MAP SUPPLEMENT: VACATIONLANDS OF UNITED STATES AND SOUTHERN CANADA

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THE JOURNAL OF THE NATIONAL GEOGRAPHIC SOCIETY WASHINGTON, D. C.

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◀ **COVER:** Play of the surf enchants a bather at Cape Hatteras National Seashore, North Carolina (page 50).

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AMISH BOY BY WILLIAM ALBERT ALLARD (MAGAZINE PORTRAIT AND PERSONALITY, 2D PLACE)

GREAT SMOKY MOUNTAINS BY BRUCE DA

NATIONAL

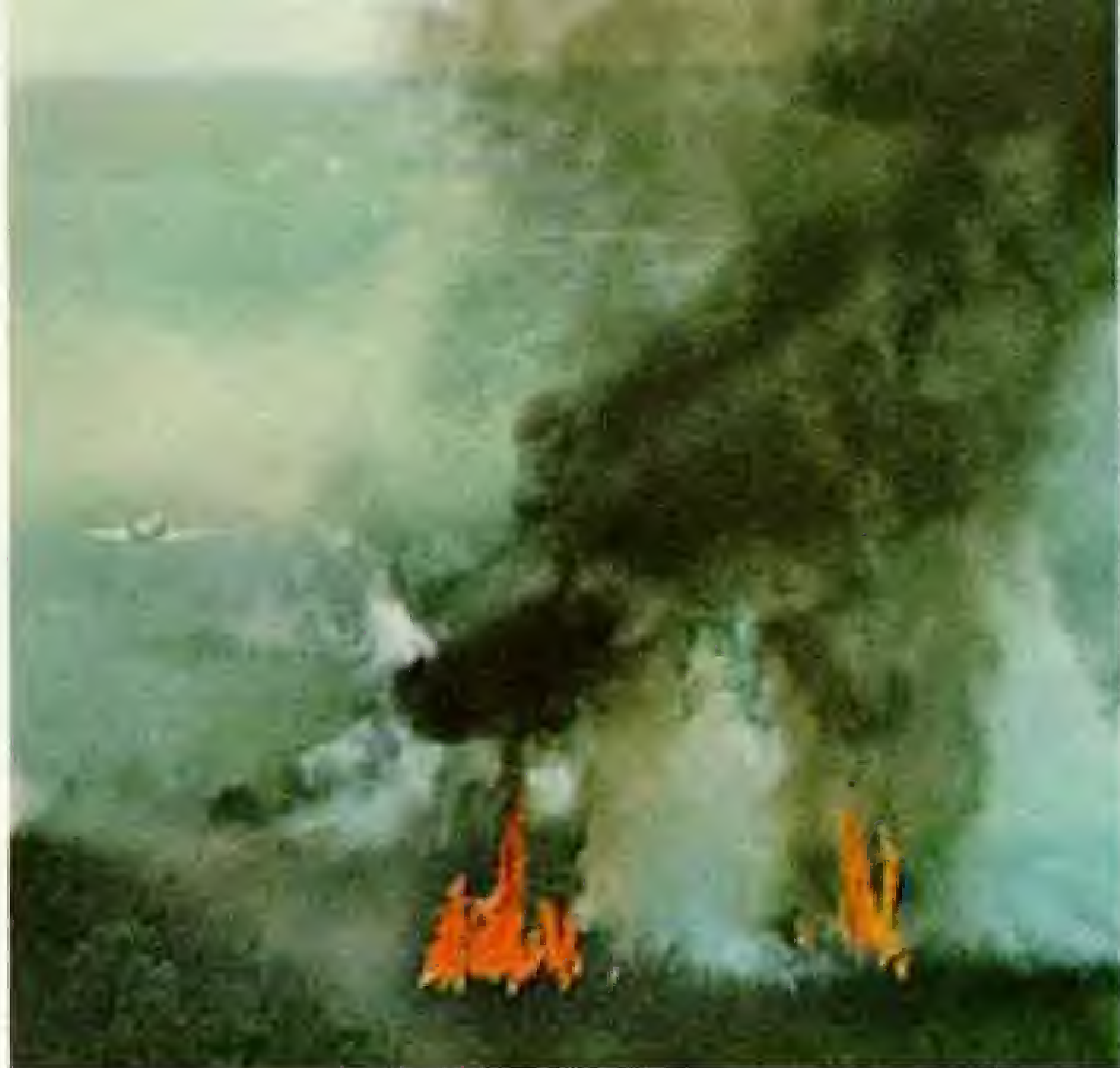
OLD WOMAN BY DAVID S. BOYER (MAGAZINE PORTRAIT AND PERSONALITY, 3D PLACE)

NATIONAL GEOGRAPHIC'S 1966 Prize Winners

Assistant Illustrations Editor Thomas R. Smith, left, placed first in Picture Editing for the Churchill articles in the August, 1965, issue. Seated with him are staff photographers Winfield Parks and William Albert Allard. Standing, left to right: Albert Moldvay, David S. Boyer, W. E. Garrett, Bruce Dale, and James P. Blair. Their photographs are now touring the Nation with other "Pictures of the Year."

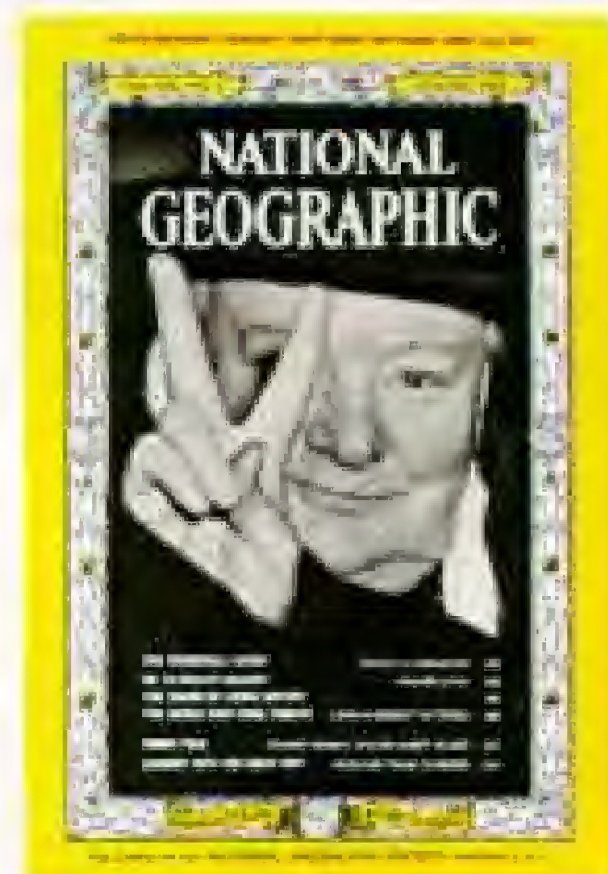
WHITE WATER BY W. E. GARRETT (MAGAZINE SPORTS, 1ST PLACE)

(MAGAZINE PICTORIAL, 1ST PLACE)



VIET NAM AIR STRIKE BY ALBERT MOLDVAY (MAGAZINE PICTURE STORY, 1ST PLACE)

GEOGRAPHIC wins 29 awards for photography



AUGUST, 1965, COVER PHOTOGRAPH

IN A FARM BOY'S SHY SMILE or an air raid's flame and smoke, National Geographic Society photographers capture the essence of life in our time. Now comes word that in the world's largest press photography contest, "Pictures of the Year," with 8,000 entries in 22 categories, GEOGRAPHIC staff men have won a record 29 of 55 magazine awards. The National Press Photographers Association, the University of Missouri School of Journalism, and World Book Encyclopedia Science Service, Inc., sponsor the competition, now in its 23d year. NATIONAL GEOGRAPHIC itself captured a coveted honor. The award for the year's best use of photographs by a magazine went to the much-praised Churchill issue of August, 1965.

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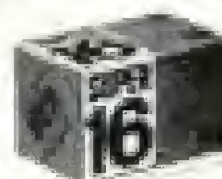

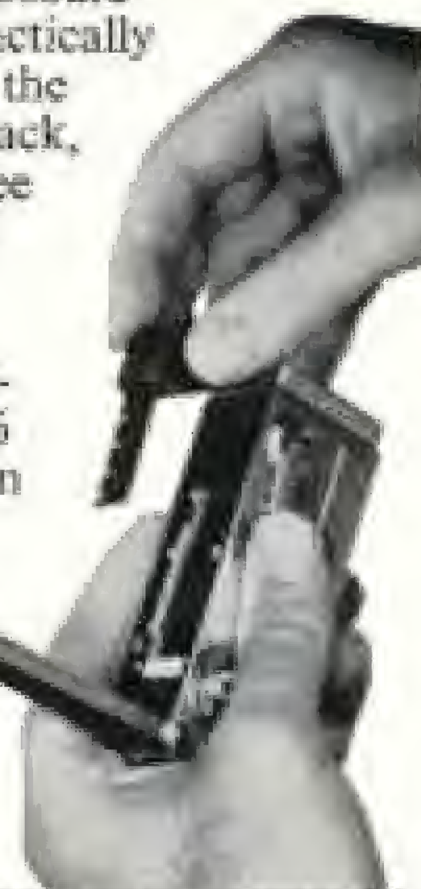

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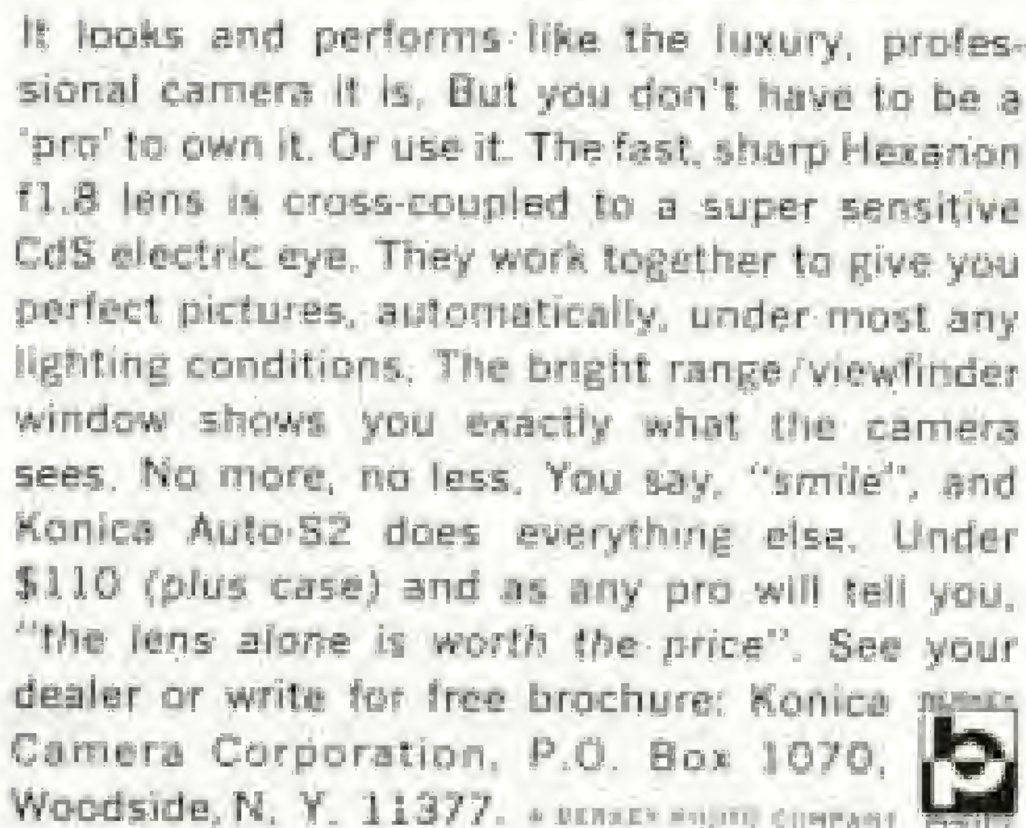

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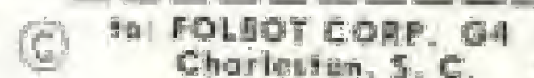

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NATIONAL
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Today and Tomorrow in Our National Parks

By MELVILLE BELL GROSVENOR
LL.D., Sc.D.
President and Editor, National Geographic Society

IN THE BRIGHT SUMMER half a century ago in Nova Scotia's Cape Breton Island, two men and a cabin boy cruised the Bras d'Or Lakes in a 33-foot yawl.

Suddenly a storm arose; the sailors steered for a snug harbor in Saint Peters Inlet, holing up for two days while the wind blew itself out. As rain pattered on the deck and the cabin boy went about his chores, the men passed long hours discussing other scenic lands thousands of miles away.

One of the pair was Franklin K. Lane, soon to be appointed Secretary of the Interior by President Woodrow Wilson. His companion and skipper was Gilbert H. Grosvenor, Editor of the NATIONAL GEOGRAPHIC, and a stalwart conservationist. Their concern: the dire state of America's infant national parks.

Our parks in that summer of 1912 presented a dismal picture indeed. Numbering fewer than a dozen, the Nation's scenic treasures had become monuments to administrative chaos. Scattered for support among various Government departments—including even the U.S. War Department—and chronically short of staff and funds, the parks were known and visited by a mere fraction of their owners, the American people.

Letter Pledges the Society's Dedication

That long-ago storm proved a milestone in American conservation, for Franklin Lane and Gilbert Grosvenor determined to save the national parks. With a group of farsighted men in Congress, in Government, and in private life, they set to work. One of the leaders, Stephen Mather, later to become the great first Director of the National Park Service, supplied the indispensable spark that ignited public support for the campaign.

Drawing on the wisdom of long experience, the small group drafted a Magna Carta in the annals of conservation. It was to become known as the National Park Service Act of 1916.

I often think back to that cruise on the Bras d'Or, for I was the yawl's cabin boy. So in a sense, through my father, the late Gilbert Grosvenor, and his wide associations, I was privileged to grow up with the National Park Service from its very birth.

Not long after the cruise, Gilbert Grosvenor persuaded the National Geographic Society to acquire a priceless privately owned stand of giant sequoias within California's Sequoia National Park and to deed it to the American people. In writing to Secretary Lane to announce the gift, Gilbert Grosvenor made a solemn pledge that endures to this day.

My father's letter praised the Secretary's vision "in safeguarding these great national playgrounds for the coming generations and in making them accessible to visitors."

The letter closed with the assurance that "the National Geographic Society . . . is very glad to have

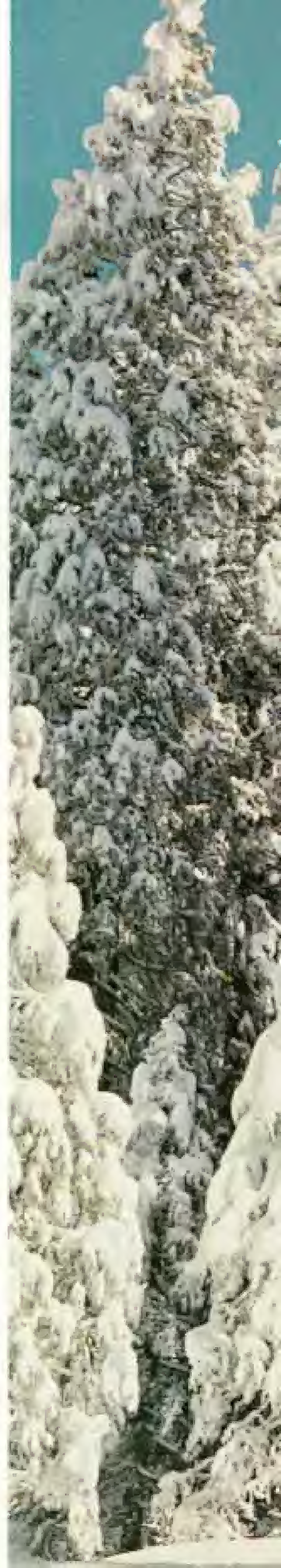
Arrowhead emblem of the Park Service guards more than 230 parks, shrines, seashores, riverways, battlefields, and other treasures featured in the two articles that follow.

Old soldier undaunted by Sierra snow, the General Grant Tree commands an army of lesser sequoias and firs in Kings Canyon National Park, California. Springing from a confetti-size seed, the titan took root perhaps 3,500 years ago.

Outstretched arms of 20 men strain to embrace the 102-foot base of the General Sherman Tree, most massive of all living things. When lumbering threatened it in 1915, a group of eminent Americans visited the grove. Among the party: the late Gilbert Hovey Grosvenor, Editor of the NATIONAL GEOGRAPHIC, who photographed this human chain.

Later the Society and its members contributed $100,000 to help preserve 2,239 acres in Sequoia National Park.

Today your Society crusades to save coast redwoods (pages 62-4).



the privilege of cooperating with the Government in preserving these priceless natural treasures to posterity."

Creation of the Park Service by Congress was indeed the key to safeguarding our natural wonders. I have counted among my good friends all seven of the dedicated men who advanced the Park Service as directors—Stephen Mather, Horace Albright, Arno Cammerer, Newton Drury, Arthur Demaray, Conrad Wirth, and now George Hartzog. Each unfailingly has followed the credo in that epic act of 1916. With deep wisdom Congress declared:

> "The fundamental purpose of the said parks, monuments, and reservations . . . is to conserve the scenery and the natural and historic objects and the wild life therein . . . unimpaired for the enjoyment of future generations."

No one has ever improved on that declaration, although Stephen Mather once offered a condensed version.

"They belong," he said simply of our national parks, "to everyone—now and always."

"Everyone" today means 195,000,000 Americans. Instead of 11 national parks the United States today has 32, together with a vast system of national historical parks, monuments, memorials, scenic riverways, seashores, parkways, and an exciting third dimension to the park system—the national recreation areas.

In his accompanying article, Conrad Wirth describes the past decade of high achievement under the "Mission 66" program. George

GILBERT H. GROSVENOR

Picnicking in Sequoia National Park in 1915, Stephen T. Mather, Assistant to the Secretary of the Interior, heads a table of prominent conservationists working to preserve the big trees. He became first Director of the Park Service. To his left: GEOGRAPHIC Editor Gilbert H. Grosvenor, who made the picture with the aid of a delayed-action trigger. Horace M. Albright, Park Service Director, 1929-1933, sits in front of the cook. To Mather's right: E. O. McCormick, Vice President of Southern Pacific; Frederick H. Gillett, U. S. Representative from Massachusetts, later Speaker of the House and Senator; travel lecturer Burton Holmes; Henry Fairfield Osborn, President of American Museum of Natural History; author Emerson Hough; publisher George W. Stewart.

KODACHROME BY N. ANTHONY STEWART © N.G.S.

Huskies drowse in the summer sun as a ranger at Mount McKinley National Park shows off Alaska's winter carryall—the sledge. Spectators include members of the Secretary of the Interior's Advisory Board on National Parks. Board members, from right: Paul L. Phillips, President, Papermakers and Paperworkers union; Edward J. Meeman, editor emeritus, *Memphis Press-Scimitar*, Board Chairman Dr. Wallace E. Stegner, Professor of English at Stanford University. Dr. Robert L. Stearns, former President of the University of Colorado (fourth from left), stands with Dr. Melville Bell Grosvenor, then Vice Chairman, now Chairman. Congressman Roy A. Taylor of North Carolina, a member of the House Committee on Interior and Insular Affairs, is at far left.

Hartzog follows with a blueprint of promise—and problems—in the years ahead. Their stories are of vital concern to us all:

In this golden anniversary year of 1966, some 130,000,000 visitors—the equivalent of two out of every three Americans—will use and enjoy the wonders of our National Park System.

I stress "use and enjoy"; that, after all, is the fundamental purpose of our parks as Congress established them. I cannot agree with those who maintain that any improvement of a park—an access road, a modest lodge—violates the principles of conservation.

Wilderness areas, of course, must be preserved at all cost. As a lifelong park enthusiast, I know of no greater pleasure than a pack trip into the solitude of timbered mountains and remote cool glades.

Even our most popular national parks—Yellowstone, for example, Sequoia, Yosemite—are still largely wilderness. Other parks, such as Alaska's superb Mount McKinley, were conceived almost wholly as primitive domain. There is no shortage of wilderness in our national parks.

But what of our older visitors, and equally, the very young? Without proper park facilities such as access roads, food, and lodging, these millions can never fully enjoy the wonders set aside for them.

In hundreds of articles dealing with the natural and historic treasures of our parks, the GEOGRAPHIC has always emphasized their use and enjoyment. Similarly, in grants by your Society to support or expand the system—recently, for example, with the proposed Redwood National Park in California—the aim has been to bring them closer to the American people.

Man and Nature Form a Partnership

For those who still believe that man can contribute nothing to our natural wonders, I would urge a visit to Jackson Hole in Wyoming's Grand Teton National Park. There John D. Rockefeller, Jr., purchased thousands of acres of private land and generously donated them to the American people as part of the park. Today, under the guidance of my good friend Laurance S. Rockefeller, a valued Trustee of your Society, attractive facilities—two lodges as well as cabins and a tent village—draw thousands of new visitors annually. Income from these accommodations goes to conservation.

Elsewhere, in a distant yet equally spectacular part of our country, the National Park Service has launched a quiet experiment in providing basic services. I witnessed this pilot project last summer at Glacier Bay National Monument, during a survey of existing and potential parklands in Alaska.

I took part in the survey as a member of the Advisory Board on National Parks to our immensely able Secretary of the Interior, Stewart L. Udall. Members of the board, appointed from a variety of fields, serve as unpaid consultants not only to the Secretary, but in effect to Congress itself.

At Glacier Bay—accessible only by plane or boat—the Park Service has broken with tradition. Despite the national monument's startling beauty, its isolation discourages any concessionaire from building a lodge or cabins as is customary in other parks. The Park Service itself has built pilot facilities at Bartlett Cove, and a responsible firm has agreed to trial management. If successful, the scheme may be applied to other remote parks and monuments—with benefit once again to the public.

Were it not for our dedicated Congress and National Park Service, many of our irreplaceable treasures would have been lost long ago to the chain saw, the shovel, and the bulldozer.

We have been blessed as well, in this century, with Presidents fully alive to the value of those treasures. Two of our greatest conservationists, President and Mrs. Lyndon Johnson, have broadened the crusade to include the entire country. Under such inspired leadership and with the Nation's new awareness of our natural heritage, the beauty of America rests secure.

* * *

Birthday cake crowned with a cabin honors former U. S. Senator Harry F. Byrd, center, who worked for creation of Shenandoah National Park in Virginia, and even today improves it with gifts such as this mountaintop shelter, Byrd's Nest No. 2. Secretary of the Interior Stewart L. Udall, left, and author Wirth, right, father of the 10-year Mission 66 plan that dramatically expanded national park facilities, play host at the dedication of this camp shelter.

A Mission 66 accomplishment, the new Tioga Road in California's Yosemite National Park (left) winds past Tenaya Lake.

TODAY IN OUR NATIONAL PARKS

The Mission Called 66

By CONRAD L. WIRTH

Former Director, National Park Service
Trustee, National Geographic Society

THE NATURE TRAIL looped back toward its starting point at the edge of a granite outcrop, shaped by a mighty glacier that melted away 10,000 years ago. I stood on the rock's glistening gray surface, sanded smooth by grit-carrying ice.

Behind me Tenaya Lake daubed a patch of blue against the swathing green of trees and meadows. Before me Tenaya Canyon spilled down to embrace the giant bulk of Half Dome, sheer-faced landmark of Yosemite National Park.

I had walked the few hundred yards of the nature trail from a parking overlook on Yosemite's Tioga Road. As my eyes swept back to that ribbon of asphalt threading through the high Sierra Nevada wilderness of California, I couldn't help recalling the chorus of opposition to building the road at all. And I thought

Yosemite

Churned to froth in its wild leap, Yosemite Falls plunges with such force that the ground trembles at its base. Upper Fall, Middle Cascade, and Lower Fall plummet a combined 2,425 feet—North America's loftiest cataract.

Swollen by spring melt, the falls fills Yosemite Valley with its thunderous roar. In early summer the waning waters whip in the wind like a gossamer veil. By mid-August only a tear trickles down the canyon face.

Pressed between sheer rock walls half a mile high, Yosemite Valley follows a seven-mile gorge carved by glaciers and the Merced River. From hanging valleys high above the river spill many other spectacular falls, including Bridalveil, Vernal, Illilouette, Nevada, and Ribbon, which drops 1,612 feet, longest single fall on the continent.

Yosemite became a national park in 1890, a few days after nearby Sequoia attained park status.

Yosemite firefall rains a river of embers down the face of Glacier Point.

Each summer evening a bonfire of bark from fallen trees blazes atop the cliff. Dying, it leaves a huge bed of glowing embers. As twilight deepens into night, an expectant hush envelops campers in the valley more than half a mile below.

Suddenly the cry sounds in the darkness, "Let the fire fall!" and men with long-handled rakes push the coals over the brink. As if in slow motion, the fiery torrent drifts toward the canyon floor, consuming itself as it falls.

KODACHROMES BY NATIONAL GEOGRAPHIC CHIEF PHOTOGRAPHER B. ANTHONY STEWART (ABOVE) AND ROY MURPHY © NATIONAL GEOGRAPHIC SOCIETY

of the Mission 66 program that brought it to completion.

Just 50 years ago—on August 25, 1916, to be exact—the Act of Congress that created the National Park Service went into effect. But only 10 years ago a crisis loomed for our parks, which Congress had ordered preserved "in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." Facilities were out of date and run down, roads were in dangerous condition, trails were washed out, employee morale was at a low level, and even scenic beauty was deteriorating. Mission 66 saved all these.

Seldom has a single program that so affects the inspirational heritage of an entire Nation, and of generations yet unborn, been carried out in such a short time. Not only was that program successfully completed, but its influence on the cultural development of the Nation has spread in ways far beyond even the wildest expectations of those involved in it.

As Director of the National Park Service until my retirement in 1964, I had the role of guiding Mission 66.* And so, in this, the year of the program's fulfillment and the golden anniversary of the Park Service, the National Geographic Society has asked me to summarize Mission 66's accomplishments.

Why were the parks, a decade ago, in such bad shape? They were literally being "loved to death." A system equipped to handle 21 million visitors a year was flooded by 55 million. Priority demands of World War II, the Korean War, and the continuing cold war cut Park Service budgets to the barest minimum.

*Mr. Wirth described national parks as a "Heritage of Beauty and History" in the May, 1958, NATIONAL GEOGRAPHIC, and wrote of state and local parks in the November, 1963, issue. For numerous other articles on our parks, consult the NATIONAL GEOGRAPHIC index.

