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FEBRUARY, 1959

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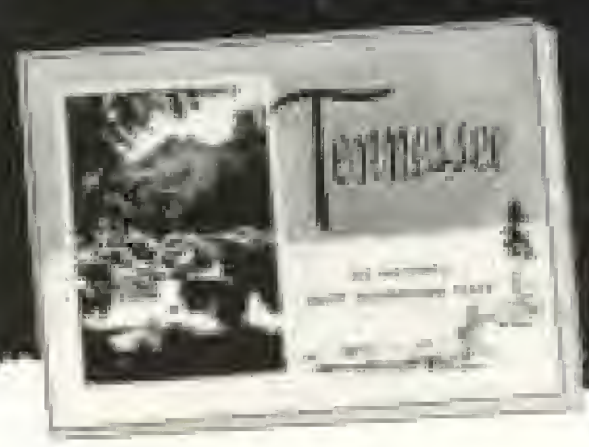

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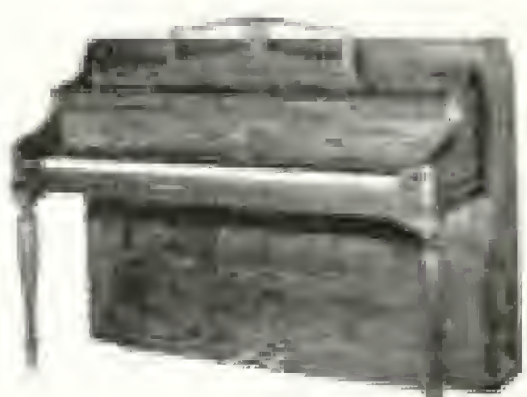

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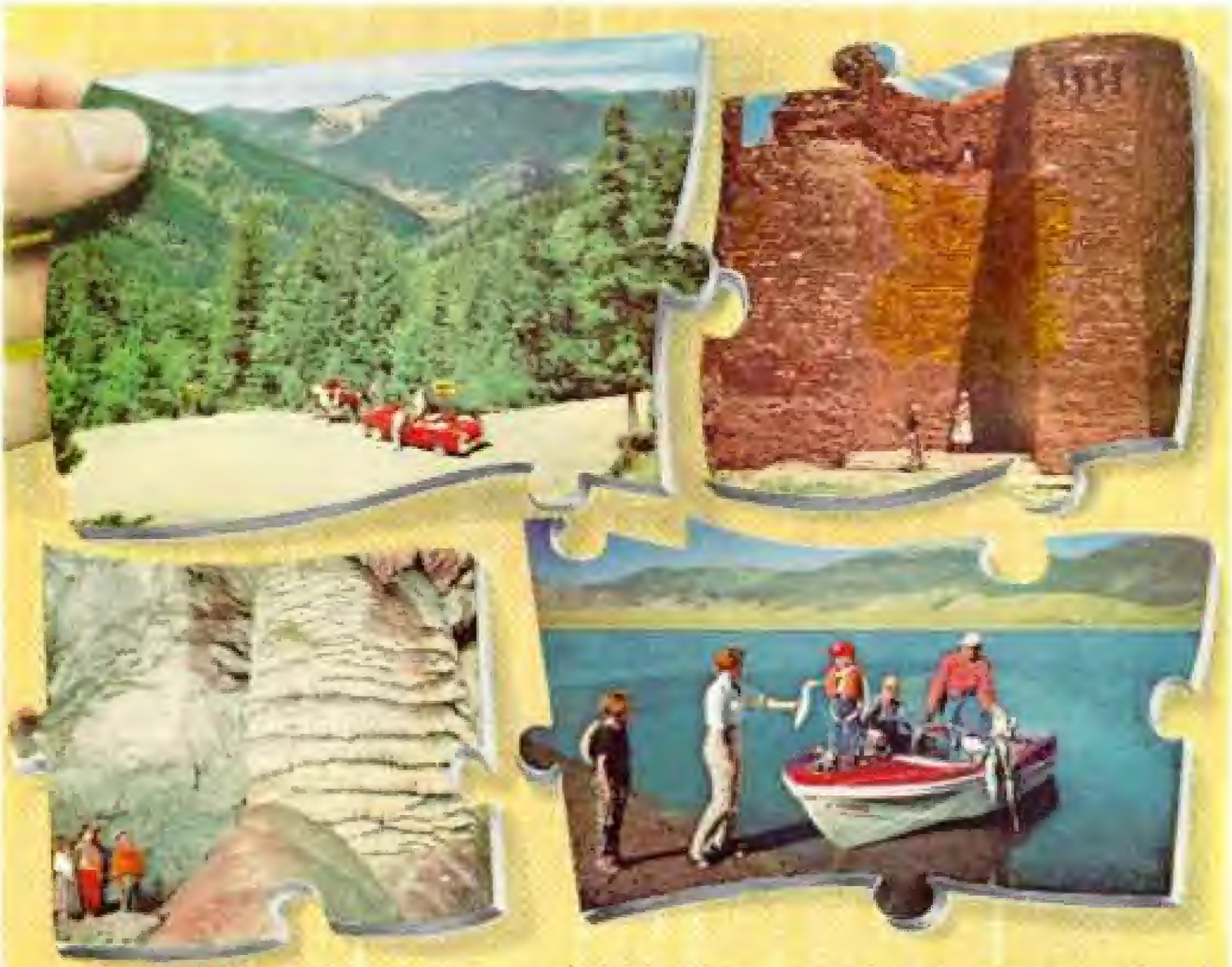

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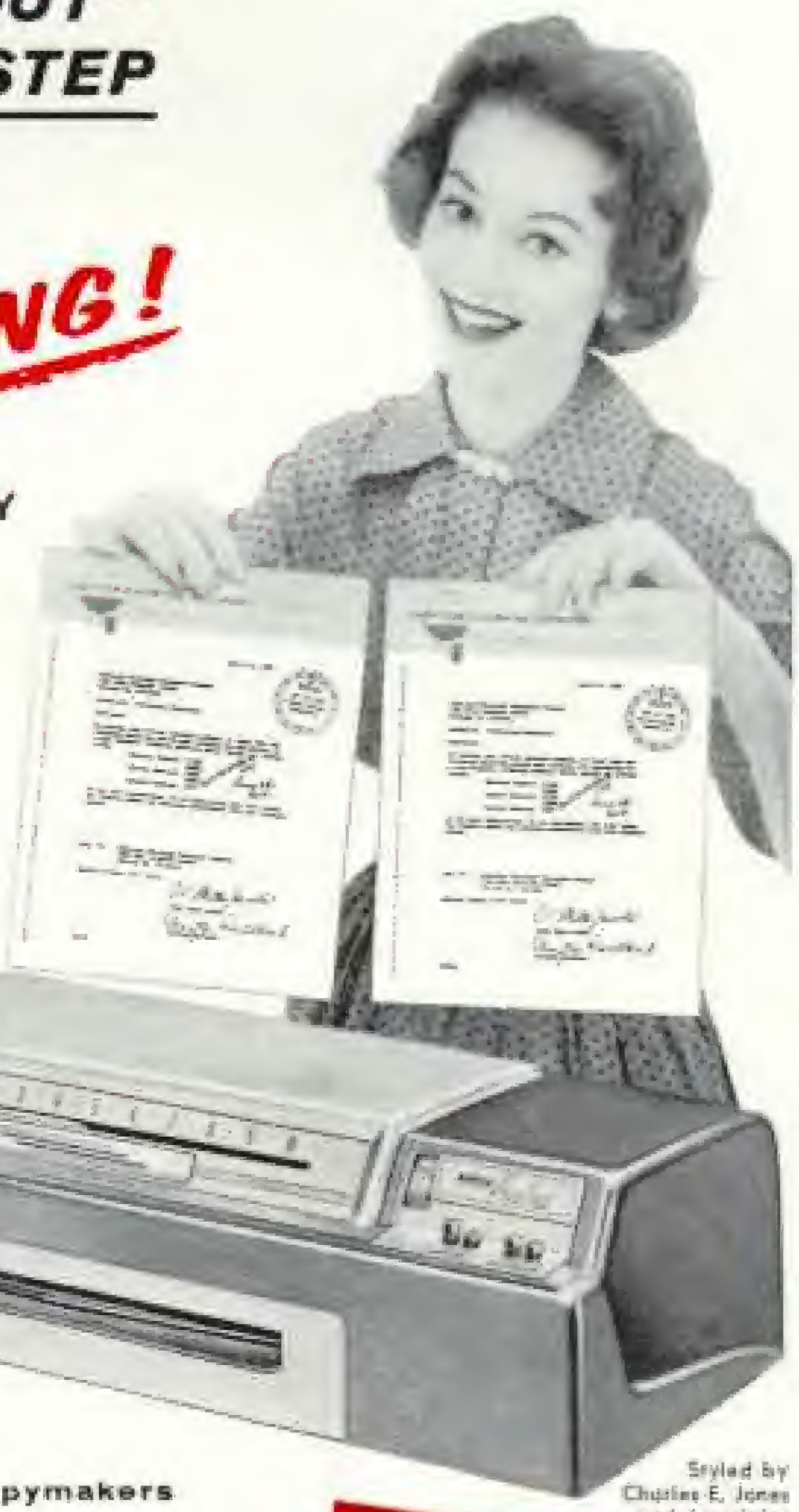

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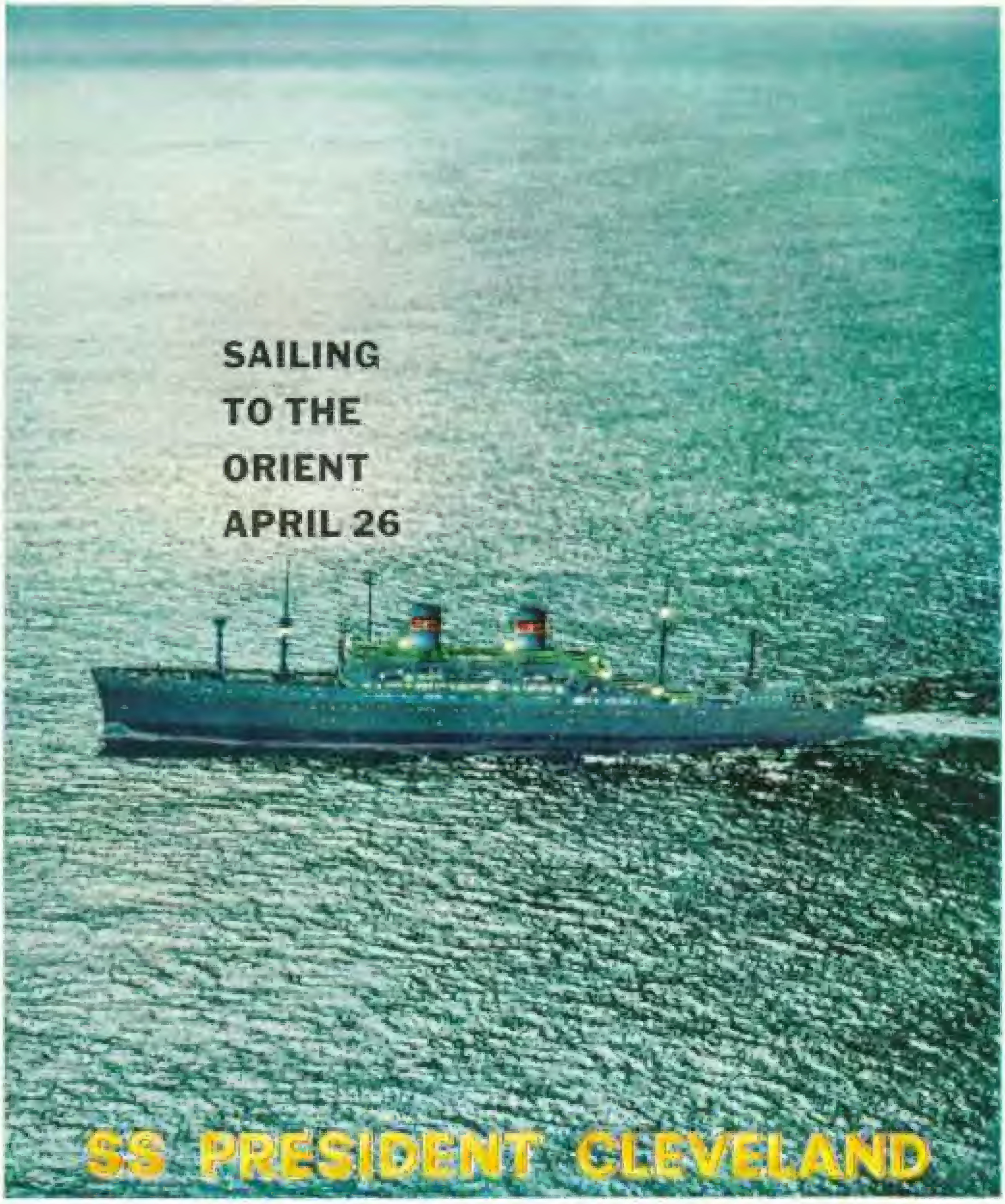

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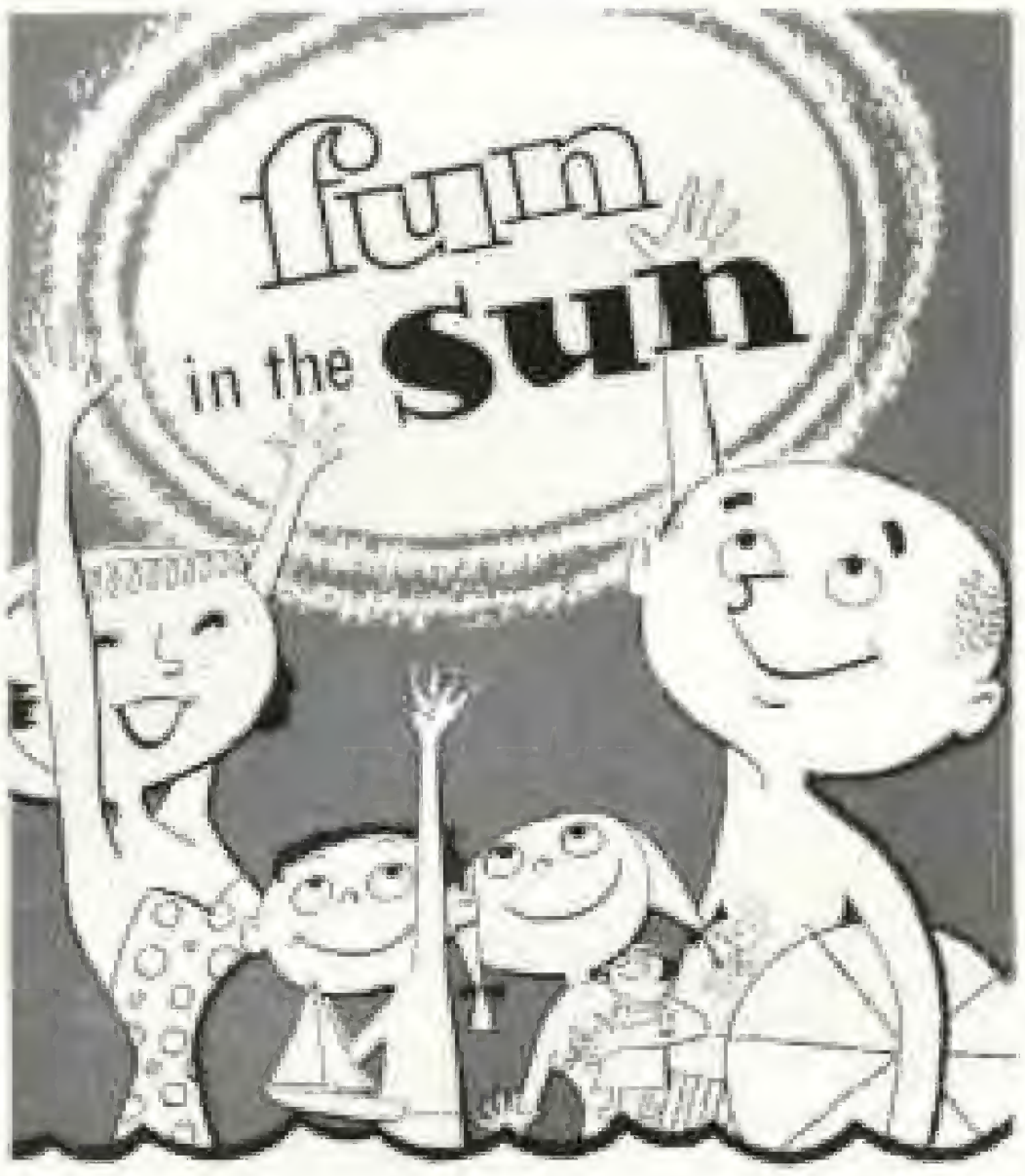

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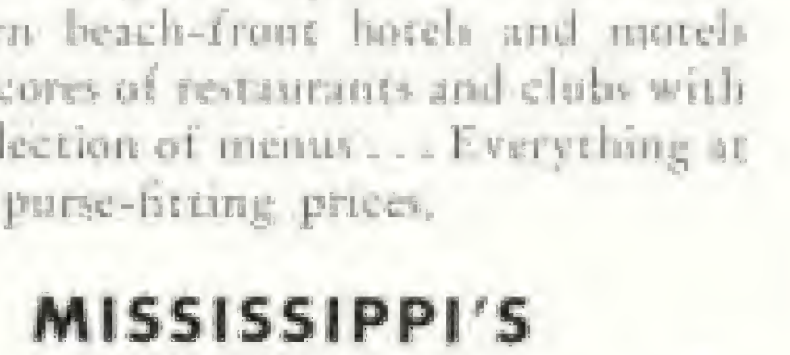

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How should you tackle the problem of reducing? First, face the fact that overweight—in more than 95 percent of the cases—is caused by eating and drinking too much. To curb your appetite and change your eating habits *permanently*, a lot of will power is required.

Next, see your doctor. He will put you on a diet to remove weight at a safe rate. He will also see that your diet includes all the essential nutrients you need—especially proteins, vitamins and minerals.

Though calorie-laden foods (rich desserts, gravies, dressings, fried foods) will be restricted, you will be pleasantly surprised at the varied, appetizing meals you can have while reducing.

Your doctor may also recommend sensible, regular exercise—such as walking. Exercise alone won't solve your weight problem. But it will help keep your body "in tone" and use up some calories that would be deposited as fat.

Reducing and keeping your weight down will be worth all the effort required. That is because excess pounds burden the *entire* body, especially the heart.

For example, it's estimated that every 20 pounds of excess weight requires the body to develop about 12 extra miles of blood vessels. Consequently, the heart's work is greatly increased as it must exert more force to pump blood through these additional vessels.

Many studies show that overweight also tends to shorten life. At age 20 and beyond, those who are considerably overweight have a mortality rate at least 50 percent higher than those of average weight.

Moreover, diseases of the heart and blood vessels—including coronary artery disease and high blood pressure—develop earlier in overweight people than in people of average weight. So do diabetes and arthritis, as well as gall bladder and liver troubles.

So, if you bring your weight down and keep it down *permanently*, you can expect to have more vigor, more stamina, better looks, better health—and perhaps added years of life in which to enjoy them.

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VOL. CXV, No. 2 WASHINGTON FEBRUARY, 1959

THE NATIONAL GEOGRAPHIC MAGAZINE

From "Spaceport No. 1," on Florida's Cape Canaveral, man's flaming rockets blast off toward other worlds

Reaching for the Moon

By ALLAN C. FISHER, JR., Assistant Editor, National Geographic Magazine

With Photographs by LUIS MARDEN, National Geographic Senior Staff

FROM A SANDY, palmetto-choked strip of land on Florida's east coast, man is reaching out boldly and gallantly toward another world in space, the moon. His robot creations, hurled aloft on raging streamers of fire, are surveying the start of a long, long road that one day will lead humanity to the planets and, perhaps, to the very stars.

"Spaceport No. 1"..."Terra Command Center"..."Earthstrip No. 1"...these are the strange-sounding, Space Age nicknames that have been given to the vast military complex on Cape Canaveral, the rocket launching area of the Atlantic Missile Range. There I witnessed the predawn launchings of the Air Force's second and third moon rockets and of the Army's first lunar probe. My vantage point, buffeted by crescendos of furious sound and illuminated brilliantly by the rockets' glare, was only 3,000 feet from the launching site during one firing and a scant 2,500 feet during the other two.

Man Chafes at Gravity's Bonds

Beside me stood National Geographic's Luis Marden, who made the remarkable photographs accompanying this article. For both of us those moments held magic, indelibly memorable. We were seeing man attempt a unique and splendid thing. After millenniums of dreaming and preparation, humanity at last had arrived at that crossroads in time, those fleeting minutes in the history of the race, when earth's shackles might be cast off.

Pioneer I, roaring into a starlit sky on October 11—the eve of Columbus Day—proved a brilliant, if limited, success. Its 85-pound payload arched into space in a tremendous parabola and attained a distance of 71,300 miles from earth, nearly a third of the distance to the moon and 29 times farther out than any man-made satellite orbiting our planet. Instruments flashed back thousands of readings on space conditions.

Velocity Only 600 Miles Short

The payload's velocity of more than 23,500 miles an hour, greater than that of any previous rocket, fell short by only about 600 miles an hour of the impetus needed to loft it into the grasp of lunar gravity. Approximately 43 hours after launching, it tumbled back into earth's atmosphere and burned. An infrared scanning device, designed to make television-like pictures of the moon's unknown far side, never had a chance to function.

But, for the first time, man had fired electronic eyes and ears into true space, far beyond the last vestiges of his planet's air, deep into the dark abyss that leads to infinity.

The other two Air Force moon rockets failed soon after take-off. On August 17, before our visit to Cape Canaveral, an unmanned first probe exploded after 77 seconds of flight. *Pioneer II*, fired November 8, reached an altitude of 1,000 miles. *Pioneer III*, the Army's

first probe, attained a height of some 63,000 miles on December 6.

While this article was on the presses, Russian missilemen launched a probe that bypassed the moon and became a man-made planet orbiting the sun. But historic *Pioneer I* was the first to travel thousands of miles from the earth, and its story—the how, the why, and many of the problems involved—is essentially the story of all similar efforts.

For days Luis Marden and I virtually lived with the Pioneer rockets and the men who so carefully tended them. High on skeletal service towers, we watched engineers mate, or couple, rocket stages and gingerly install the payloads containing custom-built miniaturized instruments. At other times, in laboratory offices, or late at night over rounds of coffee, we listened while these men patiently explained the complex interrelationships of some of the 300,000 parts in each lunar probe.

Tiny Mishap May Cause Failure

Malfunction of any one part—a valve, a pump, even some prosaic item like a nut or bolt—may cause failure. When *Pioneer I*, the Columbus of Space, functioned with near perfection, it represented a major triumph for United States technology.

T (for Test) -time, the scheduled moment of *Pioneer I*'s firing, had been set for 3:42 a. m. I had driven to the launching site, hours earlier, to see the rocket groomed and poised for take-off, and then had retreated to a roadblock to witness the giant's first awesome moments of life. Share with me, now, the mood and the strangeness of those scenes.

My watch says two hours until T-time. Above me, as I stand in a stubbled field, soars the 113-foot steel gantry, still holding *Pioneer* in a gaunt embrace (pages 160 and 162). Blazing lights, a few red, some greenish, many white, jewel the service tower's skeletal frame and reflect eerily from the rocket's sleek, half-hidden flanks.

Workmen, gazing downward, stand attentively on each platform level of the 10-story

Last seconds tick away as the test-control officer monitors the countdown in the concrete blockhouse. Capt. Millard E. Griffith, Air Force engineer, kept visual and auditory check on a team of 47 men.

Amid Flame and Thunder, the Rocket *Pioneer I* Blasts Free from Earth

On October 11, 1958, a Columbus of the outer void, the United States Air Force's 88-foot, three-stage rocket *Pioneer I* rose slowly from its launching pad at Cape Canaveral, Florida. It gathered speed, streaked into the black night sky, tilted to the northeast, and dwindled, lost to vision among the stars. *Pioneer* did not reach its goal, but, rocketing at more than 23,500 miles an hour, penetrated 71,300 miles into space before falling to a blazing death in the Pacific. Here electric cables, called umbilical cords, dangle from the crane leaning away at left. They feed power to the rocket until the last moment before take-off. An automatic camera 50 feet away took the photograph. No man could hope to stand so close and escape injury.

structure. Their immobility puzzles me. But now, with the clanking noise of a medieval drawbridge, part of the framework enclosing one side of the rocket pulls up and away. Slowly, carefully, the entire gantry backs off on its railed tracks. Now *Pioneer* stands alone, as if it has stepped from behind a lattice.

The sight forces from me an awed exclamation. Dazzling white, an incredible 88 feet tall, the rocket rests on its tail atop a concrete pedestal and points toward heaven like the shaft of some utterly strange and alien monument. Batteries of searchlights lance their beams at that gleaming shaft and bore brilliant tunnels into the night sky.

I find myself stirred by this sight as by none other of my life. Before me I see the essence of grandeur and dreams, a portent of great adventure and great achievements for my countrymen. In long perspective, it matters not if *Pioneer* fails. Other, more powerful rockets surely will follow.

Thor Missile Serves as Booster

For about two-thirds its length the moon rocket is a broad and gently tapered cylinder —the Thor first stage. Atop Thor, like an elongated, blunt-nosed bullet, ride the second and third stages and the payload, all fitted together so snugly that they seem a single entity. Rising, the rocket will drop its used stages, as a sprinter might shed encumbering garments.

Beside *Pioneer* stands a slender crane, and cables stretch from the crane's top to the rocket's side. Umbilical cords, missilemen call them; they feed electric power until seconds before firing, when they drop and the rocket's batteries take over.

From vents in Thor a chill, foggy exhalation gushes out. Thor, at rest, expels this gaseous breath to relieve the pressure of evaporation from tons of liquid oxygen, the oxidizer for its fuel, a derivative of kerosene. Frost encrusts the rocket's sides and occasionally flakes off in tiny snow showers (page 163).

Suddenly, in response to some entreaty from its entrails, Thor belches billowing clouds of vapor. They spread, obscure the pad, reach out a hundred wispy tendrils toward me, and hide all but the towering rocket. For a moment this scene evokes a curious sense of unreality, as if I stand in the swirling, heavy atmosphere of another planet in another age. Luis Marden and a second man near me, I find, share this same strange sensation.

