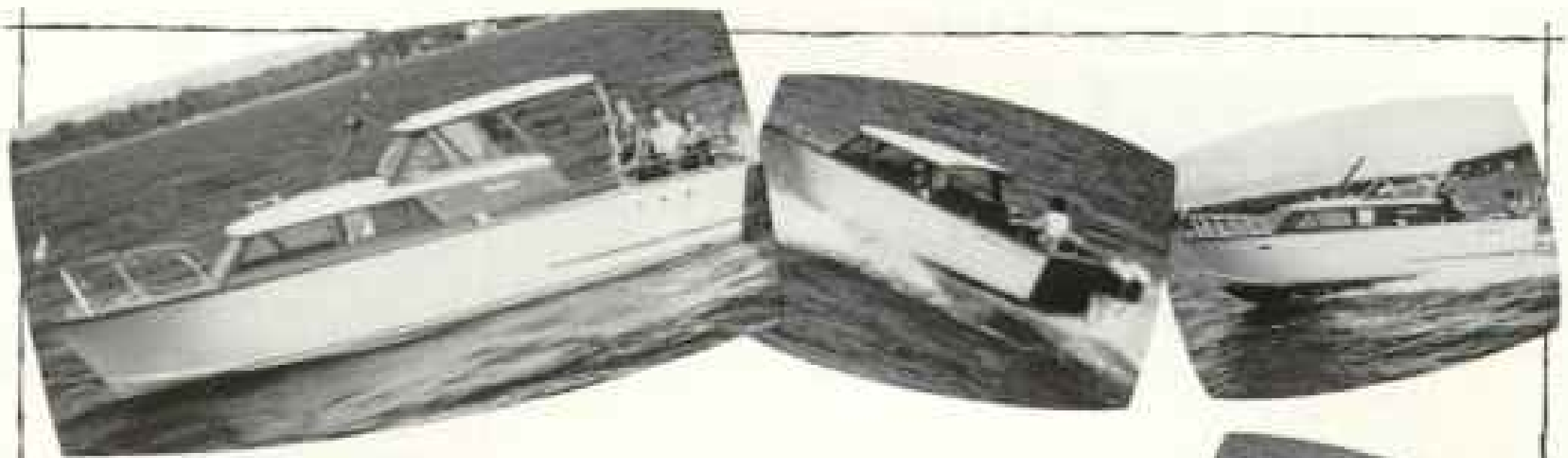
"At the Nation's Shrine" Valley Forge, shrine of our freedom, has named its name to this fully accredited, distinguished Mil. Acad. and Jr. Coll. Small classes, highest academic standards. Prep School grades 9 thru 12 & Jr. Coll. All sports. Arts. Car. Infantry. Band. Senior 1st. ROTC. Catalog, Box M, Wayne, Pa.

WENTWORTH MILITARY ACADEMY

Emphasis on self-confidence, self-direction, how-to-study. Small classes, guidance. Grades 7-12. Career analysis. Jr.-Sr. ROTC. Athletics; riding, pool. 82nd year. Near St. Louis. Catalog, Col. Ralph B. Jackson, Supt., Box N-1, Alton, Ill.

WESTERN MILITARY ACADEMY

Emphasis on self-confidence, self-direction, how-to-study. Small classes, guidance. Grades 7-12. Career analysis. Jr.-Sr. ROTC. Athletics; riding, pool. 82nd year. Near St. Louis. Catalog, Col. Ralph B. Jackson, Supt., Box N-1, Alton, Ill.



AN ENTIRELY NEW LINE OF
Pleasure Tested CRUISERS AND RUNABOUTS by
TROJAN

Every model in the new 1960 TROJAN line has been designed with you in mind . . . your comfort . . . your safety . . . and those "most wanted" features you and thousands like you have asked for. Whether it be — an inboard or outboard . . .

an express, sedan or day cruiser . . . a runabout . . . smooth sides or lapstrake construction —there's a TROJAN boat that's "just right" for your particular needs. Send today for your set of completely illustrated literature.

TROJAN BOAT CO. LANCASTER 23, PENNA.



"You'll Hit the High Notes of
 A Happy Vacation in
MISSOURI"

—says HELEN TRAUBEL,
 internationally famous
 singing star



Helen Traubel has seen the world from the glamorous Opera Concert stage. But, her native St. Louis, Missouri, is the true "Heartland of Hospitality."

Only a couple of hours' drive from St. Louis or Kansas City, lies the Ozark fishing and family vacation wonderland. Historic spots bring memories of Mark Twain, Daniel Boone, Civil War heroes of Blue and Gray.

All over Missouri, 33 state parks, 7 big lakes and a dozen famous clear-water floating and fishing streams, invite you to the happiest, low-cost family vacation in years! Let us help you plan it.