Campfire smoke hangs like mist in crowded Yosemite Valley, where throngs wait to view the evening firefall from Glacier Point. In this time exposure from 3,250 feet above the valley floor, a trail of flashbulbs traces the path of a photographer as he strolls in a loop at right center.

Automobile lights streak roads leading from Yosemite Village at upper left, across the curling Merced River, to the parking lot at Camp Curry. Royal Arches etch the beetling canyon wall.

To disperse summer crowds, Mission 66 built 1,000 campsites outside the valley.

KODACHROME BY JONATHAN S. BLAIR © N.G.S.

THIS PAGE FOLDS OUT

I marvel that my predecessors, Newton B. Drury and Arthur E. Demaray, were able to do so remarkable a job of bringing the parks through this trying period intact. Areas had to get by on a hand-to-mouth basis; patchwork repairs piled on top of patches; only small, most-urgent capital investments had been made in 15 years. Outmoded visitor accommodations creaked with inadequacies. People had to sleep in their cars and form long lines at outdoor toilet facilities. Roads laid out in days of stagecoach travel had become clogged by streams of automobiles; paving lay chuckholed and crumbling.

Park employees lived in shacks, or even tents; undermanned staffs tried desperately to cope with floods of visitors. Worse still, historic and scenic sites showed signs of ruinous wear from the impact of too many feet.

Little wonder, then, that visitors often left their national parks and monuments in frustration, unable to see what they had come to see, foiled in their desire to find inspiration. Well-meaning persons even argued that parks

"**Camp out,**" advised naturalist John Muir, and "cares will drop off like autumn leaves." Shepherded by their leader, these junior woodsmen carry their sleeping bags back to Yosemite Valley after an overnight stay above Nevada Fall.

Open-air baths delight preschool campers in the valley. Guitar music enlivens another group's chore of cleaning up after a meal cooked among the tall trees.

EKTACHROME (ABOVE) BY JONATHAN S. BLAIR; EKTACHROME (BELOW) AND KODACHROME BY B. ANTHONY STEWART © N.G.S.

should be closed to the public until they could be properly protected, or be turned over to private hands for exploitation of the timber, mineral, and other wealth they contained.

Package Approach for Postwar Problems

Pondering the problem at home one February evening in 1955, I decided the answer lay not in the piecemeal year-by-year appropriations that had been the practice. It was essential to have a package approach—a plan that would anticipate our requirements and put areas into the kind of shape the people of the United States had a right to expect.

We of the Park Service could take such a plan to Congress and say: "This is how the parks ought to be, this is what it will cost to put them there, this is how long it will take, and this is what you'll get for your money."

The plan would provide, say, for a badly needed road—and in the same package make certain that the lodges, campgrounds, public buildings, utility systems, and other things the road leads to would be ready at the same

time. And above all, the plan must assure that these facilities would not destroy the very things that people come to see: the great scenic, scientific, and historic heritage of our country.

My musing began on a Saturday evening. The following Monday we started a task-force operation aimed at producing a model park system by 1966. Hidebound views about park management and practices went out the window. We listed our needs: physical improvements, increased staff, additional lands, new operating and training procedures, new methods of visitor protection, and new interpretation of park values—all based on new goals.

Twelve months later the studies were completed, and we had our Mission 66 package. It was based on estimates that 80 million people would visit the parks in 1966. Putting the parks in shape to take care of them, and selecting new areas needed to round out the park system, would cost $786,500,000—an average of $78,650,000 a year.

For a Park Service that during World War II had had as little as $5,000,000 a year to spend, and that in the 10 years afterward had averaged only $25,000,000 a year as its budget, this Mission 66 amount was an impressive sum. But, as it turned out, we undershot.

Instead of an expected 80 million people, 121 million trooped through the national parks in the 12 months of 1965. Instead of a program cost of $786,000,000, the total has come to almost a billion—mostly because of increased costs of materials and labor, and the expenses of 50 areas added to the National Park System. Fortunately, Mission 66 laid foundations for dealing with this booming park popularity and the problems it poses for the future. But my successor as Director of the National Park Service, George B. Hartzog, Jr., tells you about that in his article beginning on page 48.

President Eisenhower Poses a Question

By 1956 we were ready to present the program to President Dwight D. Eisenhower for approval. The occasion came on February 27, before a full Cabinet meeting in the White House. For 35 minutes, with the aid of slides and charts, we talked about the shape the parks were in, what needed to be done, and what it would cost. When we were finished, Secretary of the Interior Douglas McKay asked if there were any questions.

President Eisenhower spoke first. "I have a question," he said. "Why was not this request made back in 1953?" That was Ike's beginning year in office. For the first time since I had begun the presentation, my knees stopped shaking. But I was afraid everyone in the room would hear my heart pounding. Mission 66, I now knew, would have the full support of the administration!

What have the American people gotten for the billion spent on their parks? The list is too long to print here, but let me begin with roads—to be precise, 4,337 miles of them improved or built new.

Take Yosemite's Tioga Road. Back in the 1880's the Great Sierra Consolidated Silver Company hewed a wagon track from western lowlands up through the High Sierra country. It led to a mine at Dana, near what is now Tioga Pass at Yosemite Park's eastern boundary. With pick, shovel, and blasting powder, Americans and Chinese cut 56½ miles in 130 days. But no ore wagon ever rolled

Ramrod straight stand the Four Guardsmen at the southern approach to the Giant Forest in Sequoia National Park. Thicker trunk and cinnamon bark distinguish these *Sequoia gigantea* from the taller brown coast redwoods. Mission 66 trails lead hikers through templelike groves in Sequoia and adjacent Kings Canyon Parks.

KODACHROME BY B. ANTHONY STEWART © N.G.S.

along its grades; a financial panic developed before mining operations could begin.

Yosemite became a national park in 1890. From its earliest days hardy visitors traveled the Tioga Road, sometimes unhitching horses and hauling wagons over "difficult stretches" with block and tackle. Automobiles came, and with them improvements, and finally, in 1937, paving. But the Tioga Road—particularly a 21-mile central section—remained a narrow roller coaster, skirting steep ravines, squeezing between trees, widening only occasionally so approaching cars could pass.

A postwar boom in travel and larger automobiles multiplied problems. House trailers sometimes wedged between trees. Overheated cars stalled on steep grades. Inexperienced drivers stopped in panic beside steep dropoffs, freezing at the wheel until a park ranger or friendly motorist came along to drive them to easier ground.

New Road Preserves Park Values

Years before, the Park Service had studied relocation of Tioga's central section. Now Mission 66 provided funds to carry out the construction. But the proposed route cut into the higher Sierra ridges more than the old road did, and in a place or two crossed granite formations that told tales of glacial action.

Lazing in the lupine, a coed from California's Long Beach State College studies amid the lush beauty of Sequoia National Park. Bashful leopard lily (right) mantles Sierra meadows, together with Queen Anne's lace, shooting stars, and fleabane.

Tunnel Log proves a neat solution to a weighty problem. When a shallow-rooted giant 275 feet tall crashed across this Sequoia Park road in 1937, park officials decided to burrow through rather than clear.

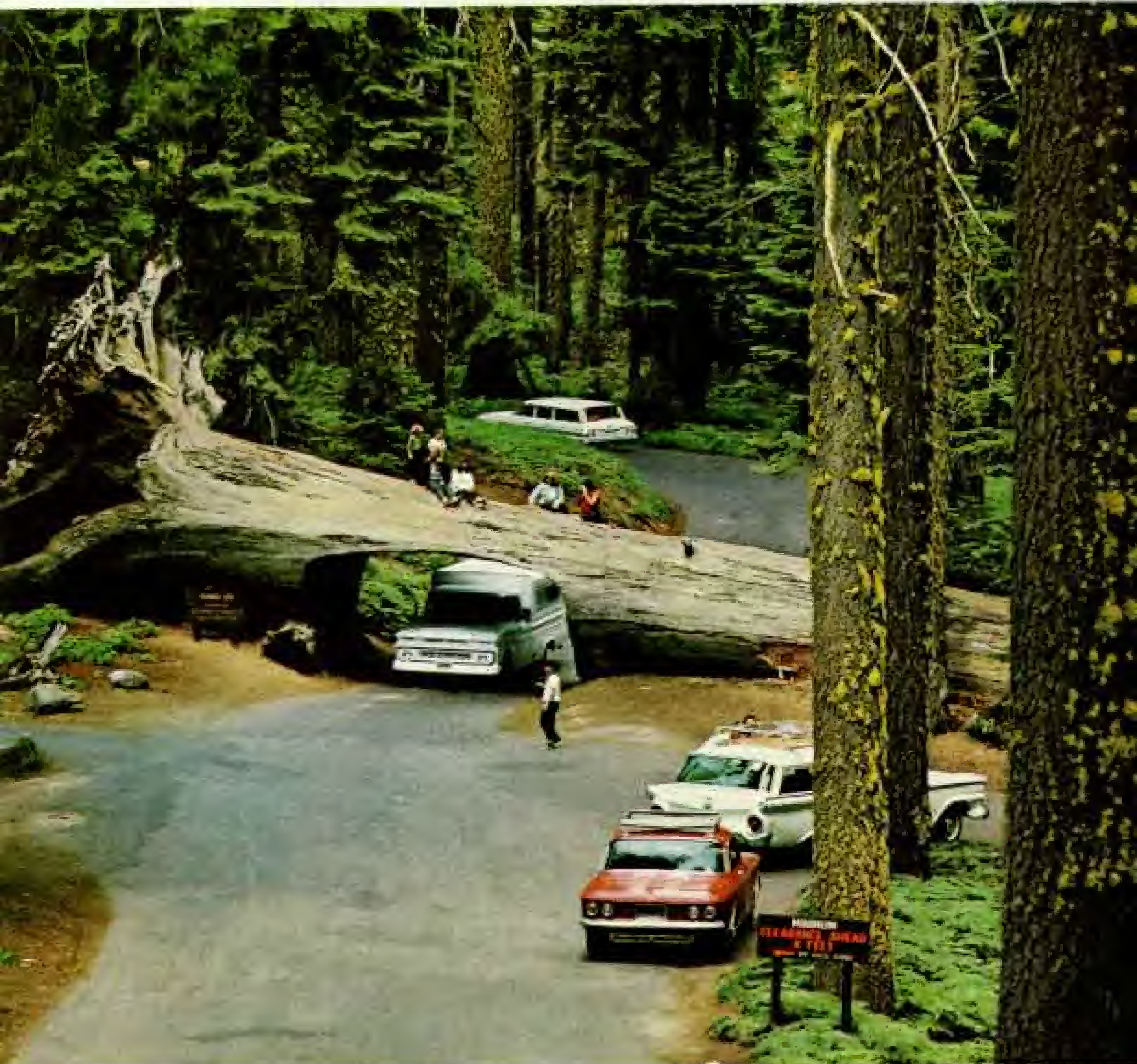
Highly vocal opposition developed. Opponents of the road said it would spoil precious wilderness; defacing the granite with a highway gash would be a crime.

I made trip after trip to the west coast to listen to delegations and to explain the thorough studies behind the recommended route. Even in Washington I had to defend the choice—once against off-the-cuff comments by a Government official of Cabinet rank who called the location "a mistake."

Finally the road was built, essentially as proposed by the Park Service back in the 1930's. While it does cross a stretch of glacial polish, no other route was as feasible. And Yosemite still has acres of glacier-smoothed rock for people to see and enjoy.

Today no one complains. Visitors who could see this natural heritage in no other way can now travel with ease one of the most scenic roads in all North America—one carefully designed to show an ancient juniper here and a stand of fir there, and everywhere to preserve the dramatic park values of the Sierra Nevada (page 6).

Some sections of the old Tioga Road are retained. For the hardy driver, they provide pine-roofed passages to out-of-the-way campgrounds, or winding routes to glades thick with beauty and silence.



Last autumn I drove the section that leads from near the White Wolf turnoff to Yosemite Creek. Along one stretch I met a car. I backed to where the road was wide enough for the auto to pass, but before it could get by, two other vehicles arrived, jamming the route.

We all got out to discuss the situation, and the old Tioga Road versus the new. In one of the cars was a family of five, Mr. and Mrs. William J. Kearns from Downey, California, and their three children.

"We think the new road is great," Bill said, "but Barbara and I are glad you kept parts of the old one. You see, we came camping here on our honeymoon. Now we're celebrating our 12th wedding anniversary by camping here again—only this time we've got kids who can also enjoy the beauty of the place."

I couldn't help thinking of Mission 66 and its boon to generations to come.

What Mission 66 did for Yosemite's Tioga Road was repeated elsewhere. Mount Rainier National Park's Stevens Canyon Road had been a-building since 1931. But the short summer construction season, plus small yearly appropriations—nearly half of which went for repairing the previous winter's damage—made progress slow. Through Mission 66, a lump sum made it possible for contractors to bring in heavy equipment and complete a section in a single season, thus avoiding damage wrought by snow and ice on partly finished grades. The Stevens Canyon Road was finished, except for paving, in four years.

Blue Ridge Parkway Grows Fast

A third of the scenic 469-mile Blue Ridge Parkway, linking the Great Smoky Mountains and Shenandoah National Parks, was yet to be built in 1955. Mission 66 completed the project in ten years, all except a six-mile stretch around Grandfather Mountain in North Carolina, where there has been a problem in acquiring right of way. The road to Desert View in Grand Canyon, the new road offering a window onto the grandeur of Mount McKinley—the list of rebuilt roads or new mileage could go on and on.

Occasionally people talk to me about roads spoiling the wilderness quality of our parks. In reply, I point to Yellowstone. It's true that modernizing the 150-mile Grand Loop Road has allowed more people—two million visited the park last summer—to view the great gorge and steaming geysers and other wonders (pages 24-5). But that modern road still traces the old route cut for stagecoaches around the turn of the century; no new areas have been opened by road since 1908.

Furthermore, suppose a road does encroach on the wilderness character for a distance of, say, a quarter of a mile on each side? In Yellowstone the area thus "spoiled" amounts to only 5 percent of the park.

No, there's plenty of wilderness left in our parks. And I'm convinced that it's worthwhile opening a few windows onto it through which more people can derive pleasure.

Workmen Risk a Dizzying Drop

Besides miles of safe roads, Mission 66 gave the parks 936 new miles of good trails—on pilings over sloughs in the Everglades, underwater for snorkelers in the Virgin Islands, into wilderness or beside natural wonders elsewhere. Two of my favorites lie in that granddaddy and pacesetter of parks, Yellowstone: The trail to Inspiration Point and the switchback walk that leads to the Lower Falls of the Yellowstone River—"400 yards down and 4,000 back up," another not-so-young climber told me as we rested on one of the handy benches.

I defy you to walk the trail to Inspiration Point when early-morning sun or evening shadows chrome the Grand Canyon of the Yellowstone and not feel uplifted by the scene preserved here for man's enjoyment.

You'll marvel, too, at the steel nerves of the workmen who replaced the old wooden walkway with pipe, stone, and concrete. Park employees laid footings inches from the edge of an 18-story drop to the nearest slope of the canyon wall below; 620 feet farther down, the river carves its way along the canyon floor. Even now the thought of men—unprotected by railings—maneuvering wheelbarrow loads of stone above that yawning

Like a great bite torn from earth's raw crust, Bryce Amphitheater gouges the rim of Bryce Canyon National Park in Utah. Rock pinnacles suggest steeples and minarets, castles and colonnades. But to pioneer cattleman Ebenezer Bryce, who gave his name to the wonderland, it was merely a terrible place to lose a cow.

Mission 66 improved park roads, enlarged parking facilities on Inspiration Point at far right, and added a visitor center.

KODACHROME BY WALTER MEAYERS EDWARDS, NATIONAL GEOGRAPHIC STAFF © N.G.S.

chasm sends shivers up my backbone.

I recall an entry in the job diary of foreman Elmer B. "One Thumb" Armstrong of Emigrant, Montana: "Had to quit this p.m. for an hour. The wind was a hurricane for a few minutes. Lampi and I had to lay down and hold onto an anchor pin—was really afraid for a few minutes."

Trails bring to mind a subject I call "park psychology." Build a boardwalk and people will follow it. But mark off a natural trailway with lines of stones or fallen logs, and people will take short cuts, skip past stay-on-the-trail signs, and wander where they shouldn't. So when a natural formation must be protected or a dangerous area avoided, you'll find "people-controlling" walks.

Yellowstone, incidentally, offers outstanding examples of how Mission 66 enabled the National Park Service to adapt to a revolution in American travel habits. Once trains, stagecoaches, and buses brought people to

EKTACHROME BY NATIONAL GEOGRAPHIC PHOTOGRAPHER WILLIAM ALBERT ALLARD © N.G.S.

the parks in bunches. Hotels and big lodges provided ideal means of accommodating such influxes. But the postwar surge in automobile travel and booming numbers of campers and trailers created new requirements.

Families wanted lodgings at lower prices than expensive-to-build hotels could supply. Campers needed places to park cars and trailers, pitch tents, take showers, wash clothes. Mission 66 poured some $30,700,000 into new campgrounds and related facilities—

Ladies first! Bull elk and his harem flee helicopter herders in Yellowstone National Park, Wyoming. To prevent overgrazing, rangers round up excess animals each winter and ship many of them to out-of-state parks and ranches. Bear, buffalo, moose, and bighorn sheep share the 3,472 square miles of America's first and largest national park.

"Bread for a hungry bruin?" Blond bear begs in Yellowstone, but children obey park rules: Don't open windows or offer food.

Cyclops eye of Yellowstone's Morning Glory Pool ogles a ring of admirers. A violent earthquake in 1959 lowered the water's average temperature by 10° to a still-hot 158° F.; as a result algae now thrive, staining the rim of the pool. Fisheye lens captures the shadow of the photographer with his camera on a rod.

Furious torrent, the Yellowstone River's Lower Falls dives 308 feet—half again as far as Niagara. Sightseers feel as if they are being swept over the brink, a sensation the photographer caught by attaching his camera to a pole and holding it out over the abyss.

PHOTOGRAPHED DEAN CONGER © N.G.S.

and concessionaires increased their outlays. Yet the parks barely keep abreast of demand.

Consider just one new campground in the park system: Yellowstone's still-burgeoning Grant Village, named for President Ulysses S. Grant, who signed the Act of 1872 establishing Yellowstone as the world's first national park. Last summer this lakeside facility by itself chalked up more than 140,000 "camper-days"—one day's stay by each camper.

No Trailer Courts in Scenic Vistas

New facilities being built at this campground include a marina with floating docks on Yellowstone Lake. Pontoons of foam plastic buoy the docks. But muskrats almost stymied the project; they gnawed away the plastic, until park authorities put narrow-mesh chicken wire on the bottom of the floats.

At nearby Fishing Bridge, a Mission 66-built trailer court with 365 spaces ranks among the largest in the world. Yet careful planning keeps such trailer cities and campgrounds well away from the points of interest that draw visitors. They have been attractively laid out to avoid creating eyesores on the park scene.

But careful planning creates its own problems, as we discovered during construction of the tent campground across from the trailer court at Fishing Bridge.

"What kind of preservation of our Nation's heritage do you call bulldozing out 20 acres of pines to make a bare campground?" one irate park visitor complained.

We patiently explained to the visitor—and to hundreds of others—that the trees were densely growing, shallow-rooted lodgepole pines. Trees left exposed in a fringe around individual campsites can't withstand strong winds as can trees in a grove. So we cleared the entire area. I hope my complaining campers have had a chance, as I did last fall, to see the site now that sturdier volunteer growth has a five-year start. Many new trees stand taller than my head; campsites begin to show again the screened privacy that users like.

Yellowstone's neighbor park, Grand Teton,

Bones of giant reptiles entombed millions of years ago inlay a wall of the glass-enclosed visitor center in Dinosaur National Monument on the Utah-Colorado border. Perched on the cliff face, museum technicians outline the relics with tools ranging from pneumatic hammers to delicate dental picks.

Frosting of snow tops the layer cake of the ages—incredible Grand Canyon in Arizona—in a view from the East Rim Drive. A display at the park's Yavapai Museum graphically illustrates how the Colorado River cleaved earth's mightiest gorge through rocks 1½ billion years old. ▶

EKTACHROMES (FOLLOWING PAGES) BY [illegible] © N.G.S.

pioneered a new type of camping facility made possible by Mission 66. We call them "tent cabins"—and sometimes "half-breed cabins" or "expanded Adirondack shelters." They're simple to build; at Grand Teton's Colter Bay each structure has two walls of logs plus two walls and a roof of canvas over a pipe frame. The concrete-slab floor extends to form a patio covered by an awning.

Two such units are placed together so that the log walls form a cross, with the canvas-enclosed living spaces between opposite legs. Each unit has table, benches, fold-down bunks, outdoor grill, wood-burning stove for interior heating, and parking space.

Why did Mission 66 develop accommodations like these? As a concessionaire at Colter Bay puts it: "We can build a tent cabin for around $2,000, compared to perhaps three times that for a motel unit. So we can offer comfortable lodging that will take care of a couple at a cost of only $5 a night. It fills a gap between roughing it in a campground and the more luxurious quarters of a cabin."

At Colter Bay, visitors without camping equipment can rent whatever they need: sleeping bags, sheets, dishes, cooking utensils—even a basic food package that includes such things as flour, salt, and pepper. Similar tent-cabin villages are now taking shape in other park areas.

I'm particularly proud of one Mission 66

KODACHROME BY WALTER MEAYERS EDWARDS © N.G.S.

School with a spectacular campus, the Horace M. Albright Training Center at Grand Canyon instructs new rangers. Maps behind supervisor Frank F. Kowski pinpoint national park areas. As a teaching aid he uses a model of an imaginary park called Avalanche Peaks. This "boot camp" and another at Harpers Ferry, West Virginia, named for Stephen T. Mather, first Park Service Director, are Mission 66 innovations.

development—the replacement of the old Canyon Lodge in Yellowstone. Built in stagecoach days and perched near the rim of the Grand Canyon of the Yellowstone, the brown-stained shingle structure detracted from the site's natural beauty. Mission 66 permitted razing it and the old Canyon Hotel as well, and establishing a new Canyon Village Motor Lodge half a mile back from the canyon's rim. New trees on the old site restore the area as nearly as possible to the pristine beauty the park system is charged with preserving.

Visitor Centers Tell Park Stories

The new Canyon Village, an $8,000,000 complex built primarily by private capital, provides a modern 493-unit motel, cafeteria, lounge, dining room, campgrounds, service station, and outstanding visitor center.

Mission 66 lays emphasis on the visitor center idea. Most units of the park system will eventually have at least one—a building where the public can get information leaflets, ask questions, and wander through displays. There are buttons to push for taped talks, dioramas and panels to explain park wonders, exhibits and presentations to tell of park history, geology, or ecology.

Museum rooms and information counters have long been part of our parks. But Mission 66 turned them into exciting centers using every tool of modern education and display. At Kings Canyon National Park, a large circular room in the visitor center has been built to the diameter of a giant sequoia, most massive of all living things. I never cease to thrill at the "gee whizzes" that come when people sense the great tree's size.

At Grand Canyon's Yavapai Museum, exhibits show how the Colorado River has cut an inner gorge 1,500 feet deep in primordial rock so hard it can wear away a steel file—and there's a file at hand for you to test the hardness of a rock sample. At Dinosaur National Monument, one wall of the visitor center is the very cliff face in which bones of prehistoric

monsters lie embedded; you see technicians at work, uncovering fossils (pages 26-7).

Visitor centers can tell you what there is to learn about a park, and how best to enjoy it. Or—as at Cape Cod National Seashore and many of the 99 other centers built by Mission 66—they can offer you comfortable theater seats from which to watch slides and movies or listen to a ranger's lecture.

But nothing takes the place of getting out into the park yourself. Go, as I have, to Yavapai Point above the Grand Canyon and watch the sunrise, for example. Dawn bathes the heights with rose, leaving night's blue haze caught in the canyon clefts. The sun bursting over the chasm rim lavishes gold over pinnacle and butte. Then, climbing higher, it begins its long day's task of finger painting with touches of light and shadow.

Funds First, Then a Park

I mentioned Cape Cod National Seashore. Here Mission 66 tried a brand-new idea. For the first time, Congress appropriated funds to buy land to *create* a national park. Before, parks had been formed from federal lands or from lands donated by states or individuals; funds voted for land purchase usually were for specific plots needed to round out a park boundary.

President John F. Kennedy signed the bill authorizing the national seashore on August 7, 1961. The proposal had brought storms of protest, though it also had many friends on the Cape. Homes stood on this sandy tip of Massachusetts' hook, where wild beach and wind-blown dunes join a dramatic meeting of sea and sky. People feared an influx of honky-tonk developments, ugly campgrounds, hordes of visitors.

But patient explanation of Park Service plans made before church circles, civic groups, garden clubs—any place we could find an audience—eased alarm and won understanding.

I can't forget one long and stormy town meeting I addressed. As the evening wore on, one persistent Cape Codder asked question after question. Finally he rose determinedly to his feet.

"It's 12:30 a.m.," he snapped. "I've heard enough and I'm going home. But I'll tell you this, young man. What you say makes sense to me. Come around and I'll be the first to sell."

I don't know which pleased me more: winning a friend for the park, or having this gray head of mine called "young."

Today Cape Cod National Seashore still is acquiring friends—and land. Several former opponents now serve on its citizens' advisory commission. The area's 44,600 acres include ground where Champlain trod, spots where exploring Pilgrims came ashore after their

Lifesaving ranger team inches down a cliff during a practice rescue in Oregon's Crater Lake National Park. Blanket imitates a body in the litter; canvas prevents ropes from chafing. Rangers may fight fire one day, lead a bird-watcher tour the next.

Mayflower voyage, and high bluffs where Marconi's spark generators in 1903 sent the first wireless messages from the United States to England—with a crackling din that local people talked of with awe. Some said it could be heard three miles away.

Here, too, are magnificent beaches for surf-boarding and swimming. The ripples of towering dunes, disturbed by the tracks of deer, rabbit, or sightseer's "dune taxi," reappear with the restless winds. Here one finds kettle holes created by melting glaciers. And salt marshes, wild-rose thickets, and oak forests form an unspoiled setting, now protected for man's enjoyment for all time (page 47).

Detective Work Guides Restorers

Say "National Park Service" and most people think of scenic areas like Grand Canyon or Yosemite. The fact is, however, that two-thirds of the sites administered by the Park Service hinge upon history rather than scenery. Mission 66 did not slight them.

There's Independence Hall, for example. This cradle of our Nation's birth, where the Declaration of Independence was signed and the Constitution written, shines with what has been called "the most concentrated and extensive effort ever devoted to an historical restoration in the United States." Second-story floors that had sagged nine inches through the years—so much that remodelers of the past century hid the droop with false ceilings beneath them—were straightened and strengthened. Weakened roof timbers gained reinforcement by steel columns and beams.