"All nonoperating personnel clear the area!"

The brassy loud-speaker voice repeats the words slowly but insistently. T-time draws near. The magic moment ends, and we leave.

Tension Grips Men in Blockhouse

Now, at the roadblock, it is T-minus-five—five minutes before firing. On either side of me, stretched out like a line of skirmishers in the scrubby brush, I see the shadowy figures of cameramen representing the armed services and missile contractors. Their powerful lenses will track *Pioneer*; so this site has a cable tie-in to the blockhouse. Someone has plugged in a receiver, and we hear the countdown.

"T minus four minutes."

I can visualize the scene in the concrete blockhouse, so near the site where an inferno soon will erupt. Men bend tensely over wall-to-wall panels of dials, checking fuel pressures . . . oxygen pressures . . . temperatures . . . the harmonic voices of *Pioneer*'s radio transmitters. . . . A few seconds before T-time, the engine monitor will plunge his hand on a button, and an electronic sequencer will control the rocket's functions and complete the countdown with an accuracy measured in microseconds. The sequencer, not man, fires the rocket.

"T minus two minutes."

I glance up nervously at the sky. There's the Little Dipper, with Draco curled around it. Never before have the stars seemed so attainable. Eyes back to the pad. Even at this distance, 3,000 feet, *Pioneer* seems enormous, its plume of oxygen clearly visible.

Now the count plummets to seconds . . . "five . . . four . . . three . . . two . . . one. . . ."

No one hears the zero count. Brilliant blasting flame stabs from the rocket's tail

Moon Rocket Stands Cradled in Skeletal Steel Against Sunset's Fading Glow

The fivefold 113-foot gantry carries cranes for erection and assembly of the 52-ton projectile. Ten stories give technicians platforms for mating of the monster's three stages and payload, checking of instrumentation, and fueling. Nylon tents shroud the top stages to keep out wind and dust. To protect the launching pad from white-hot exhaust, water flows down a plate beneath the rocket's tail and into a catchment basin. Here, on the evening of October 10, the pool mirrors rocket and tower.

Poised for Take-off, the Rocket Exhales a White Fog of Oxygen

To burn fuel in the airless reaches of space, a rocket must carry its own oxygen. Liquid oxygen at the unthinkable cold of 297 degrees below zero, Fahrenheit, flows in from tank trucks several hours before blast-off. As the oxygen chills the metal hull, hoarfrost encases *Pioneer* in a foretaste of the cold of space. Excess gas escapes from vents in the rocket.

Opposite: The gantry's upper decks lift free of the rocket's nose shroud. Soon the entire scaffold will roll back, leaving the rocket alone in the glare of searchlights.

PHOTOGRAPHED BY LOUIS MARDEN, NATIONAL GEOGRAPHIC STAFF © N G S

and hurls waves of sound upon us. Steam from thousands of gallons of protective water gushing over the pad's metal flame deflector envelops *Pioneer*'s base.

Slowly at first, then rapidly, eagerly, the white shaft rises (page 158). It rides atop a streamer of magnificent fire, almost as long as the rocket. The flame is furious, maddened, raging. A light as from the sun streams over our upturned faces.

And the sound! Not booming, muttering thunder, but something more vital. It cycles, pulses, very rapidly. It whiplashes, stabs.

With others I find myself shouting, "Go! Go! Go! All the way! All the way!"

Now the rocket flees earth with tremendous velocity. Searchlights can no longer track it. We watch the flame, dwindling, curving to the northeast on *Pioneer*'s programmed course. A brief flare-up, a winking of light, and the second stage fires. Then the rocket is gone, indistinguishable among the witnessing stars.

Lunar Orbit Requires Critical Speed

Various authorities have estimated that the gallant *Pioneer I* had no better than a one in twenty-five chance, or perhaps one in twenty, of orbiting the moon. The laws of celestial mechanics, as well as the complexity of the rockets, dictated long-shot odds.

Complicated movements of moon, earth, and sun in relation to one another all had to be taken into consideration. Astrophysicists computed that the rocket might be fired successfully only during three 18-minute periods falling on successive days each month. Nearly a year ago they set 3:42 a. m., eastern standard time, October 11, as the earliest possible moment for launching *Pioneer I*. It lifted off only nine seconds late, no small feat in itself.

Ideally, a moon rocket should be launched to the east from a point at or near the Equator. Such a site imparts to the rocket the maximum benefit of earth's 1,000-mile-an-hour rotational speed. Also, a shot from the Equator offers the best parabolic trajectory to the moon. The favorable factors diminish slightly with each degree of latitude —and Cape Canaveral lies at 28° north.

Missilemen also faced a spiny problem in boosting the probe to a certain critical velocity. Escape velocity, the speed necessary to send an object forever from earth's gravitational clutch, is approximately 25,000 miles an hour. Contrary to published reports, the Air Force did not seek, or want, such speed.

Earth and moon share a common center of gravity, deep beneath our planet's crust. Escape velocity would shoot a payload past the moon, as well as away from earth, or possibly into the lunar surface like a meteorite.

So the Air Force sought a velocity just above 24,000 miles an hour. Given this initial speed, the probe would coast to a point about 175,000 miles from earth, where lunar gravity gradually gains ascendancy over our own. Its pace now reduced to a relative crawl, the instrumented package would be captured by this secondary gravitational field, and would fall toward the moon, again accelerating.

Atop its payload the Air Force placed a small retro-, or braking, rocket (opposite). A radio command signal from earth, it was hoped, would fire the rocket and tilt the package into orbit around the moon. Earth-to-moon distance, about 223,000 miles for *Pioneer I*'s interception attempt, would require a journey lasting 2½ days (chart, page 166).

I stood near the moon rocket gantry one morning, reviewing with an engineer the inexorable laws nature imposes upon lunar probes. A workman, lounging near by while nibbling a doughnut, grinned broadly and broke into the conversation.

Pioneer I Not Quite Brainy Enough

"That's not the worst of it. What happens if you don't have a brainy bird?"

In Cape Canaveral parlance, a "brainy bird" is a rocket that performs well. *Pioneer I* was brainy, but its I. Q. was not quite high enough. It started the journey at slightly too high an angle, and later stages compounded the error.

Thor's normal guidance system would have sensed and corrected the minor deviation, but it had been removed because of weight considerations. In its place rode a less sophisticated system.

Since Thor, an intermediate range ballistic missile, is a military weapon, much detail about it remains behind the curtain of security. But I saw demonstrated some unclassified principles of its guidance on my first visit to *Pioneer I*, two days before lift-off.

J. E. Harrison, night manager of the project for Douglas Aircraft Company, led me atop a metal collar encircling the 100,000-pound first stage just above its stabilizing fins. Below me, extending from the missile's tail, I could see a ponderous rocket nozzle.

Pioneer's **eyes and ears** lie in its top-shaped tip, an artificial satellite. To prevent contamination of the moon by earth organisms in the event of an impact, technicians sterilized the satellite with ultraviolet lamps.

Robert Droz, in surgical cap, mask, gown, and gloves, checks the wiring. Eight vernier rockets, fired in pairs or in concert by remote control to make fine adjustments in speed, surround the axis below the casing.

Engineers test the electrical circuits of *Pioneer's* instrument package. Capt. M. E. Griffith (left) and Alvin Newberry use a miniature transistor receiver to listen to the signal, a harmonic whine. The infrared scanning eye looks out at lower center. Polished plate beside the eye stands ready to record the impacts of micrometeorites. A retrorocket, designed to tilt the satellite into orbit around the moon, thrusts its nozzle through the central opening.

BACKGROUNDS BY LOIS MARDEN,
NATIONAL GEOGRAPHIC STAFF ARTIST,
AND W. R. GRIFFITH, U.S.A.F., U.S.A.C.

Harrison jumped down and pushed it. The heavy nozzle tilted easily, smoothly.

"See? It works on gimbals," he said. "The guidance system gives commands, and it moves, altering the direction of thrust."

He pointed out smaller exhaust openings on the sides of the missile. "We call them vernier rockets. They're for finer control."

To an impressed visitor, the bird looked very brainy.

Behind the lunar probes are many of the best brains in the burgeoning astronautics industry. The new National Aeronautics and Space Administration, staffed by dedicated and gifted men, directs both Air Force and Army programs.

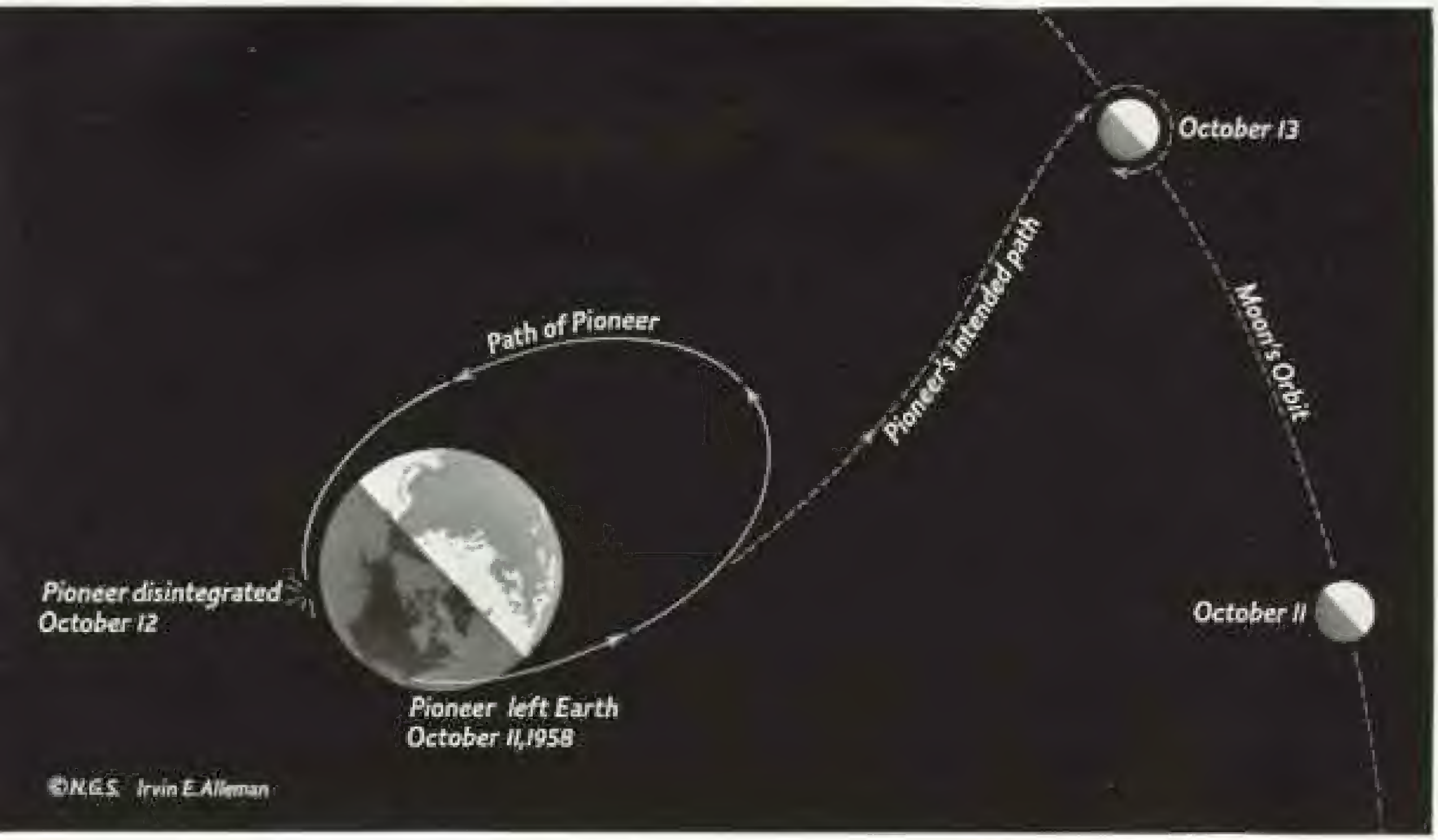
In preparing its probes, the Air Force Ballistic Missile Division delegated technical direction to its private industry partner, Space Technology Laboratories. Douglas assembled the Thor first stage, Aerojet-General Corporation built the second stage, and Allegany Ballistics Laboratory of the Hercules Powder Company the third. But behind the leaders, working as subcontractors, were some 50 scientific and industrial firms and untold thousands of men and women.

One usually thinks of their assembled handiwork only in terms of dramatic bulk and girth. Yet the tiny payload instruments, each a near miracle of miniaturization, seemed to me almost as impressive.

Scientists of Space Technology Laboratories devoted thousands of man-hours to the design and custom construction of these instruments. Robert Danta, a member of STL's technical staff, took me into his laboratory at Cape Canaveral one afternoon and proudly displayed the results (page 165).

Half the payload's Fiberglas casing, shaped like a Chinese coolie hat, rested, upended, atop a pedestal. Inside, attached to the casing's perimeter, STL engineers had installed some of the smallest electronic gear ever fashioned. Danta pointed out a magnetometer, an ionization chamber, a 14-ounce television transmitter, and other minutiae.

These instruments would measure cosmic



Like a hunter leading a fast-flying duck, rocketeers aimed far ahead of the moon, which circles the earth at 2,300 miles an hour. Had *Pioneer I* succeeded, its instrumented payload would have gone into orbit around the moon on October 13, two and a half days after take-off. Because of an error in the automatic guidance system, the rocket failed to reach the moon's gravitational field and returned to destroy itself in the earth's atmosphere after traveling a record 71,300 miles into space. At the same time earth, moon, and rocket traveled nearly three million miles around the sun

radiation, temperatures, speeds, the impact of micrometeorites, and the magnetic field of the earth-moon system. Radio equipment would beam their intelligence back to earth. Meanwhile, giant antennas would track the payload at key receiving stations from New Hampshire to Singapore.

The TV, in particular, interested me, for with it scientists hoped to obtain crude pictures of the far side of the moon. I bent down and peered into its scanning eye, an aperture in the side of the casing. My own image stared back at me.

"It contains a small parabolic mirror," Danta explained. "The mirror focuses light in the infrared spectrum on a lead-sulfide cell, and the cell emits voltage proportional to the amount of light. The voltage is then amplified and transmitted as a signal."

(Instruments at the various receiving stations recorded *Pioneer I*'s findings on tape—more than 200 miles of it. When this issue of the Magazine went to press, scientists still were correlating and interpreting the data, a painstaking job requiring months. They described their preliminary findings as "inconclusive" and indicated their desire for additional probes to check on certain space conditions, particularly the band of intense radiation mantling the earth.)

Scientists Wear Surgeons' Gowns

Danta and his colleagues, gowned like surgeons at an operation, later sterilized the payload with ultraviolet light, a precaution against contamination of the moon with earth organisms in case of an impact. Then they packaged their "baby" in a sterile container and trucked it to the gantry.

There, high on the top level of the wind-swept tower, I watched while four engineers in gowns, masks, and rubber gloves gently mated the payload to the third-stage rocket. The base of the Fiberglas casing now wore a ring of eight small vernier rockets, which would be fired by ground radio command to give the payload an added kick.

The men treated these rockets with obvious respect, and everyone on the tower's two uppermost levels had donned "no-stats," bronze shoe cleats that eliminate the possibility of static sparking.

"A spark just might touch off those verniers," said a man near me. "We figure we could survive that. But if the third stage went . . . ." He pointed downward and left the rest to my imagination.

Despite the taxing intricacy of the work,

Messages to the moon are scrawled on the nose of *Pioneer II*. This man, standing on the gantry's top stage some two hours before firing, writes his name on the protective shroud at the tip of the 88-foot rocket. Others scribbled "Good luck" and "Hello, moon." The nose shroud is designed to open at the proper moment, allowing the instrumented payload to be released into orbit (next page).

the danger, the long hours, and the haunting possibility of failure, I never heard one of these men grumble about his job or flare up in temper. Missilemen reflect a feeling of fraternity and a devotion to their work in much of their conversation. That's why, when a moon rocket is being readied, many work 70 hours a week and more without complaint.

"Overtime pay!" one man exclaimed. "What's that? Most of us work on straight salary. We don't get overtime."

Bob Danta expressed the feeling of many:

"Our man-hours can't be measured in terms of the clock, but in terms of quarts of blood and pounds of flesh. It's rough. But then you take a look at that thing on the gantry. You think, 'This rocket that I helped build is going to the moon!' Suddenly it's all worth-while."

Nor is this esprit limited to contractor personnel. The Air Force officers supervising the projects might be said to possess it even more strongly, for they constantly resist the lure of lucrative jobs in private industry.

In an Imagined View, a Spinning Top Whirls Around the Moon

Turning 120 times a minute, the satellite swings in an orbit 800 miles from the moon. Unpainted areas on its Fiberglas case absorb solar heat; painted strips deflect it. Balancing each other, they maintain an internal temperature of 83° F.

Here the satellite's infrared scanning eye (top of cylinder) turns away from the moon's craters and dark, dry "seas." If the October 11 shot had gone into orbit, man would have seen through its televised signal the side of the moon that forever turns its face from earth.

Mercury shines above the disk, and the Milky Way glows faintly. Sunlight clasps earth (right), some 223,000 miles away, in a diamond-ring effect as the atmosphere bends the rays around the globe.

Take, for example, Capt. Millard E. Griffith, "Brandy" to his friends, a test-control officer (page 159). Brandy wears a pilot's wings, and, somewhere, has a sheepskin certifying a doctor's degree in engineering. An electronic brain in Washington, asked to select from personnel cards the officers most likely to succeed with rockets, picked him and other key lunar-probe controllers, such as Maj. Hal Myers and Maj. Earl W. Anderson.

Everywhere on Cape Canaveral a visitor gets the feeling that great events impend for the area. Much evidence supports that impression.

By the time you read these words, the Army may have fulfilled its announced purpose of shooting a probe past the moon, out of earth's gravity, and into an orbit around the sun. *Pioneer III*, fired December 6, was the first such attempt. It rose some 63,000 miles, but its guidance, like that of the Air Force's *Pioneer I*, proved slightly awry and the speed insufficient.

In one respect, the Army's task was simpler

PAINTING BY BEL GELTER © N. A. S.

than that of the Air Force. The Army sought escape velocity for *Pioneer III*—enough sheer force to elude the clutch of earth-moon gravity. But the Air Force probe required a more critical and refined velocity, since missilemen wanted the payload to orbit the moon.

Pioneer III journeyed through space with only a few payload instruments: two radiation monitoring tubes, a radio transmitter, and a photoelectric sensing device, shaped like a pistol. Scientists had hoped the moon's bright face would actuate the photocells and signal that fact back to earth. Once tested, the cells would be used in some later moon probe as a trigger device for a television camera.

For its probe the Army used a modified Jupiter missile as the first stage, topped by three solid-fuel stages. Once again Luis Marden and I watched a blinding, pulsing column of flame throw heavenward another challenge to the moon. At take-off only an effort of will kept our eyes to the view finders of cameras. One's tendency is to forget everything but the sorcery of the moment.

UNITED PRESS INTERNATIONAL PHOTOGRAPHER

Pioneer III, the U. S. Army's first lunar probe, hurled a 13-pound payload to a height of 63,000 miles on December 6. Dan Schneiderman, chief of the Jet Propulsion Laboratory team that assembled the instrumentation, holds the payload's cover. Made of laminated glass cloth, the cone bears strips of white paint atop gold plate—a combination designed to maintain an internal temperature of 95° F. Tubes projecting from the assembly took cosmic-ray readings during *Pioneer III*'s 38-hour journey.

In addition to lunar probes, there are plans —informal at this writing—for probes of Mars and Venus. Recently I saw sketches of several of these planetary payloads at Douglas Aircraft Company in Los Angeles. Maxwell W. Hunter, assistant chief engineer for space systems, emphasized that the company had not contracted to build them, but he added:

"About every two years the planets are in the right spots. We must work now, and not just sit around waiting for proper planetary positions." He also said that, by using modifications of current missile developments, "There is a chance of putting a man in orbit around the moon in five years, if the decision is made now."

Many manufacturers are working to further refine and miniaturize space-probe instruments. The crude, televisionlike scanner in *Pioneer I* soon will yield to sophisticated TV cameras that give excellent detail in their pictures. Designers also plan midget tape recorders that will store many minutes of information gathered by satellite instruments and then will transmit the data to earth in relatively brief periods.

In future years, with more powerful rockets, payloads will increase greatly in weight; solar batteries will power their instruments.

Why, the reader may ask, should man attempt expensive assaults on space? Maj. Gen. Donald N. Yates, USAF, commander of the Atlantic Missile Range, answered the question for me:

"We're pushing back the frontiers of knowledge. In any scientific field you must venture into the unknown; you cannot always predict what you're going to get out of it. But I am very, very sure the work we do here, now and in the future, will develop something of value for mankind, as well as gain for our country a military and an economic advantage.

"It's bound to be worth-while," he said emphatically. "It's tremendously important."

The roar, then the diminishing whoosh of a jet airplane enveloped Patrick Air Force Base, headquarters of the missile range, and intruded into General Yates's office. That noise, after my introduction to the giant birds of Cape Canaveral, seemed curiously archaic, the voice of a slowly passing era.

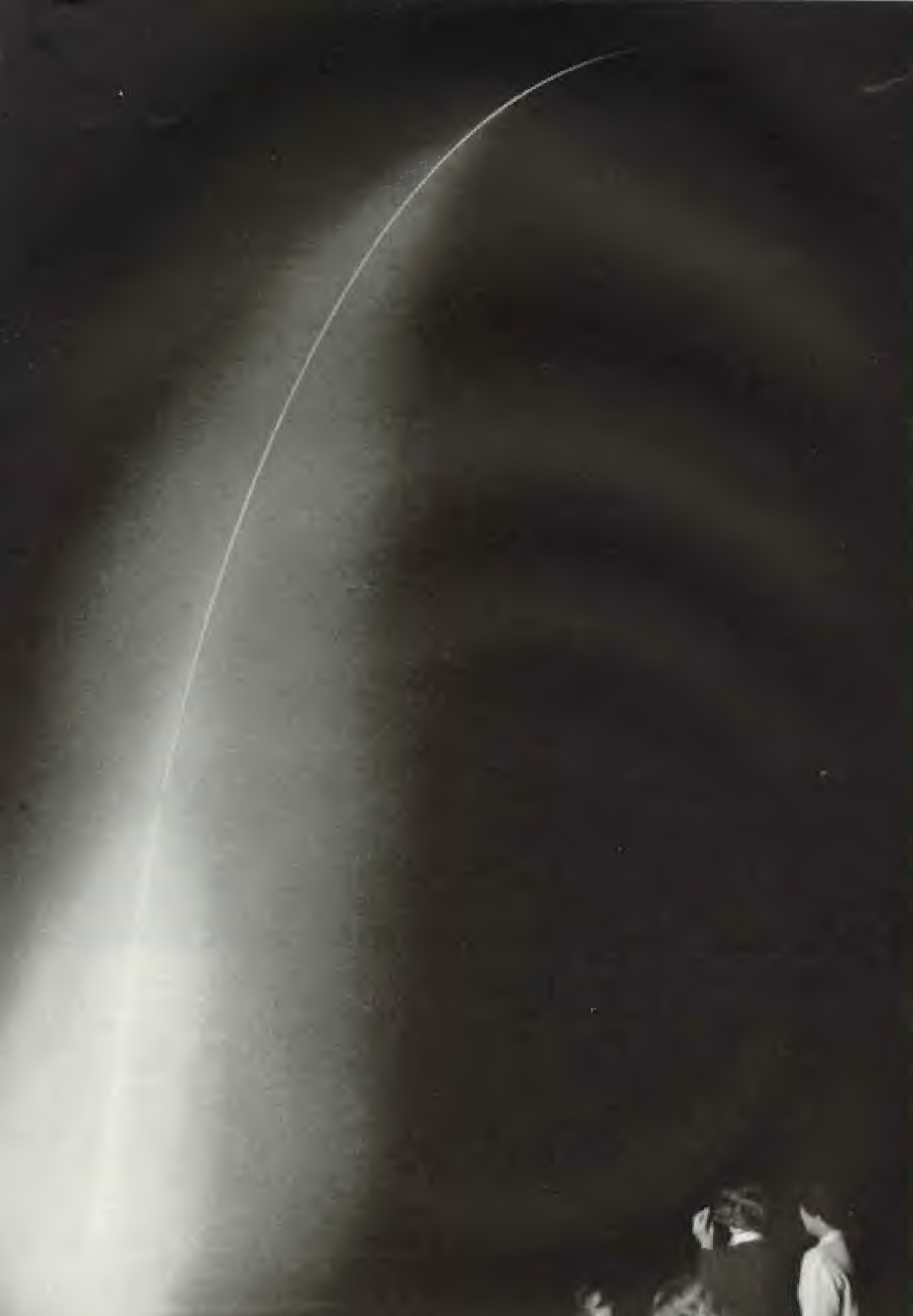
General Yates stared pensively for a moment at the sunny Florida sky, as if seeing in his mind's eye the hidden stars and the challenging, luminous face of the moon.

"I certainly believe that in my lifetime men will get to the moon and Mars," the general said. "Yes, and someday to the stars; that's certainly not beyond the realm of my imagination. We must always keep our eyes just over the horizon on what we cannot do today. Eventually we'll get out beyond the edge of anything we can dream of."

Spawning a Track of Fire, *Pioneer I* Arches into the Heavens

Usually the day and hour of a shoot go unannounced, but rumor spreads among the 16,000 employees of the missile center, and at the approach of firing time hundreds line the sands south of Cape Canaveral. This dramatic 30-second exposure was taken from Cocoa Beach. The rocket remained in view almost three minutes after blast-off.

UNITED PRESS INTERNATIONAL



Building a New Austria

Looted, pillaged, and occupied,
Eastern Austria remains
the gay land of Mozart and Strauss
while striding toward recovery

By BEVERLEY M. BOWIE
Assistant Editor, National Geographic Magazine

Illustrations by VOLKMAR WENTZEL
National Geographic Photographer

FROM below the castle's eastern battlements the rocket streamed upward and shook out upon the night its cloak of stars. For a moment we could discern across the Austrian frontier the dark hills of Hungary. To the south, 40 miles away, lay the wooded slopes of Yugoslavia.

From her wheel chair beside me, Princess Marie Esterházy clapped her hands in delight. "How lovely, and how peaceful!"