"Heartland of Hospitality"—where
 the Old South and the New West meet.



Missouri Division of Resources and
 Development Dept. CO-42 Jefferson City, Mo.

Please send FREE, without obligation, 32-page, 4-
 color brochure, "MISSOURI SPECTACULAR".

Name _____

Address _____

City _____ State _____

221 STAMPS **25¢**
 plus 88 FLAGS OF THE WORLD
 plus PLANET MAIL SOUVENIR SHEET



Look what you get for only 25¢! You get the stamps shown here — plus Indonesia "Wild Cow" Stamp, Germany "Sputnik", Transvaal King Edward (over 30 years old), French Asterisque bird set, St. Pierre, Grand Comoro, etc. Total 221 stamps — all different! You also get 88 Flags of the World in full color — plus unique Planet Mail Souvenir Sheet. All this for 25¢ to introduce our Bargain Approach. Midget Encyclopedia of Stamps included FREE.

Send 35¢ Today. ASK FOR LOT LG-9
ZENITH CO., 81 Willsoughby St., Bklyn 1, N.Y.



Send Today
 for this FREE color folder
 giving you the facts about the historic

EL PASO
Swerland

ALL-YEAR VACATION AREA
 There's see and fun all year, varied,
 interesting things to do, scenic and
 historic attractions, colorful Old Mex-
 ico across the Rio Grande. Come soon.



EL PASO Swerland Club

Dept. 111 City-County Bldg., El Paso, Texas

Nobody takes such tender, lovin' care of you as Chevrolet

(and Chevy's cradle-soft ride shows it)

One ride in this new '60 Chevrolet will persuade you most gently that what we say is true. No other leading low-priced car coddles you with Full Coil springs at all four wheels. Or looks after your welfare with Safety Plate Glass in all windows, crank-operated venti-panes and dozens of other conveniences. Your dealer will be delighted to show you all the considerate ways Chevrolet has remembered you (without once forgetting about your budget):

Roomier Body by Fisher with a lower and narrower transmission tunnel that gives more foot room.

Pride-pleasing style (combines good looks with good sense—that vacation-sized trunk, for instance).

New Economy Turbo-Fire V8 (makes friends fast by getting up to 10% more miles on a gallon).

Widest choice of engines and transmissions (24 combinations—for the most finicky driving foot).

Hi-Thrift 6 (with economy camshaft and carburetion—and Chevy's ever-faithful dependability).

Coil springs at all 4 wheels (with the extra cushioning of newly designed body mounts).

Quicker stopping Safety-Master brakes (especially designed for long lining wear).

*Chevrolet Division of General Motors,
Detroit 2, Michigan.*



Be superlatives '60 Chevrolet. . . there's nothing like a new car—and no new car like a Chevrolet. This is the Impala Convertible.



WHEN YOU HAVE A MINUTE TO SPARE...



AND WHEN YOU CAN'T SPARE A MINUTE



there's nothing like a handy extension phone!

When you're laziest or busiest, you can really appreciate a telephone at your fingertips.

Night-time or nap-time, you welcome the convenience, privacy and protection of a bedside phone.

Daytime and mealtime, you're grateful for the steps you save with

an extension on your kitchen wall.

Doesn't it make sense to put phones where *you* are—instead of running to reach them? Especially when they cost so little and come in such attractive colors? If the answer is "Yes," just call the Bell Telephone business office.

BELL TELEPHONE SYSTEM





*Fastest
moving
outboard...*

Evinrude's

new **40 hp**
LARK II

Last year, the Lark outsold all other outboard motors—any make, any model!* And, now—the new Lark II, with more power, more spirit and more sports car go—is stretching its lead in sales and popularity!

One ride will tell you why it outsells all others . . . why the Lark II is today's top-performer for sporty runabouts, fast and able fishing craft, or compact family cruisers.

You'll never cease to enjoy its instant starting with automatic choke . . . its thermostat-controlled engine efficiency for smoothness at any speed . . . its full gearshift maneuverability . . . its Cruis-Throttle fuel economy . . . its rugged, precision-built quality and lasting beauty.

The Lark II is your kind of motor in many wonderful ways. And the best way to find out is to see and try it at your Evinrude dealer now. Catalog free—write: EVINRUDE MOTORS, 4291 North 27th Street, Milwaukee 16, Wis.

*A Division of Outboard Marine Corporation
In Canada: Mfd. by Evinrude Motors, Peterborough*

**In 1959, there were 126 motor models on the market—ranging in size from 1½ hp to 70 hp. Of these, 1 in every 11½ motors bought was an Evinrude Lark.*

EVINRUDE FIRST
IN
OUTBOARDS