Simultaneously architects and contractors set about restoring the interior to the way it looked when Washington, Franklin, Jefferson, and Madison walked there.

Exhaustive research went into the task. Researchers combed more than four and a half million documents and original records seeking evidence—particularly for the Assembly Room where John Hancock presided over the Declaration's signing and

KODACHROMES BY WILLIAM BELKNAP, JR. © N.G.S.

Popping from spiny leaves, blossoms of beavertail cactus brighten California's Death Valley.

Waves of sand crest above visitors near Stovepipe Wells in Death Valley National Monument. Corrugated mountain wall shimmers like a hazy sky behind the loftiest dune.

New World's lowest pool, brackish Badwater lies 280 feet below sea level. Within five miles are two points that measure −282 feet, lowest in the Western Hemisphere. Snow-crowned Panamint Range climbs two miles above the desert floor.

A sun-tortured sink 140 miles long, Death Valley has recorded 134° F. in the shade. Yet a host of creatures adapt, from tiny pupfish to bighorn sheep. With autumn, visitors flock to ghost towns and alkali flats where 20-mule teams hauled borax.

KODACHROME (ABOVE) BY E. ANTHONY STEWA

KODACHROME BY CHARLES STEINHACKER © NATIONAL GEOGRAPHIC SOCIETY

delegates to the Constitutional Convention sat.

Travelers' diaries in Britain and courtiers' memoirs in France yielded clues. An early-day sketch proved helpful, but restorers did not accept it until a manuscript specialist had examined the paper on which it was drawn and handwriting experts of the Federal Bureau of Investigation had authenticated it as the work of a Philadelphia merchant. No detail went unchecked that would shed light on how the room looked.

Even this detective work tells only part of the story. The building itself yielded unquestionable evidence. Marks on floor joists where dirt had seeped down through cracks showed how wide original floorboards had been. Traces left on bared brick, where woodwork had been primed before the walls were plastered, revealed lines of original decorative trim. Paint painstakingly peeled off layer by layer—50 coats, an eighth of an inch thick in places—uncovered color schemes going back to the building's beginning. The one on the woodwork in Revolutionary days has been matched in Park Service paintshops.

Similar research went into restoration of the nearby building where Congress met when Philadelphia was the Federal Capital. Walls, desks, and rostrums of Congress Hall faithfully reflect the surroundings that saw Washington and John Adams inaugurated, and Jefferson presiding in the Senate Chamber upstairs (page 45).

For the carpet, old sketches suggested the pattern and colors. And park researchers tracked down old machinery and located a manufacturer who could reproduce enough of the floor covering for the restored Representatives Chamber. With the manufacturer's help, they found an 80-year-old weaver who had worked on similar "ingrain" carpeting.

Before Mission 66, the Park Service seldom had money for such exhaustive research. I

Ever mantled in white, mighty Mount Rainier looms over its namesake park. Twenty-six glaciers grip the 14,410-foot-high king of Washington's Cascade Range. Prolonged rains and as much as 83 feet of snow in a single winter water the magenta painted cups, aster fleabane, and other wildflowers lining trails and roadways.

With the wake of a tail-dragging monster, a rowboat plies Oregon's Crater Lake. Summertime fallout of pollen from pines and firs blankets the blue water.

Handle carved by nature for picking up the world, Rainbow Bridge dwarfs hikers standing in its noon shadow 309 feet below. Earth's largest natural bridge arches 278 feet between

KODACHROME BY WALTER MEAYERS EDWARDS © N.G.S.

sandstone cliffs in Utah. As Lake Powell approaches capacity behind new Glen Canyon Dam, boaters can cruise to within easy hiking distance of this once-isolated national monument.

"The 'Old Ones,' ancient Pueblo Indians, prayed in this kiva, or ceremonial chamber," a ranger in Mesa Verde National Park, Colorado, tells his rapt audience. "But springs ran dry, drought came, and perhaps enemies threatened their strangely lovely land. Seven hundred years ago they left Cliff Palace to seek a place where life was easier."

Today hordes of sightseers threaten the swallows'-nest dwellings. Mission 66 moved camp areas away, and the Park Service is making accessible similar cliff homes on Wetherill Mesa, where your Society has sponsored archeological surveys.

Skeleton of a Pueblo Indian who died centuries before Columbus discovered America comes to light in excavations near Wetherill Mesa. Salvage archeologist Donna Maronde from the University of Colorado disinters the bones.

remember when we wanted to undertake an archeological study of Wetherill Mesa in Mesa Verde National Park, Colorado. We couldn't pry appropriations from Congress, and if it hadn't been for the support of the National Geographic Society, priceless records of cliff dwellers who mysteriously left their homes 700 years ago might never have come to light (above).

Contributions helped, too, in the restoration of Independence Hall. A nation-wide campaign by the General Federation of Women's Clubs brought in more than $220,000 for this purpose. Now private and federal funds combine in a $25,000,000 project at Independence National Historical Park.

On five city blocks to the east of liberty's shrine, demolition crews cleared away shabby dwellings and apartment houses—even a 10-story office building. Now the structures intimately associated with the Nation's beginnings stand unobstructed in all their original dignity. City and state funds are financing many other improvements in the historic area.

Jail, Fort, and Flagpole Recall the Past

From Independence Hall to Wawona in Yosemite National Park is a jump of 2,400 miles. But Mission 66's concern for preserving important bits of the past bridges them and the continent between. At Wawona, a pioneer exhibit brings together structures surviving from frontier days—the old Wells Fargo Express station that once served the park, a

covered bridge, cabins, and stone jail, as well as stagecoaches and mining machinery.

All over the Nation historic sites dot the map. to bring them to life, no browsing through books can substitute for visits to the places themselves. And Mission 66 research helps the Park Service keep them for the future just as they stood when history was made there—rebuilding the redoubt at Yorktown where Washington signed the articles of Cornwallis's surrender; unearthing at Fort McHenry the exact site of the flagpole from which the Star-Spangled Banner flew, thus solving a puzzle of more than a century; restoring Appomattox Court House to the crossroads village it was when Grant and Lee met there to end the Civil War.

With Mission 66 grew two new programs to assure that the past shall live. One is the inclusion in the parks system of important cultural and industrial sites; the other, the national historic landmark program.

I've heard people ask, "How can an industrial site be worth including in our National Park System?" I refer them to the Edison National Historic Site in West Orange, New Jersey, for the answer (pages 44-5).

Here worked the father of organized research. Thomas Alva Edison in 1886-7 built what would become known as his "working bench"—on a nearby hill stood his home, or "thinking bench." The laboratory, unique for the times, included buildings for a 10,000-volume library, machine shops, pattern shop,

chemistry, physics, and metallurgy shops. It could employ 150 men.

Thus were brought together facilities for thinking out a problem and for putting minds and materials to work finding a solution. Edison termed the laboratory "incomparably superior to any other for rapid & cheap development of an invention, & working it up into Commercial shape. . . . Can build anything from a ladys watch to a Locomotive."

Everything is preserved just as it was in 1931, when death came to this remarkable man whose inventions contributed so much to the modern world. On the grounds stands a reconstruction of the world's first movie studio—a tar-papered house that could be pivoted to catch the direct light of the sun. On a laboratory bench lies a bundle of plants, one of 15,000 kinds Edison tested to find a source of rubber that would grow in the United States—a job he began at 80. In the library burns one of his earliest electric-light bulbs, from a stock found in the basement. And in his desk lie seven of his cigars.

Last autumn I overheard one visitor remark, "I feel as if the men who worked here had just stepped out for a coffee break." Such inspiration from the past amply justifies the park system's inclusion of industrial sites—and cultural sites like the Missouri farm where George Washington Carver was born, or the California home of naturalist John Muir.

Many places rich with history are possessed by other Government agencies—federal, state, or city—or belong to trusts, societies, or even private individuals. Most lack the import of an Edison's laboratory or an Independence Hall, yet all form valuable parts of our heritage. They deserve preservation and recognition even though not entrusted to the Park Service. So for them we created the designation "National Historic Landmark."

Some 560 sites now display this badge of distinction. From time to time Park Service representatives visit them and consult with the owners on improvements or procedures for making them more meaningful to the people. Should a site no longer measure up to

Sun-chasing ketch heels in the Atlantic off Acadia National Park, Maine. Bundled against cool July breezes, vacationers on Cadillac Mountain hear a ranger recount tales of a region rich in sea lore; beneath them spreads the famed resort of Bar Harbor. Islands hopscotch across Frenchman Bay to Schoodic Peninsula, where storm waves lash the rocks (below). Private donations created Acadia in 1919, first national park on the east coast.

Park Service standards, the landmark plaque and other benefits of association with the National Park Service could be withdrawn.

In its 10 short years, Mission 66 has accomplished a long roster of big things. But it has also accomplished important little things: litter bags and bearproof garbage cans, for example. Many other advances, such as ranger schools and employee housing, are not in the public eye.

Back in the 1950's, a ranger at one of the entrance stations in Mount Rainier National Park began handing motorists a paper bag as they drove up. Along with it went the suggestion that the bag be used for trash, and that it be dropped in the nearest waste can when full.

The idea had such a noticeable effect in cutting litter that our Washington, D. C., headquarters adopted it for the entire park system. Studies show it trims litter 50 percent. Or, put in a less flattering way, with twice as many people visiting the parks, we have to pick up only the same amount of litter as before. I can't prove it, but I like to think the Nation's litter-bag campaign for cars stemmed from this Mount Rainier beginning.

You'll pardon me, too, if I speak with fatherly pride about our bearproof garbage cans. The suggestion came from my son Ted, now a landscape architect in Billings, Montana, but then a park employee at Yellowstone. His design called for a can with a steel lid shaped like the top of a street-corner mailbox, swung on a post. Bears couldn't reach in through the chute or knock the can over.

Besides saving campers the annoyance of being awakened in the night by can-rattling bears, the design brought other benefits. Park employees don't have to pick up scattered garbage. And big crews don't have to be mustered to fan out all over the park in the early morning to clean up unsightly messes; fewer men, working through the day, can handle collections.

Upside Down on a Canyon Wall

Brand new, thanks to Mission 66, are two "boot camps" for training park rangers and other employees. One occupies a former college in Harpers Ferry, West Virginia. The other, completed in 1963, stands amid the piñon and juniper of Grand Canyon National Park. The Harpers Ferry facility bears the name of Stephen T. Mather, first Director of the National Park Service. That at Grand Canyon is named for Horace M. Albright, Mather's successor—like him, a giant in shaping principles that guide the park system today (page 30).

I went to the Albright Training Center last autumn to see what changes the years had brought since the October day in 1963 when I participated in the building's dedication. I found a class of 40 young rangers busy at a cliff face studying rope-climbing techniques—part of the school's 12-week training program.

My mind went back to a similar scene at an earlier class. One new man was getting instructions in rappelling down a precipice. "Lean back. Snub the rope around your body. Let yourself walk down," the instructor reminded. But the neophyte, in mid-descent, leaned back too far.

Indian-summer day adds zest to a family picnic at Byrd's Nest No. 4, one of four shelters donat-

EKTACHROMES BY DAN MCCOY, BLACK STAR © N.G.S.

ed by Virginia's former Senator Harry F. Byrd in Shenandoah National Park. Here, on the heights of the Appalachians, varied trails lure hikers. Almost 600 miles of parkway crest the Blue Ridge from northern Virginia to Great Smoky Mountains National Park.

KODACHROME BY FRED WARD © NATIONAL GEOGRAPHIC SOCIETY

Bird-on-the-wing: Poetic nickname glorifies the fringed milkwort (above), uncommon in Shenandoah. Yellow lady's-slipper thrives on the loamy slopes of the Great Smokies.

Nosegay of mountain laurel blooms in Shenandoah. "In our parks," says author Wirth, "rangers try to guard plants and wildlife as carefully as they protect visitors."

Eyes on Lincoln, backs to Diana, goddess of the hunt, tots tour the studio of Augustus Saint-Gaudens. The 19th-century sculptor's estate at Cornish, New Hampshire, became a national historic site in 1965.

Feet flew over head and he swung there upside-down, holding firmly to a safety line from his partner above.

Atop the cliff, onlookers blurted a babel of suggestions about what those standing there should do. But a calm voice from below broke the tension: "It's okay for you guys to argue, but what am I supposed to do?" Moments later, guided by advice called down by the instructor, the dangling climber regained his feet and finished the descent.

Real Fire Gives a Dramatic Lesson

Prior to Mission 66, the instruction that park rangers got before going on the job was limited at best. Men learned the hard way, through experience. Now the training schools provide a broad and invaluable background—the Albright Center with somewhat more emphasis on skills needed for protecting the parks and handling the public, the Mather Center leaning more toward interpretation of park wonders, plus research.

Not only do the centers train new park employees, but they offer refresher courses for those farther up the

Invention factory: For 44 years Thomas Alva Edison worked in this laboratory at West Orange, New Jersey, developing fluorescent lamps, motion-picture cameras, and other products of his genius. The National Park Service maintains it just as Edison left it at his death in 1931.

Stage for history, the restored Senate Chamber of Congress Hall in Philadelphia sees early lawmaking reenacted by members of the city's bar association. Independence National Historical Park preserves the buildings in which the United States was born.

promotion ladder. Other Government agencies can send personnel for instruction, if space is available. Classroom study, discussion groups, field trips, after-hours bull sessions —a wide variety of educational methods crowd the 12-week sessions. An FBI agent may teach marksmanship and how to disarm a gun-toting troublemaker. A Park Service expert may conduct sessions in fighting forest or structural fires. (One class got real-life experience when a blaze swept employee quarters at Grand Canyon.) Even down to such things as putting together a nature talk with color slides, movies, and sound effects, trainees learn by doing.

Thus today's ranger steps into his career with a far better grounding than his counterpart of yesterday. And the public benefits.

Cave Air Cools a Visitor Center

I could go on and on with Mission 66 accomplishments: A new water source for Grand Canyon that will eliminate need for hauling in supplies by tank car; new lighting to dramatize the Washington Monument at night; cooling an above-ground visitor center with air pumped up from Mammoth Cave; preventing beach erosion by stabilizing sand dunes with grass and fences at Cape Hatteras; replacing quickly fading printed cards with handsome interpretive signs of aluminum at park after park.

One more accomplishment must be listed: the influence Mission 66 has had on agencies and people outside the Park Service.

By dramatizing park needs, we have won unstinting support from person after person. Perhaps I shouldn't mention individuals, for to do justice to all would take a book. So I beg forgiveness if I cite but two as examples: Representative Charles E. Bennett of Florida and former Senator Harry F. Byrd of Virginia. Representative Bennett's enthusiasm, personal research, and even monetary gifts helped in the reconstruction of French-built Fort Caroline near Jacksonville. And Senator Byrd not only fathered the Blue Ridge Parkway idea, but, as Virginia's Governor in 1928, was instrumental in his state's gift to the Nation of the land for Shenandoah National Park.

A watchdog of Government spending as chairman of the Senate Finance Committee, Senator Byrd once commented that his group's investigations had convinced him that the National Park Service got $1.20 worth out of every $1 Congress appropriated to it.

It would be unjust for Mission 66 to seek all credit. But I am certain that our pebble in the pond set off at least some of the ripples that swept other agencies dealing with the inspirational and recreational needs of the people. Parallel development has come in the Forest Service's "Operation Outdoors," in county and state parks, wildlife refuges, Indian reservations, public lands and recreation areas, and in the studies of the Outdoor Recreation Resources Review Commission, whose chairman was Laurance S. Rockefeller, a National Geographic Society Trustee.

Yes, Mission 66 has accomplished much. But it owes more. It owes its success to the efforts of a host of people—from Presidents making major decisions down to the all-important park visitor using a litter bag.

Mission 66: Legacy to the Future

I think back now to Bradley Patterson, Assistant Secretary to the Cabinet, whose suggestions were helpful in shaping the presentation that launched Mission 66. To our "thank you" letter came a moving reply. It touched a note surely echoed by every American:

"If there was a pinch of added enthusiasm, and a few extra hours on my part, let it be in remembrance of some of those days which have enriched my life beyond measure.

"From my bank account will never come an inheritance for my children, but let there be bequeathed to them, and to their children to come, Lake Solitude, Camp Muir on Rainier, a swim in Tenaya Lake, a stroll in Crescent Meadow, a campfire at Elizabeth Lake. With these safely in trust for them, Midas could not give them more." THE END

Amber fingers of dusk touch the dunes of Cape Cod National Seashore, but still the beachcombers linger. Acres of salt marsh await exploration; each wave rolls up shells yet unsifted. One of the newest jewels in the Nation's diadem of parks, the 45-mile stretch along the sandy hook of Massachusetts entices the visitor to face seaward and, like Henry Thoreau, "put all America behind him."

To save this unspoiled shoreline, the Park Service has acquired scores of privately owned lots under a continuing land-purchase program.

EKTACHROME BY NATIONAL GEOGRAPHIC PHOTOGRAPHER BRUCE DALE © N.G.S.

TOMORROW IN OUR NATIONAL PARKS

Parkscape U.S.A.

By GEORGE B. HARTZOG, JR.
Director, National Park Service

WATER-SKIERS FURROW *Lake Powell in the new Glen Canyon National Recreation Area, spanning the Arizona-Utah border. When filled, the man-made lake will stand 300 feet higher, lapping the base of 900-foot Gregory Butte.*

"IF YOU DO NOT THINK about the future, you cannot have one."

We who have the privilege of caring for your heritage of beauty and history—the national parks of the United States—have taken to heart this advice of novelist-playwright John Galsworthy. We are doing our level best to plan for tomorrow, as did the architects of the famous Mission 66, now completed.

After long study and discussion of the course our national parks should take in the years to come, gradually a plan has evolved. We have imposed no rigid deadline for its fulfillment, but hopefully a decade—possibly even less—will transform its principal elements into reality.

A major plan deserves a name.

Take your pick of park pastimes: Stare down a bear; splash in the surf; load a stringer with bass; view a valley from on high.

As the U. S. population swells and the working week shrinks, more millions enjoy more leisure to explore America. "By the turn of the century, the average worker will spend half his year in 'off' time," says the author. "And when he heads for the parks, we'll be ready."

A host of new recreation areas already emphasize sports in action—boating, swimming, fishing, hiking, horseback riding—that will enable parkgoers to share adventures enjoyed by the pleasure-seekers on these pages.

Horseman in Yosemite Park, California, comes face to face with a black bear; his wild-eyed mount prefers to keep moving. Foam-doused swimmer defies the breakers at Cape Hatteras National Seashore in North Carolina.

Pleased with his catch, an angler steps ashore from the Current River in Missouri's Ozarks, first national scenic riverway. From a stone lookout near Skyline Drive in Shenandoah National Park, a young sightseer surveys Virginia's fertile farmlands.

We call ours "Parkscape U.S.A." In highlight, it proposes:

- To expand the National Park System by 1972 to meet the needs of this generation, as the President has asked be done. This means more parklands.
- To develop cooperative programs with other agencies to improve outdoor recreation opportunities and to seek new approaches for better management and park preservation. I am thinking of the U. S. Forest Service, Bureau of Land Management, and Fish and Wildlife Service; of state and local park services; and of private corporations and groups. This program is extremely important as we continue to emphasize recreation parks in a system heretofore made up mostly of history and nature parks. Public demand for such new parks, devoted primarily to outdoor activities such as skiing, fishing, motorboating—even hunting, where circumstances permit—grows at an astonishing rate.
- To improve our national parklands in urban areas, where more and more of us live.
- To take the parks and their conservation

message increasingly to the people, using the printed word, television and radio, and ranger talks to the schools.

• To extend advice and aid in larger measure to park systems of other lands.

In earlier pages you have learned from my able predecessor, Conrad L. Wirth, of the heart-warming success of Mission 66. The U. S. national parks of today are undoubtedly the best on earth. Their extent is shown on the Society's newest map, **Vacationlands of the United States and Southern Canada,** accompanying this issue. Why, then, must we do more than keep them clean and neat and welcome their owners, the people of the Nation?

Because no place on earth—not the summit of Everest, the South Pole, or the Arabian desert—can long remain unaffected by the onrushing progress of our fantastic era. And this progress brings to our national parks pressures such as they have never faced before.

Expanding cities push against park boundaries. Each time I leave the main west gate of serene Great Smoky Mountains National Park, I am startled by the bustling activity of neighboring Gatlinburg, Tennessee.

Man-made canals, dams, and diversion structures in Florida keep from Everglades National Park the water it must have to survive. Our naturalists suspect that wind- and waterborne pesticides are beginning to affect wildlife—especially fish and birds—in parks we once believed isolated from all dangers.

Gravest Threat: Impact of Human Feet

The oldest pressure increases with every passing day. It is the impact of human feet upon green grass or the delicate fabric of a historic building.

The population of the United States last year reached 195,000,000. Last year the national parks counted 120,000,000 visits. By the turn of the next century there may be 330,000,000 Americans—an increase of about 70 percent. But for many reasons we expect visitors to our national parks to increase at a far faster rate.

For one thing, an unprecedented social movement is taking place in the United

States. More and more of us are living in cities and suburbs; probably three-fourths of us will dwell in megalopolis in the year 2000.

But a steel-and-concrete environment does not give the American people all the inspiration they need to stay happy and productive. We also need sunshine, clean air, and natural beauty. Thus, paradoxically, the more we live in the cities, the more we turn outdoors.

Again, our extraordinary economic advances are giving most of us a larger income —and steadily increasing leisure time to enjoy it. By the year 2000, with a probable three-day weekend and a month of vacation, the average American worker will have *six months'* annual "off" time—compared to two months in 1900 and four in 1960—and no practical obstacles to distant travel.

Where will he spend much of this new leisure time? For the answer we need only glance at the steadily soaring numbers of fishing and hunting licenses issued, outboard motorboats registered, tents and camp stoves sold. The figures on sales of travel trailers are a striking indicator: From 1956 to 1965 they increased 600 percent!

Let's tour tomorrow's parks together and see what you and your children can expect in the years to come.

Glen Canyon: Playground Behind a Dam

A good place to start such a tour might be on the shores of sparkling Lake Powell, created by the Bureau of Reclamation's Glen Canyon Dam stretching across the Colorado River. Here, at Glen Canyon National Recreation Area, you see the spirit of Parkscape U.S.A. already embodied (pages 48-9).

Swimmers splash in the cool depths of a lake that will cover 250 square miles when it fills to capacity. Water-skiers skim across it, and motorboats explore canyons once difficult to reach even by horseback.

While we will give greater emphasis in the future to recreational areas, they are really nothing new for us. We have had several of them for years. Recreation parks such as

(Continued on page 57)

Sound of surf, smell of salt entice campers at Cape Hatteras to explore a 70-mile stretch of North Carolina's Outer Banks. First national seashore area, it has become a model for others being developed on Atlantic, Pacific, and Gulf coasts.

Living totem pole of braves, twirled by Indian maidens, appears in *The Lost Colony*, a pageant about the ill-fated English settlement on Roanoke Island in the 1580's. Hurricane-proof roofs (below) shade picnickers at Hatteras's Coquina Beach.

Heave ho! Vacationing sailors beach their craft at Caneel Bay Plantation in Virgin Islands National Park.

National Geographic Society Trustee Laurance S. Rockefeller donated the first 5,000 acres for the tropical park, which now embraces two-thirds of St. John Island and extends offshore to include a dazzling world of marine life.

Snorkelers leap overboard to explore another underwater preserve in the American Virgin Islands, new Buck Island Reef National Monument.

Gliding face down, they drift above gardens of living coral in waters so clear they can see a hundred feet ahead. They follow a trail marked by submerged signs, occasionally stopping to rest on giant brain corals that grow almost to the surface. The more adventurous strap on Aqua-Lungs and swim down into the iridescent Caribbean.

A barrier reef protects this calm and shallow lagoon, only five miles east of Christiansted on St. Croix Island. The Park Service plans a similar preserve in the Florida Keys, where John Pennekamp State Park already safeguards some of the reefs.

Giant's bowling pins—rock pinnacles carved by rain, frost, and wind—tower as high as 50 stories in Canyonlands National Park in southeastern Utah. Horizontal cracks and ridges in the spires mark strata deposited eons ago when a sea covered the area. Where the Green River joins the

Colorado, sandstone minarets and canyons spread across this newest national park—some of it still unexplored.

KODACHROME BY WALTER MEAYERS EDWARDS © N.G.S.

Lake Mead, Grand Coulee, Shadow Mountain, and Cape Hatteras National Seashore have been extremely popular for a long time. In fact, they have been so popular that we now know we do not have enough of them, and it is in this category, therefore, that the greatest expansion of the National Park System will take place.

These observations, I hope, will allay fears that we plan to put baseball diamonds into Yellowstone or turn water-skiers loose on Crater Lake. I cannot too strongly emphasize that we will in no way diminish the traditional values of our older parks.

Congress, as you know, regarded the first national parks chiefly as places of such outstanding natural beauty that they should be preserved in the name of, and for the use of, all the people. Later it added shrines of American history as a second category of Park Service responsibilities, again enjoining us to preserve them for the enjoyment of their rightful owners, the people.

Hence the primary values of the nature and history parks are inspirational ones. Let me reaffirm my belief that these values are more important than ever.

Show Girls Seek Unblemished Tan

The fun in nearly all the recreation parks will center on and in water. This reminds me of something that happened not long ago in Lake Mead National Recreation Area behind Hoover Dam.

On motorboat patrol one day, a young Lake Mead ranger passed an island on which he saw a dozen pretty girls sunning more of themselves than American custom usually approves. His duty was clear, and he landed.

"It turned out to be a French chorus line from a Las Vegas show," he reported. "Despite a language barrier, I finally gathered that if they showed up for work with pale strap marks on their sun tans, they'd be in trouble."

Since no official report of the incident ever reached my desk, I didn't ask how it ended.

One group of tomorrow's recreation parks will come into being through a concept so brilliant I wish I'd thought of it first. I am referring now to water parks centered around unspoiled scenic rivers.

Ozark National Scenic Riverways, authorized in 1965 in the heart of Missouri's Ozarks, was the first. We hope to have many more as the years go by. Before it became a park, I floated its main stream, the Current River, on an inspection trip. We drifted in a long, shallow "johnboat," unchanged since pioneer times.

Bass flashed in swirling pools and wild turkeys gobbled in oak and hickory woods as we shoved off from a gravel bar at dawn. In another johnboat rode Secretary of the Interior Stewart L. Udall, and in yet another were Missouri State troopers. Our hosts explained the presence of the latter:

"Among the independent-minded people of this area there is some opposition to putting a national park in their native Ozarks. Also, they're mighty keen shots with a squirrel rifle."