It was all of that. And yet, as the fireworks blazed at the annual festival beneath Schloss Bernstein, and as the villagers danced to the local band, I thought, "How strange, as well!"

For we were all but stubbing our toes on

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the Iron Curtain. The plowed border strip, the mines, the dogs and dour guards, the rickety watchtowers lurked only over the hill, and each week some new refugees stumbled across this barrier.

My companion, whose family once owned much of Hungary and of this border province of Burgenland, had seen her way of life all but consumed in the revolutionary blaze. Her brother Paul had been arrested with Josef Cardinal Mindszenty and was imprisoned with him until the October upheaval freed both men after eight years.

"But one shouldn't think about those things," she sighed. "It is better to forget."

Forchtenstein Castle keeps vigil in Burgenland historic gap in the wall of Western Europe. Down through centuries invading hordes poured across these hills from the plains of Hungary, just over the horizon. During the Middle Ages a chain of fortresses rose to dam the tide; their numbers gave Austria's eastern province the name Land of Castles.

Schloss Forchtenstein, owned by the Esterhazy family, stands, like neighboring Schloss Bernstein, as a symbol of Austria's will to survive. Its weapons and armor, some dating from Turkish wars, would equip a small army; its uniforms would clothe one. Each summer the castle's antiques dress the stage for historical dramas enacted on the grounds.

In Austria one can and does forget. There is more talk of the cold war in Washington than in Vienna, and here, scarcely a cannon shot from the empire of Communism, one talked of it not at all. Swallows wheeled over the fortress walls, cowbells chimed through the forest, and at noon the white oxen moved like sleepwalkers across the heat-struck field. Peace lay like a golden haze upon the landscape.

Volkmar Wentzel, National Geographic staff photographer, and I had come to explore Burgenland and Lower Austria (map, page 181), in the former Russian zone of occupation, and to report on these first years of fully regained freedom. It was usually we who had to bring up the subject of "the bad times." The Austrians, looking forward, had no time to waste on barren memories.*

Occupation Left Many Scars

Physical evidence of Red occupation was still at hand, certainly. We stood appalled before the once lovely baroque façade of Schloss Laxenburg, outside Vienna, which had housed Russian troops for several years. It looked as if a horde of hoodlums had vented their rage upon it. Great holes pockmarked the plaster, shutters hung crazily by a nail, the smudge of oil fires darkened half the rooms, water pipes were ripped from the walls. Not a fixture of any sort, not a pane of glass, not a stick of furniture remained.

Nearly two years after liberation, nothing had been done to restore Laxenburg's pristine grandeur; it remained as a kind of lugubrious Monument to the Unknown Looter.

Throughout the freed provinces, however, the work of digging out was well begun. The Burgtheater in Vienna, gutted by fire during the battle for the city in 1945, had been rebuilt. Baden, headquarters for the Soviet forces, had torn down the fence which literally walled off the 20,000 Russians billeted on a resort town of only 22,000 Austrians and was refurbishing its mauled and battered hotels.

In every city and hamlet the wounds of occupation, left untended till the last Russian, tears in his eyes, quit the country, were being healed in a feverish attempt to make up for lost time.

Invasion, of course, was scarcely a new experience for Austrians, and especially for those of the border provinces. At the gaunt keep of Lockenhaus, a few miles from Bernstein, we watched one afternoon a celebration of the castle's 750 years of frontier defense. Wave after wave of outlanders had beaten against this bulwark, from Hun and Avar and Magyar to Turk and Russian. In seven years of nominal peace the Turks launched upon Austria 188 different attacks.

"We have always been a border country," say the yeomen of Lockenhaus. "We are a border country still—and we will hold fast!"

This has taken stout hearts. When Mohammed IV, "King of all Earthly and Heavenly Kings," descended on Austria for the last time in 1683, he wrote the Emperor Leopold that "We have with Us thirteen kings with 1,500,000 warriors, infantry and cavalry. With this army, the like of which thou and thy followers have never seen, we will crush thy little country without mercy or compassion beneath the hoofs of Our horses, delivering it up to fire and sword. Firstly, We command thee to await Us in thy capital, Vienna, so that We may behead thee. . . ."

Baroque Followed the Turkish Tide

Yet the Turks thundered in vain at the gates of Vienna. And when the siege collapsed and the Ottoman tide receded into the Balkans, Austria breathed again. She did more than breathe. She exulted, and her joyous relief carried forward into her period of finest flower: the Baroque, that amazing burst of creative, triumphant energy.

Wentzel and I could sense something of this same spirit of release in the "Russian" provinces. Austrians date the liberation of their country not from the day the last Nazi trudged north, but from the signing of the

* See "Occupied Austria, Outpost of Democracy," by George W. Long, National Geographic Magazine, June, 1951.

Boxcar-size Gondolas Swing Around the Big Wheel in Vienna's Wurstelprater

Erected to commemorate the 50th anniversary of Emperor Franz Joseph's reign in 1898, the Riesenrad lifts 300 passengers to a city-viewing height of 210 feet. Here in 1945 German and Russian troops fought a nightmarish battle, dodging between towering girders, firing from carrousel horses, and dying amid fun-house traps. A rendezvous for the movies' sinister "Third Man," the big wheel twirls today for amusement alone.

PHOTOGRAPHED BY NATIONAL GEOGRAPHIC PHOTOGRAPHER VOLKMAR WENTZEL © N. G. S.

Baroness turned mannequin, Helma von Pach parades a hand-embroidered silk ball gown created by Adlmüller, Vienna's ranking couturier. The fashion house displays in Palais Esterházy, a mansion preserved from imperial days.

State Treaty in 1955 and the evacuation of all Allied military forces. The siege had been lifted; Austria was free to be herself. It rained that night, but bonfires burned in the streets, and all over the country men danced and drank to the dawn of a new day.

The names left by the *Piefkes*—the German overlords—had vanished. Goering Platz had become Rooseveltplatz. The Russian names were next. Brücke der Roten Armee (Bridge of the Red Army) quickly reverted to Reichsbrücke; Stalinplatz disappeared in favor of the old Schwarzenbergplatz.

But more was being repealed than names. Most surprising of all, Austria put behind her two costly legacies of her past: political bitterness and economic apathy.

As recently as 1934 the armed cohorts of Austria's two great parties—the Socialists and the Conservatives—were at each other's throats. Civil war wrecked the nation, with the city ranged against the country, worker against peasant. Democracy went up in smoke from the battle-scarred Karl Marx Hof.

Yet, barely more than a decade later, the two present major political parties agreed to shelve their differences and work together in virtual coalition for the good of Austria. They have kept the peace and maintained an integrated government which still shines as an example of stable compromise.

This half of the "Austrian miracle" is matched by the other, the economic side. Once upon a time it was usual to hear a Vien-

nese, remembering the vanished glories of the past and gazing sardonically upon the truncated remnant left by World War I, declare: "In Germany, the situation is serious, but not hopeless. In Austria, it is hopeless—but not serious!"

Today, with a country no larger than before and still convalescent from the ravages of World War II, the Austrians share a completely different mood. They reject any notion of *Anschluss*, or union with Germany, and they are firmly confident that they can build a sound and prosperous society with the resources at hand. What's more, they're doing it.

Farmers have raised their yield by 20 percent over prewar standards. Vehicle production has tripled; electric power and smelting of iron ore have quadrupled. Output of nonferrous metals has increased sixfold. And the flow of petroleum from wells in Lower Austria has shot up fiftyfold!

I talked about these achievements one afternoon in the Chancellery with Federal Chancellor Julius Raab, head of the Austrian People's Party. Dr. Raab paid his respects to the part which American assistance had played in putting Austria on its feet.

"Marshall Plan aid," he said, "enabled us to modernize several of our most vital industries—iron and steel, lumber and paper, to mention only a few. It also allowed us to start building bigger hydroelectric power plants, plants that will soon free us from dependence upon imported coal. And it helped us develop our newest natural resource: oil."

For the remarkable capacity of the two major parties to work in harness, Chancellor Raab had several explanations.

"Under the Nazis, we came to realize that the differences between us were a lot less significant than those between ourselves and the regime. From 1943 to 1955, too, when our country was occupied by four different powers and we lived in fear of permanent partition, we found it natural to stand to-

Produced in Graz and Steyr since 1957, the Steyr-Puch 500 has a 16-horsepower engine and averages 50 miles to the gallon. This dealer's window displays the 500 and other models on Vienna's Opernring.

Students Swing to New World Rhythms in a Vienna That Nurtured Music's Giants

As musical capital of the world, Vienna saw the flowering of such geniuses as Mozart, Beethoven, Schubert, Brahms, and the Strausses, father and

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son. Although the old classics still reign in the concert halls, University of Vienna students pay homage to new tempos. Here they dance to a jazzy version of "Besame Mucho" in the deep-vaulted Studentenkeller (Student Cellar). Reeds and Picasso-like paintings decorate the club.

gether. And, you know, when people have once begun to work closely together, they begin to respect each other's convictions. That's what happened to us."

When Raab added, as a kind of afterthought, that Austria's most important asset was the industriousness of its own people, I asked him if he thought all this concentration on economic recovery had changed their character.

"Up to quitting time—yes," he said. "Today we work more and faster than before, and enthusiasm for things technical has certainly captured our youth. But we have still the same love for music, for a good book, for leisurely get-togethers. All in all, I'd say we have become a little Americanized by day. But in the evening we are Austrians still!"

Best Opera Seats Bring $200

Even by day I found the Austrians reassuringly Austrian. It was often uphill work pumping Viennese officials for statistics. But when I let drop the information that I was attending the opera that evening, faces would light up.

"Ah! *Der Rosenkavalier!* Yes, the spirit, the essence of Vienna! Tell me, who is singing tonight?"

And there would be no further talk of dull matters like economics.

In Vienna a cabinet crisis can arise and pass without too much fuss. But rumors of a change in the management of the state-owned Burgtheater—that will have the whole town by the ear.

The event which to most Austrians signified the liberation was not a parade of troops or a political speech, but the christening of the bombed-out and rebuilt Staatsoper, the Opera House, in November, 1955. It contained the more hectic features of a World Series opener, an Inauguration Ball, and the first Armistice Day.

The performance had been sold out for months—at $200 for the best seats! Austrians flocked back to Vienna from all over Europe. And when the curtain went up on Beethoven's *Fidelio*, the Opera House nearly lost its roof a second time. Outside, thousands of Viennese simply stood about, sharing silently in this musical rite of freedom.

Austrians—Viennese, especially—have no great difficulty in answering the philosopher's query: "Freedom for *what?*" To them the reply is obvious: "Freedom to enjoy oneself."

In few cities of the world is it easier. There is not only a full menu of music, there is a

Austria's eastern borderlands face a Communist crescent. For 10 years they lay behind the screen of Russian occupation. When it lifted, the author and photographer set out to explore the provinces; they report on the changed and the changeless.

formidable list of plays. Nowhere in Free Europe are theater tickets cheaper.

The only problem is to get them. When an English company came to Vienna to present Vivien Leigh and Sir Laurence Olivier in Shakespeare's *Titus Andronicus*, twice as many people struggled for seats as the house could hold. I pulled all the governmental strings at my command and failed to get even standing room.

Food for thought—there is plenty in Vienna. But no Viennese spurns the humbler fuel. In fact, one sometimes is persuaded that there is no pleasant or dramatic spot in the country which has not been visited by at least two Austrians, one of whom has turned to the other and said, "Now wouldn't this be a wonderful place to put a restaurant?"

I sampled as many restaurant specialties as I could, and left Austria a wiser, weightier man. But I had scarcely dented the nation's gastronomic surface.

You can dine in any fashion you like—from the suave elegance of the Three Hussars to the pungent, raucous Esterhazykeller. You can eat shish kebab from flaming swords at the Balkan Grill, or schnitzel at the 500-year-old Griechenbeisel.

For a good solid meal you can and should repair to Sacher's for boiled beef and horseradish sauce—a plebeian-sounding dish of celestial succulence. Venison appears often on menus, and occasionally boar. For sandwiches concocted of fire and spice, Viennese in a hurry (there are a few) resort to Trzesniewski's and stand up at a bar munching pfefferoni and caviar.

Pastries Play Part in Love Affairs

One should not suppose that the Viennese eats a great deal; he merely eats all the time—a snack here, a stop for tea there. A famous halting place for a spot of confectionery is Demel's, where the whipped-cream machine works night and day, unceasingly, like the broom of the Sorcerer's Apprentice. I always enjoyed picking up a couple of chickens there—golden brown, crisp, cooked to a turn, and with no bones at all; in fact, they were made of pastry, filled with chicken.

The city's many garden restaurants afford

CZECHOSLOVAKIA

Třeboň
Heidenreichstein
Karlstein
Gmünd
Waidhofen
Zwettl
Rosenburg
Horn
Altenburg Monastery
Eggenburg
Retz
Riegersburg
Hardegg
Znojmo
Hodonín
Mikulov
Laa
Poysdorf
Břeclav
Hollabrunn
Mistelbach
Zistersdorf
Hohenau
Drosendorf
Stockerau
Korneuburg
Deutsch Wagram
Tulln
Klosterneuburg
Gänserndorf
Upper Austria
Spitz
Göttweig Abbey
Artstetten
Aggstein
Melk
Herzogenburg
Ybbs
Persenbeug
St. Pölten
Grinzing
VIENNA (Wien)
Schönbrunn Palace
Bratislava (Pressburg)
Carnuntum
Schwechat
Hainburg
17 miles to Steyr
Amstetten
Wilhelmsburg
Perchtoldsdorf
Mödling
Laxenburg
Gumpoldskirchen
Baden
Traiskirchen
Bruck
Scheibbs
Lilienfeld Abbey
Neusiedl
Eisenstadt
Wiener Neustadt
Mattersburg
Rust
Neusiedler See
Mariazell
Schneeberg
Neunkirchen
Fürstenfeld
Sopron (Ödenburg)
Semmering Pass
Gloggnitz
Mürzzuschlag
Aspang
Deutschkreutz
Kapuvár
Eisenerz
Kindberg
Stoob
Oberpullendorf
Mitterpullendorf
Unterpullendorf
Trofaiach
Bruck
Kapfenberg
Lockenhaus
Leoben
Pinkafeld
Kőszeg
Hartberg
Oberwart
Sárvár
Knittelfeld
Weiz
Stinatz
Szombathely
Judenburg
Gratkorn
Gleisdorf
Köflach
Voitsberg
Graz
Fürstenfeld
Güssing
Körmend
Kalsdorf
Feldbach
Raba
Wolfsberg
Deutschlandsberg
Leibnitz
Gamlitz
Carinthia
Styria
AUSTRIA
YUGOSLAVIA
HUNGARY
Upper Austria
Lower Austria
Burgenland
Semmering Pass
Wechsel
Semmering
Schneeberg
Hochschwab
Dachstein
Totes Gebirge
Ennstal Alps
Niedere Tauern
Gurktal Alps
Karawanken
Steiner Alps
Lienz Dolomites
Hohe Tauern
Glockner
Ankogel
Hochalm Spitze
Ötztal Alps
Silvretta
Rätikon
Lechtal Alps
Allgäu Alps
Wetterstein
Karwendel
Zugspitze
Kaisergebirge
Loferer Steinberge
Leoganger Steinberge
Steinernes Meer
Hagengebirge
Tennengebirge
Dachstein
Totes Gebirge
Warscheneck
Sengsengebirge
Ybbs
Enns
Mur
Drau
Danube
Inn
Salzach
Traun
Lech
Rhine
Neusiedler See
Lake Constance
Attersee
Traunsee
Hallstätter See
Wolfgangsee
Mondsee
Fuschlsee
Zeller See
Wörther See
Millstätter See
Ossiacher See
Faaker See
Weissensee
Klopeiner See
Turracher See
Grundlsee
Altausseer See
Toplitzsee
Hallstatt
Bad Ischl
Gmunden
Bad Aussee
Salzburg
Hallein
Bad Gastein
Bad Hofgastein
Zell am See
Kitzbühel
Kufstein
Innsbruck
Seefeld
Mittenwald
Garmisch-Partenkirchen
Füssen
Reutte
Landeck
Imst
Ischgl
Bregenz
Feldkirch
Dornbirn
Bludenz
Arlberg Pass
Brenner Pass
Reschen Pass
Timmelsjoch
Grossglockner
Wildspitze
Zugspitze
Hochkönig
Watzmann
Dachstein
Grimming
Hochschwab
Ötscher
Schneeberg
Rax
Semmering
Wechsel
Hochwechsel
Geschriebenstein
Irottkö
Kőszeg Hegy
Sopron Hegy
Rosalia
Leithagebirge
Hainburger Berge
Bisamberg
Kahlenberg
Leopoldsberg
Wienerwald
Tullnerfeld
Marchfeld
Weinviertel
Waldviertel
Mühlviertel
Hausruck
Kobernausserwald
Salzkammergut
Tennengau
Pongau
Pinzgau
Lungau
Zillertal Alps
Stubai Alps
Ötztal Alps
Silvretta
Rätikon
Lechtal Alps
Allgäu Alps
Wetterstein
Karwendel
Zugspitze
Kaisergebirge
Loferer Steinberge
Leoganger Steinberge
Steinernes Meer
Hagengebirge
Tennengebirge
Dachstein
Totes Gebirge
Warscheneck
Sengsengebirge
Ybbs
Enns
Mur
Drau
Danube
Inn
Salzach
Traun
Lech
Rhine
Neusiedler See
Lake Constance
Attersee
Traunsee
Hallstätter See
Wolfgangsee
Mondsee
Fuschlsee
Zeller See
Wörther See
Millstätter See
Ossiacher See
Faaker See
Weissensee
Klopeiner See
Turracher See
Grundlsee
Altausseer See
Toplitzsee
Hallstatt
Bad Ischl
Gmunden
Bad Aussee
Salzburg
Hallein
Bad Gastein
Bad Hofgastein
Zell am See
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Weinviertel
Waldviertel
Mühlviertel
Hausruck
Kobernausserwald
Salzkammergut
Tennengau
Pongau
Pinzgau
Lungau
Zillertal Alps
Stubai Alps

STATUTE MILES

..... chateau, castle Gebirge ..... mountain range

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GERMANY
CZECHOSLOVAKIA
Area of large map
Vienna
LIECHTENSTEIN
AUSTRIA
SWITZER-LAND
HUNGARY
ITALY
YUGOSLAVIA
STATUTE MILES
Adriatic Sea

Candlelight musicale in a Viennese home keeps alive the grace and beauty of Mozart's music and age. Count Nikolaus d'Harnoncourt (right), his wife, and friends play instruments contemporary with the composer in the belief they should be used rather than displayed as museum pieces.

Gilt-and-brocade elegance of Empire days pervades famed Hotel Sacher, where a Chilean diplomat (right), an Austrian baron, and Viennese beauties linger over *Jause* (afternoon coffee). The waiter serves *Sachertorte*, a delectable chocolate cake originally created for Prince Metternich.

more elbow room, plus plenty of flower-scented air. Wentzel and I frequented one in the Stadtpark, where a waitress who had once met Emperor Franz Joseph served us *Sachertorte* —a layered splendor among chocolate cakes— and coffee avalanched in *Schlagobers*, or whipped cream. Here couples order *Krapfen*, pastries which maidens in love traditionally share with their young men—a delicious hint.

Coffee is one of the few vestiges of the Turks which the Viennese hold dear. On a small side street I saw the plaque commemorating the town's first coffeehouse, originated about 1683 by a Polish mercenary who found a sack left behind by the vanquished foe and decided to experiment. Worship of the bean has gone on steadily since those days, and in a peculiarly civilized manner.

The Austrian coffeehouse is a last refuge of leisure, a club for every man. Here one can retire, call for a newspaper, and vanish into the day's news without further fret. No one will bustle about, trying to sell you a full meal; no one will cough meaningfully as you spin out your cup of *espresso* the whole length of the *Times*. If you wish to chat, you may; if merely to contemplate the passing parade, that is all right, too. Some of the men ensconced behind their daily papers appear not even to have been dusted off for weeks.

Vienna a City to Explore Afoot

If one of the joys of Vienna is sitting down, another is walking. The tortuous streets of the old town, enclosed by the Ringstrasse, seem to follow the routes of forgotten brooks, meandering at random with many a pleasant, suddenly disclosed surprise. There are few better ways of getting to know a city than to get lost in it, and I, starting blithely out from my quarters in Jasomirgottstrasse (Yes-so-help-me-God Street), took constant advantage of the method.

Vienna is a city of grandeur, of the vast Schönbrunn and Hofburg palaces, of magnificent churches like the Karlskirche and St. Stephen's, of princely residences like those of the Pallavicini and the Schwarzenbergs (pages 192-3). But it is also the home of old shops in the Schönlaterngasse (Street of the Beautiful Lantern), of madly crowded antique galleries run by noblewomen, of little upstairs chapels like that of St. Stanislaus Kostka—brilliant and prismatic as a Slovakian Easter egg.

This is not to say that walking is without its risks. At a crossing one day I heard a Viennese, his jacket creased by a passing fender, sigh and mutter to his companion, "Ah, yes, we poor pedestrians. . . . They should poison the lot of us and get it over with!"

In some ways the pleasantest time to walk is at night, preferably on the hills of Grinzing, a vine-wreathed outlying quarter of Vienna. Here, vintners hang out branches of evergreen, indicating that they are entitled to sell the *Heurigen*—new wines laid down the previous fall. Especially during May and June the Viennese flock to these pleasure spots in droves to drink and to eat fried and broiled chicken and to sing and sing.

That is the joy of it, to wander homeward in the darkness, singing to oneself and listening to the clink of glasses and the ballads drifting through the open windows or over the hedges, not raucous but merely gay.

Songs and Laughter Enliven Suburbs

The whole hill seems to be alive with gentle laughter and so, one imagines, are all the other neighboring soft-lit hills beneath the Kahlenberg and out towards Gumpoldskirchen.

Rather pompously, Britain's Edward VII announced years ago that "The Viennese know not of satiety but sing, dance and love in perpetuity." There are times, under a vernal moon, when the King's appraisal appears not too farfetched.

But Vienna is more than a setting for some lighthearted comic opera by Strauss. It is also a great showcase of Baroque, a cradle of musical and medical genius, and a city rapidly re-creating itself.

I came almost ignorant of Baroque and quite prejudiced against what struck me as "ornateness." I did not remain so for long.

My mentor was Dr. Sonja Jordan, an attractive young Ph.D. who needed all her five or six languages to convey a fraction of her passion for Baroque. She guided me for several days through Vienna's treasures, leaving me at the end limp but convinced.

Beneath the Karlskirche dome (page 194) she would explain, "See, it is like a cascade of grace falling from heaven. That is Baroque—a flow, a movement, a bursting through the classical forms of the Renaissance!"

Before the great staircase of Prince Eugene's Stadtpalast, she would point out, "It moves, it moves upward, like a fountain in reverse."

Gazing at the undulating façade of the

Sunset: the Winding Danube Canal Drifts Past the Haze-haunted City of Dreams

"Lovely Vienna, so gay, so free" run the words to a popular waltz. But Austria's capital mixes melancholy with gaiety. The spire of St. Stephen's

Cathedral soars like a song, yet the scaffolding evokes memories of World War II shelling. New buildings bespeak a renaissance; derricks tell of ruin. A paddle-wheel steamer sails out of the Danube Canal today on wine and dance cruises; the stream saw Russian troops only yesterday. 185

Piaristenkirche, she cried out: "There it is—on the outside, the restlessness that pervades Baroque, like a melody, and on the inside, a view of heaven here and now, all pink and blue and gold, with such a fragrance, and little angels everywhere! How can one resist it?" And she stamped her foot in pretty irritation.

For those who pursue a musical rather than an architectural pilgrimage, Vienna provides the same embarrassment of riches. "Mozart houses" are many—perhaps, as someone suggested, because Mozart couldn't pay the rent and had to keep moving.

"Well," my friend Wentzel commented, "they're getting their rent money back now."

Beethoven has given his name to even more residences; he moved when he learned that neighbors were listening to his playing. You can visit the sumptuous salon in the old Palais Lobkowitz where he conducted his *Eroica* symphony (it now houses the Institut Français), and over in the Museum of the Society of the Friends of Music you can see an *Eroica* manuscript on which Beethoven himself erased the name of Napoleon from the dedication. Enraged at Bonaparte's declaring himself emperor, the composer stormed, "Is he, too, nothing more than an ordinary human being?"

Strauss Family Fished in Danube

Memories of the great jostle one another. There is the dying Haydn, having himself carried to the piano to play three times the Austrian national anthem he had composed. There is Schubert at a funeral feast, toasting "To him who will be next!"—which chanced to be himself. There is the whole family Strauss fishing on the banks of the Danube. There are Brahms, Bruckner, Mahler, Wolf, and Schönberg—a host of men who worshiped both the muse and Vienna.

The city's medical roster, including Freud and Adler, is scarcely less illustrious. Austria still has more doctors per capita than most other countries in the world, and draws its students from every nation. The University of Vienna, when I visited it, had on its rolls several hundred students from Syria, Egypt, Iraq, and other far-flung lands.

For Vienna's students the campus is the city itself, and a well-equipped one it is. Students board how and where they please.

As many come as are qualified; the university has no formal quota. Organized athletics are unknown: it is assumed that a student will do as much or as little as he likes to keep his circulation going.

I found the casually dressed boys and girls sunning themselves in the neo-Renaissance quad of the university's main building as informed as American undergraduates, but quieter. There was no horseplay; conversation was polylingual and hushed. Some boys went in for beards, girls for demure Victorian hairdos and the faintest of lipstick.

Juvenile Crime on Wane

Chancellor Raab had told me that crime among Austrian youth has declined markedly in the past few years, with more and more youngsters preparing themselves seriously for a career. For the first time in a couple of generations, they confront all the opportunities of an expanding, not a contracting, economy. Small wonder, then, that they can look to the future with a sense of both hope and adventure.

Austria is on the move. We could feel it and see it in both her achievements and her plans. Vienna itself has not merely plugged the toothless gaps in her profile left by war; she has built more than 50,000 apartments since 1949 and has as many more on the drawing boards. Twenty percent of the municipal budget now goes into housing.