We floated around a bend, and there on the bank

stood a fellow in overalls with a long rifle cradled in his arms. The troopers poured ashore and surrounded him like Marines storming Guadalcanal.

"Well, heavens a'mighty," he protested. "It's squirrel season. Can't a feller shoot a few for the pot?"

Scenic Easements Guard Natural Beauty

As—with some relief—we resumed our journey, I did a good deal of thinking. I thought about cost, for example. It doesn't take much of the taxpayers' money to establish a river park. We need only a narrow strip of land on each bank; the river comes free.

We don't even need to buy all the land: We have a handy wrinkle called the "scenic easement," by which the landowner is paid to keep his scenery inviolate. We can also buy public access lanes to the river shore.

We used a scenic easement, incidentally, to save the Potomac River gorge near Washington from intrusion by a high-rise apartment project. We are also using easements to preserve the view from George Washington's estate, Mount Vernon, across the river into Maryland. All but the first of these were given us free by public-spirited citizens. I wish more would follow their example.

I counted a surprisingly large number of fishermen, campers, and johnboat drifters along the Current River, but rarely saw more than one group at a time. Here is another advantage of a "strip park" along a winding

Golden passports to the future: Good-for-a-year automobile passes to all the national parks and recreation areas, the tickets held by Editor Grosvenor will help finance tomorrow's preserves, such as the Redwood National Park proposed to Congress by President Johnson (pages 62-4).

A new concept to raise money for conservation, the $7 Federal Recreation Area Entrance Permit, bought by millions of Americans, will ensure a fund to preserve now-threatened wonders. This bargain can be obtained at entrances to federal recreation areas and at many Government and American Automobile Association offices.

Map's outlined sector shows the home of the world's tallest tree, discovered by National Geographic Society naturalist Paul A. Zahl; adjoining photographs reveal recent redwood logging nearby. If action on the proposed Redwood National Park is not taken soon by Congress, it will be too late.

Conferring in Society headquarters, author Hartzog, left, Dr. Stanley A. Cain, right, a distinguished University of Michigan scientist now serving as Assistant Secretary of the Interior for Fish, Wildlife, and Parks, and Dr. Edward C. Crafts, Director of the Bureau of Outdoor Recreation. Office walls reflect the Society's long-time interest in the Nation's heritage: The tallest tree soars skyward, Old Faithful erupts, buffalo stream across a wintry Yellowstone; President and Mrs. Kennedy, at upper right, accept the Geographic-produced *White House Guidebook* from Dr. Grosvenor; President Johnson, at center, dedicates the Society's new headquarters in 1964.

river or scenic highway: It spreads visitors out and enhances the feeling of wilderness.

We swam in the Current and drank from the cool springs that feed it. Pure water is one of our growing Nation's greatest needs. Clean national rivers—and you can be sure we will keep them clean—will be of tremendous value in helping to fill that need.

Eventually the Nation will have many more federally protected rivers such as the Current. Some of these will be recreational river parks, others "wild rivers" open only to canoeists. Whatever category it may be found to fit, the Suwannee of Georgia and Florida, immortalized by Stephen Foster, seems to me to be one of the most attractive water-park proposals.

From the quiet beauty of a timeless river, I'd like to take you next to the newest of our urban-area parks, Jefferson National Expansion Memorial in St. Louis, Missouri.* We have other parks in cities, of course: Statue of Liberty National Monument in New York, the monuments and memorials in Washington, D. C., and Independence National Historical Park in Philadelphia, to name a few. All have certain things in common: They are history parks, devoted to preserving and interpreting important segments of the American story, and they lend beauty to the cities in which they are located.

*See "St. Louis: New Spirit Soars in Mid-America's Proud Old City," by Robert Paul Jordan, and "So Long, St. Louis, We're Heading West," by William C. Everhart, NATIONAL GEOGRAPHIC, November, 1965.

In the Mississippi River city from which the pioneer tide flowed westward to complete the building of a nation, Jefferson Memorial bears the name of the President whose Louisiana Purchase made possible the country's expansion. The 19th-century buildings it preserves, the museum exhibits, the films, the ranger talks, are all designed to lay clearly before you the full story of a vital epoch.

But this isn't all. Above the modest 80 acres of the park soars the 630-foot-high stainless-steel Gateway Arch—a Space Age design if ever there was one—that soon will lift visitors to its top in a unique elevator-train.

And how does this striking architectural landmark fit into a memorial to the preceding century? Well, we feel it gives the park dimensions too often lacking in textbooks and museums of history. It symbolizes the present and future; it is an example of the marvels we are capable of creating today, and a forecast of even greater accomplishments in the future.

The arch is purely a work of man. Man, to put it mildly, is a part of the American scene. His nobler works belong in the history of our land. Increasingly, therefore, we will memorialize native achievements in such fields as the arts, crafts, and sciences.

In Cornish, New Hampshire, we maintain the home of Augustus Saint-Gaudens, famed Irish-born U. S. sculptor (page 44). We would like to preserve the homes of Henry Wadsworth Longfellow in Massachusetts and Robert Frost in Vermont. We should have monuments to American labor and industry, to medicine and music.

A big bite of culture for bear-wrangling park rangers to swallow? You'd be surprised how many of them have degrees in the arts.

Nez Perce Park Links Scattered Sites

It happens that the next pilot park I want to show you is also a history park, although it offers a big dividend of scenery and opportunity for outdoor fun. This is the brand-new Nez Perce National Historical Park in the Idaho panhandle, and in it we are testing many of Parkscape's advanced ideas.

For one thing, Nez Perce has no boundary in the usual sense. It is 22 separate sites tied together by a thread of history, a map you pick up in the visitor center at Lapwai, and good Idaho highways. You visit the sites in turn, as you would beautiful homes on a garden-club tour.

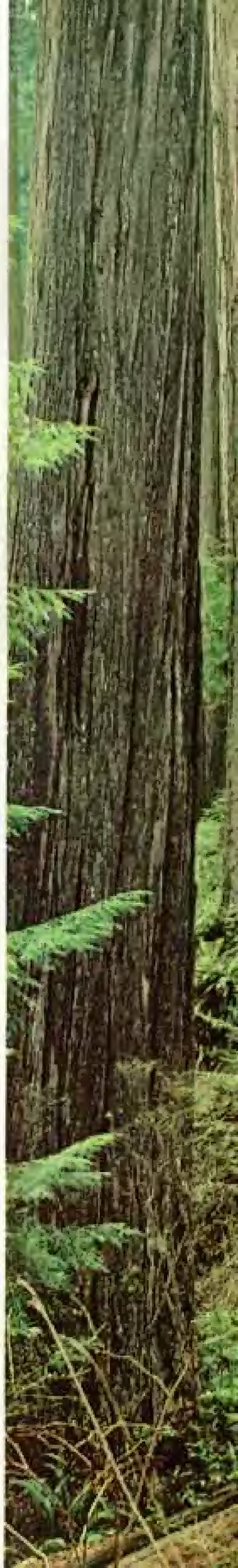
Most of the sites memorialize the Nez Percé Indians of yesteryear—their legends, their hunting grounds, the scenes of their valiant battles against the United States Cavalry. Others preserve landmarks of the Lewis and Clark journey to the Pacific (pages 82-3).

The concept of a park-without-boundary is novel and promising, to be sure. But even more unusual is this new park's underlying philosophy: Nez Perce is an adventure in cooperation.

To be specific, the Park Service actually holds title to only four of the 22 sites. Ownership of the others rests with other federal agencies, Idaho state and county governments, private groups and individuals, and the Nez Percé Indian tribe.

The Park Service coordinates the cooperative management and furnishes the interpretive services for the visitors. We do so because

(Continued on page 67)



Neighbors to the doomed: Magnificent coast redwoods in Jedediah Smith State Park dwell in safety, but trees nearby fall to the saw. Like the State of California and such groups as the Save-the-Redwoods League and the Sierra Club, your Society has long been in the forefront of efforts to preserve virgin stands of *Sequoia sempervirens.*

EKTACHROME BY JOE MUNROE © NATIONAL GEOGRAPHIC SOCIETY

A Park to Save the Tallest Trees

ATOP HIGH HEADLANDS and in mist-drenched valleys near the blue Pacific, the tallest of living things wage a mute battle for survival. Here in shadowed, cathedral-like groves rise the spires of the coast redwoods, *Sequoia sempervirens*. Monarchs of the plant kingdom, some measure more than 360 feet from ground to crown.

A century ago two million acres of redwood forests ranged in ranks as wide as 30 miles from south of San Francisco to Oregon. Today less than a sixth of

PAGE FOLDS OUT ▶

that acreage of virgin redwoods makes a last stand against the inroads of man. Highways slash the forests; proposed freeways threaten new scars. Unwise lumbering upstream unleashes erosion on groves below; a 1955 flood felled 300 magnificent trees along Bull Creek alone. Logging of the decay-resistant giants erases thousands of acres of virgin timber a year, as chain saws topple in hours what nature nurtured for centuries.

Foresters predict that some virgin stands under private ownership will be logged out in 20 years. Lumber firms do conscientiously reforest. But second-growth trees yield lower-quality wood.

Strenuous efforts by the State of California, Save-the-Redwoods League, Sierra Club, and other conservation groups, and by such public-spirited individuals as the late John D. Rockefeller, Jr., have protected about 50,000 acres of virgin redwoods in 23 scattered parcels. But the king of trees reigns uneasily even in these small domains. The proper redwood ecology—the vital balance of living things and their environment—can best be maintained by protecting an entire watershed. Yet, relentlessly, tree harvesting closes in on the protected groves.

OREGON
NEVADA
AREA MAPPED
Avenue of the Giants (Humboldt Redwoods S.P.)
CALIFORNIA
Carson City
Sacramento
Muir Woods National Monument
San Francisco
• State parks containing redwoods

Alarmed by such destruction, your Society made a grant to the National Park Service for a study of redwood survival. Concerned Congressmen from California and many others from across the Nation introduced more than a score of bills seeking additional protection. Last winter President Lyndon B. Johnson called for a twin-area Redwood National Park, outlined at right, to preserve "the majesty of a forest whose trees soared upward 2,000 years ago."

California's Jedediah Smith and Del Norte Coast Redwoods State Parks would form the basis of the northern unit. To connect and to fill out these two tracts, the Park Service would acquire a large protective watershed. It includes a primeval wilderness of graceful groves and streams sloping down to Mill Creek and the sea, and embraces some 15 miles of superlative Pacific shoreline.

The southern Tall Trees Unit of the park would shelter the mightiest of all redwoods, the 367.8-foot titan discovered by the National Geographic Society in 1963, together with the world's second, third, and sixth tallest trees. A corridor along Redwood Creek would link this area with U. S. Highway 101.

This two-unit park would preserve for all time nearly 45,000 acres containing some of the finest virgin coast redwoods. Many of us wish it could include more, but seeking too much might result in no national park at all.

Such a park would unquestionably affect the area's lumber economy. The Rellim Lumber Company, for instance, would have to abandon an entire sawmill, in return for fair compensation. Many logging jobs would vanish. But an independent study for the Park Service forecasts that demand for visitor services created by the enlarged park will diversify the area's economy, more than restore the current job level, and ensure future employment—which would not be the case after the redwoods were cut.

If you agree that these great trees should indeed be preserved in a national park, you can help by writing to your Senators and Congressmen. They are the ones who will make this important decision.

Melville Bell Grosvenor

FOREST

The U. S. Forest Service owns 11,000 acres of virgin redwoods scattered through this general area west of the Six Rivers National Forest. Redwood giants, sold by the Forest Service to commercial firms, are being cut now at the rate of about 200 acres a year on a sustained-yield basis.

Spectacular unspoiled coastline from Enderts Beach to Klamath River

Klamath River
Klamath
Klamath Glen
Goose Creek
DEL NORTE COUNTY, CALIFORNIA
HUMBOLDT COUNTY, CALIFORNIA

Proposed freeway, originally routed through Prairie Creek State Park, would skirt park's east edge.

The Save-the-Redwoods League and the State of California jointly purchased shaded portion of Gold Bluffs for $2,400,000 in 1965. It is now part of Prairie Creek Redwoods State Park.

PRAIRIE CREEK REDWOODS STATE PARK
Fern Canyon
Gold Bluffs
Klamath R.
Prairie Creek

LOGGERS CUT REDWOODS HERE WITHIN PAST MONTHS.

Lost Man Creek
Tectah Creek

Road and access corridor 400 feet wide would connect Tall Trees Unit with Route 101.

Orick
Redwood Creek
Freshwater Lagoon
Stone Lagoon

LUMBERMEN OWN PROPOSED PARK AREA AND CUT ON ITS FRINGES WITHIN PAST MONTHS.

DRY LAGOON BEACH STATE PARK

Sixth tallest tree, 352.3 feet
Second tallest tree, 367.4 feet

PROPOSED REDWOOD NATIONAL PARK
TALL TREES UNIT

Arcata Redwood Company, owner of the Tall Trees, has promised not to cut the champions, yet has put them to valuable use. Cuttings and sprouts taken from the giants now grow in west coast laboratories to be used for selective breeding of fast-growing redwoods.

Big Lagoon
World's tallest tree, 367.8 feet
Third tallest tree, 364.3 feet

we have had the most experience in these fields.

We want Nez Perce to prove that you can have a good park no matter who owns the scenery. All it takes is a common dream and determination among different groups and agencies, even though they may have had little in common before.

And I am certain Nez Perce will be a success, for it is not really an invention of the Park Service or any other agency, but a reflection of the national will. The conservation of our natural beauty and history, we have come to see, is everybody's business. Americans applaud the First Lady when she plants trees and flowers. They find inspiration in the President's campaign for improving the total environment. They respond enthusiastically to the call of Secretary Udall for a conservation effort worthy of our heritage.

Nez Perce represents our determination to honor the place on the American scene not only of prehistoric Indians and those of the Wild West era, but of their living descendants.

Through Richard Halfmoon, chairman of the Nez Percé executive committee, we invited the tribe to operate some of the park concessions, such as a motel and a crafts shop, and to take a full part in the cooperative management of the 22 sites. Mr. Halfmoon grinned.

"We've had some experience in park management," he said. "You may remember, we ran the tourists out of Yellowstone and took over for a while in 1877!"

Times change. Not long after the conversation with Mr. Halfmoon, the Nez Percé voluntarily bought up some land they felt should be included in the park.

Plastic Signs Mark Undersea Trail

For another kind of park of the future, how would you like one at the bottom of a tropical sea? We have a pilot model of such a park at St. Croix in the American Virgin Islands.

The name of it is Buck Island Reef National Monument, and it is less than an hour's sail out of Christiansted. Here we have not only one of the finest coral barrier reefs in the Caribbean, but swimming beaches such as I dream about on a February day in Washington.

Visitors reach this park in boats instead of cars, and wear swim suits and snorkel masks instead of hiking gear (pages 54-5). They follow self-guiding trails, the same sort of thing you see in Acadia or the Great Smokies.

At Buck Island, however, the signs explaining natural features are made of waterproof

Roaming free and unafraid, Roosevelt elk graze where redwoods meet the Pacific at Gold Bluffs, California. Shadowy in morning mist, the tall trees flank the sea at one of the two places on earth where they still grow near the ocean's edge. The other: Del Norte Coast Redwoods State Park. The Save-the-Redwoods League and the State of California spent $2,400,000 last year to incorporate much of Gold Bluffs into Prairie Creek Redwoods State Park. Some 15 miles south lies the Tall Trees Unit of proposed Redwood National Park, with its tallest of all living things, a 367.8-foot giant.

Living fans waving in the wind, five-finger ferns drape the walls of Fern Canyon in Prairie Creek Park. Visitors follow a winding brook through the always cool and shadowed cleft in the Gold Bluffs area.

NICKNAMED THE "AMERICAN ALPS" *for their spectacular beauty, Washington's North Cascades may one day grace a national park. Few roads scar this primeval wilderness; visitors must hike in or ride horseback to explore its wealth of lakes, glaciers, and hidden valleys. Conquerors of 7,600-foot Magic Mountain won the summit only after a rough five-mile traverse, an overnight stay at a high camp, and an early-morning ascent up almost vertical spikes.*

plastic, and must be periodically scraped clear of sea growth, for they lie 15 feet underwater.

Don't bring a spear gun, for you can't hunt fish in this national park. To enforce the rules, we've trained the rangers to be crack divers.

"I work so much in swim trunks I should have my badge tattooed on my chest," jokes Art Johnson, one of them.

We'd like to have another underwater park a little closer to where most of us live. In the Florida Keys south of Miami, a collection of coral reefs and tiny islets known as Islandia seems to be the perfect locale.

Florida's marvelous John Pennekamp Coral Reef State Park is already successfully established in this area. However, resort developers and even major industries are moving in fast. Skin divers are decimating the fish and destroying the fragile coral formations of adjoining waters. It may be difficult to acquire the reefs before it is too late.

From tropical seas I want to take you across the continent to Alaska. As the scenery changes, so will the subject. I'd like now to discuss not new kinds of parks, but the classic nature parks, the type on which the National Park System was founded.

We need more of them. We still have unprotected scenic masterpieces that should be preserved—and could be preserved under the mantle of the National Park Service. This, in turn, would relieve some of the future's pressure on our existing nature parks.

Alaska, of course, affords us our best opportunity to add nature parks to the system with the least disruption of human affairs. Vast areas of wilderness in the forty-ninth state have scarcely even been explored.

Personally, I favor a park in the Wood-Tikchik area north of Bristol Bay, a paradise of trout-filled lakes and of forest and mountain scenery to take one's breath away (page 79). I flew into Wood-Tikchik last summer with members of the Advisory Board on National Parks, Historic Sites, Buildings and Monuments. The board, which advises on national park policies and programs, also inspects proposed acquisitions.

As our floatplane circled for a lake landing, moose looked up at us with curiosity rather than fear, for the hunter is still rare in these parts. We ate lunch on a gravel beach I doubt any but Indians had visited before. Huge trout dimpled the lake surface nearby.

Clouds tumble like a waterfall down Cascade Pass. Even in August, snow patches the sky-probing summits. Lunching on a grassy knoll, backpacking Seattleites drink from a brook and breathe evergreen-spiced air.

White-water buff, a member of the Washington Foldboat Club runs rapids in the Skagit River near Newhalem. A hump of icy water hides Jo Yount's Fiberglas kayak as she flashes past rocks. Neoprene wet suit under the striped shirt keeps her warm. A portion of the Skagit would be included in the proposed national park of the North Cascades.

Bald eagle swoops down to a treetop nest in Katmai National Monument, Alaska. The Nation's official bird shares the subarctic wilderness of the 49th state with caribou, Dall sheep, wolves, moose, and Alaskan brown bear.

"Our last frontier," the author calls Alaska. "Here we should set aside nature parks for our children and give permanent sanctuary to the great animals."

Enormous bull moose—"one of the finest I ever saw," recalls Mr. Hartzog—feeds in the shallows of Alaska's Wonder Lake. Towering Mount McKinley, at 20,320 feet the titan of North American peaks, appears much closer than its actual distance—27 miles—in this long-lens photograph. To preserve more of this magnificent setting, the Park Service seeks to enlarge Mount McKinley National Park.

We already have some great national parks in Alaska, and are presently at work making their scenic glories more accessible. One is Mount McKinley, centering around the highest mountain in North America.

At the McKinley Park Hotel I watched a lynx stalk a ground squirrel. From headquarters at McKinley Park Station we took the 85-mile bus trip to Wonder Lake, largest in the park's 3,030 square miles of subarctic wilderness. Along the way, I saw half a dozen tremendous grizzly bears and so many moose and caribou I lost count.

In the shallows of the lake, with Mount McKinley itself for backdrop, one of the finest bull moose I ever saw fed unconcerned while we photographed him from the shore (right).

Also in Alaska, at Glacier Bay National Monument, we have built a lodge that will enable visitors to stay long enough to enjoy the incredible grandeur of this glacier-fed fiord. Katmai National Monument eventually will have, among other improvements, a good canoe route over its shining lakes and many new campsites, some handy to the famed Valley of Ten Thousand Smokes (pages 76-7).

Katmai, incidentally, is where last summer I tried, unknowingly, to fish the same bit of the Brooks River with a huge Alaskan brown bear, world's largest land-dwelling carnivore. In the early dawn I cast my fly over a bush I hoped would hide me from the wary fish in this renowned salmon stream.

But the fly hung up in the bush, and I had to jerk it sharply. With the movement, the bear stood up and looked over the bush at me. One mutual stare and we swiftly parted

company, the bear upstream and I down.

We propose more nature parks in the other states—one of them, I hope, in Hawaii. My Associate Director, A. Clark Stratton, returned not long ago from a trip to the suggested site of the park, on the island of Kauai.

"George," he said, "I have just seen the kind of place where almost every American dreams of going. Lush green cliffs drop a sheer 2,000 feet to meet white coral beaches comparable to those of the Virgin Islands. The cliffs are literally laced with waterfalls.

"There's a canyon similar to the Grand Canyon of the Yellowstone. There are rain forests, deserts, wild volcanic headlands, a mountaintop swamp alive with birds."

We are making a major effort to establish a coast redwood park in northern California, as depicted in the map that folds out from page 62 of this issue.

I think it unfortunate that the park system, repository of the best of our natural glories, contains but one small grove of these tallest trees on earth: Muir Woods National Monument near San Francisco. Lumber companies, on the other hand, own most of them and cut them by the thousands.

The State of California has some magnificent groves in state parks—largely the result of generosity of individual donors and institutions such as the Save-the-Redwoods League and the Ford Foundation.

Some lumber companies have been public spirited enough to keep good groves off logging schedules, awaiting purchase by park interests. The prices, however, are very high.

EKTACHROME (ABOVE) AND KODACHROME BY MELVILLE BELL GROSVENOR © N.G.S.

Wilderness brain trust, distinguished visitors discuss Glacier Bay's first lodge, at Bartlett Cove. Alaskan Congressman Ralph J. Rivers (left), Secretary of the Interior Stewart Udall, project supervisor Forrest D. Newcomb, author Hartzog, and chairman Wallace E. Stegner confer during last summer's tour by the National Park Service Advisory Board (page 4).

Accessible only by plane or boat, the monument's 3,600 square miles lie between Alaska's winding Inside Passage and the open Pacific.

Welcoming visitors, the celebrated Chilkat troupe performs outside their totem-decorated theater in Port Chilkoot, Alaska. Dancers include Eskimos, Aleuts, and Canadians as well as Chilkats, once one of the most warlike of Tlingit tribes.

Jagged river of ice, the Margerie Glacier grinds seaward in Glacier Bay National Monument on Alaska's panhandle. With sharp cracks and rumbles, huge chunks break off, or "calve," like the berg in foreground. A Park Service boat takes Secretary Udall and his party between the iceberg and the glacier.

Late in February, 1966, President Johnson asked Congress for authority to establish the proposed Redwood National Park, saying, "We cannot restore—once it is lost—the majesty of a forest whose trees soared upward 2,000 years ago . . . It is my recommendation that we move swiftly to save an area of immense significance before it is too late."

Legislation for a new nature park in the Guadalupe Mountains of western Texas is well advanced. Here sprawls a gorgeous realm of desert and mountain, somewhat like the Big Bend region of the Rio Grande River.

The Guadalupes are long on history. Apaches lived among them, and their descendants still dwell on tribal lands north of the proposed park. Pioneer ranchers ran longhorn cattle in this harsh country. Stagecoaches thundered through, harried by Apaches, Comanches, and outlaws.

We are looking, too, for a new park in the prairie grasslands, in which the buffalo once more would graze as they did before the hunters nearly wiped them out.

Park to Honor Canoe-borne Explorers

We hope to have a Voyageurs National Park in the Great Lakes country in Minnesota, near International Falls on the Canadian border. It would encompass part of the trade route of the French canoemen of the past.*

I think the Sonoran desert region of the West needs a full park; we hope to get one with Organ Pipe Cactus National Monument in Arizona as starting point.

Our most recent national park, Canyonlands in Utah, is a desert park (pages 56-7). Nearly 260,000 acres of erosion-carved sand and rock. Canyonlands is open right now. But you'd better be ready to rough it until we've done a little more work there. Some of the rangers still live in trailers and have set up offices

*See "Relics From the Rapids," by Sigurd F. Olson, NATIONAL GEOGRAPHIC, September, 1963.

Moonscape on earth: Valley of Ten Thousand Smokes in Katmai National Monument—largest of all Park Service preserves—offers the eerie spectacle of fire wed to ice. In 1912 the floor of this Alaskan valley erupted. The new volcano—Novarupta—spewed up tons of incandescent pumice, opened countless steaming fissures, and thrust up a huge lava plug. Between 1917 and 1930, seven Society-sponsored expeditions discovered, named, and photographed the inferno (below).

Park Service Board members, landing by U. S. Air Force helicopters, explore the plug in Novarupta's crater. They find smoke holes dormant but not dead. Touch a match to a fumarole, and gases trapped underground ignite; nearby vents puff up as if in sympathy, intriguing Frank Melvin (left) of the Park Service, GEOGRAPHIC writer N. T. Kenney, and Mrs. Melville Bell Grosvenor.

EKTACHROMES BY MELVILLE BELL GROSVENOR; PHOTOS BY [illegible], NATIONAL GEOGRAPHIC SOCIETY KATMAI EXPEDITION, [illegible] © N.G.S.

in a cave decorated with prehistoric Indian pictographs.

In rugged Canyonlands, as in every nature park, old and new, we face the complex and often controversial question of how much we should lay our hands on fragile natural areas, both to preserve them and to open them for human use.

First of all, we must know the parks thoroughly, identifying the wilderness and natural areas and distinguishing them from those primarily suited for development.

Our land classification studies are not complete, but it is a good bet that McKinley, for example, will remain almost pure wilderness. For years to come we will probably do little more than finish the road to Wonder Lake and build some overnight lodgings there. We will leave matters largely to nature at McKinley, and in any other parks where we find things going equally well.

It will be somewhat different, I think, at Yellowstone, Yosemite, Great Smoky, and the other parks that have now become little more than natural islands in the sea of modern civilization. In such parks we have learned that nature needs our active help.

Fire, which we have long regarded as a major enemy, is sometimes our ally. Since the dawn of time, lightning, the spontaneous combustion of decay, and aboriginal human populations have set the woods afire. Fire was and still is a necessary ecological force, modern studies now prove beyond doubt. Only fire will open the cones and scatter the seed of the southern Florida slash pine; if fires do

KODACHROMES BY R. ANTHONY STEWART (OPPOSITE), W. E. GARRETT (BELOW), AND WINFIELD PARKS © N.G.S.

Wanderer heads for home: A salmon vaults Brooks Falls in Katmai National Monument to spawn at its birthplace.

Laced with lakes and rimmed by glacier-clad mountains, the Wood-Tikchik area north of Dillingham, Alaska, may one day be a park. Waters churn with fish; islets await exploration.

Dall sheep cross summer pasture south of Anchorage. Sought by hunters for the rams' huge horns, these cousins of the Rocky Mountain bighorn find sanctuary only in parks.

not occur, the hardwoods will take over. In the Everglades we have stands of these pines and want to keep them. Therefore, we have begun carefully setting small fires in the park from time to time, picking times and conditions when there is no chance we will lose control of the blazes.

Please don't help us! Break your matches, put out your campfires as always. Leave this delicate job to the ranger.

'Glades Open a Window on Wilderness

Development, or the opening of a nature park to make it more accessible for people to enjoy, is another of our obligations.

I think that most land in the nature parks will be found to fit the definition of wilderness as laid down by Congress in the Wilderness Act of 1964: that it be unmarked by the works of man; that man enter it only on visits; and that it exist in tracts large enough to hold its primitive values against all outside pressures.

We will try to make it relatively easy for you to enjoy the threshold of wilderness. And we feel sure we can give you, from there, the feel of wilds without their physical demands.

One day I walked to Mahogany Hammock in Everglades National Park with Stan Joseph, who was Superintendent at the time. It was two minutes by elevated boardwalk from the parking area. From the end of the wooden path we looked out over "miles and miles of nothing but miles and miles," as they say of the Antarctic wastes.

"I doubt if anybody has ever been out there," said Stan. "Not even the Seminole Indians, or the soldiers who pursued them in the old days.

"It belongs to the alligators, the birds, and the snakes. But you don't have to move from

this boardwalk—you can *feel* the wilderness right here."

Indeed I could. I could smell the marsh, hear the lap of water—and feel the primeval bite of an Everglades mosquito.

To open a park for visitors, you need ways to get people in and let them move around once they are there, and you need accommodations so they can stay long enough to make the visit rewarding to them.

We can almost always find an attractive way to fit a building or campground into the landscape—in a hollow, perhaps, or behind a hill. But roads and trails, upon which we have depended almost entirely for ingress and movement until now, usually present more of a problem in a nature park. They scar the land and detract from the natural scene.

Parkscape has some new ideas for "opening" a wild area while keeping it untouched. For the proposed North Cascades National Park, in a section of Washington so majestic it is called the "American Alps" (pages 68-9), a special study team has recommended novel approaches to this age-old problem.

If we get a Cascades park, you probably will go into some portions of it by helicopter. Yes, aircraft are noisy. But they don't disrupt the wilderness atmosphere any more than bumper-to-bumper automobiles, and they leave no scars from highway cuts and fills.

Once you are in the park, perhaps you will reach the main points of interest by aerial tramway, used successfully for years in Europe. There may be a cog railway or funicular on steep slopes; we are thinking also of narrow-gauge railways, running on silent rubber wheels, and of monorail trains.

We are trying another idea—the one-way loop road—in our highly popular Great Smoky Mountains National Park. One of them takes visitors into Cades Cove, where descendants of pioneers still follow the homespun ways of their fathers.*

We've learned that you don't double a road's capacity by making it one-way; you triple or quadruple it. Furthermore, the driver can watch more of the scenery; he doesn't have to worry about head-on collisions. We may extend the one-way concept to Yellowstone's Grand Loop Road. Oddly enough, this would be a reversion to the past: The Loop was one-way when first built. Of course, that was before the time of automobiles. People went in by stagecoach.

At the other extreme—and across the country—lies a park created specifically for the motorist. It is, in fact, a highway, albeit a very beautiful one. I'm speaking, of course, of the famed Blue Ridge Parkway, beginning at the south gate of Shenandoah National Park and ending now in Great Smoky Mountains National Park.

Blue Ridge Parkway is in every sense a park of tomorrow, and we hope to have many more like it. It is a strip park like the Ozark National Scenic Riverways. But where a riverway spreads visitors over dozens of miles, a highway strings them out over hundreds.

Beside a Highway, Wilderness Waits

Blue Ridge has a little of every type of park: natural beauty, some history, modern recreational facilities—and wilderness. If you don't believe you can have wilderness a few steps from a paved highway, listen to this:

For some years former U. S. Senator Harry F. Byrd of Virginia has donated money to the Park Service to build overnight shelters along the Appalachian Trail, which passes through Shenandoah as it winds from New England to Georgia. He gave yet another "Byrd's Nest" last year, and a party of us Washingtonians attended the dedication. Park rangers took us up the mountainside in jeeps.

"I'm hiking down to the road," Melville Grosvenor, the Geographic's widely traveled President, announced in late afternoon. "Who'll join me?"

A dozen did, including Dick Byrd, Senator Byrd's son and nephew of the late explorer Adm. Richard E. Byrd.

These seasoned explorers lost their way hiking the downhill mile to their parked cars! Drenched by a thunderstorm, they didn't find the Skyline Drive until nearly midnight.

(Continued on page 86)

*Supreme Court Justice William O. Douglas recorded the speech and way of life of "The People of Cades Cove," in the July, 1962, NATIONAL GEOGRAPHIC.

Ghostly Hoh Valley rain forest, the gnarled limbs of its trees festooned with moss, dozes in yellow-green twilight even at noon on a sunny day. Twelve feet of rain a year, dropped by moist Pacific winds, drench the western slopes of Washington's Olympic Peninsula, watering dense stands of Douglas fir, Sitka spruce, western hemlock, and red cedar. "A classic nature park," Mr. Hartzog calls Olympic. "More like it would help relieve the future's pressure on existing ones."

EKTACHROME BY B. ANTHONY STEWART © N.G.S.

EKTACHROME (BELOW) AND KODACHROME (LEFT) BY B. ANTHONY STEWART; EKTACHROME BY JAMES STANFIELD © N.G.S.

Proud Nez Percé Indian, 81-year-old Caleb Carter wears an heirloom headdress of otter skin adorned with moon shells, braids wrapped in bright broadcloth, and arm band of wolf fur. He sees his heritage safeguarded for all Americans to enjoy in the new Nez Perce National Historic Park. In this pilot project, 22 widely scattered sites in Idaho's northern panhandle preserve campgrounds used by Lewis and Clark during their epic trek to the Pacific, and battlefields where Chief Joseph led the Nez Percé against the "Long Knives," the U. S. Cavalry, in the Indian War of 1877.

Spearheads of teasel guard slopes above the Clearwater River in the Nez Perce Indian Reservation.

Splitting two states, Wisconsin on the left and Minnesota, the St. Croix River courses between the Dalles. The steep rock slabs reminded French fur traders of *dalles*, the flagstones used in Paris cathedrals, so they named this stretch for them. Today it is an interstate park; a proposed national scenic riverway would encompass these riverbanks and add 150 miles of the St. Croix and 90 of a tributary, the Namekagon.

KODACHROMES BY MELVILLE BELL GROSVENOR (BELOW) AND PAUL A. ZAHL © NATIONAL GEOGRAPHIC SOCIETY

Mid-Pacific splendors of Hawaii are preserved by parks on two islands of our 50th state; treasures of a third should come under federal protection.

In the crater of Haleakala, one of the world's largest dormant volcanoes, riders jog along Sliding Sands Trail. The 20-square-mile crater, pocked with towering cones of red cinders, dominates Haleakala National Park on Maui Island.

Jungle of ferns sprouts in the shadow of active volcanoes, including Mauna Loa and Kilauea, on Hawaii Island.

Bramble-covered ruins of a Russian fort on Kauai turn time back to 1817, when traders from Alaska built the bastion and schemed, unsuccessfully, to wrest the archipelago from King Kamehameha. A proposed national park would embrace this relic as well as many exquisite tropical gardens in northwest Kauai.

In other words, highways and nature aren't incompatible at all. Judge Russell Train, President of the Conservation Foundation, has said that park men and highway engineers working together could produce a national highway system to "stagger the imagination."

He sees roads of the future "paralleled with systems of footpaths, bicycle paths, and even bridle paths, with trails to natural features, with picnic grounds and even campsites." To this I say Amen.

Everglades' Fate Depends on Water

As with highway officials, we must also try to coordinate with the U. S. Army Corps of Engineers, whose dams and other projects drastically affect the look of the American landscape. Engineers and Park Service planners are both presently cooperating with the Delaware River Basin Commission in completing a dam and recreational park at Delaware Water Gap in Pennsylvania and New Jersey. Such a park would serve a huge segment—almost 30 percent—of the United States urban population. We are expecting 10,000,000 visitors a year.

The future of Everglades National Park depends upon an eventual permanent agreement between the Engineers, ourselves, and the State of Florida. The only park whose natural values we have recently stood in danger of losing, Everglades is a classic example of what human activities, even though far from the park, can do to a biological wilderness.

Fresh water makes Everglades what it is. Without it the tall saw grass, fish, and alligators would die, and water birds move out. Most of the water comes from rains over southern Florida, but an essential part has always come in from the north, including some from Lake Okeechobee, sixty miles away.

In years past, Okeechobee waters flowed slowly to the Everglades in a natural "river" only inches deep and fifty miles wide. Starting as far back as 1881, the water has been increasingly diverted along the way for agricultural, domestic, even industrial use.

In 1928, in an effort to prevent hurricane-induced Okeechobee floods that occasionally devastated south Florida, the Engineers reinforced levees at the lake. Now they keep the lake always at a safe level by periodically sending water through the St. Lucie Canal to the Atlantic Ocean and by the Caloosahatchee River to the Gulf of Mexico.

All these diversions could lead to only one thing: In dry years—and droughts are normal in nature—the park would suffer serious

damage, and perhaps eventual destruction. From 1961 to 1965 we had not just one dry year, but four in a row. In 1964 the rangers even had to round up alligators and relocate them to save them from death in the dust of erstwhile water holes.

We went to the Engineers and asked that, instead of sending lake water to the sea, they send it to us. We asked that they send it immediately, on an emergency basis, and follow such temporary measures with a permanent system of dikes and ditches. Drought years, we knew, would come again.

The answer to the problem turned out to be far more involved than our simple request, and the Engineers had to institute complex studies that are not yet complete. Meanwhile, at considerable expense and inconvenience to themselves, they have begun pumping us enough water to keep the park alive until a permanent solution is found. Florida water-control authorities also have pledged support.

Boardwalk strollers on Anhinga Wildlife Trail taste the haunting beauty of Everglades National Park. A profusion of living things inhabits the sloughs, hammocks, waterways, and saw-grass expanses of this unique park in southern Florida: deer, black bears, cougars, alligators, and countless species of birds, including wood storks and bald eagles.

Droughts periodically plague the 'Glades, but heavy rains of last fall and winter temporarily relieved the fresh-water shortage. The Army Corps of Engineers, in conjunction with the State of Florida, has begun widening and deepening flood-control canals and pumping additional water into the third largest national park.

Threatened with extinction, Florida alligators dwindle by as many as a hundred a night. Everglades Park rangers wage unceasing war on poachers, but the slaughter goes on. The illegal hunters kill the reptiles for belly skin that brings up to $6.50 a foot for shoes, handbags, belts, and wristwatch bands.

For the last stop on our parks tour I have been saving Washington, D. C.—a most important place to me, personally, for I work and live there. But to a Director of National Parks, the Capital of the United States has added significance. The whole city, in a very real sense, is a national park.

Because Washington belongs to no state, but to the Nation itself, the Federal Government long ago selected the National Park Service as the logical agency to tend its grass, trees, flowers, and historic shrines. In consequence we administer some 700 pieces of park property in the Capital area, from the White House grounds and wooded Rock Creek Park to tiny squares with a single statue and a few benches for meditative passers-by. What we do with these properties not only determines the look of Washington, but sets a standard for the entire Nation.

And what do we propose to do about Washington? Well, basically, we're going back to its beginnings, to the magnificent concept of the man who laid it out, the French engineer Pierre Charles L'Enfant.

He envisaged a Capital City of parks and open spaces, of stately avenues, of sweeping vistas. But as the Nation grew, and with it the housing needs of its government, L'Enfant's dream was too often ignored. As a result, pockets of clutter, blight, and ugliness have appeared in the Nation's Capital as in every other American city.

First Shot: A Million Flower Seeds

Under the inspiring leadership of Mrs. Lyndon B. Johnson, we will wage major war against this blight. The first shot, fired last summer, scattered a million flower seeds. We are putting up a whole barrage this summer, to the end that Washington shall be a city of flowers—flowers in more than 70 brand-new gardens, flowers in older parks, flowers in pots and tubs.

Flames race through the Everglades during the summer drought of 1965. Before burning itself out, the fire blackened nearly 100 square miles of saw-grass prairie and destroyed untold wildlife. Such fires do lasting harm by consuming the soil itself.

Yellow-slippered ballerina, a snowy egret flutters to its mangrove nest with a beakful of twigs. Plume hunters decimated the ranks of this handsome bird more than half a century ago. Today, protected by law, it nests throughout the Everglades and as far north as New Jersey.

Foraging the shallows in Everglades Park, a roseate spoonbill seines small fish, crustaceans, and insects with its big beak. Wings and legs blaze as if dipped in a paint pot.

NATACHROME (LEFT) BY OTIS IMBODEN; KODACHROMES BY FREDERICK KENT TRUSLOW (BELOW) AND JOHN H. [illegible], M.D. © N.G.S.

Now go to the top of the Washington Monument, where you get the best view of the Capital, and you will see results of still another assault upon ugliness. This time the weapons were bulldozers, and the casualties were the dreadful "tempos"—temporary structures—between the Monument and the Lincoln Memorial. Built to hold a flood of people who came into Washington in World War II, the tempos had stood for more than 20 years.

Next, I hope, we may be able to park all those cars somewhere else; the Mall itself should become a vast promenade with gardens, sculpture, and resting and eating places.

There should be a visitor center, an absolute essential. Nine

◀ **Road so tortured** it crosses itself on a bridge, Route 441 spirals upward in Great Smoky Mountains National Park on the Tennessee-North Carolina border. Most visited of all national parks, it welcomes some five million people a year.

Curling walkway to a circular eyrie offers an eagle's-eye view of the Great Smokies. Set atop 6,642-foot Clingmans Dome, the park's highest peak, the tower surveys wave on wave of densely wooded ranges. Smoke-like mist, caused by tiny droplets of moisture blending with plant oils, often shrouds the valleys, giving the mountains their name. Light reflections in the camera lens show as streaks at right of the tower, which replaces a former fire lookout.

EKTACHROMES BY BRUCE DALE (OPPOSITE) AND GERALD HOLLY © N.G.S.

million people visit Washington every year and must now depend largely upon commercial guides in touring their own Capital.

From the visitor center a uniform fleet of buses—hundreds of little ones, perhaps, or complete small trains of them—would set forth on continuous rounds of the national shrines of beauty and history. Such a proposal has been introduced in Congress.

At the moment, Pennsylvania Avenue, traditional street of parades in the city's historic heartland, is a bit shabby. Just wait. The President has declared it a national historic site, and if plans work out, it will be transformed into a truly majestic avenue.

Old Forts Ring the Capital

Turning from broad avenues, we plan to create a city-wide loop of hiking trails and bicycle paths. We will do this by connecting small parks already in the system, the sites of the forts which ringed the Capital during Civil War times. Nearly all the land is already in public ownership.

Washington and the Nation also need to protect the Potomac River and the paralleling Chesapeake and Ohio Canal within a Potomac Valley National Park. This would stretch from the Capital to Cumberland, Maryland. Few cities in the world have such a magnificent scenic and recreational resource so near.*

Go ten miles upriver from the Nation's Capital and you find a wild river gorge where egrets feed in the shallows and eagles soar overhead. Forty-five miles farther, at Harpers Ferry, the beautiful Shenandoah meets the Potomac. As Thomas Jefferson said of this magnificent juncture, it is "worth a voyage across the Atlantic" to see. Farther still, the Potomac winds beneath forested mountain slopes, each great bend a warm invitation to lovers of the outdoors.

This entire river basin, so beautiful and so historic, replete with so much recreational opportunity for millions of city dwellers close by, is almost entirely unprotected except for an occasional small state or county park and the thin ribbon of the Chesapeake and Ohio Canal National Monument.

On a serene Sunday's walk along the old canal towpath one spring, I saw a path leading toward the river. Taking it, I found a flight of wooden steps leading down to a dock. Nailed to a tree was a sign reading: "These steps and this dock are *not* government property—keep off." Such signposts—"Keep off," "No trespassing," "Zoning reclassification application," "Lots for sale"—mark the rapid erosion of the riverside as a natural heritage available to all. The government owns considerable Potomac shoreline, but it should own more.

I wish I could describe every addition and improvement we plan for the National Capital Parks, but I have room for only one more. This is a blueprint for the first national park

*See "Waterway to Washington," by Jay Johnston, National Geographic, March, 1960.

honoring the place of music in American culture. Mrs. Jouett Shouse may have made this park possible by offering us 60-odd acres of her Wolf Trap Farm, in Fairfax County, Virginia.

Adjoining the headquarters of the American Symphony Orchestra League, also a gift of Mrs. Shouse, the park would have an amphitheater, buildings housing a research library of musicology, and meeting halls.

The park's most intriguing feature, however, would be woodland glades where musicians could go to practice on trombone or cello in peace and—well, without risking the wrath of the fellow in the next apartment.

Park Beneficiaries: the American People

And now that we have taken you on a tour of America's far-flung parklands—both present and future—there is one thing I should like to make crystal clear.

Congress, in establishing the national parks, stipulated that they were to be administered for the use of the people. The people should be free to visit them and, through them, understand the history of our Nation, our way of life, and the natural processes which have given form to our land.

I reaffirm my belief in this wise mandate: Parks are for people.

People are picnickers, hikers, devotees of skiing and swimming, fishermen, bird watchers, and lovers of the lonely wilderness. People are individuals, and each finds his own park—one that is special and private and his alone.

I know a man who never feels so close to his God as he does when he looks up at the heavens through the crown of a redwood tree. I know another to whom the sands of Cape Cod's Nauset Beach are forever sacred, because there he shared the golden childhood days of a daughter now grown to womanhood. To me, crystal Glacier Creek in Rocky Mountain National Park is hallowed by the memories of hours spent fishing for trout with my son.

For all the millions of Americans, with their myriad tastes and dreams, it is my job—and yours—to see to it that the national parks of tomorrow contain the values they cherish. THE END

Beautification begins at home. In the Nation's Capital, Mrs. Lyndon B. Johnson spearheads a program to create a more beautiful America. Tulips now brighten the west grounds of the Capitol, and other new flower beds abound in the 37,405 acres of the National Capital Parks.

"To make our cities and country more beautiful ... is a yearning of the people," says the First Lady. "The time is right—the time is now—to take advantage of this yeasty, bubbling desire."

KODACHROME BY FRED WARD © NATIONAL GEOGRAPHIC SOCIETY

ROUTE TO MEMORABLE HOLIDAYS: ***The Society's new map, "Vacationlands of the United States and Southern Canada," looms like a giant mirage superimposed on New Mexico's White Sands National Monument. Sunset silhouettes a couple strolling over the dunes.***

KODACHROME BY CHARLES STEINHACKER © N.G.S.

New Guide To Your Vacationlands

By HOWARD E. PAINE

National Geographic Staff

CREATE A MAP to give vacationing millions an up-to-date inventory of major attractions all across the North American Continent. Make it a practical guide for day-by-day use in an automobile. Make it beautiful enough to frame. And have it ready for this year's vacations.

No small order! To fill it, Chief Cartographer Wellman Chamberlin's entire staff pitched in last fall—with ideas, with energy, with enthusiasm.

National parks and forests soon colored much of the map. Then compilers began screening hundreds of smaller parks and points of interest and checking miles of highway construction, in Canada and all 50 states.

New areas cried for inclusion, such as Point Reyes National Seashore in California. So did tiny sites with long names like Guilford Courthouse National Military Park in North Carolina.

Never before was so much vacation

EKTACHROME BY WALTER MEAYERS EDWARDS © N.G.S.

KODACHROME BY DOROTHY SMALL

information squeezed into a single sheet. As designer, my chief task was "packaging"—somehow to combine the special needs of a vacation map with the inflexible demands of cartography. The package had to include a complete index, a practical fold, an attractive cover, and several thousand words of text.

The result, **Vacationlands of the United States and Southern Canada**, appears as a supplement to this issue of your magazine.*

Open the map and you unfold unique and useful features:

• A comprehensive look at vacation places and main highways. Special colors and half a dozen striking new symbols mark national parks, forests, and wildlife refuges, state and provincial parks, Indian reservations, ski slopes, and other recreation areas. The 41,000-mile, 46.8-billion-dollar Interstate Highway System is now more than half completed. The map shows the 22,000 miles built by 1966, plus 6,000 miles under construction.

• An index to the 2,380 vacation meccas shown on the map. Spending a day at each one—from Tanglewood to Disneyland, from the Grand Canyon to Mount Vernon—would require a vacation lasting 6½ years! Dividing the index into east and west adds built-in convenience: by folding one quarter of the sheet over onto the map's face, you pair the appropriate index with its half of the map.

• More than 4,500 words of travel information. Turn your map over and you find a "backpack" of authoritative advice—about camping in tent or trailer, visiting an Indian reservation, or following highways of history. Also tips on vacation driving, a calendar of

*Additional copies of the 38-by-26-inch **Vacationlands** map may be obtained postpaid for $1.00 each on paper or $2.00 on fabric. Order from Department 331, National Geographic Society, Washington, D. C. 20036.

EKTACHROME BY BRUCE DALE © N.G.S.

KODACHROME BY WALTER MEAYERS EDWARDS

annual events, and addresses in the 50 states and Canada where you may write for details.

As the map took shape, cartographers and editors scrutinized it eagerly. To us, the fresh look at our country brought surprises. New York, for example, has a state park (Adirondack) three times the size of Rhode Island. We counted Indian reservations where least expected—more of them in Maine than in Wyoming. Some of us pondered the origins of place names like Hungry Mother and Farewell Bend, and recalled the history behind others: Fort Necessity, Kitty Hawk, Shiloh.

Scores of new names are here, for many parks have been added since members received their last parks map in 1958. They range from Canada's Roosevelt Campobello International Park off Maine to Haleakala National Park in Hawaii.

Dollar Bill Spans 486 Miles

When Congress created the Park Service in 1916, motorists braved muddy and unmarked roads to cross the continent in five or six weeks. Today the trip by high-speed highway can be made comfortably in as many days.

How far in a day? Use your map and a dollar bill to find out. With an early start and little traffic, a good driver on an express highway can cover the length of a dollar bill in a day. Your map, at a scale of 81 miles to the inch, makes the bill 486 "crow" miles (not road miles) long. Fold your dollar in half if you plan many stops.

Better yet: shun-pike. Ramble down country roads. Tread unfamiliar city streets. Take pictures. Browse for antiques. Stop and fish. See Williamsburg by candlelight, Grand Canyon at sunset. A day's travel won't take you the diameter of a quarter—but it will store up memories worth millions. THE END

For the pursuit of pleasure, your map labels 2,380 places that offer recreation and cultural riches in the United States and Canada. Air travelers explore Grand Canyon's dusk-gilt walls; snow plant adds color to Yosemite. Riders cross a golden carpet in the Great Smoky Mountains. A family fishes cobalt-blue Crater Lake. Thermal springs warm winter bathers in Canada's Kootenay Park.

EKTACHROME BY JAMES STANFIELD

The Marvelous Hummingbird Rediscovered

Article and photographs by
CRAWFORD H. GREENEWALT

SWINGING FANTASTIC TAIL FEATHERS, *Peru's Marvelous Hummingbird begins morning exercises. At full stretch,* Loddigesia mirabilis *can raise the fanlike appendages high over his head. The author flew to Brazil to make these first color photographs of the rare species in the aviaries of naturalist Augusto Ruschi.*

TWICE LIFE SIZE; EKTACHROME
© AMERICAN MUSEUM OF NATURAL HISTORY

AS A STUDENT of hummingbirds, I had of course known of the existence of *Loddigesia mirabilis*, the Marvelous Hummingbird, and had read what little there is in the literature about this extraordinary bird. But it was not until Ernst Mayr, Director of the Museum of Comparative Zoology at Harvard University, showed me a skin that I knew I simply must photograph the living bird.

My friend Augusto Ruschi, the Brazilian hummingbird expert, happily agreed to go to Peru to search out the habitat of *Loddigesia*, and to bring back specimens, if possible, to his aviaries in Santa Teresa. Although ornithologists were uncertain of the bird's range, Ruschi, much to my delight, succeeded in capturing six. Later I went to Brazil to photograph them.

Loddigesia mirabilis was first discovered by Andrew Mathews, a 19th-century Irish naturalist and collector who lived in Peru. In 1835 he asked his botanist friend George Loddiges to take the first specimen to England, where the celebrated artist-ornithologist John Gould painted it for his monumental work on hummingbirds. Scientists were overwhelmed by the beauty of the bird, as shown by the name they gave it—*mirabilis*, wonderful or marvelous.

When I saw the living bird, I could hardly believe my eyes. The museum skin, impressive as it was, had not prepared me for the dazzling beauty of this superb and unusual creature.

Loddigesia's range appears to be unusually small (map, page 101). It lives only in high Andean valleys, along the banks of small rivers in the Peruvian Provinces of Chachapoyas and Luya. The total area is slightly under 1,000 square miles. Chachapoyas is relatively inaccessible, and for this reason only a handful of outsiders have seen *Loddigesia* alive.

Braking for a landing, a female *Loddigesia* (right) spreads tail feathers against the air to retard speed. Slightly larger than her mate, she wears only a hint of his extraordinary plumage.

In reverse gear, a male (below) flings himself backward from his perch. Unique among birds, he grows only four tail feathers; most birds have eight to twelve. Powerful muscles manipulate the long outside plumes, which grow to three times the length of his two-inch body. But he apparently has little control over the two thorn-like feathers. Here wind bends them forward.

EKTACHROMES © AMERICAN MUSEUM OF NATURAL HISTO

Only known home of *Loddigesia* lies along the banks of the Utcubamba and other rivers near Chachapoyas, Peru—an area of less than 1,000 square miles.

Fans crossed in normal perching posture, a male shows off his colors: iridescent green gorget and purple crown.

EKTACHROME © AMERICAN MUSEUM OF NATURAL HISTORY

Unique among hummingbirds, in fact among all birds, *Loddigesia* has only four tail feathers (normally there are between eight and twelve)—but what tail feathers! The two outer ones of the male are long bare filaments tipped with large feathered flags and are two to three times as long as the bird itself. Even the two inner feathers, shaped like elongated thorns, are unusual. Curiously, *Loddigesia* seems able to move only the outer tail feathers. The inner pair appear fixed, and move only under wind forces, such as those set up by the bird's passage through the air. It should be a real challenge to experts on evolutionary development to discover why a creature should evolve these unusual appendages.