A magnificent air-conditioned sports hall holding 16,000 has gone up, and the Prater's outside stadium is being enlarged from a capacity of 64,000 to 95,000. New schools and kindergartens, express highways, underground street crossings, a large airport, hospitals, skyscraper apartment buildings, and

(Continued on page 195)

Painting with a needle, a Viennese embroiderer preserves in petit point a bygone scene in Grinzing. A ruled pattern guides her in setting some 1,600 stitches to the square inch. The work, executed for Frau Skokan's shop on the Kohlmarkt, requires months to complete. It will adorn one side of a purse ordered by a British diplomat.

Paper frills and fancies tax the skill and imagination of fashion students preparing for a moonlight show on the grounds of Schloss Hetzendorf, their school home in Vienna. Here, aided by one of the world's largest libraries on dress style, young women study design, art, and textiles together with standard academic subjects.

Ballet Dancers Face a Blaze of Gold at the New State Opera House

In March, 1943, bombs hit Vienna's famed Opera House, which Emperor Franz Joseph built in the 1860's. As flames licked through the interior, Viennese by the thousands watched in tears.

Reconstruction began immediately after the war. Ten years later, as occupation troops left the city, Vienna appropriately reopened the Opera House to the strains of Beethoven's *Fidelio*, an immortal hymn to liberty.

A triumph in elegant decor, a miracle in stage mechanism, the $10,000,000 reconstruction symbolizes the nation's postwar recovery.

To take this picture in Super Anscochrome, National Geographic photographer Volkmar Wentzel literally became a part of the act. Having made friends with the manager, he mounted a ladder on stage as dancers assumed these final poses for a curtain call. When house lights went up, Wentzel made this single exposure. The result: a striking stage-eye view of artists reaping an evening's reward.

Opera Waltzers Swirl Like Radiant Pinwheels

Debutantes bow to society at the annual Opera Ball, climax of the carnival season (pages 188-9). The President of Austria looks on from his box above the orchestra; Vienna's elite pack five horseshoe tiers.

To capture the brilliance and movement of the dancers, the photographers deliberately opened the shutter for a long exposure.

Stone lacework and tiled roof of St. Stephen's Cathedral adorn the heart of Vienna. All Austria subscribed in repairing heavy war damage to the Gothic monument. Patrons of a near-by cafe absorb the view along with coffee with whipped cream, fruitcake-like bishop's bread, and Viennese *Mehlspeisen* (pastries).

Neptune's outrider salutes the public at Schönbrunn, where Marie Antoinette played as a child and Napoleon's son grew to manhood. Originally designed by J. B. Fischer von Erlach to excel Louis XIV's Versailles, the palace embraces 1,441 rooms—139 of them kitchens—and dozens of staircases. Imperial furnishings remain.

railroad stations have mushroomed almost overnight.

With all the building, the city's planners are nevertheless determined to lower Vienna's population density, not to raise it. They mean to insert green tongues of park and woodland into the metropolitan area, and on the southeastern sector they are already planting a tree belt seven to nine miles long to prevent erosion and shield Vienna from the biting winds of the Hungarian steppe.

Once famous for its "superblocks," Vienna is turning away from such fortresslike apartment houses toward units smaller, more colorful, and more gardenlike. Austria's architects have toured Scandinavia, and their enthusiasm for what they saw is already making itself felt.

As Prof. Erich Boltenstern, a leading architect who redesigned the Opera House auditorium, told me, "The Baroque is over. We love it, but we must express our own times and use our own new materials. Our aim isn't to show off the wealth of our archdukes, but to serve the community. In short, more schools, hospitals, town planning, traffic improvement, good zoning laws. . . ."

Professor Boltenstern smiled and waved his glasses at me gently. "Light, air, and grace," he said. "That is what we are trying to infuse into our designs today. That is the beauty which ought to go hand in hand with a strict concern for function."

Fairy Tales by Telephone

Disaster had, paradoxically, some advantages for Austria in reconstructing her economy: she could start from scratch in scrapping an old plant and replacing it with the latest and most efficient models.

One branch which has been thoroughly overhauled is communications. Its director, Dr. Benno Schaginger, told me of an emergency telephone with which he was experimenting—it plugs into an ordinary electrical outlet—and of the new, fully mechanized central post office just erected.

His greatest delight, however, seemed to be in the services anyone could summon just by dialing a number. Pushing buttons on a large control panel near his desk, he brought me over the phone a baby sitter reciting fairy tales and singing children's songs, classical and popular music, medical hints, help in doing crossword puzzles, information on film programs, snow and skiing reports, news, stock-exchange quotations, dictation for shorthand practice, true pitch for violinists, recipes, race results, and—not the least astonishing—a gentleman happy to help any child with homework.

"We can always tell when the teachers have handed out some pretty tough assignments," Dr. Schaginger chuckled. "Our circuits are jammed."

He added: "These services aren't free, you know. The subscriber is billed for them. Why, we made 200,000 schillings [$8,000] in six months—just from fairy tales!"

Dams to Increase Power Output

A national project now well advanced is the development of hydroelectric power. This has called not only for big dams up in the Alpine foothills, but also a great system of barriers along the Danube that will, in effect, turn the river basin into a chain of lakes.

Fifteen dams are planned, capable of generating 14 billion kilowatt-hours a year—as compared to Austria's present total consumption of 11 billion. They would improve, not hinder, navigation. Two-chambered locks would assure continuous traffic in each direction, and regulation of stream flow would not only eliminate costly floods but cover rocks, shoals, and narrows that now turn a Danubian skipper's hair gray. The lakes between dams would make the river even more of a playground for the Austrians than it now is.

Wentzel and I visited the first of these dams, one crossing the river between Ybbs and Persenbeug, on one of our several swings through the liberated provinces. But we found it hard to keep our minds for long on concrete and kilowatts; the Danube is too crowded with beauty. Besides, it was the eve of the summer solstice.

Munching strawberries as big as plums, we rode to the abbey town of Melk, where the great prow of the monastery—among the

"A Flow, a Movement, a Cascade of Grace": Karlskirche in High Baroque

Fischer von Erlach's masterpiece rose to fulfill a vow by Charles VI that he would build a church if Vienna were saved from plague. Inspired by Rome, the architect combined sacred and profane themes: 108-foot columns resemble Trajan's monument; reliefs laud a saint. The portico echoes a pagan temple; the dome, St. Peter's.

Like Flaming Candles, the Towers of Vienna's Town Hall Light the Night

A bronze angel looks across a park to the illumined beauty of the Rathaus. The Gothic-style structure adorns the famed Ring, where medieval fortifications once stood.

largest in the world—juts boldly out toward the river. A vast bastion of Baroque, Melk once held so much wine in its labyrinthine cellars that Napoleon's soldiery could lap it up at the rate of 6,000 gallons a day.

The monastery's fantastically rich library—one of the greatest of its kind in Austria—is heated no less fantastically. Huge round trap doors, elevated by bronze rings, are lifted to allow hot air from furnaces far below in the rock itself to rise and warm the monks' ankles.

River Lighted by Floating Candles

We cooled our own heels on the mud bank across the way, beneath Melk's proud towers, waiting for the Danube candle parade to begin. Presently, through the growing darkness, a twinkling tide of fire moved silently downstream. Thousands of tiny rush candles on little chips were borne along on the Danube's flood, and slowly in among them wove boats hung with golden lanterns. For hours the luminous procession bobbed past, to the chaps and sighs of the thousands of holidaymakers on either shore, while fireworks hissed upward above the town and exploded cheerfully.

We stayed too late to see, up in the hills, any of the older and wilder solstice rites, but we drove by the still glowing embers of bonfires through which the young boys of the countryside had leaped at midnight, a custom dating from dim pagan times.

Next day we floated serenely down the river from Ybbs on a steamer. Swept along by the impatient current, the ship creaked and groaned, swayed and yawed like a sailboat running before the wind. In the dining salon vacationing families dawdled over their stout lunches in unbuttoned ease, while groups of men played skat with enormous cards, steins handy at their elbows.

Up on the bridge we watched the terraced vineyards of the Wachau region march in even ranks to the Danube's edge, punctuated at every bend by castles of robber barons.

These tolltakers stretched chains across the river and hoisted flags warning all captains to heave to and pay their fee—or take a flying jump from the battlements. One of the worst was Schreckenwald ("Terror of the Forest"), who slept in his eyrie at Aggstein in a bed built of human bones (page 202).

Perhaps the best known of the ruins along this route, however, is romantic Dürnstein, whose gray stones cling to a cliff top a few miles above Krems. At the foot of the castle, embraced by its outer walls, crouches a tiny and exquisite village with perhaps the most beautiful clock tower in all Austria.

But it is the ruin itself which commands attention—thanks to a charming French ballad of the 13th century. According to this legend, Richard the Lionheart was held prisoner here by Duke Leopold for many a weary week, until his squire, Blondel, disguised as a troubadour, wandered beneath the walls and struck up one of his master's favorite songs. A sturdy voice took up the refrain from a high cell window, and Blondel, exclaiming "O Richard, O mon Roi!" knew his long search was over. Ransom followed.

Actually, Richard was released in a quite conventional manner on promise of payment of 150,000 marks. Part of the ransom paid for the fortifying of Wiener Neustadt, now one of Austria's chief industrial cities.

Our boat rushed on, passing young men in skiffs, barges from Yugoslavia, children in mid-current riding, as if they were surfboards, planks tethered to the bank. At Krems we disembarked.

Monastery Links Two Villages

This medieval town is actually two villages tied together, long known as Krems-und-Stein. The little connecting link, a monastery and a huddle of houses, is known as Und.

In Stein once lived a musician more famous for what he collected than for anything he wrote himself: Ludwig von Köchel, the collator of Mozart's works. Whenever you hear over your radio the announcement, "Symphony Number 40 in G Minor, Köchel listing 550," you are hearing the echo of a man's devoted lifework.

Across the river from Krems, where the magnificent abbey of Göttweig crowns a broad hill, another, more modern story of musical discovery recently cropped up. During World War II the Nazis ousted the monks and turned the monastery into a political school. When the Russians arrived, they quartered their troops in whatever rooms were handy—including the beautiful library.

Bored, the soldiers ransacked the place for jewelry, kicked in paneling, and ripped down tapestries.

Then, early in 1957, arrived an American musicologist, H. C. Robbins Landon, looking for lost pieces by Haydn. With the learned abbot he began poring over an old catalogue of *incogniti*, or anonymous authors.

Suddenly he found himself staring at the theme of a Haydn mass, dating from about 1750 but presumed lost since the early 19th century.

Was the actual manuscript still in Göttweig? Landon and the abbot rushed out to a sheaf of papers salvaged from a dung heap where the Russians had tossed them. Ten minutes later they gave a joyous shout: There in their hands reposed the yellowed document, intact, complete, after more than 150 years of oblivion.

North of the Danube is still, perversely, Lower Austria. Striking up into this remote and gently rolling land, Wentzel and I traversed the twin sectors known as the Waldviertel and the Weinviertel—the Wooded Quarter and the Wine Quarter.

Signs of Red Occupation Remain

This land of dark woods and shining castles, of steep-gabled hamlets and pleasant rivers has not gone unscathed by the deviltries of the 20th century. We motored across one area of wilderness near Waidhofen, a 12th-century gem of a town, where the Nazis had simply transplanted the inhabitants of 47 villages to other parts of Austria, just to make a troop-training center.

We passed, too, many a mansion devastated by Russian occupation. The once-lovely baroque chateau of Riegersburg, enlarged by the eminent architect Fischer von Erlach the Younger, we found a hollow shell. Russian tanks parked in the garden had ripped it to pieces; Russian trucks withdrawing to the east had carried away every piece of furniture. The caretaker, gloomily surveying the remains, estimated it would cost $120,000 to repair the basic damage.

Much, however, has been spared. Time has only added a further glow to the medieval glamour of multitowered Heidenreichstein. Across the glistening moat, in whose calm water was reflected the sturdy central keep capped by red tiles, we saw three booted and kerchiefed women slowly scything the grass beneath the beetling walls. They might have stepped right out of the 15th century.

From the serene past also seems to have come, fresh and unspoiled, the flower-girt monastery of Altenburg. We stood in the thick embrasures of its brilliant library and looked out across orchards and firs to the russet roofs of Schloss Rosenburg.

Russian troops had punched holes in the library's marbleized plaster on which to string their laundry. But the monks had restored most of the abbey to its former glory, and touring school children craned their necks again in awe at the soaring vistas on its ceilings.

To the north we followed gratefully the valley of the Thaya River, a wayward stream which ducks in and out of Czechoslovakia, heedless of political distinctions. At Waidhofen, Wentzel and I lunched with Burgomaster Franz Leisser.

Leisser told us of his many projects for getting Waidhofen back on its feet. But he did not appear much perturbed. After all, as was inscribed on his ancient City Hall, the town had been destroyed by the King of Bohemia in 1328, swept by a plague in 1613, besieged by the Swedes in 1619 and 1645, and seared by fire as late as 1873. What was one more affliction?

Time took a forward bound at Karlstein on the Thaya. We visited a watchmaking school where scores of youngsters were dissecting all manner of clocks and learning to make beautiful and intricate ones of their own. We toured classroom after busy classroom, but, as we came away, I realized I had forgotten to ask the Herr Direktor my only practical question: "What time is it?"

Fortress for $800 and Taxes

Downriver we came to Raabs. Beneath the castle's cliff-like walls, late afternoon sunlight slanted across the brown stream. Children were bathing in the Thaya, splashing diamond jets of water at each other. We crossed and clambered up a long ramp to the frowning portcullis, where Swedish cannon balls were still embedded in the gray stone. Only a caretaker with a gaggle of girls and one goat lived here now. We could have bought the whole fortress for $800 and back taxes, we were told.

We pushed on past Drosendorf overland to Austria's smallest city, Hardegg, with 312 inhabitants. Here is no fly-by-night incorporation; Hardegg got its charter in 1372.

A bridge spans the Thaya at this point—halfway, at least. For on the Czech side the planks have all been torn up. We walked out to the middle, sat awhile as trout flicked the water in the evening rise, and stared at the lifeless side of the Iron Curtain. In Austria, at our backs, the sound of singing came from

(*Continued on page 207*)

Cistercian monks amid the swirl and gilt of baroque fantasy examine bound treasures at 13th-century Lilienfeld Abbey. Their library preserves 27,000 volumes, including 280 in script and 119 printed before 1501. Paintings on the vault depict the life of St. Bernard of Clairvaux, who guided the order to influence in the 1100's. 199

ALL ILLUSTRATIONS BY NATIONAL GEOGRAPHIC PHOTOGRAPHER JOSEPH SCHERSCHEL © N. G. S.

Costumes on Parade Open the Apricot Festival in Spitz

In June Spitzers start picking apricots in their orchards alongside the Danube. Toward the end of the harvest, they pause for a party. Putting on the distinctive dress of the Wachau region, they kick up their heels in country dances and feast on apricot dumplings.

A young tester approves a fresh batch of dumplings. The recipe: pit and stuff an apricot with sugar; encase it in potato-flour dough; simmer for 10 minutes; roll in melted butter, bread crumbs, and sugar.

Threads of gold enhance the beauty of heirloom bonnets, some as old as 200 years. Ladies of Stein wear the caps.

Aggstein, Lair of a Robber Baron, Clings to a Crag Above the Danube

Schreckenwald, master of the castle in the 15th century, struck terror among rivermen. Stretching a chain from bank to bank, he stopped

boats and killed all who refused to pay toll. The story goes that prisoners were taken to the brink of a cliff and given the choice of leaping or starving to death. Attacking Turks reduced the stronghold to ruin. Far below, villages dot the riverbank; their vineyards climb the slopes.

Craftsmen at Stoob Shape Ewers and Vases

For centuries potters' wheels in this Burgenland village have turned out sturdy, decorative vessels for housewives and farm workers. Markets across Austria display the hand-crafted wares.

Water jugs designed for use in the field await shipment on the right. Evaporation through semiporous sides keeps contents cool.

Shelling corn near Mistelbach, members of the Donner family work in a courtyard surrounded by their 300-year-old farm home. Built to serve as a fortress during times of strife, the house presents a shuttered face to the world.

A pet duck accepts corn from the hand of a Donner girl.

a fisherman's inn; in Czechoslovakia we confronted only blank windows and silence.

From Hardegg we went to Retz. The center of town is a vast square, but its real heart beats beneath the cobbles; under the great plaza stretches a maze of wine cellars, some of them a mile long. The town, in fact, is said to be a good bit larger underground than above —though scarcely prettier, for its Renaissance houses are strikingly handsome.

Ski Tows Scale the Semmering's Peaks

Lower Austria is not known for mountainous scenery. Yet there is one corner of it which climbs abruptly to the snows: the Semmering, Vienna's Alpine playground (opposite). Here on even the lesser slopes the peasants farm nearly vertically; a haymaker keeps one hand for his rake, the other for a grip on the landscape; cows develop the agility of chamois.

There are fine climbs and walks throughout the Semmering, but it's not obligatory to use your muscles. You can also be wafted to the peaks in *Sitzlifts*.

Surely the pleasantest and most absurd form of transportation yet devised by man, these ski lifts present a wonderfully comic spectacle any weekend. Up and down a mountain in unbroken silence pass rows of sedate and solemn Viennese, like so many bourgeois angels on Jacob's ladder, the men, with briefcases athwart their laps, gazing stonily at the view, the women with fixed and comfortable smiles. Only an infrequent child shatters the calm with an irrepressible cackle of laughter.

I used often to wonder what the correct etiquette might be. Should one, as a stranger swings past on one's left, murmur, "*Grüss Gott*"? Or would a simple bow from the waist suffice? I never decided and learned to settle for the exchange of an occasional shy grin.

Over the whole upthrust scene the gleaming Schneeberg broods majestically, far more impressive than its 6,808-foot height implies.

If the Viennese of a summer's day is not taking the Alpine air, he is likely to be found taking the waters at Baden. This long-famous spa boasts a beach bath that can accommodate 10,000 people at a time. Its sulphur springs percolate some 1,400,000 gallons a day. Everybody down the ages has enjoyed these slightly odoriferous baths, from the X and XIV Roman legions to, I once read, a modern race horse named Pythagoras who cured a rheumatic leg here.

Under the Hapsburgs, Baden flourished as a sort of summer court. Beethoven and the poet Franz Grillparzer were in residence, and Mozart and Johann Strauss composed music here. Theater and concert and ballet amused one generation of gallants after another.

Now, guided by its stalwart burgomaster, Dr. Julius Hahn, who stayed in office somehow under the Russians ("with one foot in Siberia," as he put it), Baden caters to a less aristocratic but still appreciative clientele. Hotels and guesthouses can accommodate 2,000 visitors and patients overnight, and the number of beds grows weekly. Trotting races, the theater, concerts, and even a casino have revived. No industry is permitted in Baden, in order to preserve the purity of the health resort's air.

Electra Staged in Roman Amphitheater

Marcus Aurelius was fond of Baden's waters, but for the drama he preferred the amphitheater at Carnuntum, 30 miles away. I went there myself one evening in late June to see the Greek tragedy *Electra*.

The chorus were clad in white gowns, and their faces were painted chalk white; Electra herself, clad in crimson, was made up into masklike rigidity. The beat of a hidden drum was joined at times by a far-off flute, and over the whole eerie scene flickered an effect no stage manager could have planned: Heat lightning that threw into momentary relief the broken columns and green mounds of the half-ruined arena.

If "the East starts at Vienna," as many travelers have sensed, the smell and feel and taste of it take on real body as one enters Burgenland. The land flattens perceptibly; beyond lies the Hungarian plain—"my brother, the *puszta*," as the peasants call their windy realm. Flocks of geese commandeer the streets; storks stand deep in thought on the chimney tops; flotillas of

Oxen Pull Fresh-mown Hay Beneath the Awesome Schneeberg

Autumn scatters gold amid forests of evergreen in the Alpine valley in the Semmering region, Vienna's back-yard playground. Invigorating air and majestic scenery beckon summer visitors. In winter firm snow and steep slopes attract skiers.


FRÖHLICH OSTERN
FROHE OSTERN

ducks sail across the village ponds; a town crier beats a tattoo on his drum before reading aloud the day's news.

Burgenland means, literally, Land of Castles, and in their rugged fortresses the Esterházys and Batthyánys and other nobles guarded these marches and their own feudal fortunes with considerable success. The hamlets clustered below them still retain a shut-in, defensive air. Houses huddle shoulder to shoulder, with small windows, thick walls, great barred gates, and interconnecting passageways. To the marauder they present a cold, united front; their true life flourishes within their sunny courtyards.

Eisenstadt's Storks Winter in Egypt

Eisenstadt, capital of Burgenland, keeps, too, a slightly feudal air. The Esterházy palace looms over the dreaming town, and the principal showpiece is the modest little house of Haydn, who drew his patronage from the resident counts.

Haydn for most of his life spurned travel, clinging to Eisenstadt. I like to think that he consoled himself with the reflection: "My language is understood everywhere!" The storks of Burgenland, however, have no such stay-at-home notions. Each winter they take off on family-plan flights to Egypt.

Less choosy birds winter in the marshes of the Neusiedler See. By this body of water—20 miles long and only a few feet deep—nest the great bustard, the willow wren, the bearded titmouse, herons and geese by the hundreds.

People of Burgenland tend, naturally enough, to be pockets of many of the nationalities which, in the course of centuries, have washed over these borders, including Croats, Germans, and Magyars.

Take Oberpullendorf, Mitterpullendorf, and Unterpullendorf. The inhabitants speak German, Hungarian, and Croatian, respectively.

Old customs hang on. When a girl is born, her parents put violets in the oven so she won't get freckles. If a boy baby stretches out his hand toward money, it's regretfully assumed he'll grow up a thief; if he tries to clutch a whip, he's ticketed as a potential farmer.

A towering symbol of Burgenland's past is Forchtenstein, the Esterházy castle frowning over the vineyards of the Rosalien Gebirge (page 175). I crossed a timbered bridge over its moat one day and penetrated its inner fastnesses. On the walls of the sally port hung nine-foot muskets with one-inch bores and spiked wooden clubs suitable for ogres. A 100-foot passageway lined with gilded state coaches led to the great keep itself and a banquet hall decked with family portraits.

Forchtenstein could defend itself even now from all but artillery. Room after room, I found, contained racks of flintlocks, "siege rifles," pikes, bayonets, pistols—enough for a small army.

In cellars behind walls six to ten feet thick I saw whole floors of bridles, saddles, cuirasses, and helmets for the Esterházy hussars. Another basement contained field guns with enormous ironbound wheels of solid wood and mortars capable of throwing one-foot-thick stone cannon balls.

The castle's kitchen has a chimney hood 15 feet square and waist-high spits that could roast whole oxen. The almost bottomless well sends up a triple echo when you shout into it, and a flaming page of newspaper floats down the shaft until it seems no bigger than a cigarette butt.

Bell Clangs a Tribute to Beauty

In Forchtenstein's highest tower hangs a bell called Tota, after a 13th-century countess. So admiring was her brother that he ordered the bell to be emplaced and to ring out at sunrise and sunset in honor of her charms. The belle has gone; the bell remains; it still rings in remembrance.

Somewhat more up to date is the White Lady of Bernstein. Count Johann Almásy, our host, told us about her one evening as we were drinking a fragrant local wine called Bismarck in his vaulted Italianate dining hall.

"She was killed in the 15th century by her jealous husband," he explained.

"Later, it was discovered that she was quite guiltless; and ever afterward she has wandered about the castle in her Renaissance headdress, a green stone flashing from her forehead and her hands folded to one side of her chin.

Bonnets, Puffed Sleeves, and Dyed Eggs Say It's Easter in Stinatz

Following in the wake of Turkish invasion, many Croats settled in Burgenland's ghost towns. Their costumes remain distinctive (next page). These girls compare eggs whose inscriptions in German and Hungarian read, "Happy Easter."

"When Croatian girls are singing
To the tamburizza's sound,
You hear ancient lays a-ringing,
Every eye casts smiles around."

From such songs, handed down for generations, Burgenland's own Joseph Haydn composed melodies that swept the world. By adapting the folk music of the varied peoples in his native region, the master could say with pride, "My language is understood everywhere."

Here, in Stinatz, the younger generation learns from its elders the movements of wheel dancing. Grandmothers, hooded and gowned in black, relive the past.

Croatians both but Austrians first, a costumed couple radiate *Gemütlichkeit*, that good-humored, relaxed approach to life for which their nation is famous.

"She was last seen in 1937. Now, I fear, she has emigrated. At any rate, I've heard from a gentleman in the French Cameroons that a spirit answering her exact description appeared to him and addressed him in rather archaic Italian. Well, I don't blame her for leaving. The winters are cold here, and after a few centuries of that sort of thing the frost gets in your bones."

Castle Back in Family After 700 Years

Count Almásy himself has had the pleasant experience of "coming home" to Bernstein. The castle slipped out of his family's hands in 1199, and it was not until 1892 that they reacquired it.

He nearly lost it again in 1945. When the Soviet troops swept through, he obstinately stayed on. "After all, Bernstein is all I have," he explained. "Either they shoot me, or I keep it. Well, I kept it."

To prepare himself, Count Almásy hastily thumbed through a 17th-century volume in his library containing instructions on "What To Do When the Enemy Comes"—how to hide the silver and where to drive the pigs. But, as it turned out, his biggest break came when the first Russian soldiers, machine pistols in hand, explored Bernstein in amazement and turned back to him asking: "What *is* this place?"

Desperately, he thought of an answer: "Well, really, a sort of museum."

"Ah! A museum! And you are the director?"

"I suppose you could say that."

It was lucky he could. The Russians, it turned out, had orders to leave all museums strictly alone.

"These battlements," said the Count, "they proved invaluable. The troops down in the village couldn't scale them, and I kept the gate locked."

Along roads through this historic region once flowed an exotic traffic in bronze from the Burgenland and amber from Byzantium. The so-called jade of Bernstein, a green translucent stone of gentle beauty, still moves north in well-wrought cups and jewel boxes and *objets d'art*.

"It's really a magnesium silicate," said Count Almásy regretfully, "without the toughness of genuine jade. If it were true jade—ah, well, I'd be a millionaire."

The count could accept his loss of a theoretical fortune with amiable philosophy. And in this ability to adjust gracefully to the limitations of reality he was at his most Austrian. He and his fellow countrymen see their nation now in a position to mediate modestly between East and West.

Pledged to neutrality, yet firm in their own rejection of internal Communism, Austrians stand as a kind of bridge spanning the ideological frontiers of the cold war and as a monument to the possibilities of long, dogged, and flexible diplomacy.