Ruschi had told me that *Loddigesia*, like many of us, goes through a prolonged stretching process after awakening. I was determined to photograph this exercise, if at all possible.

Many people think that elaborate equipment alone will ensure good photographs, but after spending a good many years photographing hummingbirds, I have come to the conclusion that good photographs are more a matter of matching wits with the bird and contriving to make it perform before the camera.*

In *Loddigesia's* case, Ruschi and I accomplished this by placing a bird in a small cage furnished with a single perch, on which the camera and flash lamps were focused. The bird, having no other place to go, perched in front of the camera and went peacefully to sleep. We rose before dawn, turned on the equipment as quietly as possible, then awaited the awakening. The first two attempts failed, but fortunately for our enforced insomnia, the third succeeded. One result was the photograph that opens this article.

While I am no anatomist, I was once an engineer, and I find it remarkable that the muscles controlling the outer tail feathers are powerful enough to cause the extraordinary movement pictured. Ruschi says the male *Loddigesia* uses his tail feathers to make himself especially attractive to his lady. He has seen the nuptial flight, in which the male hovers in front of the presumably dazzled female, raising one tail feather after the other high above his head, somewhat like a living semaphore. She seems to find these acrobatics irresistible.

I should love to photograph the process, but I regret to admit that I have not yet figured out how to induce this romance to take place before the camera. Perhaps in time my wits will prove equal to the challenge. If so, I shall be off again to Brazil, or Peru, or wherever I must go to take that picture.

THE END

*Crawford H. Greenewalt's remarkable action pictures of earth's smallest feathered creatures have illustrated two memorable GEOGRAPHIC articles, "The Hummingbirds," November, 1960, and "Photographing Hummingbirds in Brazil," January, 1963. In the latter issue, too, Luis Marden told the story of "The Man Who Talks to Hummingbirds"—Mr. Greenewalt's Brazilian naturalist friend Dr. Augusto Ruschi. A noted engineer and business executive, Mr. Greenewalt is Chairman of the Board of E. I. du Pont de Nemours & Company and a Trustee of the National Geographic Society.

GIBRALTAR *Rock*

By HOWARD LA FAY

Photographs by BATES LITTLEHALES

Both National Geographic Staff

ROCKY BUTTRESS of British naval power for two and a half centuries, Gibraltar overwhelms the shipborne visitor with one of the world's best-known and most dramatic skylines.

As my liner slipped into the bay at night after five days of Atlantic emptiness, the towering, majestic Rock seemed suddenly to blot out half the sky. Streetlamps glittered along Gibraltar's roads like fallen stars, and a Union Jack snapped bravely above the floodlit ruins of the Moorish Castle (page 110).

This is the way to approach the Rock—by sea, as the Phoenicians came, and the Moors, and the British in their ships of oak. But I had still another good reason for choosing the sea approach. Since October, 1964, Spain has severely curtailed traffic across Gibraltar's sole land frontier—the narrow, sandy isthmus linking the British Crown Colony to the Spanish town of La Línea de la Concepción. A foreigner must have both patience and luck to get through the rigorous, lengthy customs inspection imposed by Spain.

"And why not?" demanded a Spanish acquaintance. "Great Britain continually invokes the 1713 Treaty of Utrecht as a justification for occupying what is essentially Spanish territory. The same treaty, as we see it, closed the land frontier. If the British want to observe the letter of the law, so can we. Believe me, only our charity allows any traffic at all."

of Contention

Guardian of the gateway, Gibraltar juts into a narrow strait that connects the Atlantic and Mediterranean. Spain claims the British Crown Colony and harasses border traffic to draw attention to the dispute. Ignoring a bored flower seller, French sailors at a sidewalk cafe sample the hospitality of the Rock—liberty port to the world's fleets.

EKTACHROMES © NATIONAL GEOGRAPHIC SOCIETY

Quenching Gibraltar's thirst, galvanized iron paves a slope to catch fall and winter rains. Gutters drain to cisterns in the Rock that store 16,500,000 gallons. Lateen-rigged fishing boats—used since Roman times—bob near the Caleta Palace Hotel.

Sign-waving demonstrators proclaim their allegiance to Britain during a visit last year by Prime Minister Harold Wilson. Spain's agitation for return of this last colony in Europe unites residents of the Rock, which has been British for two and a half centuries. Some ask full citizenship through "integration," actual union with Britain as an English borough. Both countries have brought their claims before the United Nations.

Turning their backs on a visitor's car, Spanish customs officers detain it an hour and a half at the Gibraltar frontier. Other travelers have waited as long as two days. Harassment slows to a trickle a former flow of 1,500 vehicles a day. Spain's restrictions have cut by more than a third the number of Spaniards once allowed to commute to the Rock for work. The 8,000 who still do can bring home no goods—not even a stick of chewing gum.

Spanish officials cite smuggling of tobacco and other contraband as a cause for the border restrictions. Gibraltarians admit smuggling exists but charge that Spain exaggerates it to justify the blockade.

Sir Joshua Hassan, Chief Minister of Gibraltar, said: "As many as 1,500 cars a day used to enter from Spain. Now only 30 or so squeeze through. Tourism is a major factor in our economic life. It would be idle to pretend that we haven't been hurt."

Gibraltarians, possessors of a touchy pride, have responded in kind. For more than a century they had enjoyed free passage of the frontier. Historically, they poured into Spain for weekend surcease from incredibly cramped living conditions. But no longer.

"I haven't left 'Gib' for 18 months," complained a merchant, "but I will not submit to Spanish indignities at the frontier!"

One day, in a newly purchased automobile, I decided to try the crossing personally. My map listed the isthmus leading to Spain as Neutral Ground. It is neutral in name only.

As I drove toward Spain, a jet screamed up from an airstrip built athwart the 250 or so acres of the isthmus occupied by the British since 1838. With rubble blasted from their Rock, they have extended the runway well into the bay (page 114, and map, page 109).

The Spanish, too, have advanced into the Neutral Ground. They fortified it during World War II, and I found that driving across it from the Rock was like traversing an old battlefield. Cement blockhouses slept in the sun; cows grazed among the jagged concrete teeth of tank barriers.

Customs Check Can Take Two Days

At La Linea, two green-clad Spanish guards motioned my car to a halt. Minutes lengthened into hours as I waited my turn to pass through customs. Eventually, an officer collected my documents. The most innocent irregularity, I knew, would cause him to turn me back, or perhaps to impound my car. I smiled and said it was a "*dia lindo*," a beautiful day. No, he answered flatly, it was merely a "*dia*

EKTACHROME © N.G.S.

"*Pescado*—fish," cries a vendor in the town of Gibraltar. Except for some fish and fresh produce, Spain in 1964 barred all exports to the peninsula. Gibraltarians have turned increasingly to North African suppliers.

bueno," a good day. Disagreement has become a conditioned reflex on the frontier.

Finally, four inspectors attacked the car with tools. One dismantled the trunk; another probed under the hood with a screwdriver; the third prodded the upholstery; the fourth inserted a length of wire into every crevice.

Most of the morning had slipped away when they finally waved me on. But I was lucky: Some motorists have spent as long as two days struggling through customs. On the return trip it was the same story.

Such troubles are nothing new to the massive 1,398-foot-high limestone boulder that juts from the southern tip of Europe. In its long history, this natural fortress—the key to naval control of the Mediterranean—has faced 15 separate sieges. The Rock's most recent occupants, the British, have survived three of them, all at the hands of Spain.

"And we will survive this one as well," an officer of the Royal Navy informed me matter-of-factly.

Continents Once Met at Gibraltar

The ancients knew Gibraltar and its African counterpart across the strait as the Pillars of Hercules, limits of the familiar world. Limestone strata of the two areas bear striking similarities, indicating that in some distant epoch Europe joined Africa here (pages 108-9).

The Phoenicians, sailing the Mediterranean, left their artifacts here 1,100 years before Christ, and Roman geographers knew the Rock as Mons Calpe. But Gibraltar did not gain strategic importance until the Moorish conquest of the Iberian Peninsula.*

Sweeping across the strait from Barbary, a Moslem host under Ţāriq ibn-Ziyād landed at Gibraltar in A.D. 711 and went on to overwhelm the Visigothic rulers of Spain. Immediately recognizing the importance of the Rock, Ţāriq built a castle on its slopes. His troops christened the place Jabal Ţāriq—Mountain of Ţāriq—which the centuries have slurred into Gibraltar.

Save for a short interruption, the Moors occupied the Rock until Spanish armies captured it in 1462. Then in July, 1704, Sir George Rooke, commanding a fleet of British and Dutch ships, seized Gibraltar, which eventually came under exclusive British control. After sacking the city, Rooke's forces permitted the 6,000 Spanish residents to depart or remain as they chose. Fewer than 100 elected to stay. The rest crossed the isthmus and settled at San Roque. The Spanish Government still regards the population of this town as "inhabitants of Gibraltar residing at San Roque."

The resulting human vacuum filled slowly through 2½ centuries of British rule. Soldiers took Spanish wives and settled on the Rock. Sephardic Jews, their ancestors expelled from Spain by the Inquisition in 1492, drifted back from Morocco. Genoese traders, Portuguese mariners, and Hindu merchants gravitated

*Bart McDowell wrote of "The Changing Face of Old Spain" in the March, 1965, NATIONAL GEOGRAPHIC.

toward Gibraltar. Strangely, marvelously, they fused into a new people now 19,000 strong—Gibraltarians.

"I guess I'm typical," Sir Joshua Hassan told me. "I'm a Sephardic Jew who was educated by Irish Christian Brothers."

And a woman added: "Even though I'm a Gibraltarian, it always astonishes me that inasmuch as we're so diverse in origin, not a single unpleasant incident involving religion or race has ever occurred here."

Languages Mix Freely on the Rock

The Gibraltarian way of life, I discovered, oscillates somewhere between British reticence and Latin flamboyance. Virtually everyone speaks Spanish and English with equal facility, and occasionally the languages mingle in the same sentence. *"Pero que es el* wholesale price?" I once heard a customer demand of a salesclerk. And a mother admonished her child, *"Se prohibe* to sit *aqui."* Gibraltarian interests flicker across a wondrous spectrum of cricket and bullfights, crumpets and *paella*, flamenco and the frug.

Beneath their Latin sheen, however, Gibraltarians are profoundly British. In this era of independence at all costs, the colonials of Gibraltar stand overwhelmingly for the status quo. Signs proclaim: "British We Are, British We Stay."

England, in the opinion of some—notably Spaniards—has left its climatic mark on Gibraltar. From early summer through fall a damp wind, the prevailing Levanter, blows against the eastern face of what Spaniards call El Peñón, The Big Rock. As it swirls over the crest, its moisture condenses, often forming a thick cloud. Below it the town swelters in oppressive humidity. Contemplating the fogged Peñón from Algeciras, white and bright across the bay, a Spanish writer bleakly pronounced it *"El beso que Londres ha enviado a su colonia"*—"The kiss that London has blown to its colony."

Clouded or not, each weekday morning on the Rock begins with the influx of some 8,000 Spanish workers, who perform much of Gibraltar's manual labor, from cleaning streets to repairing ships in the dockyard. Once as many as 13,000 swarmed in daily from the Campo, or hinterland. But Spain, as part of the steady pressure exerted upon the colony, has reduced their number.

At eight o'clock the workers are at their posts, barely in time to avoid a monumental traffic jam. Gibraltarians, along with British military personnel and their dependents stationed on the Rock, drive 6,000 automobiles—one for every 10 yards of pavement. All seem to converge upon Main Street, the business and social center of the tiny city.

EKTACHROME BY OTIS IMBODEN © N.G.S.

Soviet whalers shop Gibraltar's free port after a season's work in the South Atlantic Ocean. They show a fondness for Sloan's Liniment and each year buy great quantities from the colony's stock.

Gibraltarians revel in commerce, particularly that engendered by tourism, and Main Street is its chief arena. By nine o'clock the merchants and traders have opened their doors. Then from the warships, liners, tankers, and freighters in the roadstead surges a

KODACHROMES © NATIONAL GEOGRAPHIC

Pillars of Hercules, ancient name for mountains flanking the Strait of Gibraltar, watch 30,000 merchant ships a year pass through. Telescopic lens compresses the distance between Gibraltar's rooftops and 2,782-foot Jebel Musa in Morocco, 15 miles away. Ships of the Royal Navy, illuminated by their own lights at dusk, blaze at berths in sight of Spain. For views of two continents, visitors may ride aerial cable cars to the top of the Rock, off limits until this year.

Staunchly British, the 19,000 Gibraltarians claim Portuguese, Italian, Maltese, Spanish, and Jewish ancestry. Some 6,000 resident aliens from every corner of the world add to the cosmopolitan flavor. With the military garrison, they jam the Crown Colony's 2¼ square miles.

Regarded as impregnable, the Rock fell to a British-Dutch fleet in 1704; in the Treaty of Utrecht, Spain ceded the fortress to Britain "to be held and enjoyed absolutely with all manner of right forever."

EKTACHROMES © NATIONAL GEOGRAPHIC SOCIETY

Legacy of seven centuries of Islamic rule, the Moorish Castle caps fortifications begun in 711. The colony houses its wrongdoers in a jail abutting the castle walls.

Rock 'n' roll in the Rock: Teenagers shake to jangling beat in eerily lighted St. Michael's Cave. With magnificent acoustics, Gibraltar's largest cave seats 1,000 for classical concerts.

human tide that each year deposits several million dollars in Gibraltarian coffers.

Thanks to Gibraltar's status as a free port, all the world's treasure and all the world's dross have washed up on Main Street. Ice-blue diamonds and shimmering brocades share show windows with hideous plastic knickknacks; elegant watches nestle among gimcrack souvenirs.

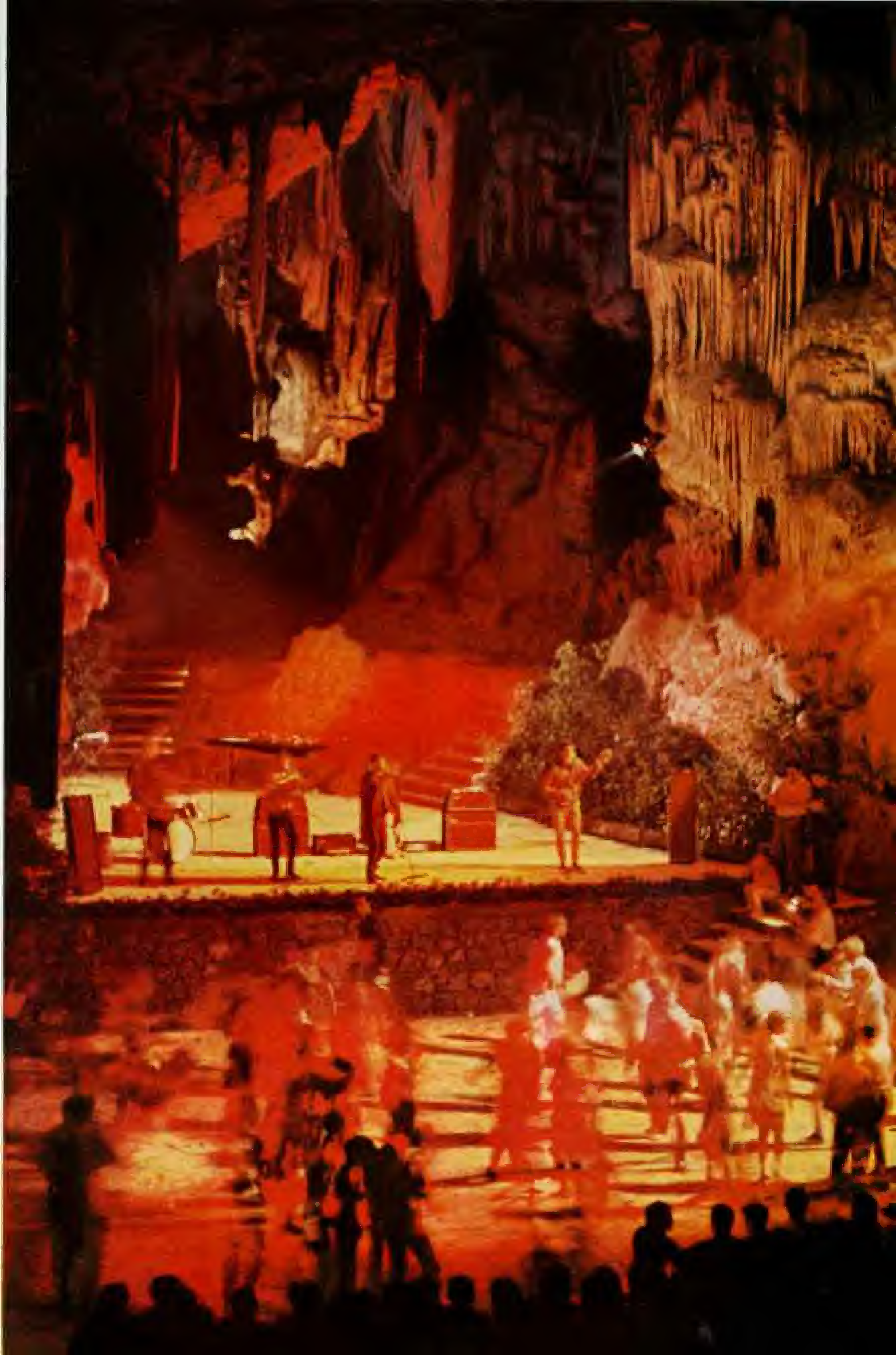
Newlyweds Face a Housing Problem

You can buy a German camera, a Danish tape recorder, or an Italian shotgun at the Casa Colorada. Sakata Ltd. features cultured pearls from Japan, and the Star of India offers a complete line of French perfumes. The SPQR Tobacconist stocks Havana cigars and Turkish water pipes. Garcia Ltd. specializes in tartans from the Scottish Highlands. French cheeses, Italian salamis, and Swiss chocolate jam the food shops. The Aix Bakery displays French, Vienna, and—after all, this is the age of science—Helium Bread. J. T. Hulhoven Ltd., "patronized by royalty," will dress your hair. The Baker Studio will clothe you in a *traje de luces* and take your portrait as a bullfighter. And, as you stagger to the end of this ultimate bazaar, James Sanguinetti, undertaker, promises you a *gran funeral*.

The keynote of Gibraltar shopping is transience. Seaborne tourists arrive in the morning, depart in the evening, and the morrow brings fresh faces. Rarely does a ship linger overnight, and when one does, passengers have difficulty finding accommodations in Gibraltar's crowded hotels. Living space of any kind is rare in the town; few Gibraltarians can boast a house and lot of their own. While everyone lives comfortably in public-owned apartments at rentals—subsidized by the government—as low as $2 a week, lodging represents a formidable problem for newlyweds; last Christmas an eminently successful lottery offered as its sole prize a lease on a flat.

Like divided Berlin, Gibraltar boasts two mayors, and neither one recognizes the other. One day I visited the Spanish *alcalde*, or mayor, of Gibraltar; I found him in the town hall of San Roque. The village lies five miles beyond the Spanish border, which I crossed on foot this time to avoid another long ordeal with customs.

San Roque impressed me as an eerie analogue of Gibraltar. As on the Peñón, white



houses with overhanging balconies of wrought iron march up steep streets. Even the village church bears the same name as Gibraltar's Catholic cathedral, Santa Maria la Coronada.

Yet I knew I was in Andalusia. From a cafe on the corner of Plaza del General Franco came the deep wrenching sorrow of a gypsy song played on a scratchy gramophone. And here no cloud obscured the golden sunshine.

The alcalde, Pedro Hidalgo Martin, escorted me into the council chamber, a hall rich in history. The traditional scarlet-and-gold arms of Gibraltar—a tower with a key pendant—emblazoned the dark wood of the chairs and tribunals.

"Yes, I am Mayor of Gibraltar," Señor Hidalgo told me. "And in the eyes of Spain, the people of San Roque are the true Gibraltarians. As to the present blockade of the Peñón, I can only hope that the world will understand our reasons. Colonialism is supposed to be dead, yet a colony continues to exist on Spanish soil—the only colony in all Europe. I wonder how you Americans would

BROKEN BRIDGE TO AFRICA ***dangles from Europe: Gibraltar once formed part of a mountain wall that linked the continents. Caves riddling the Rock have yielded elephant and rhinoceros fossils. The city crowds beside its mole-enclosed harbor. Andalusia spreads beyond Gibraltar Bay.***

KODACHROME BY BATES LITTLEHALES © N.G.S.

react if New York City were a foreign base.

"Let's be realistic. None of us wants to drive Great Britain from the Rock. But we do want recognition of Spanish sovereignty there. Without cooperation, all of us—Gibraltarians and Spaniards alike—are lost.

"Consider this bay that we share, one of the finest harbors imaginable. The Mediterranean and Atlantic meet here; so do Africa and Europe. Even now, on the coast above La Linea, we are building a large petroleum refinery. If we can resolve our problems, if Gibraltar and the Campo work together, the future holds promise beyond any dream."

"We are willing—even eager—to negotiate with Spain," a British official said in rebuttal. "But we will not negotiate the question of sovereignty."

Britain's strong attachment to Gibraltar springs from history. Between 1779 and 1783, when English arms were suffering serious reverses throughout the world, a valiant garrison of 7,000 commanded by Lt. Gen. George Augustus Eliott held the Rock against a land

Barbary ape and young visitor play on a long-silent cannon. Antique weapons bristle from the Upper Galleries (below), hewed out by redcoats who held off Spanish and French troops during the great siege of 1779-83. In one chamber, St. George's Hall, Gibraltarians feted former President Ulysses S. Grant on his round-the-world tour in 1878. More than 30 miles of tunnels honeycomb the limestone Rock. During World War II, embattled Gibraltar helped guard Allied supply lines.

Like a giant flattop, Gibraltar's airstrip reaches into the bay for almost half its 1,800-yard length. Royal Air Force jets share the strip with commercial craft. The only road to Spain crosses the runway, so cars must await a green light between landings and take-offs.

force of 40,000 Spanish and French besiegers. In that four-year artillery battle—one of the most awesome in history—opposing batteries fired almost half a million shots.

In the end, the Spanish and French attacked by sea. Ten French-designed *flottantes*—"incombustible and insubmersible" vessels with sides reinforced by seven feet of wet sand, cork, and green timber—sailed awkwardly out to bombard Gibraltar at close range. Early on the morning of September 13, 1782, they struggled into line and opened fire.

Eliott, the "Cock of the Rock," responded with a deafening cannonade, which included balls preheated red-hot to set fires. As night came on, one of the bigger flottantes began to blaze; the discouraged attackers scuttled the others. Eliott had saved Gibraltar for Britain and had given the world a new symbol for permanence.

Every age tends to discount the strategic value of the Rock. Our own is no exception. Yet, in World War II, Gen. Dwight D. Eisenhower established his headquarters at Gibraltar for the launching of "Operation Torch." Later he wrote: "In November, 1942, the Allied nations possessed, except for the Gibraltar Fortress, not a single spot of ground in all the region of Western Europe. . . . Gibraltar made possible the invasion of northwest Africa."

Today Gibraltar is headquarters of two NATO commands, a vital base in the defense of the West. And history has stamped the town with a military imprint; place names near Main Street—Bomb House Lane, West Place of Arms—ring with the echo of battle.

Both Sides Feel Blockade Effects

Not long after my visit to San Roque, I called upon the other and more widely recognized Mayor of Gibraltar, Sir Joshua Hassan (page 117). Sir Joshua—short, ebullient, learned—has been in the forefront of Gibraltarian politics since World War II. I had already met him in his role of Chief Minister of the Crown Colony.

"Although we number only 19,000 people,"

Her Majesty's man. General Sir Gerald Lathbury governs Gibraltar and commands its military forces. Statue of a distinguished predecessor, General Sir George Augustus Eliott, who withstood the siege of 1779-83, guards the patio of the 16th-century official residence—once a Franciscan convent. Coats of arms and portraits of past governors decorate the beamed dining hall (left). Keys to Gibraltar rest on a cushion before Sir Gerald's chair at the table's head.

Wearing his chain of office. Mayor and Chief Minister Sir Joshua Hassan (below) consults with Town Clerk Reginald Norton at a City Council meeting.

EKTACHROMES © NATIONAL GEOGRAPHIC SOCIETY

he told me, "we have both a city government and a kind of national government. On a per capita basis, I daresay Gibraltarians are the most governed people on earth.

"All principal powers reside in the Governor, appointed by the Crown, but through the years we have achieved considerable control over purely domestic affairs. And though Britain is actually responsible for our foreign affairs, Gibraltar's elected representatives are consulted on all such matters.

"Our chief problem now and for some time to come centers, of course, upon the Spanish blockade. For example, since cars can't freely cross the frontier, few tourists patronize our ferry service to Tangier. And we've had to turn to Morocco for fruit and vegetables, and even for labor.

"The blockade has caused a painful readjustment, but in the end it will benefit Gibraltar because we are making ourselves independent of Spain. And remember, this sword cuts two ways. Gibraltarians used to spend $6,000,000 a year in Spain. Now we spend nothing. La Linea, I assure you, has suffered as much as, if not more than, Gibraltar."

Sir Joshua was right about La Linea. One afternoon, I sat with a Spanish friend at an otherwise empty sidewalk cafe on La Linea's Explanada. Save for a shoeshine boy halfheartedly soliciting business, nothing stirred.

"In the old days," observed my friend with a sigh, "I can tell you that we had movement in La Linea. Movement and pesetas. People streamed across from the Peñón, and their cars filled the Explanada.

"Now anyone can park where he chooses. And we have no pesetas."

Tunnels Honeycomb "Solid" Rock

No one who really knows Gib ever speaks of anything as being solid as the Rock of Gibraltar, for the simple reason that the Rock resembles nothing so much as a mammoth Swiss cheese. Galleries, caves, and basins riddle the great limestone mass. Tunnels alone measure more than 30 miles—equaling the total length of streets and highways outside.

In my journeyings through the Rock I discovered no greater wonder than the huge man-made grottoes that serve as Gibraltar's reservoirs. Save for some brackish wells near the frontier and a small unit that distills sea water, all fresh water comes from rains that lash the Rock each fall and winter. Galvanized iron panels cover the relatively smooth upper slopes, creating acres of catchments to trap these seasonal showers (pages 104-5, 113).

In addition to man-made passages and reservoirs, natural caverns honeycomb the Rock. With spelunkers John M. Piris and Louis B. Payas, I set out one morning for a tour of some of the 78 known caverns. In 1848, a Gibraltar cave—since sealed by a rockslide—furnished the world's first known Neanderthal skull, that of a woman. In all, 17 caves have yielded evidence of early human habitation, including another Neanderthal skull. Investigators have also uncovered fossilized bones and teeth of ancient seals, bears, leopards, rhinoceroses, and an extinct elephant.

After a morning spent in the bowels of New St. Michael's Cave—all stalagmites and stalactites and rock waterfalls in ocher and gold—John, Louis, and I headed for sea-locked Gorham's Cave, site of countless neolithic relics. Incoming breakers drenched us as we darted across the narrow, drowning sands at the eastern base of the Rock.

Upon a beach, we found a chunk of limestone with one flat surface covered by fossils of shellfish. Apparently it had crashed down from the heights. Such fossils indicate that much of the Rock once lay below sea level.

We passed into the great vaulted entrance of Gorham's Cave. Inside, the floor rose in three successive terraces. All of us carefully prodded the earth. John found a charred piece of shell that had once served a cave dweller as a spoon. Potsherds—neolithic, Phoenician, Roman—lay everywhere. Old burn marks on the ceiling marked the location of an ancient fireplace. Lichen streaked the walls with green, and here and there little clumps of vegetation clung to the sides.

When I finally emerged onto the sunny beach, I experienced a peculiar sense of continuity. The remote foragers—our ancestors—who had found peace and security there beside the pounding sea seemed somehow very close and very real and very human.

Barbary Apes Guard British Interests

Great Britain, insists a local legend, will hold Gibraltar only so long as the Barbary apes continue in residence. Powerful, tailless macaques, these golden-brown monkeys—the only wild ones in all Europe—may have descended from pets kept by the Moors (pages 114 and opposite).

Thirty of them roam the Rock at will, leading lives of simian luxury. The Gibraltar Government provides sixpence a day per ape to feed them. Should one of them fall ill, he is whisked away to the Royal Naval Hospital for appropriate therapy or surgery. Officially numbered in the strength of the garrison, the apes are under the orders—and the protection—of Lt. Col. J. M. E. Gareze, commanding officer of the Gibraltar Regiment.

Talent for Larceny Causes Trouble

One clear morning I joined Colonel Gareze for an inspection tour of his charges.

"We've divided them into two packs," he explained. "In this way, no catastrophe or epidemic can wipe out the lot of them.

"The Middle Hill Pack, which lives high up on the Rock, is relatively wild. These apes are quite independent and usually in excellent health.

"On the other hand, the Queen's Gate Pack roams in the tourist areas. Everyone feeds them sweets and other muck, so they're rather prone to stomach upset.

"The two packs rarely meet, but when they do, they invariably fight."

Fortress Orders faithfully chronicle births and deaths among the apes, and Colonel Gareze showed me a recent sample: "Rock ape Wilma of Middle Hill Pack gave birth to a male apelet. . . . His Excellency the Governor and Commander-in-Chief has approved that the new apelet should be named Sam."

"Generally," the colonel told me, "I try to name them after distinguished local people. But the apes have had a small population explosion and I've run out of candidates. So now I'm switching to Biblical names. My last is called Rebecca."

About halfway up the western slope of the Rock, we parked near the haunt of the Queen's Gate Pack.

"We'd best roll up the windows," the colonel said. "They have a habit of looting cars. They've also developed an unfortunate taste for windshield wipers. They can nibble off the rubber in seconds."

Lance Corporal Alfred Holmes, noncommissioned officer in charge of apes, greeted us with news that his charges were all present and accounted for.

The corporal's troop, it turned out, was in minor difficulties. The Middle Hill Pack had visited town, entered a house, and stolen an alarm clock. The outraged occupant demanded action.

"I've looked everywhere, sir," said the corporal. "All the usual hiding places. But I just can't find it."

Hair-raising ride: An ape ruffles a cruise-ship passenger, ashore to see the sights. Barbary apes—actually tailless monkeys—reached the Rock from their native North Africa, perhaps as pets of the Moors. Legend holds that Gibraltar will remain British until the apes desert it. When they dwindled to a few animals during World War II, Prime Minister Winston Churchill ordered the pack replenished from Morocco.

Today, 50 uninhibited monkeys roam the Rock in two mischievous groups that fight if they meet. Despite this lack of discipline, the Gibraltar Regiment "enlists" them, and the government pays each sixpence a day for their service. The money buys bananas, vegetables, and oatmeal. When an ape is transferred abroad to a zoo, orders are cut and military records show it posted overseas.

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Charging a hilltop on the southern flank of the Rock, soldiers of the Gibraltar Regiment overrun a make-believe enemy position. Subject to compulsory military service at age 18, Gibraltar's men undergo periodic training for home defense.

"Well, keep searching," said Colonel Gareze without much hope.

The colonel's responsibilities as commanding officer of the Gibraltar Regiment extend far beyond his complement of apes. Gibraltarians are subject to conscription, and at 18 every able-bodied male receives four months of military training in the Gibraltar Regiment (preceding page). He then becomes an active reservist until the age of 28. Thereafter, he remains in an inactive reserve status until he reaches 41.

Soldiers Train Under Mothers' Eyes

Training the Gibraltar Regiment presents a problem peculiar to the Rock.

"You'd never dream how hard it is," a corporal remarked ruefully to me. "Gib is so small that the lads are never more than a few hundred yards from their families. How can you forge a soldier with his mother plucking constantly at your sleeve?"

I met no one on either side of the frontier who expects that the Gibraltar Regiment will ever be called upon to repel a Spanish attack. When this siege ends—as one day it will—perhaps Rock and Campo will return to their pleasant and promising interdependence. Bitterness has no place in the sunny natures of either Gibraltarians or Andalusians.

A Spaniard in Algeciras expressed it best. "Look," he told me, "I have friends in Gibraltar. Before the border closed, I often visited them and they visited me. Now suddenly we're expected to hate each other? No, *hombre!* There will never be trouble between them and us. Between our governments, yes. Between our peoples, never." THE END

Running wing and wing—mainsail to port, jib to starboard—Albacores race across Gibraltar Bay. Members of the Royal Air Force crew the sailboats in a regatta sponsored by the Royal Gibraltar Yacht Club, one of the oldest outside England.

Bathers at Catalan Bay cavort by an enormous boulder in the warm waters of the Mediterranean. Vacationing Rita Krogh from Norway prefers a dip in the pool at the Rock Hotel.

Long a day's stop-over for tourists en route to Morocco or Spain, Gibraltar today advertises a temperate climate, little rainfall, and comfortable though crowded hotels as inducements for travelers to linger on longer visits. Although Spanish border restrictions hamper the peninsula's plans, air and ocean liners still bring thousands to enjoy the sights, shops, and sea at Gibraltar.

Living With Thailand's Gentle Lua

Article and photographs by PETER KUNSTADTER, Ph.D.

WHEN MY WIFE SALLY and I set out to live for most of a year with the Lua, a mountain people of Thailand, we wondered whether they would be friendly. Not long after our arrival in Pa Pae, a Lua village deep in the hills near Burma, our question was answered in full.

At dawn on a cold morning, we were comfortably dozing in our sleeping bags when a man we had met in a neighboring village climbed up the ladder of our bamboo house and walked into its one room. At first he sat in a corner, silently watching us as we sat up and rubbed our eyes. Then he came closer and squatted in the narrow space between our air mattresses.

I put a few sleepy questions to him. He said that he wanted to get acquainted. Didn't Americans visit each other?

When he had satisfied his curiosity, he departed to report to the villagers. We scrambled into our clothes before the next visitors arrived. Having friends drop in at dawn, or at any other time of the day or night, was something we soon took for granted.

"You are always welcome in a Lua house, Khun Peter," explained my next-door neighbor, Ai Po. "To be alone is no fun at all!"

My title *khun* meant simply "mister," but as my medicine kit, my typewriter, and my cameras became familiar, the villagers sometimes called me Khun Nai, meaning "big shot."

During our stay among the Lua, Sally and I were never lonely. That, of course, is ideal for a nosy anthropologist. We learned to respect and love these gentle people and to understand something of the horde of spirits that inhabits their world.

It must have been a benevolent spirit that brought us to Pa Pae. Professionally, the material for study was rich; the villagers practice a vivid animistic religion and preserve some ancient and fascinating lore. The personal rewards were as great, for the Lua are the friendliest people we have ever known. They are descendants of the original inhabitants and rulers of northern Thailand. About 10,000 of them live in 25 to 30 villages scattered in the mountains—an isolation that helps them retain their traditions.

The journey to Pa Pae was a long one—a jet flight across half the world from New York to Bangkok, Thailand's temple-studded capital; then by Land-Rover across nearly 500 miles of often rough roads to Chiang Mai, the provincial seat of northern Thailand. I left Sally in Chiang Mai and went on by plane to Ban Mae Sariang, the closest market town to the Lua mountain villages (pages 124-5).

Lua Mistaken for Wild Head-hunters

Next morning, a Border Patrol guide and two carriers joined me for the day-and-a-half climb to Pa Pae. As we struggled across chest-high rivers and clambered up slippery hills, I began to have serious misgivings. I had been pleased that the National Geographic Society, Princeton University, and the United States Public Health Service had provided grants for a study of the hill tribes of the northwest mountains. But now that I was actually in those mountains, I kept remembering a letter I had received from a French missionary informing me (mistakenly, I soon learned) that the Lua were identical to the wild Wa, a head-hunting people of northern Burma and southwestern China.

Pa Pae is a village of 49 houses nestled in a high stream valley. As we walked toward it, late in the afternoon, we heard the "ka-thunk, ka-thunk" of women pounding rice. Boys sprinted up to see the foreigner. A crowd gathered, and in a few minutes a tall man with a shock of gray hair arrived. The only

Warmed by friendship and fire, three generations of Lua women shake off sleep as a winter dawn slips into the village of Pa Pae. Black puppy snuggling beside the right foot of Nia Kham broke its neck in a rice-pounding device, but the Lua refused to destroy the animal and tenderly nursed it back to health.

KODACHROME © NATIONAL GEOGRAPHIC SOCIETY

BURMA
LAOS
0
100
STATUTE MILES
Lua population areas shown in yellow
Mekong
BURMA
THAILAND
Salween
Phayao
Doi Suthep
5528 feet
Chiang Mai
Lamphun
Yuam
Chaem
La Oop
Pa Pae
Lampang
Ban Mae Sariang
Ping
Wang
THAILAND
BURMA

LAOS
Vientiane
Mekong
THAILAND

Phitsanulok
Yom
Nan
Ping
Nakhon Sawan
Lop Buri
Chao Phraya
Ang Thong
Bangkok
Rat Buri
Gulf of Siam
Phet Buri

Moulmein
BURMA
THAILAND
Andaman Sea
Mergui
Chanthaburi
THAILAND
CAMBODIA

The long road to Pa Pae wends through Bangkok, Thailand's teeming capital, where gleaming spires of nearly 400 Buddhist temples stud the flat horizon. Most sumptuous, the Wat Phra Keo (below and left) contains the "Emerald Buddha," a figure carved from a single piece of green jasper, mounted on a many-tiered golden altar. *Kinnari*—half human, half bird figures—guard the temple. The wat stands within the walled grounds of the Grand Palace, home of Thailand's King Bhumibol and his beautiful wife, Queen Sirikit.

To the north, at the end of a 19-hour drive, bustling Chiang Mai offers a cool retreat from Bangkok's hot and humid weather. A plane flight from here to the market town of Ban Mae Sariang passes over mountains harboring Lua villages. Travelers climb the steep trails to Pa Pae on the backs of swaying elephants.

Some 10,000 Lua, descendants of Thailand's first inhabitants, maintain islands of their own culture amid an increasing population of Karens, hill people who have migrated from Burma during the past 150 years.

"Land of the Free"—the meaning of Thailand—has enjoyed independence from outside domination for many centuries and now boasts one of the highest standards of living in Southeast Asia. Teak logs float to Bangkok through the Central Valley, one of the world's best rice-growing regions. Although largely Buddhist, the nation shelters many religions and races in a population that is 70 percent literate. Hill tribes like the Lua continue their ancient ways in peace.

PHOTOGRAPHS BY W. ROBERT MOORE, NATIONAL GEOGRAPHIC STAFF (ABOVE), AND PETER KUNSTADTER © N.G.S.

weapon he carried was a greeting bottle of *plai*, a crude rice liquor that is menacing enough to any Western head.

The tall old man was Kae Ta Kham, the headman of the village and also its "big *samang*," or religious leader. The samangs trace their descent from an ancient Lua king or from one of his princes. Guardians of Lua culture, they make many important community decisions, such as when to plant the rice crop. As the Lua say: "If we didn't have a samang, we would have to live like apes and monkeys in the jungle."

Cemetery No Place for a Live Samang

Samangs are consulted on all major ceremonies except funerals; as every Lua knows, a samang who sets foot in a cemetery immediately loses all his knowledge. Out of respect for his position, the samang receives a leg from each pig sacrificed in connection with the rice planting and a leg from any large animal caught or killed in the jungle.

I explained to Kae Ta Kham that Sally and I wanted to come and live in his village and study the Lua way of life. He agreed readily and expressed pleasure that someone would record the Lua traditions.

After the dry season began and the rivers subsided, Sally and I were able to drive our Land-Rover along a lumber road for 14 miles into the mountains beyond Ban Mae Sariang before having to walk. As we shouldered our bags and began the three-hour hike up steep trails to Pa Pae, we knew that now we were really on our own.

Since the dry winter had arrived, we needed a warm place to stay as soon as possible. One of the villagers, Ai Po, agreed to act as contractor for a house, since we were helpless in the jungle and as yet had no friends to share the work of building it.

"How long will it take, Ai Po?" I asked him in Northern Thai, which the Lua speak in addition to their own Mon-Khmer language.

"Perhaps a month."

"But we may freeze to death before that."

"We will try to work faster. Two weeks."

With this chilling prospect, I toured the village with Kae Ta Kham and Ai Po to select a homesite. I chose what seemed a good place, right beside the main trail leading through the village, and next door to Ai Po.

I told them I wanted to live in Lua style, and Ai Po explained: "Your house must not line up evenly with the one next to it. That's just not done. Your house must be far enough away from your neighbor's house so that rain

Nestled in a verdant valley, the bamboo houses of Pa Pae shelter 200 Lua. When the six-month rains begin in May, the Lua dam the stream and flood low-lying fields for wet cultivation of rice. Trail through the jungle leads to steep slopes for dry-rice growing.

"To be alone is no fun at all!" Gregarious Lua youngsters swarm around Peter Kunstadter and his wife Sally. "True, we lacked privacy," says the author, "but that is ideal for an anthropologist. We spent one of the happiest periods of our lives among the Lua. We not only completed serious studies of their busy social and religious life—we had fun together."

Dr. Kunstadter holds a deep affection for peoples with whom he has lived—Pueblo, Apache, and Ute Indians of North America, as well as the Lua (also spelled Lawa). Recently he left Princeton University for three more years of study in Thailand, including a return to Pa Pae.

PHOTOGRAPHS BY PETER KUNSTADTER © NATIONAL GEOGRAPHIC SOCIETY

falling from your roof does not mix with rain from his roof. Otherwise, you might get sick. But most important, you must not be too close to the trail."

"Why, Ai Po?"

"Because if an elephant bumps into your house, that is very bad luck."

Building Costs Include Food for Spirits

Building the house introduced us to some of the many spirits of Pa Pae. Ai Po organized the materials and workers, while Pu Di, a village elder, undertook the equally important service of summoning the house spirits. Our home cost $35—for house posts, bamboo poles, and labor, also two pigs for a feast and a dog and two chickens to sacrifice.

While the Lua were gathering wood from the jungle for our house, Sally and I spent our chilly nights wrapped in sleeping bags on the porch of the house of Khru Pan, the Border Patrolman, who teaches the children of Pa Pae. Many policeman-teachers help educate the hill tribes.

When the day came to begin our house, custom demanded that we be up long before dawn to help the builders lift the heavy house posts into deep holes. Then we gathered around a fire for a toast of plai.

To work alone in Pa Pae is to be lonely—which is intolerable—so when it was light enough, most of the village began gathering around to work or just to superintend.

By early afternoon, the 12-by-15-foot framework, with its woven bamboo walls raised on stilts, was in place. The workmen

tied a covering of bamboo mats over the steeply pitched roof until the permanent roofing of grass shingles could be woven.

Our home, which was to have taken two weeks to build, had been put up in a single day, after only three days of gathering materials. Ai Po had not wanted to make a promise he could not keep.

In accordance with Lua custom, Sally and I climbed up the ladder with rice, cotton, tobacco, money, new clothes, and other symbols of the good life. Pu Di sacrificed a chicken, summoning the good spirits to protect the house and its inhabitants.

The women of the village began to troop in with small bags of rice for Sally and me and bottles of plai for everyone. Someone came from every household to make us welcome.

Pounding chili peppers for a stew, a girl helps prepare the feast that follows the periodic sacrifice to ancestor spirits guarding this house. Care and feeding of hundreds of different spirits occupy much of the Lua's time and resources. After the pious Lua sacrifice, the practical Lua eat—a convenient arrangement for both body and soul.

Study in silver, the widow Ee Suin gins cotton on the porch of her son's house. Downy seeds squeezed from the fiber by the hand-cranked roller spill onto her lap. Later she will fluff the cotton for spinning by whanging it with a bowlike device. Most households use gins to process the winter crop. Silversmiths in the neighboring village of La Oop fashioned the gleaming necklaces.

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The construction of the fireplace, a wooden frame filled with sand, was entrusted only to the older men. At the lighting of the first fire, Pu Di and some elders sat down on one side of the hearth and a group of guests on the other. In a repetitious but pleasing chant, Pu Di then sang out a Lua song of welcome, requesting blessings of long life, many children, lots of pigs, chickens, and water buffaloes, and plenty of rice for the inhabitants of the new dwelling.

One of the guests replied with a song raising questions about the hospitality:

"Are you sure there is enough food to eat?"

When Pu Di's turn came, he sang reassuringly, "Everything is going to be just fine; we have plenty for everybody."

The guest replied, "We hope so, and we do wish that all the blessings come to pass."

The singing banter, toasting, and feasting continued with great good humor into the night.

Crisis Threatens at Housewarming

About midnight teen-age boys and girls drifted onto our porch and were serenading each other when a worried messenger rushed up the ladder.

"Khun Peter, come right away, please!"

"What has happened?"

"Kham Müang is very sick."

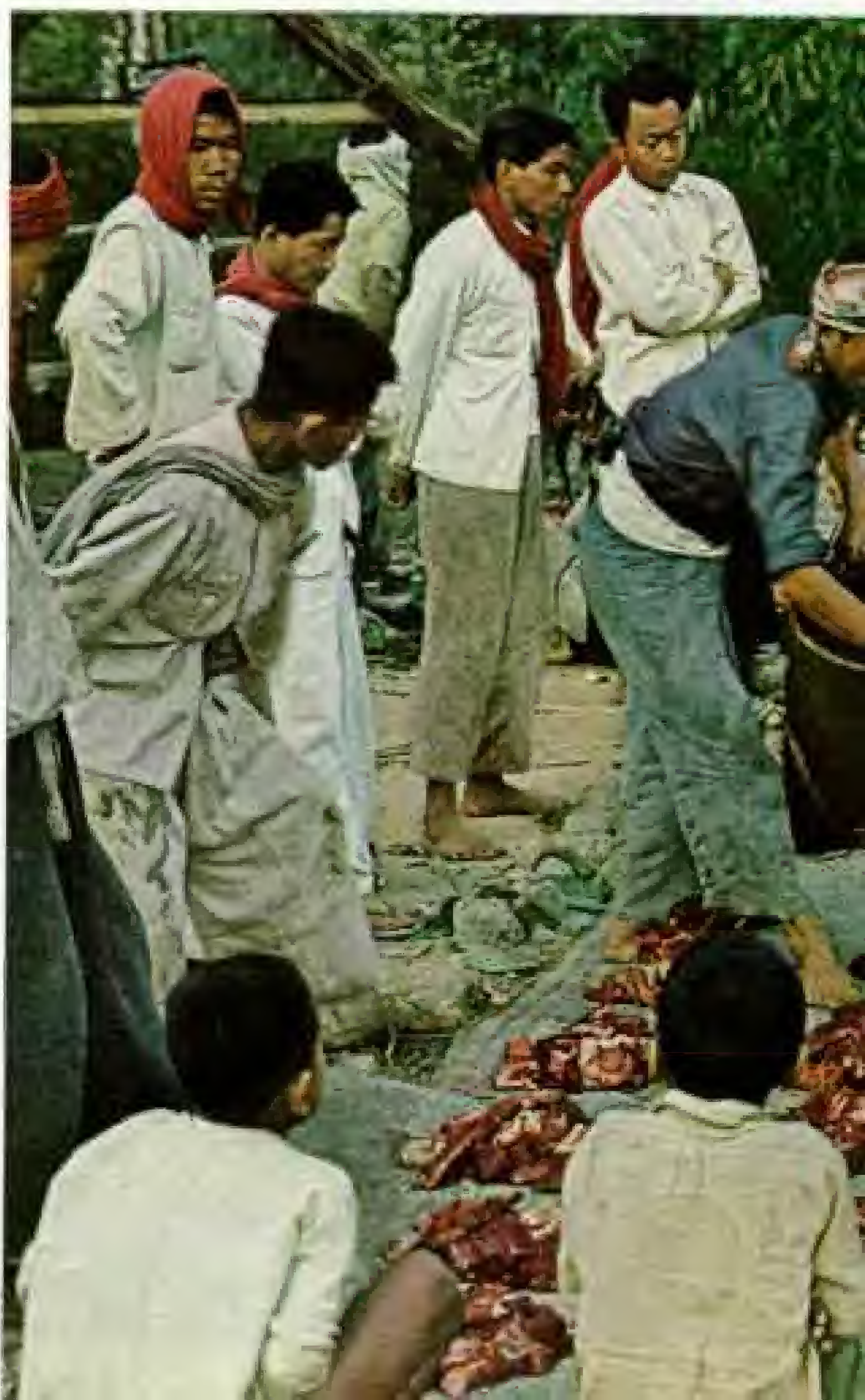
My heart sank. The boy had seemed healthy working on the house earlier in the day. Suppose he had appendicitis? I doubted that an anthropologist would be of help to him. Besides, I might be accused of bringing evil spirits into the village.

Kham Müang's house was full of people. "You need lots of friends around to help you get well," the Lua say. Friends, relatives, and spectators sat around. Some were massaging the boy's hands and feet. Some sat and gossiped. Some came with blankets, prepared to spend the night. The old men were trying to divine the cause of the illness by counting grains of rice from Kham Müang's bowl.

The boy complained of a severe stomach-ache. I gave him some paregoric and kind words. To our mutual great relief, he began to feel better. A non-Kunstadter spirit got the blame, and I was given partial credit for the cure.

I had no sooner returned to our new house than another emergency call came. Nang Mawng, a woman

Lulled by the churring song of a spinning wheel, little Ee Kawng daydreams while her grandmother, Ee Nang, makes yarn. Turning the wheel with one hand, the spinner holds the fibers twisting from the whirling spindle with her other hand. Full spindle of thread ready for sizing and washing hangs on the bamboo wall. Well-behaved, eager-to-learn Lua children take part in the daily work of their village at an early age.



"Spirits eat little, but we eat a lot," admit the devout but practical people of Pa Pae. Ai Pan lifts a foot-long knife to slaughter a water buffalo, a major sacrifice offered to ancestor spirits to keep the dry rice growing. The spirits, not greedy about food, receive tiny bags of meat plus the tips of the ears, nose and tail, eyelashes, and a sliver of a hoof. The Thai Government levies a tax on slaughtered animals, so villagers sometimes hoist a throttled buffalo to a tree limb and claim the animal hanged itself.

Hawk-eyed and hungry, villagers supervise the careful distribution of the buffalo meat. To combat an illness, the Lua sometimes give a spirit a trial offering of burned bone, unspun cotton, and a few sticks. If the patient recovers, they promise to give the spirit a big feast—most of which the Lua themselves will eat.

Sacrifices imbued with this happy blend of piety and common sense govern Lua agriculture as well as social life. The big *samang*, village religious leader, directs the most important ceremonies. "Without him," the Lua say, "we would have to live in the jungle like monkeys."

of about 30, was lying beside her fireplace with cramps that made her body rigid. I gave her a sedative and some hot tea. Fortunately, she also began to feel better. My reputation as a healer was secure. For the rest of our days in Pa Pae, morning began with sick call as our porch filled with patients.

Farmers Spare Spirits' Jungle Homes

In February, about a month after our arrival, Kae Ta Kham and several of the elders went out to select fields for planting. Most of the fields are used for a centuries-old system of upland dry-rice agriculture.

The Lua practice slash-and-burn farming, but they live in permanent villages and do not migrate from place to place leaving charred and spent land behind them, as do many of the world's slash-and-burn farmers. They plant their rice after clearing and burning the hillsides within a few hours' walk of their village. They use a field for one year, then let it lie fallow for the next seven to ten years. Field users or their heirs expect to return to the same field at the end of that time.

The Lua preserve streamside stands of trees between fields, for these are vital as fire breaks during the dry season. Teak forests are left standing because the sandy land is no good for growing rice. The Lua also spare the virgin jungle for equally practical reasons: It is the home of powerful forest spirits, so cutting the trees would offend them; besides, it is too hard to cut down the huge trees that grow there.

Kae Ta Kham and the elders returned to the village with a sample of soil. They sacrificed a chicken and examined its gall bladder. It was fat, shiny, and filled with liquid—a good omen. If it had been otherwise, a new site would have been tried.

The big samang has first choice of fields. The next selection is made by the *lams*, the eldest men and religious heads of family groups which make up the village. After this, other men are allowed to return to the fields

EKTACHROME (OPPOSITE) AND KODACHROME BY PETER KUNSTADTER © N.G.S.

that are a part of the family inheritance.

The spirits, however, may not be kindly disposed to every farmer. Therefore, each man goes to his chosen field and sacrifices a chicken to check the omen for his own place.

Ai Nyo, one of the older men, failed to get a good omen. He could have traded fields and sacrificed another chicken, but he was discouraged.

"I'm not going to plant a field this year," he told me. "I got a bad omen. If I eat rice from that field, I will get sick and probably die."

"How are you going to live?" I asked him.

"I'll eat off my relatives. I've been feeding *them* long enough."

Everyone Knows of Wedding but Bride

One afternoon Ai Po, whose wife is from the nearby Lua village of La Oop, climbed the ladder to my porch.

"I'm going to La Oop tonight. One of my in-laws is getting married. Would you like to come? Weddings are fun!"

The invitation surprised us, since the wedding season at Pa Pae is ordinarily after the harvest, when there is leisure time. But they do things a little differently at La Oop.