Already Vienna has been chosen as the site for the International Atomic Energy Agency, the offspring of President Eisenhower's "Atoms for Peace" proposal. And there has been some agitation to make the city the capital of the Council of Europe, advance guard of the hoped-for United States of Europe.

From month to month Vienna entertains scores of other groups: journalists, biochemists, historians, geologists, bankers.

Tact Is Vienna's Long Suit

To this demanding role as host, mediator, and diplomat, Austria brings impressive talents. I was reminded of them strongly when, as I wandered through a historic room in the Chancellery, I was told of a legend widely quoted in Vienna. As my informant explained:

"This is where the delegates first met for the great Congress of Vienna in 1815, at which the fate of Europe was determined. Originally, the salon had only four doors, and the problem was this: How could the crowned heads of five proud states agree on who was to enter and leave first?"

Austria, as the host, made a simple and characteristic decision: overnight, another door was added to the hall. At the critical moment, without loss of honor, all of the monarchs who were guests in Vienna—the Tsar of Russia and the Kings of Prussia, Denmark, Bavaria, and Württemberg—could step across the threshold at the same time.

The doors are still there. And Austria is still prepared to open them.

Güssing Castle Crowns the Basalt Cone of an Extinct Volcano

Fissures at great depths warm waters for a chain of healing springs in Burgenland. Houses cluster beneath this one-time fortress like chicks under a hen's wings.

NATIONAL GEOGRAPHIC PHOTOGRAPHER VOLKMAR WENTZEL

1914 Beverley M. Bowie 1958

MEMBERS of the National Geographic Society, who have known Assistant Editor Beverley M. Bowie through his beautifully written articles in their Magazine, will share with the officers, trustees, and staff a deep sense of loss in his untimely passing at Bethesda, Maryland, on November 15, 1958, at the age of 43.

Author of "Building a New Austria," on the preceding pages, and of many other articles in the National Geographic, Bev Bowie was a brilliant writer whose lustrous style was at once the envy and the pride of his colleagues. He wrote rapidly, always in longhand.

His Austrian assignment—his last overseas —produced three articles: "The White Horses of Vienna," in the September, 1958, number, the one in this issue, and a delightful word picture of the Salzkammergut, to appear later. In England on the same trip he obtained a fourth article—his memorable account in November, 1957, of the round-the-world travels of Prince Philip.

Mr. Bowie was born in Richmond, Virginia, and graduated from Harvard in 1935 *magna cum laude* and Phi Beta Kappa. He held editorial posts on several magazines and also worked for the Department of State's research and intelligence division. He was decorated for intelligence work in World War II; as a naval officer attached to the Office of Strategic Services, he was one of the first Americans to land in enemy-held Romania.

He joined the National Geographic in 1951 and became an Assistant Editor in 1957, contributing greatly to the Magazine by his talents and taste as editor and critic as well as by his genius as a writer.

Mr. Bowie could write with tremendous emotional impact, as in his "Known but to God" in the November, 1958, issue. But he particularly delighted in articles that gave full play to his deft humor. Then his words sparkled, and his sentences smiled.

In addition to his many magazine articles, Mr. Bowie was the author of a satirical war novel, *Operation Bughouse*, and a posthumously published book of poems, *Know All Men by These Presents*, written during his last long illness.

For almost two years Beverley Bowie lived and worked beneath the lengthening shadow of cancer. But no darkness could quench the light of his personality. He faced death with gallantry, poise, even wit. And in the end he dominated it.

1913 # George W. Long 1958

EVERY ISSUE of the National Geographic, month in and month out, bore the impress of the mind, heart, and talent of Assistant Editor George W. Long. On November 9, 1958, George Long was lost in line of duty when a Portuguese seaplane flying from Lisbon to Madeira was forced down at sea and vanished without trace. He was 45.

Besides contributing many articles to the Magazine on subjects ranging from California to Yugoslavia, from the St. Lawrence River to Iran, and from Hong Kong to Montana, Mr. Long played an important part in the planning and preparation of the Magazine, working closely with the Editor and Associate Editor. Combining unusual administrative ability with his editorial talents, he coordinated the efforts of the editorial, illustrations, cartographic, research, and other departments in preparing each issue and meeting the monthly deadlines.

A native of Haddonfield, New Jersey, Mr. Long attended Amherst College, where he received B.A. and M.A. degrees in American history. He taught this subject for ten years, before joining the staff of the National Geographic in 1945. In 1953 he became an Assistant Editor.

George Long carried his heavy and exacting editorial and administrative duties with unvarying calmness, efficiency, patience, and consideration for others. His scholarly zeal for accuracy, his insistence upon the right word or phrase, his quiet humor, unfailing good taste, and alert, well-trained mind made him an outstanding National Geographic editor and writer.

On his last trip abroad, Assistant Editor Howie jots notes on the back of a Lipizzaner colt at the stud farm of the famed Spanish Riding School near Vienna. His travels took him from Austria to Indonesia, and from Buckingham Palace to colonial Williamsburg. The reports that he fashioned reflected vividly the humor, the drama, and the realities of the world we live in.

Amid splendors of glacierland, Assistant Editor Long and daughter Judy interview a small cowboy. Between months of arduous duty at his headquarters desk, Mr. Long found refreshment exploring the American West with his family. He considered Glacier National Park and its Canadian counterpart, Waterton, a kind of paradise. Here, he wrote in the May, 1956, issue of the Geographic, lay "a place of solitude where the world and its worries seem a universe away."

As snow blankets slopes from coast to coast, millions of Americans mount seven-foot hickory boards to schuss, jump, and slalom

Skiing

IN THE UNITED STATES

Article and photographs by

KATHLEEN REVIS

National Geographic Staff

POISED at the top of the slope, the six skiers checked their equipment: boots snugly laced, bindings secure, skis properly waxed. Then, with wet snow whipping their faces, they pushed off down Massachusetts Avenue, in the heart of the Nation's Capital.

Motorists peered incredulously through frosted windshields and pedestrians leaped aside as the skiers poled past the stately mansions of "Embassy Row."

These snow-starved members of the Ski Club of Washington, D. C., were merely welcoming an unusually heavy snowfall by doing what comes naturally. For all across the United States the first snow flurries cause a growing army of skiers to head for the nearest incline. In 1958 several million enthusiasts left their sitzmarks at winter resorts from Maine to California.

The sport has spread far beyond the snow belt, and organizations like the Washington Ski Club—one of the larg-

Geländesprung! Snow spumes hip-high as ski instructor Bill Briggs executes a running jump, or geländesprung, on Cannon Mountain near Franconia, New Hampshire. Using a knoll as a springboard, he digs his poles into the snow, tucks his feet up, and hurtles through the air.

est in the East, with 800 members—typify the fervor of its adherents. In their search for accessible snow-covered slopes, club members scouted the too-sunny hinterlands until—eight years ago—they found a suitable site at Cabin Mountain, near Davis, West Virginia.

Contributing their own time, money, and ingenuity, the Washingtonians have fashioned a remarkable ski area out of 40 acres of Allegheny Mountains farmland. Here, 45 miles below Mason and Dixon's line, snow is a sometime thing. But winds pile up deep drifts on the mountainside, assuring an average of 10 skiing weekends a year.

Skiing Fever Rekindled

Winter was at its frozen zenith when I motored the 185 miles from Washington to Davis. On the ski slope, a blond girl with a southern accent offered to lend me her equipment for a run down the hill.

Having been on skis once or twice before, I was familiar with the snowplow. In this basic method of control, you angle your skis into a V shape. As you descend an incline, the snowplow exerts a steady braking action. And by rotating your body, you can effect a slow, sweeping turn. As I carefully slid down Cabin Mountain that day, the skiing fever was rekindled in me. It has been burning ever since.

What is the fascination of sliding down a hill on two boards? Chiefly, there is the sheer exultation of speed—skimming over clean snow with the wind tearing at your face. Daily frustrations are forgotten. Alone, the skier pits his skill against nature in its most glorious setting—the high, wild solitude of the winter mountains.

The spirit of camaraderie comes into its own after a long day of battling the snow. Generally a group clusters around the hearth in the lodge. The flames of a roaring wood fire reflect redly across relaxed faces. A guitar may strum in mellow counterpoint to the crackling fire and voices blend in old, well-loved songs:

On top of old Smoky
All covered with snow
I lost my true lover
From courting too slow.

Cabin Mountain, where skiers sometimes have to fight off the cows, harks back to the days when a handful of enthusiasts first popularized the sport in the United States. While ski jumping had come to Michigan and western States with Scandinavian immigrants, the downhill run made its bow as a sport in the early 1900's in New England.* Time and popularity have now transformed these pioneer slopes into well-organized resorts where lifts and tows hoist skiers to the heights with clocklike precision, and expert instructors teach them how to descend in graceful, swooping turns.

My arrival at New Hampshire's Cannon, or Profile, Mountain coincided with that of some 200 U. S. and Canadian youngsters who were to ski in the National Junior Championship races. Volunteers from the Franconia Ski Club were busily packing the snow for the first race when I arrived at steep Zoomer Trail. Bright flags fluttered from the bamboo poles marking the slalom courses. Here I would see skiing's most exciting competition (page 245).

Slalom Skiers Race Against Time

The slalom racer—who runs against the clock—must streak between the poles in a sharp zigzag pattern. Success requires fantastic speed and absolute control.

Just as I reached the top, the first racer exploded into view. Snow sprayed as he dived and twisted between the poles. In mere seconds he shot out of sight over the brow of the hill. Another skier followed immediately. Body low, he too careened through the course like a low-flying hawk in pursuit of some frantically dodging prey.

The next day fog shrouded the mountaintop and a wind-driven snowstorm cut visibility still further. This boded ill for the risky downhill races. Here speed is paramount; as

* See "Mountains Top Off New England," by F. Barrows Colton, National Geographic Magazine, May, 1951.

Swirling Snow Dots Skiers Riding a T-bar Tow up Spruce Peak, Vermont

An army of skiers, variously estimated at three to five million, invades the American highlands each winter. In the last quarter of a century more than 400 ski areas have been developed in 28 states, from Maine to California, and from Canada to Mexico.

Spruce Peak and its neighbor Mount Mansfield offer some 20 miles of trails and slopes. Both lie near Stowe, one of the East's earliest and largest ski resorts.

a skier rockets down the mountain, any unseen bump or patch of icy snow can mean a spill and perhaps even broken limbs.

I shivered with cold on the hillside as, one after the other, crouching contestants hurtled out of the mist, skis chattering. One snow-spattered form swept past—a girl barely in her teens. A nasty spill had jarred her goggles loose and tears streamed down her cheeks. She flashed by, disappearing into the overcast. But in her face I had glimpsed something indomitable.

Later I met Roger Peabody, executive director of the U. S. Eastern Amateur Ski Association. "Competitors like those kids out there today," Peabody told me, "are the forerunners of the sport. They test equipment under extreme stress, they improve on technique, and their performance lures spectators into taking lessons. The sport would be lost without them."

Two Spectators for Every Skier

Peabody's interest in skiing dates from 1929, when he attended Sig. Buchmayr's classes at near-by Peckett's on Sugar Hill —the first resort in the United States to engage a European ski instructor. "There were only seven of us in Sig's first class," he recalled, "but we drew a crowd of 15 eager spectators who couldn't wait to see the darned fools break their necks."

Peabody's father, Roland, who learned to ski at the same time, was largely instrumental in developing Cannon Mountain's magnificent winter sports facilities, operated by the State of New Hampshire (pages 217 and 222).

Another of the early New Hampshire ski centers that has prospered with the years is North Conway, 18 miles south of Mount Washington, mightiest of the White Mountains (opposite). A skier climbed this massive peak as early as 1899, setting an example that is followed every spring by die-hards who trek two and a half miles up the east flank. There Tuckerman Ravine, a glacial cirque where snow sometimes accumulates to a depth of 120 feet, offers skiing until late in June.

It was snowing when I climbed aboard one of the "kiddie cars" of Cranmore Mountain's unique Skimobile (page 224). At the head of the North Slope I snapped into my bindings, dug my poles into the snow, and pushed off. As I picked up speed, I realized that this was unlike any snow I had ever skied on. Small granular pellets acted as ball bearings under my skis. Turning became effortless, and self-confidence soared as I suddenly realized that for the first time I was skiing with both speed and control.

Steel-edged hickory sang the sweet *wis-s-s-s* so dear to a skier's heart as I shot down, down past a blur of silent trees. At the bottom I came to a halt in a spray of snow. The memory of such rare perfect runs is enough to keep any skier trying, long after the fresh snow has rutted and his old faults have returned to haunt him.

Next morning the Boston radio reported roads choked by a blizzard. At North Conway seven inches of fresh powder covered the old. The skiing was slow and easy as I poled my way to Cranmore Mountain, where Sno-Cats with rollers busily packed the new snow.

These slopes are among the best groomed in the United States. When the famous Hannes Schneider—Austrian creator of the Arlberg technique that revolutionized skiing—came

Sno-Cat Tamps Slopes for a Class on Cranmore Mountain, New Hampshire
The late Hannes Schneider, famed Austrian instructor who fathered a modern technique of skiing, took charge of this school at North Conway in 1939. Today his son Herbert (center) directs operations on Cranmore's slopes in the White Mountains. In the distance, solid white snow blankets Mount Washington, New England's loftiest peak

here in 1939, he insisted that all stumps and rocks be removed from the runs. Special grass that grows until late fall provides an ideal base for snow. In icy conditions, a platform of chains and calks—locally called "the magic carpet"—is dragged across the surface. When the abraded layer refreezes, it forms a pulverized ice.

Later that day I saw clusters of skiers—each group shepherded by an instructor—deployed across the mountain learning variations of the stem turns perfected by Schneider. I made one long run myself down North Conway Trail in a series of linked stem christianias. In this turn, sharper and faster than the snowplow, you shift your weight and rotate your body so that the skis slip sideways, effecting a rapid change of direction. Nothing in the long history of skiing has contributed so much to its popularity as the development of the fast, controlled turn.

The origins of skiing are lost in the mists of prehistory, but archeologists surmise that men first employed long boards or bones to travel across snow of central Asia several thousand years ago. In Norway and Sweden scientists have found actual skis dating from 4,000 to 5,000 years ago. As early as A.D. 1200, Swedish soldiers were using skis in winter campaigns; later, by fastening animal skins between the

Snow-smothered Trees Line Tramway Trail on Cannon Mountain

A wan winter sun spotlights the hoary crown of Mount Lafayette across Franconia Notch. The

Franconias and the Presidential Range dominate the lordly White Mountains. An aerial tramway (not shown) lifts skiers to the summit of New Hampshire's 4,077-foot Cannon.

Rubber-tired Cable Cars of the World's Only Skimobile Whisk a Thousand Skiers an Hour

skis, they devised a crude battlefield stretcher.

In 1507 the Persian writer Rashid al-Dīn described skiing among the Mongols: "In their land are many mountains and woods where snow falls in abundance, so they hunt eagerly in winter on the frozen snow. For this purpose, they make boards out of wood, which they call *sang or hamz*, they fasten them on their feet with straps, take a staff in their hand and press this staff against the earth, so that they glide on the upper surface of the snow, as one goes in a canoe on water."

By the middle of the 19th century skiing had graduated from its purely utilitarian character and, particularly in Scandinavia, people were doing it for fun. Cross-country racing and jumping thrived in Norway, and Norwegian immigrants brought their skis when they resettled abroad. But it was the Arlberg technique of the Austrian Alps that emancipated skiers from the sedate upright style of the north countries.

The next stop on my swing through the Northeast was Stowe, Vermont, a typical New England town dominated by a church spire. Severely plain farmsteads—interspersed with ultramodern ski lodges with big picture windows—dot the valley between the town and Mount Mansfield, six miles to the northeast.

The air was crisp and snow crunched underfoot, and as I rode up Spruce Peak, the sun shone warm on my back. Swinging through the air, I had a bird's-eye view of Mount Mansfield and the ski trails on its flanks.

up the Slope of Cranmore Mountain

After several sorties down the winding two-mile length of Sterling Run, I girded myself for the more exciting challenge of Mount Mansfield itself. But once aloft on the mounting lift, I had second thoughts. From my chair I could see skiers whizzing down the mountainside at speeds that left me breathless.

At the top a ski patrolman, wearing a red parka with a white cross on the back, reassured me: "You'll enjoy the Toll Road. It's the oldest run we have, and relatively easy."

"Well, here goes," I thought, as I dug my poles in to shove off. "At least I can count on the ski patrol to pick up the pieces."

It wasn't always so. In the late '30's a skier from New York City, Charles Minot Dole, fractured his ankle while skiing on the Toll Road. He lay in the snow for an hour while a friend went for help. Then Dole was hauled down the slope on a piece of corrugated tin, without benefit of a splint. More than two and a half hours after the mishap, he finally reached a doctor. While recovering, he learned that a good friend had died as a result of another skiing smashup.

Something clearly had to be done to prevent such accidents and to care for the victims of those that did occur. Thereafter Dole worked tirelessly to promote safe skiing. Largely through his efforts, the National Ski Patrol System came into being in the fall of 1938.

Recruited from the skiing elite, national patrolmen are specially trained in first aid. Since they must rely solely upon the power of persuasion in dealing with obstreperous skiers, they should also possess tact and judgment.

In the 20 years of its existence, the patrol has come to the aid of almost 185,000 accident victims and has saved at least 66 lives. Na-

Every five seconds a car heads for the top of 1,680-foot Cranmore. The tramway's two units carry passengers a distance of 5,000 feet, with a change at a halfway station. The mountain's smooth, grassy slopes, which assure skiers of good sport with as little as four inches of snow, have transformed near-by North Conway from a placid village to a bustling winter resort.

tional Ski Patrols now operate in Alaska, as well as with U. S. military units in Germany. Canada and Chile have patterned their skiing first aid after the N.S.P.S.

The long run down the Toll Road completed, I made my way back down the valley toward Stowe. At a farmhouse I stopped to visit Charles Daly, president of the U. S. Eastern Amateur Ski Association. Daly reminisced about the early days of skiing at Stowe.

"I'd been coming up from New Jersey ever since the railroad started a snow train in 1936," he said. "Finally I decided to move entirely. So here I am. But in the '30's skiing was more exhausting than it is now. We had few lifts; you had to walk up to the top after each descent. About two downhill runs a day was par for the course."

Lumberjacks Brought Skis to Michigan

Daly's 16,500-member organization is one of seven regional divisions of the National Ski Association. This body—the overseer of U. S. skiing—was founded in 1904 in Ishpeming, Michigan, where Scandinavian lumberjacks had introduced skiing long before the turn of the century.

From Stowe I went west and dropped in at N.S.A. headquarters in Denver, Colorado. There I met ex-president Robert C. Johnstone and National Ski Patrol director William Judd. All elected officers work without pay for the cause of better skiing.

The N.S.A. supervises competitive ski events throughout the country. "And," Judd told me, "surprising as it may seem, we found in a recent survey that 15.4 percent of American skiers participate in competition."

Equally mindful of those who ski only for recreation, the N.S.A. promotes safe and courteous sport through education. Surveys have indicated that 50 percent of the victims of skiing accidents had taken no lessons. The organization sponsors certification tests for instructors to guarantee top-quality ski schools throughout the Nation.

From downtown Denver I drove through the chill glory of a western sunset to Steamboat Springs, which bulged with visitors to the annual Winter Carnival. Every available room in town was occupied, and cots had been set up in the elementary school gymnasium for a group of 50 girls. The Chamber of Commerce came to my rescue and billeted me in the home of vivacious Mrs. Dee Richards.

The town, boasting some 150 medicinal springs, derived its name from one that made a chugging sound like the exhaust of a river boat. Lying in the Yampa Valley almost 6,800 feet above sea level, Steamboat ranks as one of Colorado's earliest ski centers.

In the morning I awakened to the sound of children's voices. A shaft of sunlight beckoned me to the window, where I was overwhelmed by the sheer magnificence of the view. To the east rose snow-capped mountains, cloaked in spruce and aspen. Across the sparkling, snowbanked Yampa River lay the ski slopes of Howelsen Hill.

At breakfast I met the other members of the family: five children and two dogs. Eight-year-old Tommy hobbled about with one leg in a cast.

"Tommy's grandfather took three of the boys on a skiing trip to Aspen," Mrs. Richards explained. "On his first run from the top of the mountain, Tommy fell and broke his ankle. When Father phoned to tell me, all I could say was, 'Oh, no, not another.' Earlier that same day one of our dogs, Sitzmark, had been hit by a car, and the vet had just called to say her leg was broken. As you see, Sitz got out of the cast first."

Main Street Becomes Race Course

Carnival events were to start at 9 a.m. on Lincoln Avenue, which is also transcontinental U. S. Route 40. To keep through traffic moving, the State Highway Department usually removes snow from the main street as quickly as it falls. But for the carnival, trucks hauled snow back into town, and it was plowed onto the race course.

When we arrived at Lincoln Avenue, barricades were diverting traffic, and riders warming up for the skijoring races were galloping their horses along the street (page 232).

In one race I watched a teenager work her way along the tow rope, hand over hand, as she slid along, until with a final tug she

Trail Blazers Etch Parallel Grooves Beneath Boulder Peak, Idaho

Spectacular alpine scenery enhances an exhilarating run through virgin snow by youthful employees at near-by Sun Valley, one of the Nation's most famous ski resorts (page 248). Rosmarie Bogner (foreground) wears the Bogner ski pants designed by her father. The nylon-and-wool stretch pants set a new trend in skiing wear a few years ago.

Making a high-speed turn, Lloyd Newman kicks up a wake of snow on the approach to Nose Dive, Mount Mansfield. With skis held almost parallel throughout the skidding turn, he swoops and circles and brakes in one long, continuous movement. Snow-clad evergreens typify the mountaintop forests of New England. In the Far West (opposite), the dry, light-as-dust snow rarely sticks to the trees at high altitude.

Double Chairs at Alta, Utah, Hoist Skiers to the High World of the Rockies

Alta, a booming silver-and-lead camp in the 1870's, and later a ghost town, was rediscovered by winter-sports enthusiasts in the mid-1940's. Avalanches frequently block the narrow canyon route connecting the resort with Salt Lake City, 29 miles away. Here skiers, queuing up for the lift at the base of Peruvian Ridge, watch riders climbing to Germania Pass. The tang of spruce spices the thin, cold air.

In the distance Flagstaff Mountain thrusts its peak through snow flurries.

lunged ahead of the horse that was pulling her. Among racing 6-year-olds I caught sight of my cohostess, Pam Richards, pony tail swinging back and forth in time to the slap of skis. Dick successfully speared a series of four rings suspended along the skijoring course, and Bruce came in first in a street slalom.

Ski Carnival Started by Norwegian

During the carnival I met a skier whose enthusiasm was undimmed by the years. Miss Marjorie Perry hadn't missed one of the 45 that have been held in Steamboat Springs.

"Carl Howelsen, a Norwegian, started the carnivals," she told me. "He came to the United States with a circus and once performed a ski jump in Madison Square Garden on a slide greased with vaseline for speed. Later he moved to Denver; then in 1912 he came to Steamboat and a year later originated our carnival.

"Carl had quite a time convincing the townspeople that skis had to be tied on for jumping. Mothers said their children would surely break their legs that way, so the kids went off the jump with boots thrust through a strap on each ski. As often as not, the skis would fly off in mid-air.

"We girls skied in skirts. It was hard to get cloth by the yard then, and flour sacking was used to make odds and ends of clothing. I remember one girl taking a spill: her skirt flew over her head and on her underclothes we read *Pride of the Rockies*."

Climax of the Steamboat Springs carnival came with the night events on Howelsen Hill. I stood among the spectators as a steady line of skiers ascended the floodlit slope via the T-bar tow. Promptly at show time, the lights went out. Somewhere in the sudden blackness a luge hoop burst into flame. From high above, a skier brandishing a torch in each hand started down the hill. Heading directly for the burning hoop, he gathered speed and then, at the last second, leaped through the circle of fire in a high, graceful arc.

Two lines of torch-bearing skiers then crisscrossed the hill in S-shaped curves (page 254). Following the crowning of the carnival queen came the exuberant finale: a pair of skiers kiting through the darkness exploding fireworks to left and right.

On Monday morning, with the carnival over for another year, Pam approached me after breakfast. "Won't you come to school?" she asked. "We're having our skiing lesson today."

When I arrived at the school, Coach Crosby Perry-Smith was marshaling his troupe of first and second graders. As I watched, he showed his apple-cheeked pupils how to glide their skis across the surface of the snow (page 234). They side-stepped up the gentle slope, and he demonstrated the proper method of crouching on skis, with knees bent and hands ahead and to the side.

One by one, the tots "schussed the hill." One laughing girl took a real spill, shooting out of her skis and ending up like a chubby snowball. As she uncurled, I noticed that her boots were still firmly in the ski bindings. She had fallen right out of them (page 237).

Steamboat Springs has produced a bumper crop of Olympic skiers. Among them is Gordon Wren, a three-time member of the U. S. team and one of only 14 Americans in the National Ski Association's Ski Hall of Fame. Gordy, who now heads the Reno, Nevada, recreational skiing program, often grows nostalgic for his home town.

"I'll never forget my childhood in Steamboat," he told me. "There were so many things for kids to do. We could step outdoors and walk to good fishing, go riding, or camp and hunt in the mountains. Along with a lot of the other kids, I spent every winter on skis. The carnival triggered our interest, and the townspeople made it possible."

Skiers Bring New Prosperity to Aspen

As Steamboat Springs' enthusiasm for skiing grew with the years, another Colorado town, Aspen, slept peacefully beneath the winter snows. The dreams it had—if any—were of past glories: of the 1880's and '90's when a flood of miners, spilling over Independence Pass from Leadville, had struck it rich in the region. By 1892 the new mines were producing $6,000,000 a year in silver

Body Bent, Arms Stretched Like Wings, a Jumper Vaults into Space

Howelsen Hill at Steamboat Springs, Colorado, witnessed the record American jump of 316 feet by Anston Samuelstuen in 1951. Top form demands skis held close together, tips raised slightly. Upper body should form an angle of approximately 30 degrees with the direction of flight until skis almost touch the landing slope.

Galloping Cow Pony Drags a Skijorer Through Downtown Steamboat Springs

Favored with deep snows, Steamboat Springs in the Rockies calls itself the skiingest town in the U. S. A. A three-day sports carnival attracts thousands of visitors each February. Guests crowd into private homes; public buildings serve as dormitories. U. S. Route 40, the town's principal thoroughfare, turns into a race course.

In the original Norwegian version of skijoring, the skier drives the snorting horse with long reins, but Steamboat Springs uses a variation. A cowboy hitches his lariat to the saddle horn and rides the icy highway at breakneck speed. The skier, clinging to the rope, skims through a hail of ice chips raised by the pony's hoofs. A bruising skid awaits any skijorer who falls.

Olympic stars of 1972? Perhaps this line-up includes some future greats, for schools in Steamboat Springs teach skiing along with reading and arithmetic. Too young for skijoring, these contestants use ski poles to push down snowy Lincoln Avenue in a race for six-year-olds.

Youngsters in an obstacle race squeeze through the rungs of a ladder, then scurry to their feet and press on to the finish line. Winners earn goggles and ski mitts.

and lead ore; Aspen's population had skyrocketed to 11,000; two railroads had pushed tracks into the valley, and 10 passenger trains a day roared into the booming town.

Next year, with the repeal of the Sherman Silver Purchase Act, came disaster. Mines closed; banks failed; miners and their camp followers departed in droves.

In 1930 only 500 people lived in Aspen. But by then skiers were prowling the mountains in search of suitable slopes. Swiss expert André Roch came to survey the region, and fathered the Roch Run on Aspen Mountain. During World War II, mountain troops from Camp Hale, 30 miles away, crossed the Continental Divide on maneuvers and lingered for sunny skiing weekends in the town. Eventually Aspen became a unique year-round resort where musicians, writers, and artists gather in summer and skiers in winter.

As I soared aloft on the Aspen Mountain chair lift, I was wrapped in solitude. Below stretched wide slopes separated by stands of spruce. At times my skis dangled dizzily 40 feet above the snow; again they seemed to brush the treetops. Only the harsh caws of Rocky Mountain jays and the distant halloo of an early skier disturbed the stillness.

When I stepped out on the Sundeck at the summit, the breath caught in my throat. From my perch the mountain tumbled for miles to Castle Creek. Across the valley snow peaks of the Elk Mountains reared in a jagged crest (page 239).

Aspen offers slopes to challenge the most skilled skiers, but it also has wide, gentle runs ideal for the novice. I tried slopes requiring varying degrees of skill—some calling for more than I possessed.

Nine miles from Aspen, on Castle Creek, lies the ghost town of Ashcroft. Now and again distant howls shatter the silence that has lain on it since the last miner pulled up stakes. For near by stands the Toklat Kennel of Stuart and Isabel Mace.

One sparkling morning I waxed my skis and set out for the Maces' retreat. From there, instead of a chair lift, my tow was a team of huskies on the six-mile trek to Montezuma Basin.

Stuart Mace handed me a towbar attached by rope to the sled. "Just take it easy," he said. "Lean back slightly and bend your knees to take the shock of the start."

At his command, the dogs leaped forward (page 240). They soon settled into a smooth trot. But when we stopped to take a picture, I came to grief. As the sled lurched forward,

Snow Bunnies Half a Ski High Rack Up at Lesson's End

Steamboat Springs is one of the few towns where skiing ranks as part of the public-school curriculum. Students from first grade through high school receive two hours of instruction a week during the winter.

Many youngsters master the snowplow at about the same time they learn the multiplication table, and the novice who can't do a stem christie, a fast, graceful turn, by Easter is likely to land at the foot of his class.

"Keep those knees flexible," coach Crosby Perry-Smith reminds a beginner as pupils take turns at schussing, or running, the slope behind their school.

Debra Green, only seven years old but already infected with the ski virus, laces her boots. Her friend prefers cowboy gear.

"Oops!" Skis Go South, Junior North, on Sterling Run Near Stowe, Vermont

I floundered in snow, an arm hopelessly caught in the rope; any increase in tension might have broken a bone. Although the dogs were raring to go, a shouted command made them drop in their tracks. As I untangled cameras and skis from the rope, I appreciated the obedience Stuart exacts from his team.

The trail wound through a grove of aspen. As the dogs barreled along I felt a deep exhilaration. Nature—raw, ruthless, and magnificent—unfolded before us. Here and there the virgin snow lay rumpled and tossed from a recent avalanche. Tracks told of unseen dramas: a coyote had dug in the snow for mice that got away; a splash of red marked the spot where a wily marten had tracked down its prey.

A chorus of barking welcomed us to our goal, a high mountain chalet. Soon lunch was ready. Jays clamored for crumbs, but the dogs—still in harness—lay quietly by the hut.

The weather turned raw and blustery as I drove west into Utah heading for my next stop—Alta, 29 miles southeast of Salt Lake City. The road, usually passable, was blocked by 64 inches of new snow that had fallen on the Wasatch Range, and my chances of reaching Alta Lodge were shaky. But at the foot of Little Cottonwood Canyon, I managed to transfer to a convoy of taxis led by

a supply truck that was attempting to break through to the lodge.

Daylight faded as the cars slithered and sideslipped between towering walls of snow. Motors whined as we inched forward. Finally we reached a rendezvous point where Chic Morton, manager of Alta Lodge, awaited us. A flock of outgoing skiers piled into the taxis for the return trip. Morton motioned us into an open boatlike vehicle on caterpillar treads.

"The road is still blocked from here on," he said. "We'll go the rest of the way by weasel."

By now the last wisp of cloud had blown away, and a full moon rode high in the sky. Glistening peaks reflected its light. The air sparkled with frost. The temperature was 6°, and our vehicle afforded little protection.

To get onto level snow, we first had to drive up and over a six-foot bank. Chic made a break in it by shoveling down the snow; then he rammed the weasel into the bank. As if sucked up by an ocean wave, the weasel tilted and seemed about to flip backward. Skis clattered down and loose clothing spilled from the back. Next the passengers hailed out. It was like jumping into a feather bed. I sank to my hips, and when I reached out to retrieve my skis, I floundered deeper.

Again and again the weasel lunged. Finally it leveled off on top. After collecting clothes which were by now buried under layers of snow, we continued.

Teeth were chattering by the time lights ahead twinkled a welcome. Soon Chic pulled up at an entrance that seemed to be buried deep in snow, and called: "All out!"

Toi Takes a Header and Falls Right out of Her Boots at Steamboat Springs, Colorado

Elk Mountains Shine Down on Skiers at Aspen, Colorado

"One of the few places in America where you can ski right off a big mountain into town," Aspen residents boast.

Aspen boomed into skiing prominence almost overnight: in 1946 a quiet mining community; a year later the scene of championship competitions.

Four chair lifts haul skiers up 11,000-foot Aspen Mountain. Here Ralph Jackson and Bobbie Lyons relax at the Sundeck, a restaurant atop the peak.

Icicles frame a view of the Rockies from the Sundeck.

Waxing the skis ensures faster runs on snow softened by Aspen's warm sun.

Was this the lodge? We peered down a long snowshed that looked more like a mine tunnel, and I was reminded that Alta had once been a thriving silver and lead camp.

As we emerged from the tunnel onto the open deck of the lodge, a trio of skiers was waving goodnight to friends before schussing down the valley to their lodge. They could have the frosty air! I for one could think only of the hot meal and soft bed that awaited me.

Snow Ranger Dick Anderson was up and on the go at 5 o'clock the next morning. While skiers lay buried in blankets, he checked the weather and snow depth and relayed this information to the Utah State Highway Department. Next he took the daily instrument

Glass walls capture sunshine and Sierra at new Squaw Valley Lodge, California. The valley will play host to the 1960 Winter Olympic Games. Some 1,200 athletes, as well as 35,000 spectators a day, are expected. An Olympic village with four dormitory buildings and an 11,000-seat ice arena is taking shape.

Husky team hauls skiers in the Colorado high country near Ashcroft. Laden with camera equipment, author Kathleen Revis set out ahead of the team to make pictures, but the sled dogs soon caught up with her.

readings—temperature, wind velocity and direction, snow settlement, and precipitation—in order to estimate the avalanche hazard. By 7:30 he had made a full report to Salt Lake City, and ski lodges were briefed on slope conditions.

By the time the skiers at Alta were drifting down to breakfast, Dick and another snow ranger had already blasted with artillery fire any areas that threatened to slide. As soon as the chair lift started, they would be the first up to test-ski the slopes and set any small explosive charges necessary to dislodge unsteady snow.

Avalanches Pose Constant Peril

The day was crisp and clear. At breakfast I met Alf Engen, head of the ski school at Alta, who offered to take me up Mount Baldy.

Up we swung toward Baldy's wind-whipped summit, passing through a huge mountain-rimmed bowl of snow. On all sides open slopes beckoned skiers (page 228).

But this very attraction could be an invitation to danger. Famous for its powder-snow skiing, Alta is also known for the deadly avalanches spawned on its slopes. A booming mining town of almost 5,000 people, Alta was dealt its death blow in 1874, when a series of slides ripped through its buildings and killed more than 60 persons.

The fact that skiers now swarm over the slopes in safety is due to the Forest Service's experimental work in avalanche control and to the eternal vigilance of its snow rangers. Like most western ski areas, Alta lies in national forest land. When the skiing boom really burgeoned at the end of World War II, Forest Supervisor Felix Koziol recognized the need for an active avalanche-control program. That's when Monty Atwater entered the scene.

I met Monty at Squaw Valley, California, where he was setting up a snow-safety program in preparation for the 1960 Winter Olympic Games. He spoke in matter-of-fact tones of lugging explosives up the mountain and placing charges by hand to set off slides.

"That was how we first tried to control slides in 1948. Before that, the only program was to set up signs: 'CLOSED! Avalanche Danger.' I spent most of my time patrolling closed areas and chasing out skiers. That's

one reason we got in the blasting business—in self-defense.

"To shoot slides now we use recoilless rifles that have a range of 7,000 yards. We can drop a 75- or 105-mm. shell onto most of the danger spots at Alta without even leaving the parking area." He grinned. "I suppose next we'll be using guided missiles."

When I asked Monty if he'd been caught in any avalanches, he shrugged.

"It's all part of the game. If you go looking for trouble, you eventually find it. I've landed in the hospital only once, though. The culprit was a small one, as avalanches go—but I went with it. It dragged me over some rocks that nearly cut my leg off.

"A larger slide once carried me half a mile down the mountain before spitting me out to the side. I walked away from that.

Packed Snow Reduces Risk

"Still," he said philosophically, "slopes steep enough to avalanche make the best ski runs. Once we establish the safety of a slope and skiers get on it, they pack the snow and reduce danger to a minimum."

Soon Alf Engen and I reached the top of Alta's Peruvian Ridge. I watched as Alf and another skier, moving in unison, glided and swirled down the powdery, untracked slope. It looked as effortless and lilting as waltzing, but when I tried it my ski tips kept diving into the snow.

"That's because you're used to skiing on packed slopes," Alf explained. "Powder skiing is more like aquaplaning. Put your weight farther back on the skis and use lots of knee-bend."

Skiing alone the next morning, I headed for the ridges of Westward Ho! As the slope steepened I began to regret the venture. Finally I paused to rest in a narrow chute.

A trickle of snow made me look up. A skier was poised on a cornice overhead. As he shifted weight on his skis, more snow settled down my neck. I started to move out of range, and my skis suddenly dropped through the surface. A snow bridge between an outcropping of rock and the mountainside had collapsed, and my feet dangled in a small crevice.

My first thought was of avalanches! Leaning back in the snow, I kicked both skis up to the side and over the rocks, turning to land in the direction I had come. Then I scrambled back. A moment later I realized that my dark glasses had fallen out of my pocket. But horses couldn't have dragged me back to search for them.

Snow Blindness, Bane of Skiers

The next day—after six hours on the sun-swept slope—I regretted my haste. By evening my eyes felt as if sand had been flung in them. At each movement the sting brought a fresh flow of tears. Sleep was impossible and morning brought little relief. While others clomped outside to ski, I sat in misery. Sun glasses, applied too late, made my world even darker.

Mrs. Engen slipped into a chair beside me. "I know just how you feel," she commiserated. "I was snow-blinded once, and there's nothing quite so wretched. But cheer up—it should be gone by tonight."

She explained the gritty feeling: "The eyes sunburn just like skin, and the burned outer layer peels off. The lids then rub the flakes against your eyeballs, causing irritation."

All things come to an end; next day my eyes were healed. Once more the sun shone for me; once more I was awestruck by the beauty and majesty of the mountains.

Swimmers Bask in Snow-rimmed Pool

The road in Little Cottonwood Canyon was clear of snow when I retraced my route to Salt Lake City. There I took a train for Sun Valley, Idaho.

Soon bleak plains we had been crossing became dotted with crumpled volcanic rock. The ground swelled and mountains stabbed the horizon. Snow appeared, made a delicate tracery of sagebrush, and spread sugar frosting on haystacks.

In Sun Valley snow was drifting down on the village square. The big resort's delightful contrasts were immediately apparent. As a few figures with skis over their shoulders strolled past (page 248), I could see swimmers—oblivious to the snow—soaking in a steaming outdoor pool.

Flying Clown Seems to Scrape the Treetops at Winter Park, Colorado

Outstanding skiers from all parts of the Nation converged on this resort last March for the 11th annual National Junior Ski Championships. The meet featured downhill and slalom races for boys and girls, a cross-country event, and jumping competition.

SUPER ANSCOCHROME BY KODACHROME NATIONAL GEOGRAPHIC STAFF © N. G. S.

Junior Racers Inspect the Slalom Course at Winter Park

Thousands of Denver skiers each weekend pour into this public playground north of Berthoud Pass. Flag-marked Hughes Trail overlooks the spacious new warming house (left), and, a few hundred feet distant, tracks emerge from the west portal of six-mile-long Moffat Tunnel, just below Route 40.

Slalom turns skier to dancer as he twists through gates, or paired flags. Lorie Werner demonstrates his prize-winning form in this hairpin gate at Steamboat Springs.

Crack skier Starr Walton competes in a downhill event at California's Sugar Bowl. Last year she was first in downhill and fourth in slalom races in the National Junior Championships.

ARRANGEMENT BY ARTHUR GRAY,
NATIONAL GEOGRAPHIC STAFF

While guests enjoy a variety of entertainment at Sun Valley, running the lightning-fast slopes remains the chief drawing card. This miniature alpine village on the edge of the Pioneer Mountains, which opened during Christmas week, 1936, has given tremendous impetus to the cause of powder skiing in the western mountains (pages 226 and 249).

When W. Averell Harriman of New York—an expert and enthusiastic skier—was chairman of the Union Pacific's board of directors, he conceived the idea of a ski resort to be served by the railroad. Once a site was selected, Harriman asked Union Pacific engineers to devise a mechanical means of ferrying skiers to the tops of the mountains. The product of their labors has become a universal skiing landmark—the chair lift.

The steel company that made the first Sun Valley chair lift had previously specialized in banana conveyers. "That," I was told by one Sun Valley veteran, "is why they decided to handle skiers like bunches of bananas."

Skiers Race for Silver Belt

The last leg of my skiing tour brought me over the granite-domed Sierra Nevada into California. An aerial tramway—aptly called the Magic Carpet—wafted me above the headwaters of the South Yuba River to the popular Sugar Bowl, 75 miles northeast of Sacramento (page 252). I arrived on the heels of a 10-day storm that had left a whopping 270 inches of snow on the ground at near-by Norden.

I was just in time to see the Silver Belt Giant Slalom race, an annual event inspired by contests held in the Sierra during gold-rush days.

In 1853 miners snowbound in the mountains north of the Yuba had taken to using primitive skis called "Norway skates." Within a year they were racing on 9- to 14-foot models. A belt agleam with silver became the traditional prize. Bitter rivalry sprang up among the various camps, each boasting its champion.

Like modern skiers, the racers waxed their wooden runners to increase speed. "Dope makers," using such ingredients as balsam, pine tar, camphor, and candle grease, concocted waxes known as "Sierra Lightning." Recipes were jealously guarded, and racers were convinced that they won or lost because of the dope they used.

However, the primary function of the old skis remained transportation. An almost legendary figure of the era was John A. (Snowshoe) Thomson, a Norwegian settler in California. He carried the mail on skis over the Sierra from Placerville to Carson Valley, Nevada, from 1856 to 1876. Whatever the weather, it took him three days to ski the 90 miles to the valley; this while laden with a pack weighing from 60 to 100 pounds. The return trip, with its more frequent downhill runs, required only 48 hours.

From the Sugar Bowl I proceeded to Squaw Valley, also high in the Sierra, where the 1960 Olympic Winter Games will take place (page 240). When I arrived in the last week of April, snow still was many feet deep. But solitude and tranquillity had long since departed from Squaw Valley. The air reverberated with the roar of charging bulldozers and the cadenced boom of an immense pile driver as engineers worked feverishly to fit the area for the coming human deluge.

A mammoth stadium to seat 11,000 was well under way, and foundations had been set for the sprawling Olympic village that will house 1,200 contestants and officials.

Ski Instructors Put on Show

On the slopes of KT-22—a steep mountain on the south side of the valley—I had an envious preview of the caliber of Olympic skiers. A convention for the certification of ski instructors had drawn 150 skimeisters of the Far West Ski Association.

Frankly dazzled, I watched the endless stream of experts flash down the mountain in the lightning-fast turns of the newest ski technique, the wedeln, taken from the German word for "tail wagging."

As I watched the smooth rhythmic flow of the experts' descent, I thought of my own lingering difficulties with the simple stem christie. At least, I reflected with some satisfaction, after an entire winter of skiing, we shared the same enthusiasm for the sport—that, and a healthy tan.

Quersprung, an Abrupt Jump Turn, Arrests the Skier in Mid-air

Lacking speed or space for a steered or sliding turn, the accomplished performer pivots his body around the ski poles to execute this classic maneuver. Doug Pfeiffer, director of a California ski school, demonstrates at Squaw Valley. To capture the action, photographer Revis set her camera at f/2.8 and shot at 1/500 second.

Skis Aloft, Guests Quit the Inn at Sun Valley for White Pastures

Defying the depression in 1936, W. Averell Harriman, who later became Governor of New York, invested millions to create fashionable Sun Valley on the west slope of Idaho's Pioneer Mountains. Early morning sees skiers parade from rambling Challenger Inn to buses bound for Bald Mountain close by.

Piping-hot cheese fondue served at the inn appeases the hungriest appetites after a day on the slopes.

To the Skier Each Mountain Is His Private Everest

Hurtling through unbroken powder, ski instructor Chuck Quinn traverses a steep slope at Alta, Utah (next page). Craggy Superior Peak, its white crest unconquered by skiers, soars skyward. More than 1,000 feet below, a road's black ribbon of pavement follows Little Cottonwood Canyon.

Skating on a single ski, instructor Hans Nogler glides down Dollar Mountain, Sun Valley, Idaho.

On Wings of Wood, an Expert Skims the Heights Above Alta

Ecstasy of breathless action.

Baseball on Skis: an April Tradition at Sugar Bowl, California

Each spring the Silver Belt meet attracts the world's leading skiers to this resort. Following the meet, contestants inaugurate the baseball season with a game providing few hits but many laughs.

Mountain-rimmed Tahoe, largest of the Sierra lakes, provides a scenic backdrop for Easter holidayers riding the double chair lift at Heavenly Valley, California. Shorts and T shirts are uniform of the day for skiing sun-drenched hills blanketed with corn snow, a granular surface formed by thawing and refreezing.

Face-first fall clogs goggles and glasses, but this Alta, Utah, skier comes up smiling.

COLOR TRANSPARENCY BY KATHLEEN REVIS, NATIONAL GEOGRAPHIC STAFF © N. G. S.

Flares Set White Slopes Afire as Torchbearers Zigzag down Howelsen Hill

Lights held aloft, skiers perform a night show at the Steamboat Springs carnival.

On this Caribbean "island of those who return," Gallic verve spices the lives of planters and fisherfolk

Martinique

A TROPICAL BIT OF FRANCE

By GWEN DRAYTON ALLMON

Photographs by CHARLES ALLMON, National Geographic Staff

AROUND our disabled automobile lush wooded hills locked and interlocked until they tumbled into the sparkling Caribbean. In all Martinique, we had chosen the island's loneliest road for a breakdown.

Suddenly a jeep drew up. A bespectacled young Frenchman stepped out and plunged his hands under our lifted hood. Finally a light dawned on his face.

"Ah! *Le condensateur!*"

Roaring off homeward in his jeep, our new-found friend returned shortly with a condenser which he promptly installed. The car responded instantly.

Hot and grease-stained now, he brushed aside our thanks and scorned payment even for the new condenser.

"*Mais non!* You have enough for trouble, I think so," he said. "I want that you have a pleasant memory of Martinique."

Trade Winds Cool Mountainous Island

My husband and I savored much of this special brand of hospitality as we vacationed in one of the most beautiful islands in the West Indies (map, page 261). Subterranean activity has heaved its surface into rugged peaks and fertile valleys. Trade winds air-condition the island's 40-by-19 miles, keeping temperatures in the 70's and 80's most of the time.

Martinique's discoverer, Christopher Columbus, called here on his fourth voyage in 1502. Twenty-one days out of the Canary Islands, he took on fresh water and rested three days before pressing on in search of El Dorado.

More than a century later adventurer Pierre Belain d'Esnambuc arrived with his band of French colonists. On the wide roadstead at the foot of Mount Pelée, he founded a settlement and named it, none too modestly, St. Pierre. The names Mount Pelée and St. Pierre rank high in the history of disaster. On a May morning in 1902 Pelée erupted in a holocaust that engulfed the city. Of the town's 30,000 inhabitants, only one is known to have survived.

St. Pierre's destruction thrust the island's second city to the fore. Today most of Fort de France's 45,000 inhabitants are crowded between two rivers named, with Gallic gallantry, Rivière Madame and Rivière Monsieur.

There was a touch of magic about our first morning in French Martinique. Flowering bougainvillea, shading from royal purple and red to palest lavender, cascaded over the patio of our hotel near Fort de France, the capital. Hummingbirds flashed like jewels among the blossoms.

Just off the palm-shaded Caribbean shoreline below us, floats of a seine net bobbed in a wide arc between two native boats. Straw-hatted fishermen shouted excitedly as fish leaped, fell glittering, and leaped again.

I turned at the whisper of bare feet behind me. A tall, dusky woman strode lithely along the pathway beside our patio, balancing a wooden tray of vegetables on her head. After her trotted a pint-sized copy, perhaps her daughter, bearing a smaller burden.

Planter's Day Brings Throngs

Caught in the ebb and flow of Fort de France's pedestrian traffic, we leaned over Rivière Madame's crowded wall. Below us, fishermen rowed boats up the shallow river mouth to peddle their catch.

Eager housewives elbowed us for space. One impromptu buyer, finding herself without a basket, handed down her battered hat. It was Monday, Planter's Day, when the country comes to town, overflowing the tiny cubicles which serve as shops.

Stepping into a Lilliputian hardware store for a tin of shoe polish, I ducked to avoid a galvanized bathtub hanging just above my head, not to mention a bicycle, garden hose, lanterns, brooms, and pots and pans.

Yet this dearth of space did not deter free enterprise. One barber operated an ice-cream

Martinique Fishermen Launch Their Fleet from Volcanic Sand at Grand' Rivière

Villagers outfit the slender but seaworthy boats on the northern tip of the island (map, page 261).

ALL PHOTOGRAPHS BY CHARLES O. HYDE, NATIONAL GEOGRAPHIC STAFF

Here a knife-prowed dugout, poised precariously on its stern, leaps the barrier of surf. These tiny craft, with oars and sail, venture far beyond sight of shore.

parlor in a back room of his shop. Along the canal others staged cockfights to attract trade.

My husband still winces at the mention of another enterprising barber. Chuck had asked, in his "working" French, to have "just a little" taken off, then settled back in the chair to bone up on the language with a French magazine. Minutes later, he looked like a freshly shorn sheep. The barber had clipped off "all but a little."

Governor Undaunted by Mosquitoes

When d'Esnambuc's colonists established a settlement at Fort de France in 1638, in addition to the original colony at St. Pierre, they were confronted with mosquito-ridden marshes. But Gov. Jacques Dyel du Parquet persevered, insisting that the splendid natural harbor promised untold opportunities to a town on its shore.

He was right. By 1680 Fort de France, then Fort Royal, became the official capital. To protect the settlement, Fort St. Louis sent its massive stone walls sheer to the sea. The fort still juts into the bay on a bootlike promontory.

A dapper lieutenant of the French Navy escorted us along dim passageways. He told us that Fort St. Louis's earliest encounters were with buccaneers and fierce Carib Indians.

With the 18th century came a long series of clashes between France and England. Three times Martinique was tossed from one to the other and back, until it was finally regained by France in 1809.

Earthquake and hurricane have so tumbled Fort de France's buildings that today wooden replacements mingle with old stone to give the city a weathered appearance (page 264). The yellow-tinted business district fronts one of the finest harbors in the West Indies.

Our favorite haunt in Fort de France was the market, where a high roof arches over an entire city block. As our eyes grew accustomed to the dim light, we saw pyramids of green breadfruit, velvety-brown sapodillas, oranges, tomatoes, pineapples, pails of tawny tiger lilies and pastel gerbera daisies—all lying on long trestle tables. Around a central pillar piles of straw baskets and hats wobbled precariously.

Roosters crowed defiantly over the hurly-burly. Shoppers jammed narrow aisles, as busy greeting friends as doing their marketing. Martiniquais seldom meet, be it four times a day, with less than a handshake. Usually they embrace.

We discovered the women behind these laden tables were a match for the shrewdest shopper.

"Your bananas are rather speckled this morning," I overheard a customer tell a vendor named Lise.

"You aren't so pretty yourself," said Lise.

Several blocks from the market, stately white buildings of the Préfecture symbolize Martinique's newly emancipated government. After almost three centuries as a French colony, Martinique became a department of France on January 1, 1948. The move was similar to Alaska's achieving statehood.

Roger Albert, a young Fort de France businessman, showed us around his store, where the main attraction to me was French perfume—at French prices. Leaving me sniffing happily, M. Albert went over to help a young pig-tailed customer who stood gazing at a shelf of elaborately dressed dolls.

Designs Date from Slave Days

"These dolls are wearing the traditional Martiniquais costume," M. Albert explained. "It dates from the abolition of slavery. Today you'll find only older folk wearing it for weddings or festive occasions.

"Why don't you go and see Monsieur Louis Boislaville's folklore group?" added our friend. "They wear this old costume to welcome visitors."

Next day we met M. Boislaville and six costumed girls from the Groupe Folklorique on the lawn of Yves Bertè's home high in the hills above Fort de France (page 263).

"I tell for you the language of the madras [headdress]," one of the girls said. "If single point is tighted, it means my heart is free. If I tight two or three points," she smiled coyly, "there is nothing to expect."

All four corners of her madras were showing (page 262).

"With four points, it means a place is left

Field-fresh Fruit Rides the Owner's Head and Hand in Fort de France

Women of Martinique effortlessly balance burdens of 60 pounds. Men support unbelievable loads: one visitor saw four stevedores calmly transporting a grand piano. This smiling *marchande* hawks her wares in Martinique's capital. She offers gleaming tomatoes, pebble-skinned breadfruit, a fat pineapple, and green bananas.

for someone. I hope you will remember you of my picture. Perhaps someone sees it. I shall be so happy and a new husband."

When leaving, I extended my hand to the Bertés' handsome grandson. Immediately he bowed low to touch it to his lips. I was thoroughly smitten—and he was only three years old.

We encountered the Gallic touch often in this outpost of France. In the warm sun men and boys in woolen berets cycled past. After noon, restaurant proprietors put chairs and tables out to form sidewalk cafes.

Islanders Speak Own Brand of French

"Yes, Martinique is French to the backbone," I remarked to Chuck one afternoon in Fort de France, and looked up at a billboard to see a tight-lipped Gary Cooper squinting from beneath a Stetson. The poster advertised a film called *Le Train Sifflera Trois Fois —The Train Will Blow Three Times*. In other words, *High Noon*.

Native Martiniquais speak French—with a difference. "The difference," says a local historian, "is really French deformed, garbled, cut up, abbreviated." The end product is a patois incomprehensible to a Parisian.

Unique, too, is Martinique's celebration of carnival. In most countries, Lenten festivities end the night before Ash Wednesday. But not here. Merrymakers dance through the streets until nightfall on Ash Wednesday. Then "Val-Val," a great effigy of the carnival spirit, is burned as a climax to the celebration.

Of the calypsos and other sprightly rhythms to which every hamlet echoes during carnival, one particularly is dear to the hearts of Martiniquais. On their island, they claim, began the beguine, a dance which has spread all over the world.

Taking the west coast road north from Fort de France one morning, we leapfrogged from hill to hill. Steep ridges stretch from the Pitons du Carbet to drop abruptly into the Caribbean. Between these promontories, wherever the sea washes a beach of glistening black sand, fishing villages nestle.

We found most of Belle Fontaine's villagers hip deep in surf, hauling in a 600-foot net. Strung out in two groups, perhaps 200 feet apart, buxom women, naked children, and oldsters pulled rhythmically. Offshore, fishermen leaned from their boats, slapping the water with oars to turn escaping fish back into their prison.

Judging from the babble of voices, each gay soul seemed to feel that he personally was directing the entire operation.

"If advice could spawn fish, this should be a record catch!" said Chuck.

The joke soon was on him. With trouser legs rolled, he waded in with a camera. A brisk wave slapped down, soaking him to the waist.

"Ay! Ay! *Les pantalons!*" laughed the toiling villagers.

Rain-bearing trade winds, robbed of their moisture by the high central range, give little sustenance to these parched leeward slopes during the dry season. Yet fields of sugar cane find toe holds in the upper reaches of some valleys, or *fonds*. Occasionally, fragrant odors drifted down to us from a gray stone mill at the head of a valley.

I grew to love these dim, high-roofed buildings, impregnated with the delicious smell of cane juice simmering in huge vats—first step in making sugar or rum. More than once we quenched our thirst with freshly squeezed juice, which has a grassy flavor.

Martinique's earliest colonists grew tobacco, until the market was glutted. Today sugar and rum, produced from 37,000 acres of cane, account for a big share of island exports.

Over good roads we crisscrossed Martinique's largest sugar bowl, the extensive plains around Le Lamentin, the island's third city. Drainage channels have freed some of this rich, swampy lowland for cultivation. They also provide cheap barge transportation, carrying sugar to ships in Fort de France Bay.

Collective Plants Process Cane

Central sugar-processing factories were instituted in 1850. Most planters send their cane to these collective centers, but rum is produced in 32 scattered distilleries.

To give us a good look at cane cutting, planter Jacques Bally took us on a bumpy jeep tour of his Plantation Lajus, near Le Carbet.

"Couldn't do without this runabout," he said, busily shifting gears. "Most of this land belongs to my family," he told us proudly, adding as an afterthought, "I have 10 children and 31 grandchildren!"

As we pulled abreast of barefooted cutters hacking away with flashing machetes, they grinned good-naturedly. Cane stalks were severed close to the ground, stripped of their leaves, then trussed into bundles for head-loading by women and boys to waiting trucks

(page 270).

Martinique

STATUTE MILES

Gilbert H. Emerson

Baie .... bay Presqu'île .... peninsula
Pitons .... peaks

Grand'Rivière
Beauséjour Plantation
Poticha Plantation
Grande R.
Le Lorrain
Marigot
Mt. Pelée
Lorrain
Morne Rouge
Ste. Marie
Presqu'île de la Caravelle
Baie du Trésor
(Treasure Bay)
St. Pierre
La Trinité
Deux Choux
Le Carbet
Morne Vert
Pitons du Carbet
3594
Gros Morne
Plantation Lajus
Belle Fontaine
Le Robert
Madame R.
Plateau Didier
Le Lamentin
Le François
Fort de France
Fort St. Louis
Fort de France Bay
Ducos
St. Esprit
Le Vauclin
Trois Ilets
Pagueman
Pilote R.
Le Diamant
Rivière Pilote
Diamond Rock
(Rocher du Diamant)
Ste. Anne
Baie des Anglais

93°
79°
23°
Miami
Bahama Islands
CUBA
70°
22°
63°
50°
JAMAICA
HAITI
DOMINICAN REPUBLIC
PUERTO RICO
Leeward Is.
St. Kitts (St. Christopher)
Antigua
Guadeloupe
Dominica
Martinique (France)
St. Lucia
Barbados
Windward Is.
West Indies
Aves.
Caribbean Sea
STATUTE MILES
Panama Canal
SOUTH AMERICA
Trinidad
0°

Madras headcloth and jewelry complete a costume. This widow's four-pointed kerchief informs young men that a place in her heart is "left for someone."

Soccer Game in Fort de France Matches Traditional Rivals, Martinique and Guadeloupe

Fierce competition exists between Martinique, largest of the Windward Islands, and Guadeloupe, administrative center of the French Leeward Islands. Both territories in 1946 rose from French colonial status to the rank of overseas departments.

Dark-shirted Martiniquais here converge on a Guadeloupe player in the interisland championship. A banana boat of the Compagnie Générale Transatlantique puts out from the harbor.

Colonial costumes adorn members of the Groupe Folklorique, a Fort de France dance team. Performers at left, right, and third from right show a once-fashionable lace-trimmed white gown. Others model a brilliant style described by one visitor as "blouses tinted with a Martinique sunset and skirts like the tail of the paroquet." Some believe the designs were adapted from fashions of provincial France.

"All of our canes go into rum production," our host explained on the drive back. "But I'd suggest you try a glass of my wife's tomato juice. It's better in the head and the stomach."

Two days later we returned at M. Bally's invitation to watch the harvesting of bananas. Martinique's banana production has flourished, reaching an export total of 93,000 tons of fruit in a good year.

"Yes, they're a fickle crop," sighed Bally. "One year they bring a good price. The next year, as you Americans say, you lose your chemise.

"You must dig canals, pump water, irrigate, spray, worry . . . ." he threw up his hands. *"C'est formidable!"*

At a central packing shed, women padded and wrapped each banana stem individually for the 10-day trip to France in refrigerated ships.

Suddenly, one woman leaped back. A calloused heel stamped on a bristly *matoutou falaise*, local name for a small poisonous spider occasionally brought in on bananas.

Back-yard Farmers Produce Most Bananas

"Actually, large-scale production on plantations like ours accounts for only 30 percent of Martinique's banana output," our host explained. "Small farmers find it easy to plant a few bananas in a back lot."

The island's abundance of food is multiplied by this back-yard planting. In the sheltered southern valley of Grande Rivière Pilote, we noticed that most homes grew orange or grapefruit trees, forming Martinique's citrus belt.

To bring breadfruit trees from Tahiti as food for the West Indian slave population, Lt. William Bligh made his ill-starred voyage in H.M.S. *Bounty*.* Today these trees grow profusely, providing a starchy staple in the islanders' diet, together with yams and imported rice.

Even stranger circumstances than those associated with the arrival of breadfruit made a Martinique army captain the Western Hemisphere's first coffee planter. Early in the 18th century, the greenhouse of Louis XIV of France sheltered rare coffee plants which proved too great a temptation to the green thumb of Martinique's visiting Captain Gabriel de Clieu. He obtained one plant and nursed it tenderly on the long voyage home, even sharing with it his ration from the ship's dwindling water supply.

Coffee took an immediate liking to the Indies. Seedlings from the flourishing plants of de Clieu in Martinique found their way to French Guiana. The governor's wife, charmed by an attentive Brazilian diplomat, de Melo Palheta, gave him several plants.

From this modest start South America grew into a coffee giant, pouring almost 2 billion pounds into the United States alone in a typical recent year. In Martinique, however, the demand for sugar and bananas has almost eliminated local coffee production.

Orchids Cling to Lofty Trees

Like a colony of giant anthills, the 3,900-foot Pitons du Carbet loomed ahead of us through swirling gray mists the morning we took the rain forest road north. A refreshing coolness crept in our car windows as the narrow highway plunged deep into the jungle.

Clutching lianas festooned mammoth trees, filtering tiny shafts of light to choking undergrowth. On the trunks of jungle giants, fragile orchids of palest pink found toe holds. In this teeming fertility we were hardly surprised to see a signpost which had taken root and sprouted leaves.

The forest's spell was suddenly broken as a Fort de France-bound bus careened wildly around a bend ahead of us, bulging with countryfolk and produce. Leery of schedules and chary with space, Martinique's country buses bore the notice, "Occasional Service to _____."

Taking its half of the road out of the middle, this one missed us by an eyelash.

"Time for my country horn," said Chuck. Our small car was equipped with two horns—a polite one for city traffic and an ear-splitting blast for rural corners.

Near the crossroads of Deux Choux—Two

* See "I Found the Bones of the *Bounty*," National Geographic Magazine, December, 1957; and "The Islands Called Fiji," October, 1953, both by Luis Marden.

Narrow Streets Squeeze Fort de France Shoppers and Cars Hip to Fender

Fort de France became the capital of Martinique after the destruction of St. Pierre (pages 268 and 270). Crowds jam the city each Monday, known as Planter's Day. Shoppers here funnel through a one-way street. Hillside arch marks a shrine.

PHOTOS BY ELLIOTT, NATIONAL GEOGRAPHIC STAFF

Cabbages—we came upon a solitary thatched hut. Laughing children scampered across the clearing toward us, shyly offering for sale gourds filled with tiny wild strawberries.

Reaching the northern outskirts of the rain forest, we wound down through an enchanted world of ferns. Tiny ones, knee-deep ones, "archbishop" ferns with their shoots unfurling like a bishop's staff, giant tree ferns—a delicate green fairyland laced with mottled sunshine (page 272).

We stopped our car below one embankment. Above us, tier upon tier of tree ferns rose on slender trunks. Gazing up at their crowns as high as a house, I felt as Alice in Wonderland must have when she saw the caterpillar on a mushroom.

Visit to a Sugar Plantation

Martinique's mountainous terrain gives highway engineers nightmares. We covered many rugged dirt miles the day we visited Jean Lucy de Fossarieu near Grand' Rivière, on the north coast.

It was almost noon when we reached Beauséjour, Jean's sugar plantation. When our host learned that I had been brought up on the neighboring British island of Barbados, he told us, "I went to school on the island of Antigua. Mind if I practice my rusty English on you?"

His wife Monique, petite and blonde, with the prettiest blue eyes in all Martinique, spoke no English at all. So I practiced my French on her.

After luncheon with Monique, Jean, and their three children, we strolled onto a terrace shaded by huge mango trees. Standing on this northern bluff, we could almost have been at a ship's rail looking across the white-flecked 23-mile channel to the gray ghost of Dominica, next in the island chain.

In a garden ablaze with bougainvillea, three-year-old Jean Louis sailed his toy boat in an attractive swimming pool under big sister Elizabeth's watchful eye.

"Our pool is fed by water from a mountain stream," big Jean explained proudly. The stream emerged from the pool to turn a small turbine. From there, it splashed on to the distillery, revolving huge rollers. After such yeoman service, it plunged over a cliff to the beach more than 200 feet below.

In the distillery—*rhummerie* in local patois—massive old machinery squeezed juice from sugar cane to make rum, just about as it did when the walls were constructed in 1824.

"Of course, there have been renovations since those early days. But even the best rum isn't difficult to produce," Jean said.

He added with a grin, "We have a saying in Martinique—'Boys make rum; men make sugar.' Almost 75 percent of the Island's cane is made into sugar, but that 25 percent we 'boys' distill brings in nearly half as much as all the 'men's' sugar—about $5,000,000 a year.

"We've got problems, though," continued Jean. "Since Martinique became a department, we pay the same wages as in some parts of France, despite the difference in living standards. Our payroll has more than doubled.

"It's after three," he said, glancing at his wrist watch. "Let's go down and watch the fishing fleet come in at Grand' Rivière."

Leaning against the cliff base, Grand' Rivière braced against stiff winds and pounding surf. Children were skipping home from a new school. Center of activity for the 1,200 inhabitants was the short black-sand beach where fishing boats landed.

Fishermen Land Four-foot Dolphins

Crewmen strode to a weighing room with their catch. Four-foot dolphins tipped the scales at 35 pounds. Other fishermen brought in smaller kingfish and redfish. Ten-inch flying fish, netted as they spawned among dried banana leaves scattered on the water's surface, were hauled by the basketful.

"They're the finest boatmen on the island," Jean told us. "You should see them zip through those breakers at dawn. Stay with us tonight, and we'll come down tomorrow."

Rod and Gaff Land a Blackfin Tuna off Fortresslike Diamond Rock

Martinique waters, a rich harvest ground for commercial fishermen, attract sportsmen in search of dolphin, tuna, kingfish, and bonito. This team boats a catch near 577-foot-high Diamond Rock, an uninhabited speck a mile off the southern coast. Some 100 British sailors and marines who fortified it during the Napoleonic wars named the station H.M.S. Diamond Rock. They held out for almost 18 months, surrendering to a French naval squadron after inflicting casualties of five to one. Caves in the sheer cliffs sheltered barracks, coastal batteries, a hospital, and a warehouse.

St. Pierre, a Ghost Town Reborn, Lies at the Foot of Its Slayer, Mount Pelée

French colonists from the island of St. Christopher established St. Pierre in 1635 and made it the capital of Martinique. For two and a half centuries the city flourished as the financial and

cultural center of the island. Disaster struck on May 8, 1902. Pelée, a quiescent volcano exploded, engulfing St. Pierre in a cloud of superheated ash and steam that annihilated 30,000 inhabitants in three minutes. A new eruption on May 20 completed the devastation shown on the next two pages. The author (right) views the rebuilt town from a ruined villa.

Old St. Pierre's Roofless Walls Suggest a Ghastly War Scene

One writer described the blasted shell as "that hair-stirring corpse of an entire city slain in a matter of seconds. . . ." Another likened the effect to that of a tropical hurricane whose violent winds bore superheated air.

This picture was taken in the early 1900's.

Members of a National Geographic Society expedition, one of the first of some 150 scientific projects and exploring expeditions conducted during 70 years, were among the earliest to inspect Pelée's still active crater. "I . . . do not hesitate to acknowledge that I was terrified," reported Professor Robert T. Hill, a member of the party (National Geographic Magazine, June, 1902).

The city never recovered: St. Pierre today has only about one-fifth the population of its predecessor.

Back at Beauséjour, I asked Monique if she found her plantation life lonely.

"Oh, no," she replied. "There's another plantation—Potiche—a few miles to the east. You'll see. . . ."

Scarcely had she spoken when an overladen car drove up, tooting a welcome. Within minutes, more visitors of all sizes poured out of a second car and a jeep.

After 18 almost identical introductions, I felt sufficiently familiar with their name to venture conversation with Madame de "Champignon."

"No! No! Pompignan," she smilingly corrected me, amidst giggles from the youngsters.

I was reminded that *champignon* is French for mushroom. I also learned that Hippolyte de Pompignan and his wife had 13 children, several with children of their own.

A jollier, more warm-hearted group than the Pompignans would be hard to imagine. Pierre, one of the sons, began strumming catchy calypsos on his guitar. Soon we all gathered around, joining in quickly learned choruses with a camaraderie which sped the evening hours away all too quickly.

Two immense four-poster beds were made up for us in the guest room that night. Over both hung a single mosquito net seemingly as large as a circus tent.

Coffee and delicious crusty French bread, warm from the oven, made our 5:30 breakfast next morning.

Golden shafts of sunlight slanted over the cliffs when we arrived in Grand' Rivière. Three-man crews were busy preparing each of the 40 fishing boats for launching.

A helmsman of one, intently studying the rhythm of cresting swells, signaled a forward thrust. All three leaped in, the two bow men rowing frantically. In seconds, the prow shot skyward (page 250). The light craft seemed certain to snap in half atop the wave.

Fifteen seconds more and they were in calmer water beyond the surf. Stowing oars, the men stepped a short mast with a rectangular sail braced diagonally by a supple bamboo pole. Within a mere 20 minutes the last boat had joined other white specks of sail fanning out toward the horizon.

Now the youngsters launched their boats,

COURTESY OF ROBERT L. REESE

Astride gaily painted logs, they paddled out a short distance, turned, and careened shoreward, their logs riding the breakers like surfboards. On the nearest, I spelled out *L'hirondelle du Printemps*—Swallow of Springtime.

Watching such peaceful scenes, we found it hard to believe that in World War II Martinique nearly brought the fighting to the New World.*

When France fell in June of 1940, the aircraft carrier *Béarn*, homeward bound with 106 American-built planes, anchored in Fort de France harbor, together with a gunboat and six new tankers. A cruiser, *Emile Bertin*, raced to Martinique to deposit a glittering cargo of Free French gold bullion—variously estimated at from a quarter to half a billion dollars.

The United States negotiated an agreement with Rear Adm. Georges Robert, High Commissioner for the French Antilles under the Vichy regime. Robert agreed to demobilize the warships at Fort de France and allow United States ships and planes to enter Mar-

* See "Martinique, Caribbean Question Mark," by Edward T. Folliard, NATIONAL GEOGRAPHIC MAGAZINE, January, 1941.

tinique's territorial limits. But the 106 planes, which Robert refused to hand back, weathered to ruin on a hillside.

Robert kept his word. In return, the U. S. sent one shipload a month of food and medical supplies. German submarines had such good hunting in surrounding waters that Martinique's food was in perilously short supply. Gasoline became so scarce that automobiles operated on a dizzying diet of 80 percent gasoline and 20 percent alcohol!

Host Digs with Toes for Tiny Shellfish

"The telephone is axing for Monsieur," reported our English-speaking hotel maid one morning. Charles Clement, a Martinique businessman just back from Paris, was calling to invite us for lunch and a swim at his country home near Le François.

With other guests, we boarded two sailing canoes for a swim among the numerous offshore islands.

Just as we began to wonder when the swim was coming, Clement's heels disappeared over the side in a neat dive.

"All overboard!" he bubbled through his gray beard.

Plunging in, we found ourselves in chest-deep water on a shallow sandbank.

Our host produced a bottle of clear liquid and filled cocktail glasses.

"I always mix my 'Clement Special' out here for new guests," he said.

I had an odd feeling everyone was staring at us, but took a sip anyway, only to spit it out amidst a chorus of laughter. Clement's *cocktail de mer* was common sea water.

"Now try something really good," he said, digging in the sandbank with educated toes to bring up a tiny clamlike shellfish. "We call these 'soudons.'"

Skeptical now, we nibbled. They were so delicious that we began searching too. Thirty minutes of digging produced little more than toe cramps for us. Clement brought up another every few minutes, claiming the wily soudons knew their master's toes.

By the time we returned, the noonday sun had scorched my nose as pink as the lobsters Madame Clement heaped on platters for the hungry swimmers. In leisurely succession followed turtle soup topped with a floating turtle egg, kingfish, tiny French loaves, creamed chicken and rice, a green salad, assorted cheeses, light French pastries, and black coffee.

Another day found us sampling more of the east coast. Hidden from view until we crested a low ridge, the red-roofed village of Le Robert nestled beside turquoise-blue water. Its white church spire looked watchfully over tiny islands dotting the bay like a brood of ducklings.

In La Trinité we asked directions to the beach at Baie du Trésor from a black-frocked priest standing beside the road with his motorcycle. A small boy sat on the pillion behind him.

"Follow me," he said cordially. "I'm taking young Pierre there."

Kicking up a generous dust cloud, the priest roared off ahead of us, his black skirts billowing. The neighborhood dogs tore after the flying motorcycle, leaping and barking frantically. Young Pierre hung on for dear life, desperately trying to keep his bare shins out of range of snapping teeth.

After a swim and picnic lunch, we swung north through Ste. Marie and Marigot to Le Lorrain. Historically, these eastern bays belonged to Martinique's pre-Columbian settlers. We learned about these early tribes from Robert Pinchon, a young science teacher.

Arawaks Routed by Caribs

Artifacts excavated along the east coast establish the existence of two distinct races and cultures in Martinique, Pinchon told us.

"The Arawaks lived here from about A.D. 1 to 1000. Then a fierce warring tribe, the Caribs, began pressing up the West Indian archipelago. They chased the Arawaks from island to island."

"Where did the Caribs settle?" I asked.

"Mainly on the southeast coast," Pinchon replied. "They usually chose fresh-water streams beside high lookout points. I found a typical settlement near the mouth of Rivière du Paquemar, with stone weapons and axes shaped from conch shells. Even their pottery reflected their warlike mode of life.

"Island-hopping Carib warriors wasted little time or skill on the amenities of life," our friend continued. "They traveled light and they resisted European invasion so fiercely

Towering Tree Ferns Spread a Lacy Canopy Above a Martinique Hillside

These 20-foot relatives of plant ferns abound in tropical rain forests. The author inspects a stand near the village of Deux Choux (Two Cabbages).

that the race has all but perished. Today only about 100 full-blooded Caribs remain, living on a preserve in Dominica."

"When Pinchon isn't off excavating, he helps me with bird studies," put in our host, Marcel Bon Saint-Come, handing us a booklet on birds of the French West Indies which he and Pinchon had published.

"We banded migratory birds for more than five years for the Fish and Wildlife Service in Washington, D. C.," he explained. "Baie des Anglais on the south shore is one of our stations. Over on Aves Island, about 175 miles northwest of Martinique, I banded a noddy tern which was recorded at Miami, Florida, 10 months later."

Island Gave France an Empress

We often paused to look up at a white stone statue of a woman on Fort de France's public square. The daughter of one of Martinique's oldest families, she became world famous as Napoleon's Empress Josephine of France. Sculptor Vital Dubray has softened Josephine's determined chin. With gracefully sloping shoulders accentuated by her Empire gown, she gazes pensively across the bay toward her childhood home near Trois Ilets, where the stone shell of her family's sugar factory still stands.

From the beginning of our visit, we had wanted to climb Mount Pelée. But time and again the mighty thunderer stood shrouded in clouds. We asked U. S. Consul Clint Olson about a guide.

"Look up Paul Cazalé," he suggested. "Mountaineering is his hobby. And if you go, my wife and I would like to join you."

We found Cazalé striding across his lawn with a vigor that belied his 65 years. We told him of our plans. Glancing at the gray sky, he shook his head.

"Light clouds here mean the mountain will be completely overcast," he said. "We'll have to wait for perfect weather. I have a healthy respect for Pelée. You know, I was one of 30,000 people sleeping in St. Pierre on the eve of the great eruption.

"It's quite a story," he added, leading us into his sitting room. "I was just a youngster then. My family lived at Morne Vert, back in the hills. I boarded in St. Pierre while attending school.

"That first week in May, 1902, was a fine one for us schoolboys. Mount Pelée rumbled and steamed like a boiling kettle. In all the commotion we got off without a stroke of homework.

"It was like twilight, even at noon, as ash kept falling like a snowstorm. It got so deep in the cobblestone streets that carriage wheels didn't make a sound.

"On the night of Wednesday, May 7th, our coachman knocked at the door.

"'I've come to take you home, Master Paul,' he said.

"The last thing I wanted to do was miss all the excitement. Almost everyone was remaining in St. Pierre. It was sugar crop time, with ships to be loaded. But my landlady insisted, and I hardly noticed the long ride home because Pelée put on a giant fireworks display.

Blast Creates Boiling Harbor

"Safe at Morne Vert, I was catapulted awake at ten minutes before eight next morning by a terrible explosion. Pelée had blown her top." *

A tremendous burst of superheated ash and steam ripped open the southwestern slope of the volcano. St. Pierre was enveloped in a sheet of flame. In a few scorching minutes, one-sixth of Martinique's population lay dead (page 270).

Volcanic boulders weighing as much as 1,000 tons hurtled to the ground for miles around. A huge wave swept the boiling harbor, capsizing 17 of 18 ships. The British cargo steamer *Roddam* managed to get her anchor up. Thus freed, her few badly burned survivors maneuvered the ship to near-by St. Lucia.

(Continued on page 283)

* See, in the National Geographic Magazine: "The National Geographic Society Expedition to Martinique and St. Vincent," June, 1902, and "Report by Robert T. Hill on the Volcanic Disturbances in the West Indies," account of The Society's expedition to St. Pierre, July, 1902.

Gauzy Nets, Hung on Poles to Dry, Curtain Fishermen in Le Carbet

Christopher Columbus called at Le Carbet in 1502 to take on water and stayed three days. Inhabitants today divide their time between fishing and cutting sugar cane (page 276). These men weave nets beneath a canopy of coconut palms. Boats, their keels fitted with bladelike stabilizers, bear such names as *St. Jacques* and *Toi et Moi*, patois for "you and me." Man in foreground stretches a net with his toe.

Sugar-cane Cutters Harvest Martinique's King of Crops

Sugar and its side product, rum, account for a heavy share of Martinique exports. When fuel ran short during World War II, islanders operated trucks and automobiles on a blend of gasoline and rum.

A mounted overseer directs the leveling of a field near Le Carbet. Cutters keep a sharp eye for the fer-de-lance, a venomous serpent that lurks in cane fields and retreats as the stalks are cut. Crews frequently flush the snakes by burning the last few yards of cane. Pelée rises in the distance.

Yoked bullocks haul cane to a crushing mill. Mechanization has made few inroads on Martinique's small plantations.

On-the-job lunch, a stalk of cane, refreshes a woman stevedore loading bananas at Fort de France. Workers pick the fruit green, wrapping it for export in refrigerator ships.

Wave-scrubbed Beaches at Ste. Marie Thrust a Sandy Finger into the Caribbean Thatch-roofed houses and whitewashed buildings hug the shore. Cane fields surrounding dwellings

church, and sugar refinery (left) spread an emerald carpet across the undulating foothills. Uniform rows of palm trees lift tufted crowns above the winding seacoast road.

A Huge and Lofty Dry Moat, Pelée's Crater Circles the Peak

Water once filled the volcano's basin-like mouth. Eruptions in 1902 drained the lake and raised a 1,000-foot spire that later collapsed. These visitors on the crater's rim survey a dome (left) also thrust up by the 1902 upheavals. Martinique honors the volcano as a national monument.

Knee-high mantle of ferns surrounds climbers on Pelée's flank.

Jagged dome left by Pelée's last eruption in 1929 rises from the crater floor. Volcanic slopes such as this suggest the mountain's name: Pelée means bald.

Boulder-strewn Slopes Attest Pelée's Wrath

The 1902 eruptions catapulted enormous rocks more than a mile. These visitors examine a projectile in view of the peak, which Lafcadio Hearn described as the "cloud-herder, lightning-forger, and rainmaker . . . drawing to itself all the white vapors of the land—robbing lesser eminences of their shoulder-wraps and head-coverings."

Prison cell in St. Pierre saved Auguste Ciparis, only known survivor of the May 8, 1902, disaster. Massive stone walls resisted heat and shock so effectively that the prisoner first learned of the catastrophe from his rescuers. The author peers into Ciparis's dungeon. Ash partially fills its door.

"Is the volcano still active?" I asked Cazalé.

"Occasionally I have smelled sulphur near the crater rim. But there's no sign of activity since the 1929-32 period."

We will never forget our first glimpse of Mount Pelée. In the sparkling morning sun the jagged crest cut sharp as a saw edge against the sky. Twin domes jut above the crater rim to 4,583 feet.

Along a crescent beach St. Pierre nestles at the volcano's feet, closer by a mile than Pompeii to Vesuvius. A few hundred yards from the water's edge her buildings end, merging with tropical vegetation. This is the rebuilt town of 6,000 people (page 268).

New Town Rose on Ruins

Enterprising homemakers have salvaged debris from the shattered town to build anew. A factory has been opened to can pineapples. We walked out on a new pier being built to attract more trade to the now quiet roadstead. But in scores of places old foundation walls crumbled into gray heaps of weathered rubble.

In the volcanological museum we examined clumps of nails fused together by heat; queerly distorted bottles still containing liquid; contorted watches forever pointing at a few minutes before eight; carbonized coffee and rice. Having exchanged our U. S. currency at the rate of 350 French francs to the dollar, we paused before a charred check for the sum of one franc, then worth about 19 cents. How times have changed!

Only five days remained to climb Pelée when a clear-weather forecast brought a call from Paul Cazalé that we'd tackle the volcano next day.

A few persistent stars dotted the five-o'clock sky when we picked up the Olsons at the American Consular residence. The village of Morne Rouge snatched a last 40 winks as we motored through quiet streets. Pelée's bulk loomed hazily ahead in the graying dawn.

Turning off the highway, we jeeped up a bone-shaking side road for half a mile until a nose dive into a pothole damaged our jeep and we started climbing afoot.

Resting for a moment where the path petered out beside a low stone building, Cazalé indicated our route up the southern slope.

As my arches and enthusiasm began to give way, we scrambled onto level ground atop a great lava shoulder. Large gray crickets zoomed from under us as we flopped down for a breather.

From our aerie we looked down on pools of mist cupped between sun-warmed peaks. St. Pierre lay at our feet along the Caribbean.

Getting our second wind, we followed Cazalé across a narrow ridge connecting this lava mass to Pelée's upper slope. We forged through an endless sea of knee-deep ferns. Black-shelled snails, about half an inch in diameter, littered our pathway. The shells crunching underfoot made our little party sound like snow-trekking mountaineers.

Clouds swirled dense white curtains about us as we neared the crater rim. Occasionally the wind folded them back, giving us a closer view of Pelée's twin peaks.

"Slow down!" warned Cazalé, peering intently through wisps of cloud. "There's a sheer drop, maybe 200 feet, from the brink of the crater. I was standing less than 10 feet from one of my best friends when a careless step plunged him to his death."

With fern-fringed lip, the gaping crater curved symmetrically away on either side. Green to the top, two domes jutted several hundred feet above the crater rim, obscuring the island's north tip (page 280).

Martinique spread below us, crinkled into green contours like crumpled paper. A feeling of elation swept over us. Then, clear and high, the tolling of St. Pierre's church bells reached us faintly, sadly.

Hector Sleeps on Luggage Rack

Four days later we were up early to catch our 5:20 a.m. flight north. Minutes sped by as we waited with packed bags at the hotel.

When it became apparent that our taxi driver had overslept, we roused a hotel attendant who agreed to drive us. Screeching around a sharp turn, we heard a strange scuffling and bumping atop the car. "What on earth is that?" I asked, with alarm.

Our driver grinned. Reaching an arm through the window, he rapped on top of the car.

"*Ça va, Hector?*" (Everything all right?)

"*Ça va,*" came a distant voice.

"It's all right," the driver reassured us. "It's only Hector, the garden boy. He sleeps up there on the luggage rack. He wants to help with your baggage at the airport."

How can you resist an island like that? Not for nothing is it called *L'Ile des Revenants*—The Island of Those Who Return.

MAINE'S LOBSTER ISLAND

Monhegan

By WILLIAM P. E. GRAVES,
National Geographic Staff

Photographs by Kosti Ruohomaa, Black Star

STRANGELY but logically, the quietest night of the year on Monhegan Island is New Year's Eve. No lights blaze, no music blares, no toasts ring out in the snugly shingled homes of this rocky outpost 10½ miles off the coast of Maine. Let the rest of the world stay up past midnight: Monhegan goes to bed early.

To the query "Why?" the 60 permanent residents answer with a single word. "Lobsters!" Monhegan makes its living trapping the armor-plated delicacies of the deep. New Year's Day means Starting Day, the opening of the lobstering season. No one can afford to celebrate, for the fleet leaves at dawn.

Under a 50-year-old State law proposed by the islanders themselves, lobsters may be taken in Monhegan waters only between January 1 and June 25.

"We give 'em the other half a year to grow," a veteran lobsterman explains. "You don't see farmers killing all their chicks. You might say lobsters are our chicks."

Protected by conservation, lobsters grow as fat and prime as their forebears, which were taken in Monhegan waters three and a half centuries ago by such explorers as Champlain and Capt. John Smith.

In summer artists and vacationers throng Monhegan's tranquil coves and spruce-blanketed heights. These photographs show the island's other face: a lonely offshore community all but marooned by wintry seas.

Monhegan's hardy fishermen spend their leisure hours over cigars and cards in a fishing shack. Painted lobster pot buoys, strung from the ceiling like chandeliers, symbolize the islanders' debt to the sea.

Lobster pots ride a wheelbarrow on their way to the fishing boat. Monhegan islanders build traps of oak laths and spruce and sink them on offshore ledges. Lobsters, attracted by bait, enter through doors whose funnel-shaped nets prevent exit.

Andrew Winter, a seaman turned artist, helps his neighbors haul gear.

Top-heavy cargo of pots screens a lobsterman in his dory. Men in boots and waterproof overalls prepare a skiff. Bait tubs hold redfish, pollack, and herring.

Rock ballast sinks the pots, which become dry and buoyant during storage ashore. Once submerged, they absorb water, requiring only a built-in concrete slab to keep them on the bottom.

Anchored fleet takes on traps beneath the snow-powdered slopes of Matinicus Island, Monhegan's neighbor.

Mainland lobstermen, who trap the year round, scrupulously avoid Monhegan's protected zone, a two-mile strip encircling the island.

These men transfer dorylands of traps to the lobster boats on Starting Day.

Oil hats and slickers protect Douglas Odom (right) and his brother Harry on a winter run to haul their traps.

Most islanders work in pairs, one man to pilot the boat, the other to tend the pots. Foul weather keeps few crews ashore.

Fishermen dread "the vapor," a shrouding mist produced by the meeting of cold air and warm water.

Pounding home, a lobster boat kicks up spray off Nigh Duck Rock, one of many uninhabited islets surrounding Monhegan.

Sail mounted aft, called a jigger, steadies the boat against wind and sea when the crew cuts power to haul pots.

Heeling to an Atlantic swell, a heavily loaded boat slices the waves. Superb seamen, the trap tenders put out in all but the dirtiest weather, braving winds as high as 45 miles an hour. Their oak-and-cedar craft, built to order in mainland yards, carry depth finders to detect shoals and radiotelephones for ship-to-ship talks. This boat carries pots stacked beside the furled jigger.

Hungry gulls mount an aerial patrol on a lobsterman preparing bait. Monhegan islanders tend as many as 250 pots a man, endlessly inspecting, baiting, hauling, repairing. In good seasons top fishermen, known as "highliners," harvest as much as 15,000 pounds of lobsters apiece.

Gulls, the crews' friends and tormentors, accompany every boat. Chary at season's start, they soon became accomplished thieves. "The rascals come so close they'll knock your glasses off," one fisherman remarked.

Lord of Monhegan, a four-pound lobster shows claws that can easily break a man's finger. Measuring the catch (left), the fisherman uses a brass gauge to determine length of the heavy cradle shell. Law forbids the taking of "shorts" and "jumbos." Plugging claws with a wooden peg (below) prevents lobsters from maiming one another on way to market.

Sizzling steaks, the lobsterman's delicacy, brighten a day in the fishhouse. Shacks, built at water's edge, provide workshops, men's clubs, bunkhouses, cardrooms, and forums. Wives keep clear. Eaton Davis, broiling this feast on a gasoline stove, turns the steaks with branding irons used to mark pots and buoys. 293

Snow Blurs Monhegan's Spruces, Houses, Trucks, and Lobster Pots. A Solitary Villager,

Wrapped Against the Blinding Storm, Trudges Down the Island's Icy Main Road

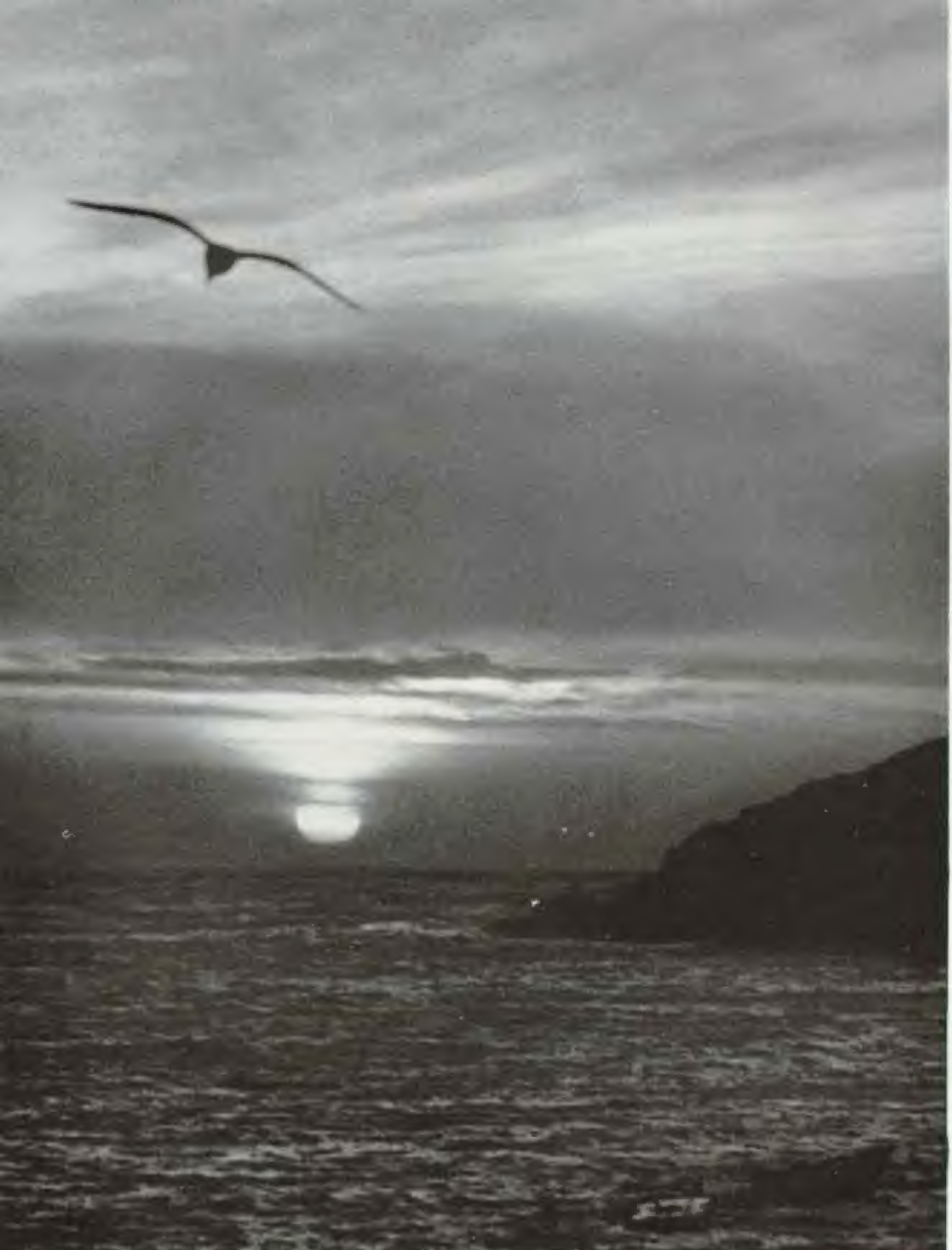
Monhegan Island, a community of 60 permanent residents and 300 summer visitors, faces the coast of Maine across ten and a half miles of water. Too small to incorporate as a town, the island operates as a plantation, a civil unit with minimum government.

Once an American landfall for European sailing ships, Monhegan earned the nickname "sentinel of New England." Ocean-going vessels bound for certain ports in Maine still call to pick up pilots.

This view from Monhegan Light looks across the channel to Manana Island.

Sewing circle, the housewives' answer to the men's fishing shack, meets once a week in winter. Members fashion quilts, mittens, socks, potholders, and embroidered goods to support the island's only church. These women work by kerosene lamps. A few villagers have their own power plants.

Gertrude Anderson (third from right), a missionary in Burma for 20 years, serves as Monhegan's nondenominational pastor. Marion Cundy (head bowed) held office as the plantation's third assessor. Christine Orne (smiling) is the wife of the truant officer.



At Sunset a Lonely Gull Effortlessly Rides the Winter Wind off Monhegan Island

Shipping lanes that once brought a constant stream of colonists past Monhegan's forbidding headlands now bypass the island. Winter gales isolate the outpost still further, often barring all but the mail boat for days at a time. But few islanders would desert their beloved "Rock" for the mainland. "Find me a better island," one lobsterman remarked, "and the day you do I'll move."

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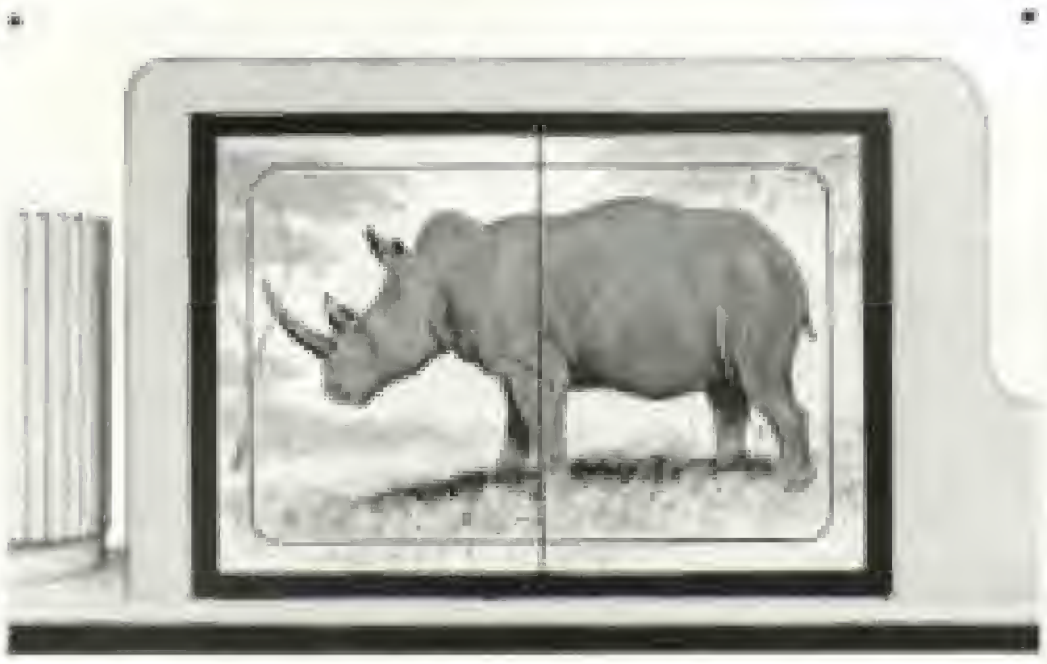

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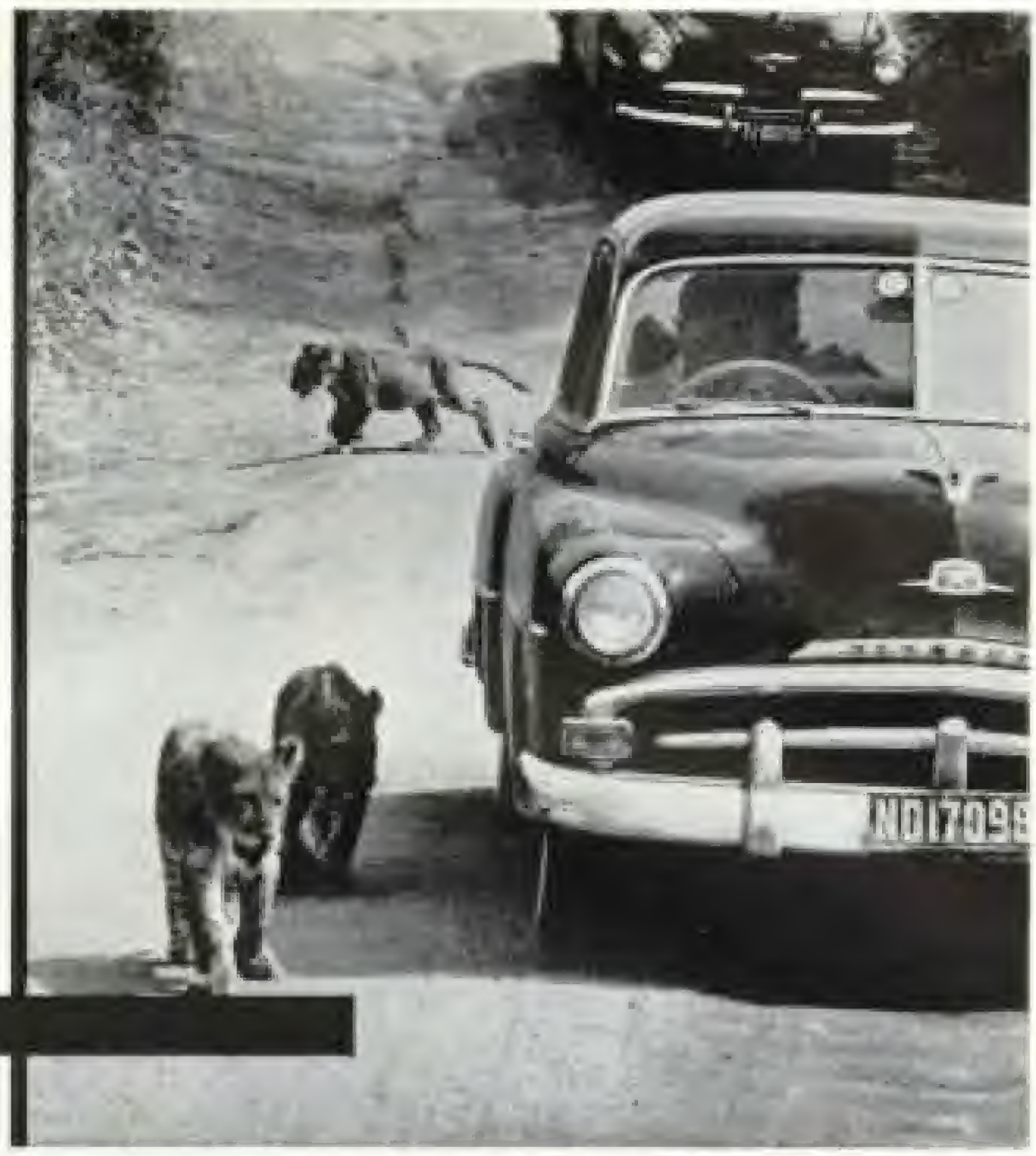

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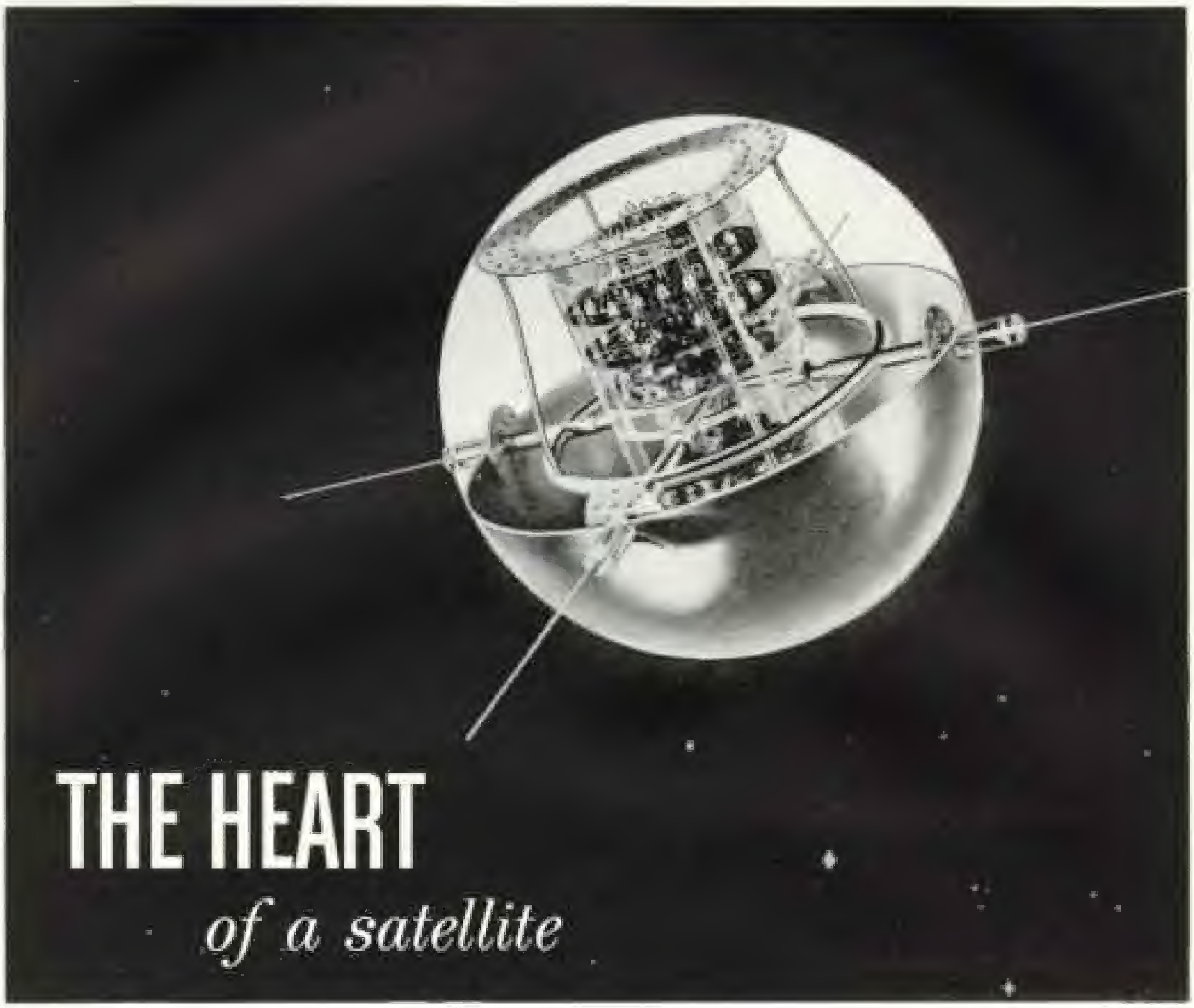

As astonishing amount of equipment can be put in a satellite. There are devices to measure temperatures in outer space, for example, and meteorite density, or cosmic ray activity.

There are also two small, battery-powered radios equipped with transistors—the tiny amplifiers invented at Bell Telephone Laboratories. In the Vanguard satellite shown here, all of this equipment is in its cylindrical core.

Why can small satellites do such big jobs? Because hundreds of pounds of equipment have been reduced in size, or "miniaturized," so that they weigh only a few pounds, and take up little room.

The rugged, durable transistor is a good example of this. About the size of a lima bean, it can do the job of a vacuum tube fifty times larger and it needs so little power that very small batteries can be used.

The qualities that make the use of transistors essential in satellites are also used to advantage in much new telephone equipment. Transistors now help millions of telephone customers dial their own long distance calls directly. And those who are hard of hearing can order transistor-equipped telephones with adjustable volume control.

Small as it is, the transistor has already won a big place for itself, and has an even bigger future . . . in the heart of many a satellite yet to orbit, and in the heart of tomorrow's better telephone service.

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