We arrived in La Oop after a three-hour walk. I asked the groom's older brother, an assistant headman, whether I could take some pictures. He told me it might be difficult, since the bride had no idea the wedding was about to take place. Otherwise, all right.

A band of ten conspirators soon gathered in the groom's house. As night deepened, the

Farming with fire. Ai Pan ignites parched hillsides to clear the ground for dry rice and cotton. Wisely, the Lua allow burned-over upland fields to lie fallow after each planting for seven years or more. Intense heat from this fire forced Peter and Sally Kunstadter to take refuge in a streambed.

Shower of seeds, sprayed from Ee Tip's bamboo stick, sows cotton on the charred but fertile hills. Later, men and women, digging in their toes to maintain balance, will clamber over the same precipitous slopes to hand-plant dry rice.

Fragrance of flowers wrapped in banana leaves summons the Thai spirit who will guard Pu Di's dam when he floods his wet-rice fields. The spirit may use the little bamboo house, complete with ladder. Pu Di will help him eat the white chicken trussed beneath it.

KODACHROMES © NATIONAL GEOGRAPHIC SOCIETY

mountain village grew still. Long after midnight, we hurried quietly under the stars along back paths to the home of the bride. Her family were all asleep. Stealthily, the groom crept up the stairs, quietly woke the girl, and pulled her by the wrists onto the porch. There his friends dragged her off, whimpering and crying, as I ran along behind, taking flash pictures.

She had known for several months that her prospective husband would come and carry her off some night. They had exchanged silver pipes, tobacco, and small ornaments, and he had been working hard to afford a proper wedding feast. Still, when the expected happened, it was a surprise.

Immediately after the abduction, the girl's father—who also had known what would happen but not when—rushed over to awaken the village elders. "My daughter has been taken! What has become of her?"

The elders made their slow and serious way to the house of the groom, while the rest of the village began to turn out for the festivities. The elders asked of the groom's father:

"Do you know where the missing girl is? Why has she been taken from her parents?"

He replied: "She has been taken for marriage. They love each other!"

Young boys dashed off to arouse the samang and the lams. It is customary for these religious officials to take their time. "What's the rush?" they say. "Nothing will happen until we get there."

The groom's relatives walked over to the bride's house to discuss the bride price. Young men scurried under the house to catch and prepare a pig for feasting.

Tradition firmly fixes the price of a bride—sixteen old silver pieces (page 142). It is also traditional, however, to haggle about it. The bride's family said to the groom's family: "Is that all you are going to offer? She's the best girl in the village!"

The groom's family said to the bride's family: "Do you think we are made of money?"

After two hours of discussion, a price was agreed on. Then the bride's family asked for

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just a bit more. Reluctantly the groom's family agreed, but asked for one of the coins back —"Otherwise, we will be flat broke."

By dawn things were settled, and the village of La Oop began the five-day task of cooking food, brewing plai, adding a partition to the house of the groom's father, and summoning all the relatives.

Odd Illness Strikes a Lua Bride

Late the next day, after we had returned to Pa Pae, we were surprised by a visit from the groom's brother, who had given me permission to take the pictures. He joined us on our porch in obvious embarrassment.

"The bride has become nervous and ill," he said. "The wedding cannot go on."

"What seems to be her trouble?" I asked.

"Flashbulbs."

It was the first case of flashbulbs I had handled. I asked what might be the cure.

"The spirits were offended," he said. "One small pig would make them happy again. Otherwise, the bride might not recover."

At this our friends in Pa Pae, who had gathered to hear the news, began to snort and chuckle among themselves at the extortion. Somewhat amused, I paid the price and sent along a couple of tranquilizers to boot.

"Khun Peter," my friend Ai Toon said, "if you want to take pictures of anything, you had better stay around your own village. We don't have as many bad spirits here as they do at La Oop. You've taken pictures of all of us, and no one here has come down with flashbulbs yet."

Sally and I, minus flashbulbs and cameras, went back to witness the wedding at La Oop. Several months later, in our own village, we saw two more weddings (pages 142-3).

One of the difficulties the people face in preparing the customary feasts for such occasions is a tax levied by the Thai Government on the slaughter of animals. Before dawn on the final day of the wedding, the young men of the village throttle a water buffalo, tie a rope around its neck, and hang it from a stout tree branch. Then they run and tell Kae Ta

Chore of clothmaking needs only two hands, but with a companion the task becomes more pleasurable. A ball of yarn flies as Ee Kawng threads a belt loom, a device common in many parts of the world. Warp threads wrapped around a stick at her waist stretch from a porch beam. Leaning back in the harness, she pulls the warp taut to produce a fine, even weave. Girls will sew the narrow strips of homespun into loose blouses.

EKTACHROME © NATIONAL GEOGRAPHIC SOCIETY

Weaving a web of bamboo, Loong Ta, a village elder, shapes the frame for a rainproof head shield. Tattoo on his knee, a sign of manhood, extends like pantaloons all the way to his waist. Its dark designs, representing tigers and apes, protect him from injury by such animals, he believes. Despite good-natured ribbing, the author declined an offer of similar ornamentation.

Patient puffs kindle home-grown tobacco in pipes of wood and buffalo horn ringed with silver as friends exchange lights. Ee Suk's daughter, who will herself acquire the habit at the age of four or five, ponders the mystery of eating smoke.

PHOTOGRAPH BY PETER KUNSTADTER © N.G.S.

Kham, "A buffalo has climbed a tree and hanged himself!" After an appropriate moment to consider the matter, the big samang replies: "Well, if that's what has happened, we might as well eat it!"

I walked out one day to map the location of each family's field for the coming rice planting. On the way back, I asked Ai Toon how the Lua had acquired their lands.

"All the people in Pa Pae," he told me, "are descended from Lua who once lived in several other villages. About 150 years ago, armed bands of robbers began coming into these mountains from Burma. The Lua villages used to warn each other and call for help by beating big drums. Finally, things got so bad the separate villages got together and built Pa Pae. It was safer and has a stream, which makes it pleasant and clean. But this land still belongs to the people of the now-abandoned village of Mo Hong.

"If your father's family always lived in Mo Hong, you can cultivate this land, but if your family came originally from one of the other villages, which are also now abandoned, you have to ask the permission of Kae Ta Kham to farm. He is Mo Hong's samang too."

Villagers' Appetites Greater Than Spirits'

As soon as the field assignments were confirmed, each family began to clear its land. The men sharpened their 18-inch-long machetes before dawn and began the long walk to their fields as soon as the sun rose. I went to the fields with Loong Ta and his two sons, Ai Toon and Ai Tang. They attacked the ten-years' growth, and trees and vines fell before the swinging blades.

All during the day they worked their way up the steep slope. Loong Ta told me, "We try to make the trees fall so they spread evenly and will burn completely." The larger trees, more than six inches in diameter, are left standing. They survive the fire and provide the basis for new growth after the fields have been used.

It is the hot, dry season now. While the fields dry, the villagers work hard to repair roofs for the onslaught of the monsoon rains, and a brilliant sun bakes the hillsides.

Almost every day people stop by to ask us to join their fishing expeditions.

"To catch fish?"

"Yes, and to cool off! Come along; if lots of people don't go, it's no fun!"

The big samang finally declared the day had come for the dangerous burning. "We must wait until the brush is as dry as possible, but if we wait too long, the rains will start and the fire won't burn well," Kae Ta Kham told me.

On an early April morning, the oldest women walked to the edge of the village with trays of food and drink. They called in loud, clear voices to the ancestral spirits and asked their assistance in this important event. This was one of the few times we saw women taking an active role in the spirit worship of Pa Pae.

After these preliminaries, Loong Ta, Pu Chü, and other elders went out along the trail to the upland fields. They built 12 altars to various forest, water, field, and ancestral spirits. A large water buffalo and several chickens were

killed. Later in the day, their meat—minus tiny portions for the spirits—would be divided into 49 shares, one for each household of Pa Pae (pages 132-3). Four lucky families would each receive a buffalo hoof!

Loong Ta then took the small pieces of meat, the beaks and claws of the chickens, and the tip of the buffalo's tail and placed these offerings at 11 of the altars.

Pu Tip, an older man helping with the sacrifice, said to me, "The spirits eat only a little bit, but we all eat a lot."

"Why don't you sacrifice at all 12 altars?" I asked Loong Ta.

"If we feed all 12 of these spirits, the fire will burn so hot it will get out of control."

Land Claimed Before Spirits Return

Firebreaks had been cut with great labor around the parched fields. Just about noon, when the wind was right, the young men ignited long bamboo torches after spraying mouthfuls of plai on them, asking for a fire to burn the fields as the rice liquor burns the throat. Then they ran along the bottom of the slopes, dipping and brandishing their crackling torches (pages 134-5).

A Lua field fire is huge, a tower of flame burning with a roar that reverberates from the hillsides. Vast clouds of smoke cover the sun. Ashes rain down for miles in every direction, as if a volcano had erupted.

Sally and I, along with Ai Mü, a Lua teenager who was our constant companion, crouched by a little stream as the fire mounted over our heads. For a bad moment, everyone feared that the twelfth spirit had gotten into the act after all. But after a while the flames subsided.

During the fire, the villagers had been making *talias*, small ownership signs woven of bamboo strips. The fire had of course frightened the spirits away, and the Lua wanted to claim the land before they returned.

Now they moved out over the smoking ground, walking barefoot through the blistering ashes and live coals. Sally and I found it painfully hot even through thick rubber-soled shoes. It did not seem to bother the Lua a bit. Each field owner planted his talia in his field and said a small prayer, telling the spirits that this land now belonged to human beings.

Whereas the Lua have made a stable and relatively secure life for themselves by wise management of their fields, they once enjoyed greater wealth, renting their lands to later comers. Many Lua who once lived in the valleys eventually fled to the mountains during the time of troubles associated with the arrival of the Thai about 900 years ago.

I asked Loong Ta, the second oldest man in the village (page 137), where the Lua had come from. We often sat on his covered porch in the afternoon and discussed such matters.

"Many hundreds of years ago, before the Thai came," he said, "the Lua had a king named Khun Luang Wilanka. From him or his princes the samangs are descended.

"The king wanted to marry Cham Tewi, the queen of the Mon people who lived in Lamphun. She didn't want to marry him, but told him she would if he could throw a spear from the top of Doi Suthep, the mountain near Chiang Mai, to her palace in Lamphun."

I translated the distance into 20 miles.

Human moving van transfers a bride's belongings to the home of her husband-to-be. The leader of the happy procession carries clothing, weaving equipment, cook pots, and jewelry in a bag suspended from her head. Sally Kunstadter marches third in line

"He threw the spear," Loong Ta continued, "and it almost reached the palace, but not quite. Cham Tewi, afraid he would succeed on the next try, gave him a piece of cloth from her skirt to wrap around his head. The cloth so weakened him he could hardly throw the spear. After this magical defeat, the Lua fled into the hills."

Stone Still Looks for Fleeing Lua

Some of the Lua who live in villages to the north of Pa Pae believe they were chased into the mountains by a huge rolling stone. After a desperate flight across the Salween and Yuam Valleys—perhaps a memory of early migrations—they managed to reach the hills.

The great stone lost track of them and asked a bird, a secret friend of the Lua, whether it had seen them. The bird, a white-crested laughing thrush, told the stone that it, too, was searching for the Lua and had looked for so long that its hair had turned white. The stone is still looking.

During a walking tour to another village, I saw the stone. It is a geological oddity, an immense rock standing in a small river valley. An ancient shrine crowns its shaggy top. As we were looking at it, some Lua people from a northern village passed us. No one would speak. All Lua know that if they speak their language within hearing of the stone, it will recognize the tongue and start chasing them again. I was impressed that the people hurried by the boulder in genuine fear.

Until the visit of American missionaries to Pa Pae a few years ago, the Lua did not know how to write their Mon-Khmer language. The

(Continued on page 144)

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Wearing an Asian facial of rice powder that makes her even prettier to Lua eyes, Sally watches Ai Nyo prepare a gift to the spirits: banana leaves stuffed with flowers. Like other villagers, Sally received a ceremonial head washing as a sign of respect

When Lua wed, silver buys a stolen bride

AFTER THE BRIDE PRICE changes hands (above), literal bonds of matrimony—tied in the *mat mü* ceremony—climax the wedding (opposite). Lengths of cotton yarn wound around the wrists of the bride, Ee Pee, and her groom, Ai Püp, keep their collective 64 souls in place and ensure long life and happiness.

Tired spectators feel the pace of a week of exciting events. It began with a romantic raid. Late on a chosen night, the groom and his friends stole through the sleeping village. He pulled Ee Pee from her bed and hurried her, whimpering and crying, to his home. Even though the Lua bride expected to be kidnaped, the date of the event remained the secret of her amorous abductor.

Following the raid, the girl's parents roused the village elders and all proceeded to the home of the groom. "Why has this maiden been taken

away?" the elders asked. "She has been stolen for marriage," the groom's father replied. "They love each other!"

A host of well-wishers crowded into the house as the word flew through the awakened village. They came to witness the haggling over the bride price, paid in twisted silver pieces, the larger ones minted more than 300 years ago. Here, Pu Yeah and Pu In Ken, relatives of the bride, examine the quality of the coins, remarking that they have seen better in their time, while her parents enlarge upon her comeliness and domestic virtues.

The groom's family protests: "If we pay what you ask, we will all be flat broke!" The bargaining and feasting last until dawn, when both parties agree to the price—always the same, unless the bride is the daughter of a big samang. Days of feverish preparation for the wedding follow.

missionaries taught the Lua so that they could read the Bible, but the lessons had a somewhat different result.

Ai Toon, for example, used the missionaries' script to convey amorous messages to his fiancée in La Oop before their marriage. The script is also used to solicit medical advice from the spirit doctor in La Oop. A note goes up from Pa Pae describing the nature of the serious illness. The doctor replies with a non-Biblical injunction—sacrifice a black dog and a white chicken.

"We worship in our own way," Loong Ta told me. "Our ancestors built the biggest Buddhist temple in Chiang Mai. We still respect the Lord Buddha, but we have no monks here to be our teachers."

One fine spring day, Kae Ta Kham declared the fields ready for planting. The whole village was happy, for the spring planting is a time of feasting, gaiety, and courtship.

Planting Sticks Create Strange Symphony

Sally and I joined a large group of Pu Di's friends and relatives going out to plant his field. The maidens wore their largest hats to shield them from the hot sun. The bachelors had adorned their hats with sweet-smelling flowers. They carried 15-foot bamboo poles with sharp iron tips. The poles were fitted out at the top with a gong that sounded each time the tip was struck into the soil.

On Pu Di's steep field we found it almost impossible to stand up, much less work. The

Leaning tower of grass, toted through the village by Ai Daw, will make a sturdy roof when woven into thatch shingles. The

Lua, digging into the earth with their toes, moved right along.

When the planting began, the most incredible music I ever heard filled the valley. Twenty or thirty young men, jabbing their planting sticks every foot or so, sent up a gonging and donging that sounded like an orchestra of nothing but xylophones.

The boys, maidens, and women followed after the young men and threw small handfuls of rice grains into each hole. At midday, the workers feasted at a field house. The boys sat in the shade beside the little house, the girls sat below it, and they serenaded each other. Then one of the workers tried to take a nap and was doused with water. This started a general water fight, a traditional ritual of which Pu Di thoroughly approved. It increased the fertility of his field.

After the planting, at a time determined by the spring moon, the big samang made a sacrifice of a pig to Chao Nai, a mighty heaven-dwelling spirit, and the rains came down.

Lua Make Annual Trip to Town

In May the mountain rivers, surging with the rains, begin to rise. The path to the valley becomes a slippery, dangerous defile. Before this happens, the villagers walk down to Ban Mae Sariang, carrying heavy baskets of rice from the previous harvest. A basket brings them about 75 cents.

"What are you going to buy with your

(Continued on page 151)

EKTACHROME (ABOVE) AND KODACHROME © N.G.S.

wild grass, found in fallow rice fields, grows to more than six feet. The villager's harvesting knife protrudes near the bundle's top.

Stacking straw on a wooden frame, Pu Peng and his helpers divert a stream to glean fish. After completing the barrier, they harvested fish stranded in the mud—but not until they had killed a snake that reclined on an overhanging bough.

Living green of young rice surrounds Ee Bua and her mother, Nang Fain. Taking up the tender shoots, they bundle them for overnight storage in water. Next day, men will join the women to transplant the rice into the mud of flooded fields. July planting yields a December harvest. Ee Bua wears a store-bought hair clip; like other girls, she often scrambled under the Kunstadter house to reclaim bobby pins dropped by Sally.

Learning man's work: a Lua boy imitates his elders. Lua children begin to help in the fields at the age of seven or eight. Formerly without schools, Pa Pae youngsters now have a Thailand Border Patrol teacher.

KODACHROMES © NATIONAL GEOGRAPHIC SOCIETY

STIPPLING THEIR GOOD EARTH *with young rice shoots, the farmers of Pa Pae bend low in the fields beneath jungled slopes that protect—and isolate—their village.*

money?" I asked Ai Po as we trudged along.

"I need a new knife, and a hoe blade, and some matches and kerosene," he said. "And maybe I'll buy some dried fish and some candy for my boys. Who wants to eat peppers and rice all the time?"

"That's right," Loong Ta added. "The Thai are lucky—they live near the market where there are many different things to eat."

Elephant's Soul Tethered by Ear Cord

Once the rains have started, the farmers who own irrigated fields begin to let the water into the ditches. The people of Pa Pae never practiced irrigated agriculture, the usual method of rice growing in the lowlands, until about 40 years ago. At that time they hired some northern Thai farmers to teach them how to build the dams and ditches. From the outsiders they also learned, of course, the proper spirits to worship.

After the ditches have been cleaned and cleared, a small house is built for the spirit of the dam (page 134). Since he is a Thai spirit, he is addressed in the Northern Thai language when he is invited to partake of the offerings made to him.

Plowing and harrowing the fields may go on for as long as a month, while the young plants are growing in a fenced nursery (page 146). When the seedlings reach a height of about a foot, sometime in July, they are transplanted to the watery fields.

Preparing irrigated fields is hard work for both men and buffaloes.

"The buffaloes get very tired," Pu Di told me one day. "We have to tie their wrists just like we do for people; otherwise, they will get weak and their souls will run away."

The Lua believe that a person's 32 souls can be bound to his body by tying cotton yarn around his wrists (page 143).

"But how can you tie a buffalo's wrists?" I asked him.

"We tie a loop of cotton around his horns and give him a little something special to eat. We also have a wrist-tying ceremony for elephants if they have been working hard or if a woman has been riding them."

"You're kidding," I said. "Elephants don't have wrists."

"No, but they do have souls," Pu Di replied, "and that is the important thing."

Later in the year we had to hire some elephants to carry our collections of artifacts out of the mountains. Sure enough, after Sally rode a short distance, I had to pay extra for the ceremony in which the "wrist-tying" cord was looped around the elephant's big ears.

The Lua devotion is often tempered with practicality. One day, after the fields had been harrowed, I saw our young bachelor neighbor, Ai Dam, catching one of his pigs and preparing to kill it.

Animals are scarce in the village and are usually eaten only when there is a ceremony.

"Why are you killing a pig, Ai Dam?" I asked him.

"I'm going to bind my mother's wrists."

"I didn't know she was sick."

"She's not," he said, "but I'm hungry for pork. I'll bind her wrists for good luck! Come and eat with us!"

Guessing Game Finds Guilty Spirit

A few weeks later, as the rains kept pouring, Ai Dam began complaining of weakness, fever, and "shaking heart." Vitamin pills, aspirin, and antimalarial chloroquine did not help. Now the villagers set about curing him. Twenty of them called at his house. The elders sat down and began to *sepak*, or divine, the cause of the illness.

First they guessed the name of the spirit at fault; then, without looking, they scooped a few uncooked grains of rice from Ai Dam's bowl. If they counted an odd number, the guess was wrong and they started over, this time naming a different spirit. If they counted an even number, the same guess was repeated until three even-numbered sets turned up in a row, indicating that the correct spirit had been detected.

After innumerable tries, the proper sequence was achieved, and a pledge was made to the named spirit that if Ai Dam got well, a sacrifice would be made.

When Ai Dam still failed to recover after

Gentle, open face of a Lua maiden, Ee Kawng, symbolizes the serenity of Pa Pae. The Lua live in the mountains, they say, because an ancient king, Khun Luang Wilanka, suffered defeat in a magical contest with the queen of the Mon people. She agreed to marry him only if he hurled a spear 20 miles from a mountaintop to her palace. Her magic prevailed, the king's toss failed, and his people fled to their present homeland.

KODACHROME © NATIONAL GEOGRAPHIC SOCIETY

"Have we captured a wandering soul?" Two Karen spirit specialists, called in on a medical case, believe the balanced egg proves that they have trapped one of ailing Ai Dam's 32 souls inside the shell. They fed the egg to the sick man. He recovered, and all agreed on the wisdom of their diagnosis.

several days, the villagers decided they had guessed the wrong spirit after all. It was thought that perhaps his dead father's spirit was causing the problem.

Pu Tip and I and several young men went to the cemetery trail just outside the village. Pu Tip called to Ai Dam's father to come and partake of the feast that had been prepared. As he led the spirit to the altar, the other men stopped Pu Tip. They asked the spirit—who was now inside Pu Tip's body—whether he was really Ai Dam's father, and told Pu Tip to go back and make sure he had the right spirit. This double-checking is always done when spirits of the dead are called by name. Pu Tip went back, called again, then returned with the right spirit and fed him.

When Ai Dam still did not respond, outside consultants were called in. They were not Lua but Karens, who live in villages scattered in the same region. The Karens said the problem was due to several causes, including a spirit who required the sacrifice of a large bronze drum. This would cost $80 to $100, far more than any Lua villager could make in a year selling rice in Ban Mae Sariang.

"Never mind," the Karens said, "the spirits will not know the difference, so we will make a fake drum out of an old cooking pot and give that instead."

Finally, the Karens had to summon one of Ai Dam's 32 souls that had wandered away. They went to the forest and called to the soul, coaxing it into a hard-boiled egg, which they then carried to Ai Dam's house. Stooping at the bottom of the ladder, the two men stuck a bamboo pipe stem into the ground. If the egg balanced on the stem (left), it would prove that the errant soul was indeed inside.

Visit Ends With Harvest of Souls

The Karens, however, had been sharing sacrifices of plai with the spirits, and by this time their coordination was a trifle faulty. After repeated tries, they managed to balance the battered egg and carried it, and the soul, up the steps. Ai Dam ate the egg—and, sure enough, he was well for the harvest.

The harvest lasts through the long autumn, since the Lua plant at different times to make sure enough hands will be available to bring in each crop. During the harvest, ceremonies and sacrifices call the souls of the rice from the fields and make sure that the souls accompany the rice into the barns. Another ceremony calls back to the village, before the winter sets in, the souls of any villagers that might have wandered away on the upland fields during the harvest.

After the souls are brought home, the village is closed and a ceremony is held for the village guardians. Wooden guns, swords, and spears are carved for these spirits. Thus armed, they can protect Pa Pae from robbers, famine, and disease for another year.

But now Sally and I were also being called home. The villagers of Pa Pae came to say goodbye. Loong Ta came with a bottle of plai and offered it to our house spirits, asking them to accompany us and take care of us on the long journey to America. We both feel deeply that the blessings of Pa Pae and its spirits have been with us ever since.

Until this morning, the biggest lady Mike McCabe had ever seen was his Aunt Stella.

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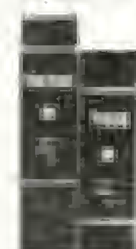

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Touch-Tone push buttons are swift servants of the modern hand. With them you place calls faster and someday will "input" instructions into bank and store computers to render and pay bills, transfer money, charge purchases, verify credit and thus gain greater command of personal time and energy. Still other ways they can free you of daily drudgery are being explored.

Tomorrow's Telephone Service – A Forecast

Bell System planning now extends to the year 2000. We see possibilities that go beyond. Already, Touch-Tone* service has become a magic key to many doors.

New advances in telephone service promise to make your daily life easier, and give you still more command of your personal time and energy.

One advance is today's Touch-Tone service—the push-button means of placing calls that is now being introduced in many areas.

These buttons will not only let you call your bank, for example, but may someday put you "on line" into your bank's computer in order to pay bills and verify deposits and use revolving credit. There are many such "input" uses for these ten little buttons.

Another big step forward is the Electronic Switching System, which in the years ahead will be handling almost all phone calls. The first ESS office went into operation last year and more are being added.

Spurred by what we have learned from Electronic Switching, we are now adapting existing equipment to test new optional services that . . . switch your calls to your host's home for the evening . . . add a third phone to a conversation . . . hold one call on your home phone while you answer another.

Picturephone* service that lets you see while you talk will add visual enjoyment to your calls.

There is no end to telephone progress. As new service needs arise, new Bell System thinking will meet them.

For the Bell System is simply people at work for other people, to make communications serve better in many more personal ways.

*Service mark of the Bell System

Bell System

American Telephone & Telegraph
and Associated Companies

What can a little 5'1", 102-lb. girl like Susan Catt do to make your next vacation drive more enjoyable?

Little things.

Susan is one of the specially trained girls on the Gulf Tourguard Team. And her job is cleanliness. She keeps a friendly eye on every Gulf dealer's station in her area. Looks inside and out. Checks the restrooms, display racks, pumps and equipment. (She even goes out back where you'd probably never look.) All in all, she checks 49 little things that add up to one big thing. Satisfaction. *Your* satisfaction at finding consistently neat, clean stations where your driving takes a turn for the best at the Sign of the Orange Disc.

GULF OIL CORPORATION

Relax at colorful Marina Grande, Sorrento. But don't bring losable cash. Bring First National City travelers checks. You can cash them anywhere in the world. And their big advantage is—a faster refund system.

Other travelers checks are every bit as good as First National City Bank's

...until you lose them!

Other leading travelers checks, like First National City travelers checks, can be cashed all over the world. But if you think all travelers checks are alike, you may be in for a rude shock if you *lose* your checks.

With other leading travelers checks, elaborate and time-consuming inquiries often have to be made. It may be days—even weeks—before you get your money back. Who wants to wait?

But, if you lose First National City travelers checks, you don't have to worry. There are more than 20,000 places around the world authorized to give you a *fast refund—right on the spot!*

First National City travelers checks come from the *leader* in world-wide banking, and have been in use over 60 years. They are known and accepted in more than a *million* shops, hotels, restaurants, air terminals, etc., the world over.

So, *insist* on First National City travelers checks. They cost just one cent per dollar.

First National City Bank Travelers Checks Sold by banks everywhere

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION