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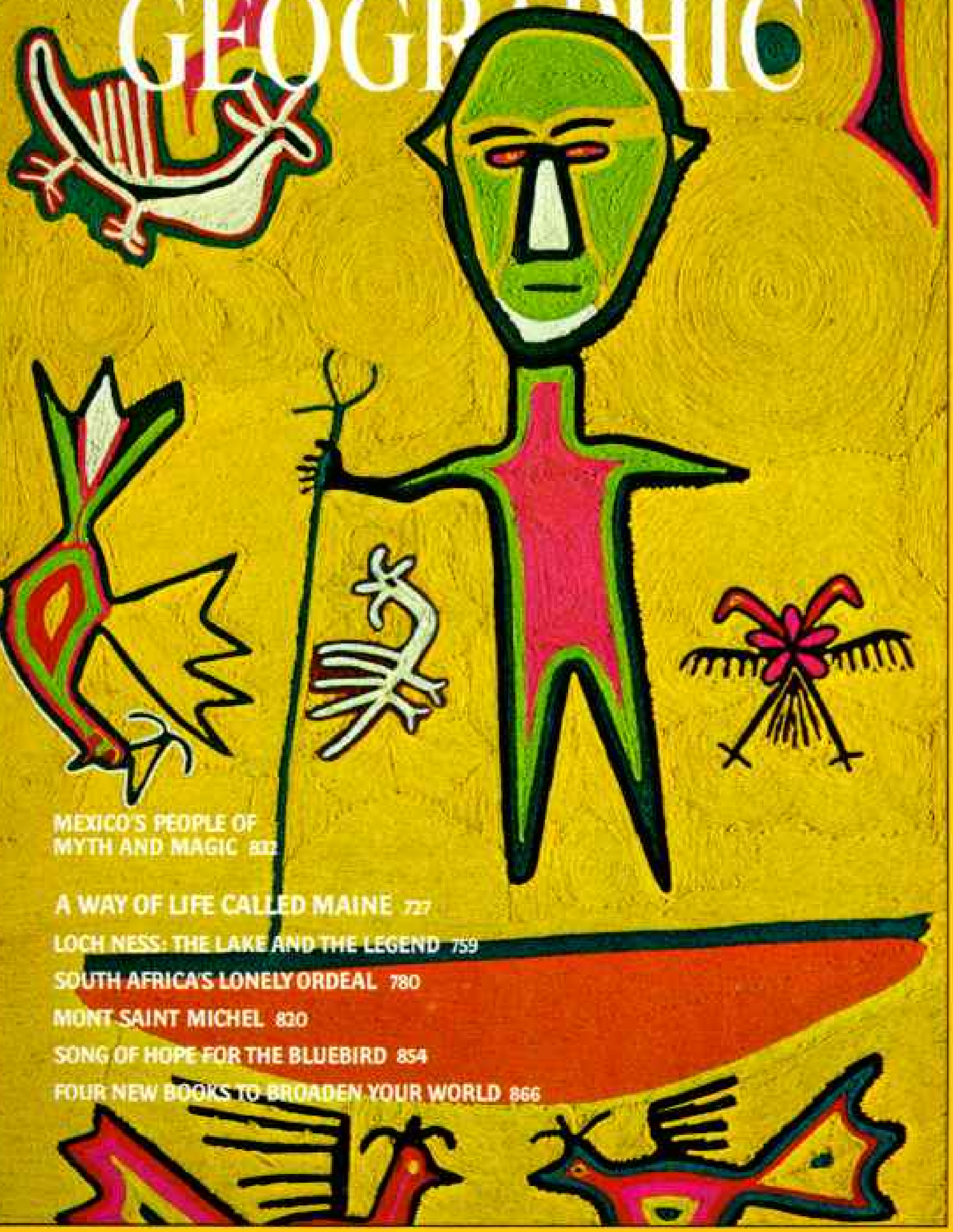

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OFFICIAL JOURNAL OF THE NATIONAL GEOGRAPHIC SOCIETY WASHINGTON, D.C.

AFRICA TODAY seems once again a dark continent. The euphoria that followed freedom from colonialism has too often given way to chaos, guerrilla warfare, and despotisms founded on terror and bloodshed. A recent estimate that one in every 130 African adults has fled his country of birth is a startling measure of the murderous course of history there. Yet, in the world's view, the critical question for that great continent is apartheid—or separate development—in South Africa.

Proponents of apartheid in the National Party consider as outright hypocrisy the protests from Western democracies about debasement of human rights. Their critics reply that while segregation may exist in other nations, only in South Africa is it a cornerstone of national policy. South Africa's rejoinder: Given the arithmetic of population, separate development is not a matter of conscience but of survival.

The Afrikaans-speaking whites consider themselves an indigenous African tribe, as entitled to feelings of nationalism and desire for freedom as the next. They believe that making the tribal homelands into separate, independent nations is a far more democratic solution to the question of majority-minority coexistence than American Indian tribal reservations or the displacement of ethnic groups by the Soviet Union.

Though the government denies it, most homeland leaders in South Africa oppose the proffered autonomy. Independence is regarded by them as a sham. The tribes would prefer to seek their freedom and wealth within the system as citizens and not as subjects of South Africa.

As to the matter of wealth, many white South Africans question whether any government not their own could manage and maintain an economy hard won by their own exertions and by massive amounts of black labor. They believe that money earned in the mines and a house in a township, however segregated, provide a better life for a black than can be found in a rural village—or anywhere else in Africa.

So the argument swings between insistent moral demands and rigorous practical considerations. Among the latter, the most practical of all is continued national existence. Afrikaners relate the parable of the zebra, as told by an African bishop:

"If the zebra were shot," he said, "it would not matter whether the bullet penetrated a white stripe or a black stripe—the whole animal would die."

Gilbert M. Grosvenor

NATIONAL GEOGRAPHIC

THE NATIONAL GEOGRAPHIC MAGAZINE, VOL. 151, NO. 6

June 1977

A Way of Life Called Maine 727

"More problems . . . than we rightly need"—newcomers, Indian land claims, limping local economies—fail to dull the zest and humor of the Down Easters, as captured by Ethel A. Starbird and photographer David Hiser.

Loch Ness: The Lake and the Legend 759

Does a monster really lurk in those moody Scottish waters? William S. Ellis describes the continuing search for "Nessie," as photographers Emory Kristof and David Doubilet try out some sophisticated gadgetry.

South Africa's Lonely Ordeal 780

An island of white rule in a sea of black, South Africa tries to come to grips with rising demands for racial equality. William S. Ellis and James P. Blair assess its progress.

The Hallowed Isle, Mont Saint Michel 820

Kenneth MacLeish and Cotton Coulson portray the glory of a sea-girt French monastery raised in honor of the archangel Michael.

People of Myth and Magic 832

Deep in Mexico's mountains, Huichol Indians give James Norman and Guillermo Aldana E. a glimpse of a world where reality blurs.

Hope for the Bluebird 854

Home-built nesting boxes can lessen a threat of extinction for the harbinger of happiness. Lawrence Zeleny and Michael L. Smith chronicle a two-nation effort to save a bird.

Know Your World 866

Four new Special Publications explore America's still-wild rivers, plants that make medicine, the Maya, and natural catastrophes.

COVER: *Yarn pressed into beeswax depicts Noah's Ark in a Huichol Indian work.*

A Way of Life Called Maine

By ETHEL A. STARBIRD

NATIONAL GEOGRAPHIC STAFF

Photographs by DAVID HISER

NOBODY KNOWS how my cousin Don's barn became a fountainhead of Yankee philosophy. Cousin Glenna declares it was all those old chairs: too tacky for the house; too good for the dump. So they ended up out back in her husband's workshop. Most every day some of the sages of South Paris, Maine, end up in them.

"Snowed all night to beat four of a kind."

"Mebbe eight, ten inches. Just a dustin'."

"No sense going to Florida, now spring's here."

"Fellow at the filling station near talked my ear off this morning."

"Know the one you mean. Never had a thought his mouth couldn't use."

"Papers say we got more problems in Maine than we rightly need."

"Have a durn sight fewer if they'd blow up that bridge at Kittery." This, the state's southernmost town, serves as the major gateway for a recent upsurge in new settlers.

Native Mainers view with mixed emotions the emergence of their homeland as the Northeast's latest magnet for refugee megalopolitans. Net in-migration, about 10,000 last year, has helped boost population over the million mark.

Cousin Glenna defends the trend. "But," she adds, "I can't help wondering why those who want to make Maine over so bad didn't make where they *were* more to their liking."

From its army of new admirers, plus a goodly number of homegrown critics, comes considerable pressure on Maine to mend her ways. Concern for natural resources has led to strenuous efforts to control timber cutting and offshore fishing, prevent additional power projects, and prohibit any development potentially detrimental to the environment.

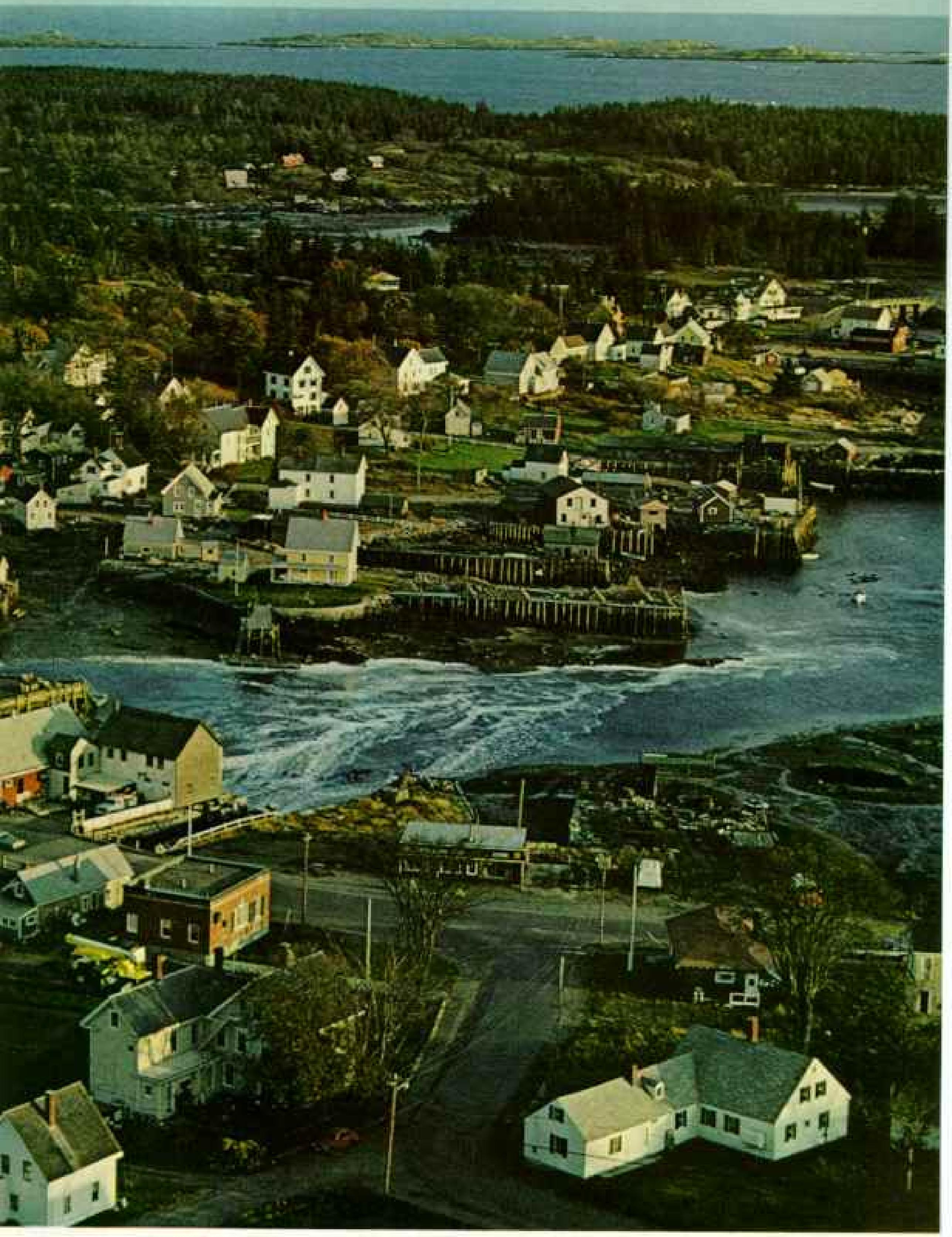
As a mill hand in Millinocket put it: "That sure don't leave us much to work with."

Since one job in four derives from the products of the state's woods and water, it sure doesn't.

In such a tight economic situation, a lot of Mainers are a little touchy about being told, especially by those with "outside" incomes, that they must *(Continued on page 731)*

Adventuring in books on the swing of grandmother's porch, two vacationing children store up present knowledge and future memories on Squirrel Island. Sanctuary of about a hundred cottages, the island has been summer home to some families for as many as six generations. The astringent graces of Maine have worked their ways on millions, summer people and Down Easters alike.

Putting out to sea, the nine-foot tide at Vinalhaven rushes from a tidal pond toward Penobscot Bay. Once a prime site for quarrying blue-gray granite, the island now depends largely on the summer trade and lobstering. Many lobstermen still prefer boats



built the traditional way, cedar planks on oak ribs and keel. Of course with lobsters increasingly hard to find, you'd best know where you're going, so a new boat ought to have radar, a depth sounder, citizen's band radio, and loran navigation gear.

Elevations in meters (black)
feet (red)

KILOMETERS 0 50 100

STATUTE MILES 0 50

DRAWN BY GRAEME BASH
COMPILED BY GUS PLATE
NATIONAL GEOGRAPHIC ART DIVISION

Maine's northern half, roughly, lies within an Indian land claim that appears headed for court unless a negotiated settlement is reached.

Quebec
Montreal
CANADA
U.S.
MAINE
Augusta
Oil pipeline
VT.
N.H.
N.Y.
Portland
Gulf of Maine
MASS.
Boston
Plymouth
CONN.
R.I.
New York
Atlantic Ocean
N.J.

CANADA
UNITED STATES
QUEBEC
N.B.
St. John
Allagash
ALLAGASH WILDERNESS WATERWAY
Fort Kent
Caribou
Presque Isle
AROOSTOOK STATE PARK
AROOSTOOK COUNTY
NEW BRUNSWICK
St. John
Chesuncook Lake
Chamberlain Lake
Penobscot R. East Branch
BAXTER STATE PARK
Houlton
Sandy Stream Pond
Mt. Katahdin 5,606 1,722
Penobscot R. West Branch
Moosehead Lake
QUEBEC
Jackman
Attean Falls
Moose R.
Greenville
Indian Pond
Millinocket
M
W
T
APPALACHIAN TRAIL
Milo
Dover-Foxcroft
PENOBSCOT COUNTY
MAINE CENTRAL RAILROAD
Passamaquoddy & Indian Township State Indian Reservation
Calais
CANADA
U.S.
Pleasant Point State Indian Reservation
Eastport
Campobello Island
Penobscot State Indian Reservation
Old Town
Orono
Lead Mountain
Bangor
Sugarloaf Mountain
Strong
MOUNT BLUE STATE PARK
GRAFTON NOTCH STATE PARK
Skowhegan
Burnham Junction
Wilton
Waterville
Buckspport
Orland
Ellsworth
Rumford
Androscoggin R.
South Woodstock
BELFAST AND MOOSEHEAD LAKE RAILROAD
Searsport
Belfast
Harborside
Augusta
CAMDEN HILLS STATE PARK
Northeast Harbor
Cadillac Mountain
Bar Harbor
ACADIA NATIONAL PARK
Seal Harbor
Mount Desert Island
Western Way
Blue Hill Bay
Swans Island
Deer Isle
Penobscot Bay
Vinalhaven
Isle au Haut
ACADIA NATIONAL PARK
Matinicus Island
South Addison
Nash Island
Norway
South Paris
Waldoboro
Rockland
Auburn
Lewiston
Androscoggin R.
Damariscotta
Wiscasset
Cushing
Sabbathday Lake
SEBAGO LAKE STATE PARK
Brunswick
Walpole
Bath
Boothbay Harbor
Squirrel Island
Monhegan Island
Cumberland Center
Casco Bay
Westbrook
Peaks Island
Portland
Saco
Old Orchard Beach
Sanford
Biddeford
Kennebunkport
York Harbor
Kittery
NEW HAMPSHIRE

MAINE

Tart as her apples, earthy as her potatoes, but about as gregarious as her clams, she has cultivated character as well as crops. A leader in both the temperance movement and whiskey smuggling during Prohibition, Maine sacrifices consistency for independence under the motto: *Dirigo*, "I direct." It became a state in 1820 after separation from Massachusetts.

AREA: 33,215 square miles, 90 percent forested. **POPULATION:** 1,070,000. **ECONOMY:** Forest products; manufacturing; fishing; tourism; farming—poultry, fruit, potatoes. **MAJOR CITIES:** Portland, 61,000; Lewiston, 42,000; Bangor, 33,500.

improve their management of forests and fisheries or face a worse fate in the future.

Certain facts lend credence to this warning. Annual hauls of some highly marketable fin- and shellfish have been diminishing for a decade. The state still has plenty of trees, but supplies of good-size fir and spruce are shrinking. Now, more acres of smaller growth must fall to feed Maine's 1.2-billion-dollar-a-year pulp and paper industry.

Job alternatives have proved hard to find. Thrust above the rest of New England like a catcher's mitt reaching for a high one—and almost as large as her five sister states combined (map, left)—Maine is too far removed from basic materials, markets, and transportation networks to attract much attention from labor-intensive industries.

Yet, from this isolation came a hardy, humorous, self-reliant breed whose Maine-born men and Maine-built ships once trafficked with the world.

Tall Tales Keep Strangers Guessing

History omits the name of the first lucky European to lay eyes on Maine's spectacular coast. But in the vanguard of last year's four million tourists were some of the greatest names in early exploration: Gomez, Verrazano, Champlain, Hudson, John Smith, and possibly John and Sebastian Cabot.

Englishmen set up fishing stations on Monhegan Island years before they put ashore at Plymouth. From Maine beaver dams came furs used by Pilgrims to settle their bill for passage on the *Mayflower*—perhaps the first "go now, pay later" booking.

Verdell "Casey" LaCase still manages to trap his share of pelts in that upper third of the state known as the North Woods. That is, when he's not barbering in Greenville at the lower end of 35-mile-long Moosehead, largest of Maine's 2,500 lakes and ponds.

Stopping by to see my hosts, "Reddy" and Faye Gregan, he let me sample beaver meat sliced thin and sautéed in a cast-iron spider. Finding it similar in taste and texture to beef fillet, I reached for a second helping.

"Wouldn't eat too much of that stuff," Reddy warned. "Knew a fellow once who did. Wife never could break him of gnawin' the bedposts in his sleep."

In common with other up-country Yankees—my father among them—Reddy's speech features an abundance of flat vowel sounds accomplished, as far as I can fathom, by removing a great number of *r*'s from where they belong and putting them where they don't.

Come tourist season, accents thicken to the consistency of Down East chowder, for Mainers like nothing better than to spoof the sports. Or, as they are called in less charitable circles, "summer complaints."

Loggers' Work No Job for Weaklings

At the time, I was a "winter complaint," out to explore the vast frozen empire of evergreens that blanket most of Maine above the Greenville parallel.

Aloft, our helicopter chased its dragonfly shadow through an endless wilderness marbled with logging roads and frozen streams. A pale February sun basted the crusted slopes of mile-high Katahdin, the state's loftiest peak. No matter which way we turned, it was Maine as far as eye could see.

Here, some say, Paul Bunyan got his start. I'm sure the legendary lumberjack and I had the same cook: Rodrique, who chefs for a Johns Lumber Company camp east of Chemquasabamticook Lake, considers any meal of less than 5,000 calories an insult to his art.

Washing down a 5 a.m. smorgasbord with tea as black as a witch's heart, I followed the work crews into still-dark woods where temperatures had tumbled to minus 20° F.

Clear, strip, or selective cutting, there's nothing very picturesque about modern timbering methods. Even the sounds—whine of chain saws, snarl of skidders—lend harshness to the scene. But these machines can earn a man up to $600 a week if he hustles. And that buys a lot of living when spring soups the roads and the whole operation shuts down.

Maine's original forest wealth reached all the way to her Atlantic shores; the line receded as coastal pines became ships and homes along the Eastern Seaboard. So woodsmen bundled themselves into mackinaws and started chopping their way toward Canada.

At ice-out, long logs felled during the winter came crashing down spring-swollen rivers like the Androscoggin, Kennebec, and Penobscot to tidewater towns below. And with them came the cowboys of the waterways: "bubble cuffers" in steel-calked shoes who rode the bucking timbers. Armed with peaveys, pike poles, and considerable derring-do,

they broke open jams and rounded up strays to keep the log drive moving.

"They sure was feisty by the time they come birling into Bangor, money to spend, and nine months of waiting to do it." George Knox should know; he was a riverman himself. "Them fellows would work off steam brawling with blue-water sailors along Exchange Street. Why, back in the 1850's, this was the rowdiest, busiest lumber port on earth."

Today Bangor leads a more sedate life, river drives are only a memory, and a lot of "woodchucks" now cutting up northern Maine are French Canadians, taproot tough but not much taller than Bunyan's boot tops.

French influence in Maine stems from 1613, when Jesuit priests opened a mission on Mount Desert Island. Resident Indians responded to these kindly "black robes" by converting wholesale to Roman Catholicism and later terrorizing British colonists, until France finally surrendered her New World holdings to England in 1760.

The French connection still runs deep. Lewiston and Biddeford in southern Maine remain about 60 percent Franco-American; in boundary towns along the St. John River, where some schools have gone bilingual, the ratio reaches 90 percent.

Octogenarian Favors the Simple Life

These days loggers from both sides of the border often leave the woods for home on weekends. But when 83-year-old Walter Arnold was a lad, whole families sometimes moved into camp and stayed as long as work lasted, for as much as five years at a stretch.

In 1959 this gentle Mainer withdrew for good to the northern woods that cradled, nurtured, and matured him. He now lives in a moss-chinked log cabin of his own making on Indian Pond (below), 13 miles from the

"**Keep to the dream,** but temper the idealism with practicality," reflects Susan Margonelli (**left**). She and her husband, David, after six years in Maine, have turned the corner on their dream of building furniture and running a small farm near Dover-Foxcroft.

About as far as you can go into the heart of the Maine woods is where hunter and trapper Walter Arnold (**above**) went to retire in 1959. Of those who deplore trapping, he says, "When someone decides to take up reformin', they first find somethin' that won't interfere with their style of living, and then *brother, can they reform!*"

nearest settlement. "Which," he says, "is nowhere when you get there.

"Used to run traplines from here to Katahdin. Took four days each way on them snowshoes layin' 'cross the rafters. Made that pair and a lot more, too; wa'n't many store-bought ones back then.

"Earned me a little somethin' extra pickin' gum. That is, till they cut off all the spruces round these parts."

Blisters of pitch, pried from a spruce tree's wounds, once kept local jaws chomping. But, in my many summers on Moosehead, I was never able to work up a wad that was even remotely chewable.

Darkness stitched a billion brilliants across Walter's sky. Somewhere in the distance a bobcat screamed like a frightened child. "You've got to believe in God to live out here alone. It sure don't pay to leave. Last year a tooth got to kickin' up somethin' fierce, so I flew out to have it fixed. 'Fore I could get back, the flu hooked onto me and I near died. Next time I'll stay home and pull the dang thing myself." Which, I'm convinced, he will.

At dawn two friends dropped by for breakfast: Chuck, the groundhog, and a doe named Susie. As we were all cleaning our plates, Dick Folsom landed his floatplane with a load of mail and groceries, and I climbed in beside him. Walter waved us off, then disappeared into the woods to see what spring was up to. Susie, her food bowl empty, decided to tag along. Henry David Thoreau, who penned high praise for this region, would surely approve of Walter's private Walden.

MARC A. JOHNSON (FACING PAGE)

Seasoned sawyers Arthur Geetersloh and Daniel Doran (**above**) tally another "twitch," or cluster of logs, near Greenville. It will become lumber, if of high quality, or paper products, if of lower quality.

Log drives, like this one on the Kennebec River in 1975 (**facing page**), have now been stopped by environmental laws.

Tribes Lay Claim to Much of Maine

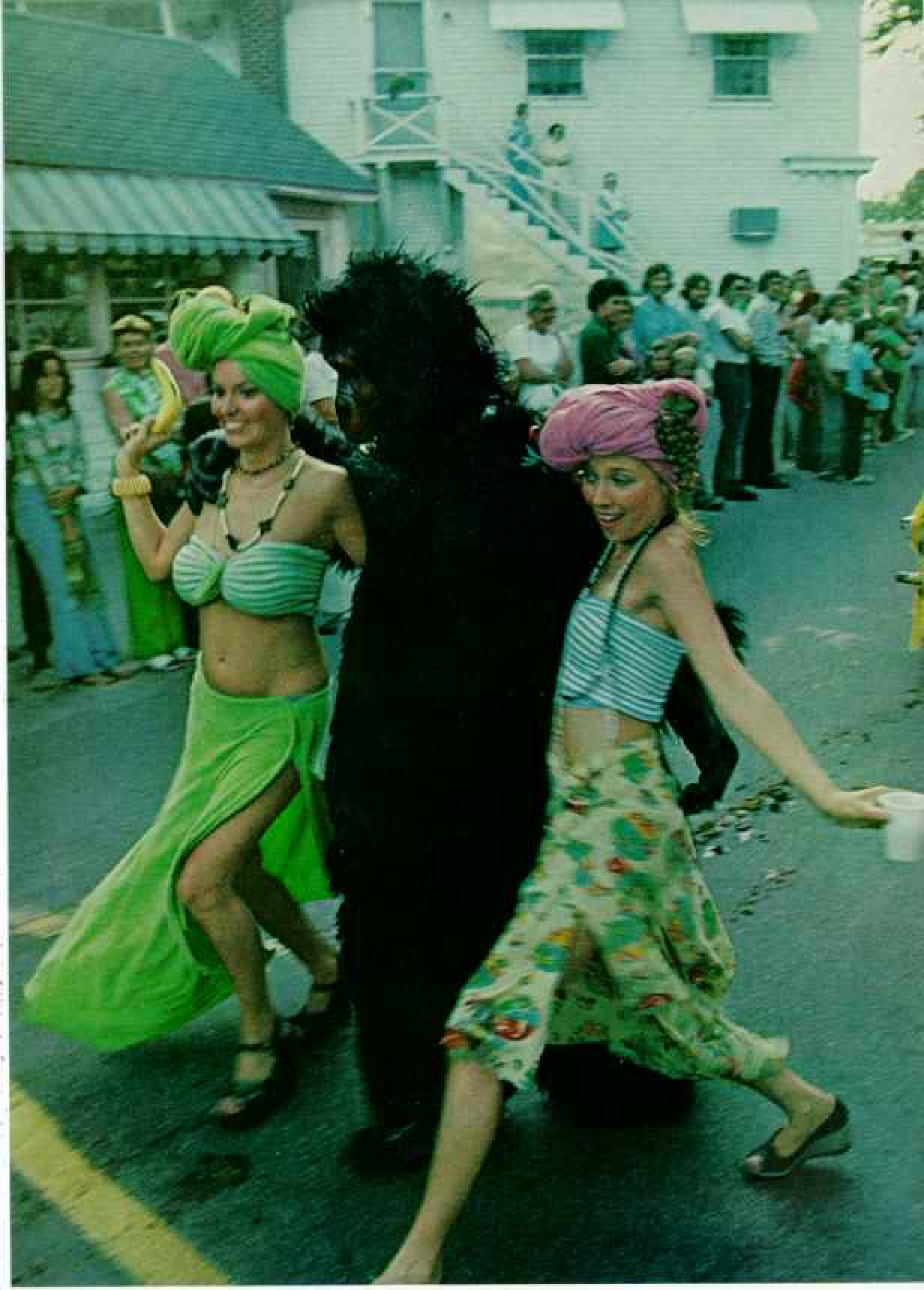
Early Mainers were quick to pick up Indian ways and also Indian lands. By the time settlers finished acquiring real estate, the Penobscots—about 1,200 at last count—owned only 146 small river islands around Old Town. The two reservations where more than half the 1,500 Passamaquoddies live cover 17,000 acres near Eastport and Calais.

Tweed-suited Joseph A. Nicholas, a former barber, says he "may be the only Indian with a license to scalp the white man." As Passamaquoddy representative to the state legislature, he fights for Indian rights.

"What we lost, largely without reimbursement, is about half of Maine, most of it within and east of the Penobscot watershed."

Seeking recognition of their right to the bulk of this tract, the tribes based their case on the state's alleged failure to abide by a 1790 federal law requiring congressional approval of Indian land transactions. Thus, they argued, all transfers since were null and void. Without ruling on the claim itself, a U. S. district judge held that the federal government must serve as trustee for the Indians.

The Justice Department subsequently agreed to sue the state and large landowners for the return of at least 5 million acres of the 10 million originally claimed by the Indians,



unless a negotiated settlement could be reached by June 1. Congress could intervene to provide direct redress or extinguish the land claim altogether, leaving damage actions as the only recourse.

Besides creating temporary turmoil over property titles, Maine's recent Indian "uprising" will doubtless keep countless barristers busy for many years to come.

As the case took shape, federal programs kept the Quoddies busy while the Eastport sector as a whole remained one of the most depressed in Maine. "It's been this way so long that hard times hitting the rest of the country don't make a ripple up here."

Back in the 1930's an era of "happy days" seemed inevitable: President Franklin D. Roosevelt was pushing the multimillion-dollar Passamaquoddy project to generate electric power from 20-foot tides nearby. Only a housing area and causeway were built before Congress cut off all funding. As one old-timer remarked, "We're still gettin' over all the good Roosevelt done us."

Many Eastporters now dream of instant prosperity from Pittston Company plans, already state approved, to convert their idle waterfront into a half-billion-dollar oil refinery and superport. However, Canada controls the best channel into Eastport's harbor and, for environmental reasons, has thus far opposed its use by crude-carrying, 250,000-ton tankers that would feed the operation.

City Manager Everett Baxter, who says a majority of the community supports the project, sees no substitute for the Pittston proposal as a means of creating jobs.

Opponents view the project as an invitation to disaster: oil spills that could smother the remaining fishing industry, among other damages. And after construction, little payroll advantage to local people, other than some spin-off for support services. It may take years and a sustained interest on Pittston's part to make the installation a reality.

Kids Make Sport of Digging Spuds

A few miles inland from Eastport, U.S. Route 1—meandering from Key West, Florida, to Fort Kent, Maine—turns from the sea to follow a long and lonely course northward to "the County," as potato-growing Aroostook is known. Here dirt farmers forever gamble with weather and dealer demand. They proceed more cautiously in conversation:

"Having a good year?"

"May be one of my best. I think I'm breaking even."

By and large, Mainers are about as apt to admit to a profit as they are to reveal where they find good fishing or fiddleheads, those edible curls of young ferns northern New Englanders prize.

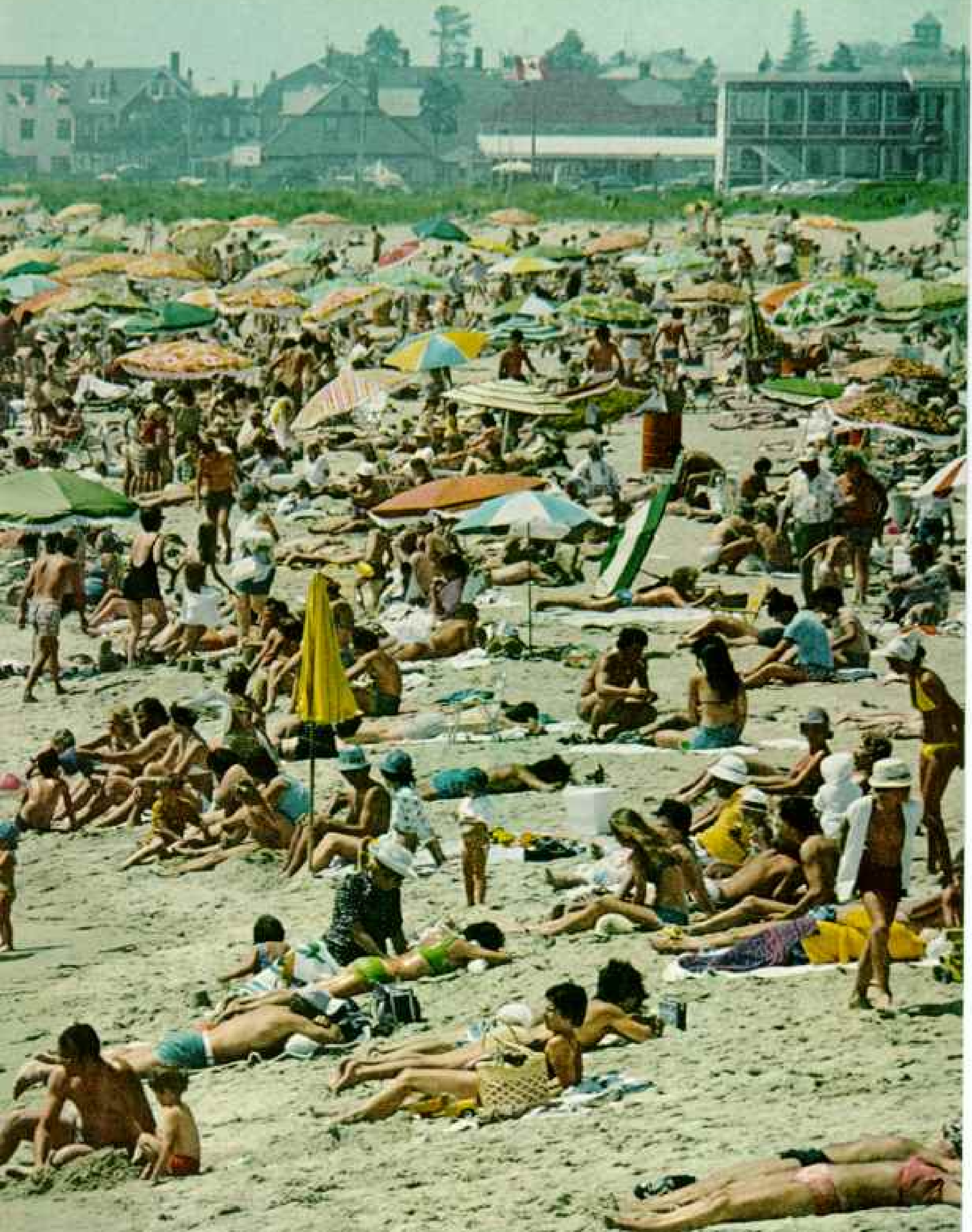
The states of Idaho and Washington each produce more potatoes than Maine. But the County still digs 8 percent of the nation's crop, some 1.4 million tons a year (page 743).

About 25 percent of the output is harvested by hand, mostly by youngsters who start school in August so they can recess later to pick for pay or papa. In a typical storage barn, banked to the eaves with insulating earth, growers Don Gallagher and Jim Conant assured me the student-labor system satisfies everyone but the federal bureaucrats, who say kids shouldn't be working.

In the annals of refuse perhaps only the sewers of Paris have reached the legendary status of the Kennebunkport Dump, and even they don't have a yearly parade (**left**). Begun to fight litter, the hoopla has elevated garbage from a put-out to a put-on.

A moccasin is stitched at G. H. Bass & Co. in Wilton (**right**). Maine's economy marches a long way on her shoes, with other leather products the state's third largest manufacturing industry.

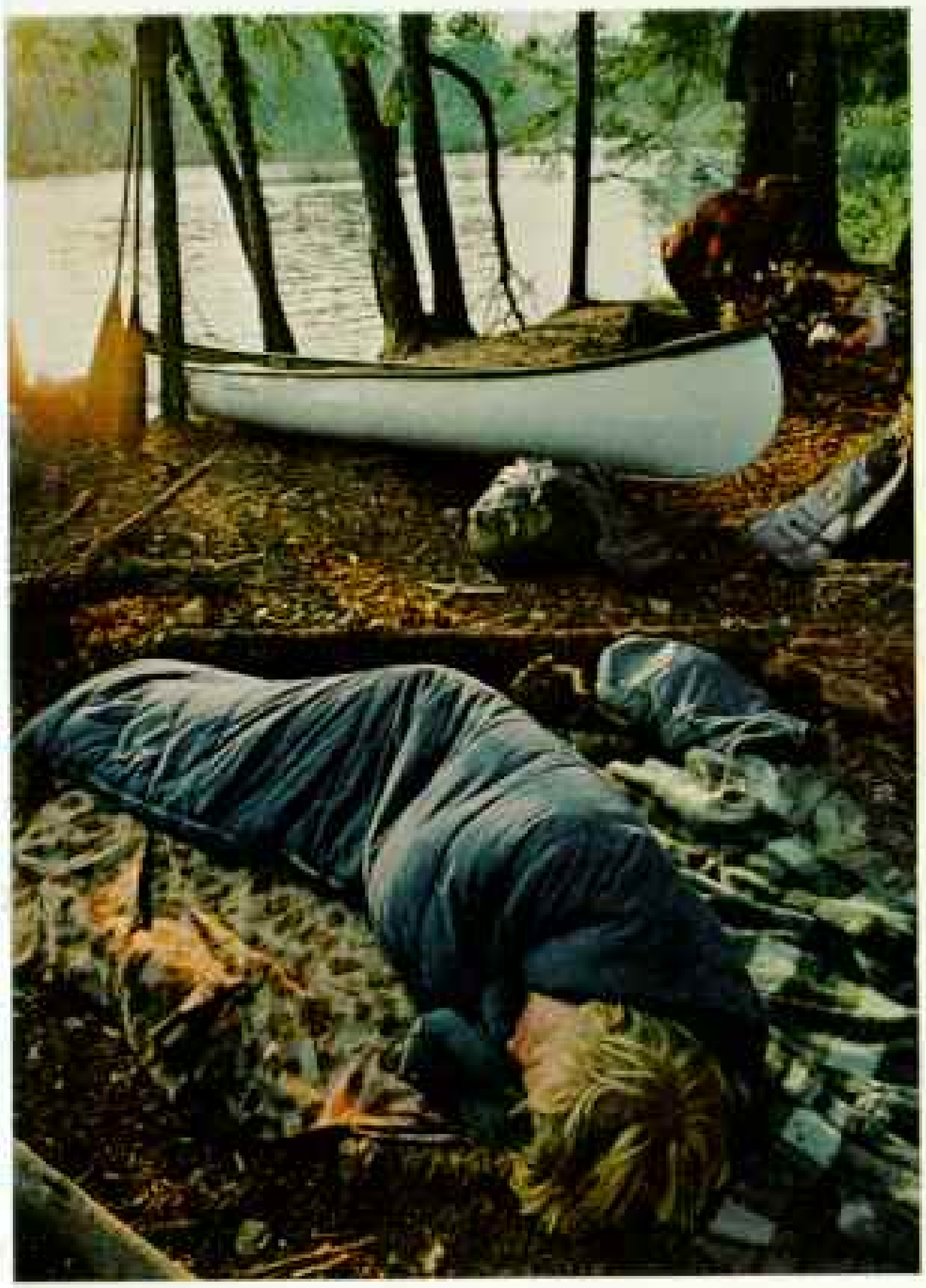
Maine's Coney Island and Quebec's Riviera: Old Orchard Beach can rightly claim to be both. Since the 1850's, when they first came in numbers by rail from Montreal, Quebec families have been vacationing on the Atlantic resort's fine sands, an inviting



sweep accounting for seven miles of Maine's scant 29 miles of beach. Bordered more by Canada than by New Hampshire, Maine draws visitors from both north and south. Yearly they bring more than 200 million dollars to the state's economy.

After dawn but before bacon, a member of a canoeing party on the Moose River near Attean Falls still lies wrapped in dreams and down, while another starts breakfast (**below**).

Up early, a bull moose (**right**) snorts contentedly in the shallows of Sandy Stream Pond beneath mile-high Mount Katahdin, pinnacle of the state.



"Hard to tell who's more meddlesome—Washington or Augusta."

"At least down in Augusta it's Mainers making their own mistakes."

"Washington says our kids shouldn't work; it might be harmful to their health."

"Probably the same fellas who put hockey and soccer into the schools and called it physical fitness."

"Never knew an injury from two weeks in the fields. My kids are going to keep pickin' unless some Congressman wants to come up and do it for them."

Indians from nearby Canadian provinces do much of the picking for J. Hollis Wyman, baron of the largest slice of blueberry barrens southeast of Bangor. At 76, Hollis is a tall, solid oak of a man; together we toured Wyman country in a 1949 Chrysler as durable as its driver.

"Maine'll rake in about twenty million pounds of blueberries this year, mostly within forty miles of here. They still grow wild, just as they always have; all we do is give nature a little nudge."

Which means burning the barrens periodically to hold down brake and brush. And hiring New York and Pennsylvania bees by the trailer-truckload to pollinate the blossoms. "Costs me $50,000, and the other fellow keeps all the honey. From *my* bushes!" Seldom bested in a business deal, Hollis is still

trying to figure out how he let this happen.

In August, I joined his starting lineup of pickers. Armed with a short-handled rake shaped something like a dustpan, I attacked a strip marked out with string. In the time I gathered and winnowed three bushels of berries—or twelve dollars' worth—the Indian family of nine combing the next rows had piled up earnings of $600. Working the full three-week season at that pace, they could return home richer by some $12,000.

Despite its rural character, Maine is minor league as farm states go. However, in addition to potatoes and blueberries, it does well with poultry and eggs—and with apples cultivated primarily in the western counties.

Here lakes and ponds remain a frequent feature. But the landscape takes on more pronounced curves as it ruffles the hem of the Longfellow range or merges with the foothills of New Hampshire's White Mountains.

Snowshoes, Caskets, and Tourmaline

Other than apple growing, an intriguing diversity of enterprise has cropped up in this region: to wit, a snowshoe factory in Norway; a casket maker in South Woodstock; two mills at Strong that major in toothpicks; and tourmaline mining near Rumford.

Extensive deposits of feldspar, beryl, garnet, and quartz are banked beneath the west Maine soil. But only tourmaline now

Muffins' delight, hand-picked blueberries are poured from a box (**above**) by a Micmac Indian from New Brunswick, Canada. Though pollinated by imported bees, fertilized, and sprayed, the Maine berry grows wild. A family of pickers may earn hundreds of dollars a day.

Potatoes bound for Europe, drought stricken in 1976, are unloaded at Searsport (**facing page**) by part-time workers making windfall wages of up to $100 a shift.

finds a ready market, with high-quality stones fetching as much as $120 a carat.

Looking the part of a successful sourdough, Dean McCrillis, president of Plumbago Mining Corporation, poured a small fortune in fiery red and green gems from a chamois sack onto his desk top.

"Wish all we had to do is dig. But there's enough skulduggery in this business to make a sequel to *The Treasure of Sierra Madre*. People use false claims to get at the mine. And sneak thieves carry off valuable material by the sackful."

Small wonder Dean has posted guards full time at Newry Hill: In a honeycomb of shallow pits and tunnels, even the pillars left to prevent cave-ins have been gouged by chiseling bandits.

By contrast, serenity prevails on another hilltop to the south, overlooking Sabbathday Lake. Here the last active community of the United Society of Believers in Christ's Second Appearing perpetuates a life of piety and purpose now two centuries old (page 744).

At an impressive Sunday service in which everyone participated, I joined hands with Sister Mildred Barker to move about the Meeting House floor with the three men and six women who now comprise the settlement's total flock. Their *a cappella* singing in foot-tapping tempo filled the room:

Come life, Shaker life,
Come life eternal;
Shake, shake out of me
All that is carnal.

Later, in museum rooms reflecting Shaker devotion to simplicity, Brother Theodore Johnson showed me functional, unadorned furniture and furnishings now recognized as trademarks of a once vigorous faith brought from England to New York State by founder Mother Ann Lee in 1774. Sabbathday, "the least of Mother's children in the East," opened eight years later.

There's nothing museumlike about its members, whose ages now average well over 50. Sister Mildred, their cricket-lively leader at 79, was just back from recording an album of Shaker songs in Portland; Brother Ted teaches in Cumberland Center. Within the enclave itself, everyone works; nobody shirks.

Now, as always, these unpretentious people depend primarily on the products of their


FOXCROFT MD

hands and lands—herbs and apples, firewood and hay—for material necessities. Mildred's royalties help; so does Ted's salary. But spiraling costs like property taxes, which the Shakers have never tried to avoid, allow little margin to live on. Yet, saying a silent prayer of thanksgiving, they set another place at table so I would not leave unfed.

Coast Dwellers Shift Gears for Summer

When I bade these fine folk good-bye, spring had advanced far enough to drape willow trees with saffron gauze, convert car tops to canoe carriers, and set in motion the "turtle tourist," whose lodging—camper, trailer, van, or bus—travels with him.

Perhaps because large numbers of vacationists come Down East this thrifty way, tourism accounts for less than 7 percent of the state's wages and income; nonresidents spend only about 200 million dollars a year on Maine holidays. "Sometimes I get the feeling," a visitor muttered over his lobster roll, "Mainers would be happier if we all stayed home and just mailed our money in."

Most out-of-state traffic originates within a tankful of gas of the state. And most of it beelines for the seaboard, where 45 percent of the population dwells. From Kittery to Ellsworth, and up tidal rivers between, lie most major cities, the better-known resorts, and a great many coiners of the one-line quip.

Inching into Burnham Junction on the Belfast and Moosehead Lake short line, I waved from the engineer's cab at two trackside idlers.

"You see that, Henry? Wimmen's even taken over the railroads."

"Doubt they'll do much wuss."

Ask a Down Easter how many people he has working for him, and he'll likely say, "'bout half."

Surprisingly, in a state with 3,500 miles of tide line and 7 percent of its interior awash, the first white settlers to come in a sizable wave were farmers, not sailors or fishermen.

Maritime trade began modestly enough, with the transport of fish and lumber to other U. S. ports. By 1800 a shipbuilding craze had swept up rivers and into back pastures; at one time scores of shipyards lined the Kennebec. The last of them, the huge Bath Iron Works continues to send sleek cargo carriers and Navy frigates down the ways.

In the days of sail Portland harbor teemed with oceangoing commerce, but today, except for oil imports, it attracts few cargoes from far places. Still, I like to wander its weary waterfront, trading pleasantries with those who work and loiter there.

"Looks like a great day on the bay."

A leather-skinned fisherman squints at the sky and shakes his head: "It'll be blowin' like Gabe's horn out beyond Peaks Island."

"You can tell that just from the clouds?"

"Nope. Heard it on the radio."

Portland saddles a swaybacked ridge commanding striking views of Casco Bay and its emerald-chip Calendar Islands. Downtown has seen some recent redevelopment. But because residents are committed to preserving old neighborhoods, wrecking crews have barely dented the city's turn-of-century charm.

Ships or shelter, bygone Mainers built for the long haul and often with a flair. Bearing both in mind, they created some of the most exquisite front doorways in Christendom. Then, for reasons unrecorded, they rerouted all traffic—except possibly the parson—in through the kitchen entrance.

They also stitched the house, barn, and auxiliary buildings together in a sensible arrangement best described as "connective architecture." Wise planners put the woodshed somewhere between cookstove and privy "so's everyone could pick up a chunk or two on the way in."

Learning to Love Saltwater Rejects

Down Easters don't do as much traipsing about as they did when windjammers jammed Portland harbor. But thousands still turn their eyes and lives seaward, fishing the capricious Gulf of Maine for cod, herring, flounder, scallops, and haddock. With many of the market favorites becoming harder to find, Reggie

Few in numbers but large in spirit, the world's last active community of Shakers celebrates Sunday services with a visitor to their Sabbathday Lake Meeting House. Following the tenets of unity, simplicity, and industry, the celibate sect has contributed much to American agriculture, invention, craftsmanship, and design.

Home folks gone, an abandoned house keeps company with dairy cattle in Penobscot County. As early as the start of the 19th century, Maine lost farmers to "Ohio fever"—the

Midwest's longer growing season and fewer rocks. Now population decline has been reversed. Newcomers settling in small towns may help alleviate chronic economic problems.

Bouchard of the Department of Marine Resources hucksters less lovable species.

We met at Rockland's annual Maine Seafoods Festival, a four-day orgy of eating that even ancient Romans would have applauded. Kettles large enough to float a Boston Whaler boil some three tons of lobster, which customers consume to the last morsel.

Reggie offered me a shark-meat "Jawsburger" and his views of fishing futures in the gulf. "No serious shortages yet, but there may be soon if we don't start dipping into ignored species like elvers, sea urchins, and fresh bluefin tuna, all in great demand abroad."

Having long since accepted "scallops" stamped from skate wings, and fish sticks whittled from almost anything that swims, I endorse Reggie's campaign to expand tastes in seafood.

Sea Farmer Sows a Succulent Crop

After all, Mainers didn't bother much about mussels, latest Cinderella in shellfish society, until a few years ago. They were so plentiful that Coasters collected them with pitchforks from rocks and pilings. Demand is now rapidly depleting convenient caches, so Edward A. Myers was raising eighty million replacements in a quiet cove near Walpole.

We pulled up to a larvae-settling raft of somewhat scrambled ancestry. "Aquiculture and a junkyard have a lot in common—we don't throw anything away," Ed said. "If it floats, it'll likely make a buoy; if it sinks, an anchor." He began thinning a string of spat, young mussels the size of my thumbnail.

"They reach market size in about a year; these should be ready by October. Like any farmer, I have to keep weeding or the whole crop suffers. Nobody around here knows much about this business, so we guess a lot. Why am I in it? Guess I'm just constitutionally unable to leave well enough alone."

Other Coasters cultivate European oysters and coho salmon, but at a cost unlikely to provide protein for the masses. At the present time, these are high-investment, slow-return operations geared to the gourmet.

On tidal flats near Wiscasset, Damariscotta's Ivan Flye introduced me to a saltwater bonanza requiring little outlay: the marine-worm industry that baits sportsmen's fishhooks as far south as Florida.

"I'm paying diggers 3½ cents apiece for sandworms, 5½ for bloodworms. Pound for pound, that's five times the current dock price for lobsters."

Slogging through muck with rake and pail, I flailed at the goo around my boots, bagged a few of the king-size crawlers, and suffered a few nipped fingers from their bites. The bounty that blesses Maine is seldom easy pickings.

Above Wiscasset, Route 1 bends eastward, through a procession of tidy towns and across estuaries where historic rivers unravel, splicing their waters with the sea.

Come summer, such sights must be taken

The reach of a helping hand has been linked in a chain of concern by H.O.M.E.—Homeworkers Organized for More Employment. Whether shearing sheep, mending fences, or teaching adults to read, the Orland cooperative founded by Sister Lucy Poulin (**right**) has bridged the chasm of unconcern to help thousands of the rural needy.

H.O.M.E. outreach worker Cathy Tracy (**above**) talks with Helen Eaton, whose sewer needed repair. Mrs. Eaton, in turn, was recruited to help distribute clothing.

Turned by a rising tide, clam diggers retreat with their haul off Deer Isle (**right**). Once called "Down East welfare" because it traditionally supplemented the income of Mainers, clamming in winter has fetched up to $25 a bushel for back-breaking work with rake and hod.

"Portland has lost none of its charms," wrote native Henry Wadsworth Longfellow in 1881. Maine's largest city (**below**) and once a great international port, Portland is still an important petroleum terminal for a pipeline to Canada. "The pleasant streets of that dear old town" remain largely intact, as Portland has been able to accomplish renewal through practical preservation rather than enlisting a phalanx of bulldozers.

in quick glances. The most consistent view is that of brake lights on the car ahead. The coastal corridor from York to Bar Harbor crawls with travelers, motels triple their winter rates, and long-dormant lobster restaurants and pounds start their kettles steaming. Outside of one, an old fellow in oilskins confessed he was hired to sit there, look picturesque, and utter snappy sayings.

Parade Promoters Overdo It

Much of Maine's magnificence lies well off the beaten track, down lesser roads that lead to surf-scoured headlands, rolling breakers, pink granite shores, and sauce-dish harbors.

Branching off at Waldoboro, I finally ran out of land in front of the Friendship Academy of Folklore. A sign on the door reads, "Exhibition of Art." Below it, another, "Today is Art's day off."

Happily, the whimsical author of this nonsense was on display inside, pounding a clam hod together while an Edison Speaking Machine spun out a stirring oration by William Jennings Bryan against annexation of the Philippines.

John Gould has got to be the most genial gentleman in Maine and, likely, its most prolific writer. He's been telling and selling stories about his state for fifty-three years.

"One thing certain about Mainers: They can do anything they set hand and mind to. Take those folks over in Cushing; they'd never had a parade but figured they couldn't let the Bicentennial go by without one. Did such a bang-up job organizing, there was no one left in town to spectate. So they put a 'Watchers Wanted' ad in the Rockland paper, and two thousand people showed up."

John recaptured the spirit of the occasion by replacing Bryan with a Sousa march. I asked what he planned to do with his new clam hod. "Why, give it to you, of course."

Carrying a new hod to the tidal flats is like walking a St. Bernard in the city: It sets total strangers to talking. The clam digger beside me unfolded, admired John's handiwork, and refueled his pipe. "I'm most 80 and could get by on Social Security. But I board with a widder woman who loves them soap operas. It's stay in and listen or get out and dig.

"Everybody talks poor around these parts, but a man can always find work if he's not too choosy."

More-stable employment stems from manufacturing, mainstay of Maine's economy. Few towns function without one or more mills, symbols of the state's long-standing expertise with loom, lathe, and leather.

But along Route 1 beyond Bucksport, little factory work exists outside of canneries. A few miles inland neglected trailers, hard-scrabble farms, and sagging shanties attest to the sad plight of the region's rural poor.

Needy Find a Selfless Friend

Lucy Poulin knows their problems. Born 35 years ago into an impoverished family, she has labored most of her life to lessen the burdens of the indigent, the ill, and the aged. In 1970 she started a nonprofit cooperative called H.O.M.E.—Homeworkers Organized for More Employment—to encourage handicrafts among the needy and provide a marketplace for their wares.

Since then, the center she opened in Orland has blossomed into a self-help compound of six workshops, two stores, a school, and a church. "We reversed the domino theory: Setting up one activity gave rise to others."

H.O.M.E. now reaches some 2,000 people through a dozen different assistance programs, from teaching illiterates to read and write to furnishing seed and stock for household farming (pages 748-9).

A shut-in reported a leaky roof; within the hour a crew was on its way with shingles and tools to fix it, free of charge.

Weren't they bothered by deadbeats?

"Not the same one twice."

Bound for the back roads to milk a sick man's cow, Lucy made room in her red pickup for me. Clad in heavy boots, worn combat jacket, and jeans, she doesn't look much like a Carmelite nun—which she is, though she now lives apart from the order.

It's wise when making house calls with Sister Lucy to dress as she does. After milking the cow, we unloaded and stacked a cord of stovewood, carted a yardful of junk to the dump, moved a refrigerator, helped mend a fence, and took a muddy trek to check on a recent H.O.M.E. gift of sheep.

Back in her office, Lucy resumed the wearisome task of trying to stretch a budget where every dollar already does the work of three, thanks to a dedicated low-salaried staff and a steady flow of no-salaried volunteers.

"When state officials surveyed us a few months ago, they concluded there was no way an organization so loosely structured and funded could exist. So, maybe we're just a mirage."

H.O.M.E. is a reality, all right—because a remarkable Mainer goes by a far older book than the manuals that guide civil servants.

On the seaward side of Lucy's territory,

Hard on the wind—the perennial course of a man in public life—Nelson A. Rockefeller drives his yawl, *Nirvana*, while Mrs. Rockefeller and other crew line the windward rail. Astern lies Mount Desert Island, where the Rockefeller summer home shares the scenery with Acadia National Park.

ancient glaciers etched a rambling shoreline, carving the coast into splendid bays like Penobscot, Frenchman, and Blue Hill, sprinkling them lavishly with spruce-tufted islands.

Notables Fanned Bar Harbor's Fame

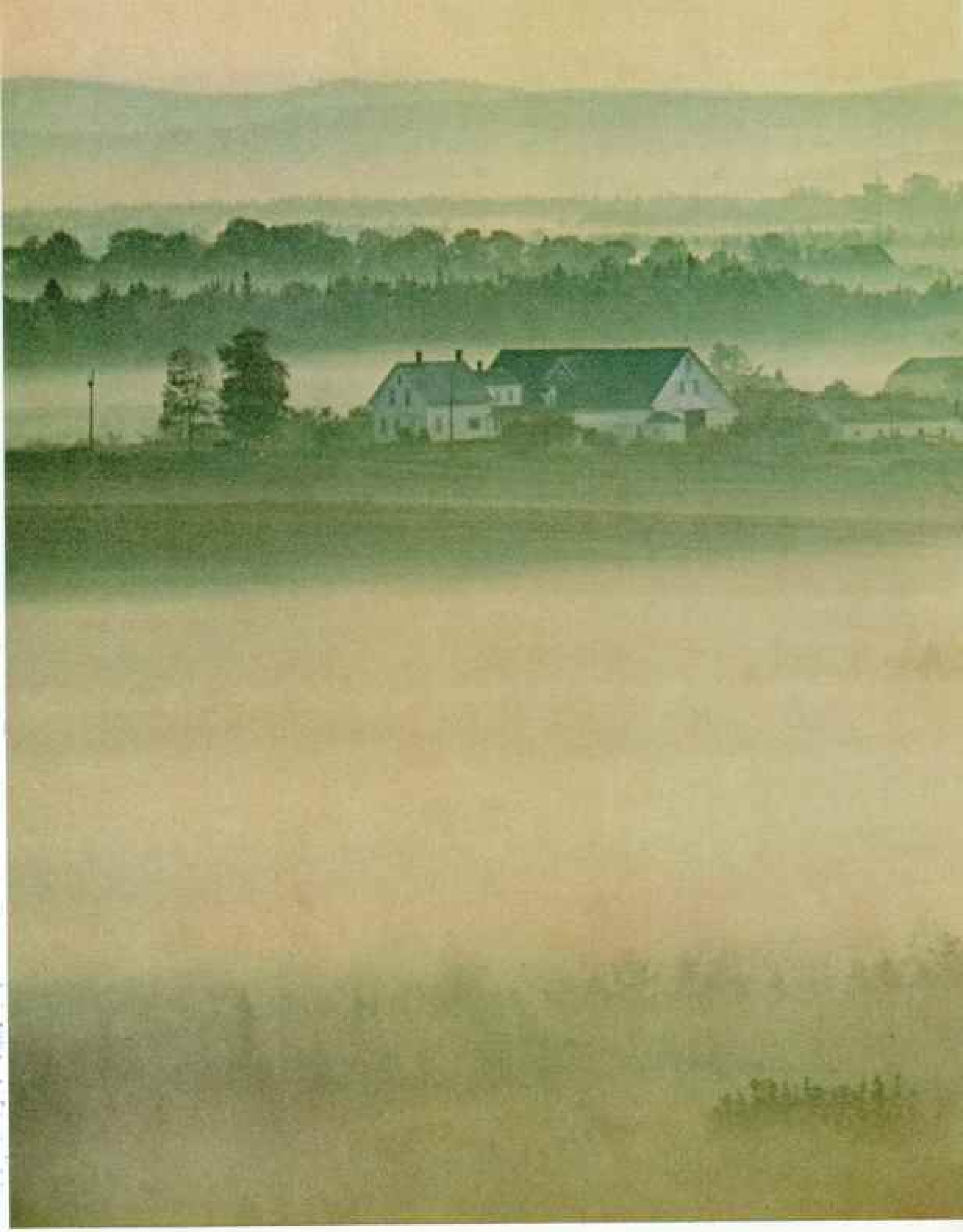
Largest of Maine's 2,000 or more coastal islands, Mount Desert first lured visitors when woodland Indians spent summers there for a change of scene and diet. Later, colonists dropped by, liked what they saw, and stayed. Their descendants witnessed the gilt-edged era, when the nonresident rich "rusticated" in hotel-size "cottages" owned by the likes of A. Atwater Kent, Joseph Pulitzer, George W. Vanderbilt, and John D. Rockefeller, Jr., who donated more than 11,000 scenic acres of what is now Acadia National Park.

So things went until 1947, when Mount Desert found itself "so dry it could have patched hell two times over." In mid-October a fire raged out of control for days, ravaging a quarter of the island, including 67 estates.

Spared were the homes of rusticators on the south shore. One of these is more of a Mainer than most suspect. "I was born in a rented house in Bar Harbor in 1908, the first year my parents vacationed here. I don't think I've missed a summer since, though recent stays have been pretty brief" (below). From the rock-ledge terrace of his Seal Harbor home, Nelson A. Rockefeller and I watched distant sails send white splinters across Western Way.

"What makes Maine so special? Well, there's a rare

(Continued on page 757)



"**The County,**" as Aroostook is called, covers an area in northern Maine larger than Connecticut and Rhode Island combined. Rich in farmland where 8 percent of all U. S. potatoes grow, and in dark forests where few roads penetrate, this quiet countryside

seethed with dispute over the border with Canada in the 1830's. Bloodshed in the "Aroostook War" was averted only when Maine and British troops were within firing range. Now ties across the border are close, and many Canadians have settled in the county.

compatibility up here between place and people. Nothing has seriously diluted the salty character of either, and neither would be half as enjoyable without the other."

Sea Remains a Magnet for Mainers

Among the saltiest sailors on Mount Desert Island is the Reverend Stanley Haskell, mariner-minister for the Maine Sea Coast Missionary Society. I boarded the society's 65-foot *Sunbeam* for a four-hour run from Northeast Harbor to Matinicus Island, westernmost port of call in Stan's widely scattered parish.

Ministering to outposts "from Kittery to Calais," he brings both spiritual and material aid to isolated year-rounders. Many of the island's 100 people were on hand to welcome him when we docked. Here, where kids practically cut their teeth on a lobster trap, *Sunbeam*'s cookie jar does a brisk business, and the cabin doubles as a cozy chapel when winter closes in.

Matinicans are independent and purposely inhospitable to strangers; they want no outsiders trampling their inviting moors, wild-cranberry bogs, and superb stretch of beach. "Lobsters are our livelihood," Town Clerk Lona Ames told me after evening services. "There's nothing here for tourists, and we aim to keep it that way."

As *Sunbeam* careened homeward in rough seas, the moon seemed suddenly to set behind a wall of water. The all-steel vessel had taken a 40-degree roll. Stan was reassuring: "We've fetched 45 degrees and didn't flip. It so happens I have an excellent Copilot."

One of *Sunbeam*'s extracurricular chores a couple of years back was to cart the sheep of a deceased hermit from Manana Island near Monhegan to a new home with Jennie Cirone in South Addison.

Laming up in one leg, Jennie is what fashion describes as a full-figured woman. I guessed her age at "pushing 60" (left).

"More like 60's been pushing me for five, six years," she corrected. Jennie's been lobstering since she was 10 and still hauls a mess of traps by hand when her brother Benny or her husband aren't around to winch up the 200 or so they set and share farther out.

I worked with Benny and Jennie one March pea-souper, pegging claws, bagging bait, replacing rotted trap slats.

"There's no money in sheep, but I'm fond of the critters. Got 'em spread around islands I own, including little Nash, where my father used to keep light.

"My schoolin' was kinda spotty: Teacher'd come out for a couple weeks, then go off to another lighthouse family. By the time she got back to us, we'd clean forgot everything she'd learned us.

"When all nine of us kids got school age, we rated a teacher full time. But my seven brothers took to marryin' them fast as they come on the island. Think it was Raymond who got the last one they ever sent us."

A tiny flycatcher landed on the fantail, too exhausted to resist when Benny gently nested it in a warm mitten inside his wheelhouse. Jennie offered it a crumb of cracker and allowed as how she was slowing down too. All she can manage now is lobstering most every day, tending 123 sheep (more or less), midwifing the ewes at lambing time, shearing the flock, keeping house, knitting bait bags, and picking out crab meat for market, "if I don't have me a lazy spell.

"Except for ten years ashore farmin' and drivin' truck, I've been on the water all my life. Lobsterin's a fever; never knew anyone to get rich at it. But out here you retire when you feel like it—or the undertaker decides it's time."

Most deep-down Mainers of Jennie's stripe are amiable, tolerant people who rather enjoy new neighbors and don't really want to blow the bridge at Kittery (it's more the new neighbors who do).

"I've got to admit though," says my cousin Don Starbird, "when newcomers talk of communes, back-to-the-land living, wood-stove heating, and, now, a bathroom without flush power as society-saving concepts of this enlightened age, it's kind of hard for Mainers not to smile." □

Comforting an ailing friend, Jennie Cirone takes time out from the flock of ducks, herd of sheep, and lobster boat and traps that keep her busy. Come cold weather, she can really relax: "I play all winter." Like snowmobiling into the woods to chop maple and birch to feed the stove. As for Maine: "I can't imagine being anywhere else."

Loch Ness
The Lake and the Legend

By WILLIAM S. ELLIS

Photographs by
EMORY KRISTOF
BOTH NATIONAL GEOGRAPHIC STAFF
and DAVID DOUBILET

To fathom the mystery of Loch Ness, Scottish divers plumb the cold, murky waters of Urquhart Bay—recent hub of scientific activity to either prove or dispel as myth the existence of the loch's fabled monster. Though Highland lore has it that monster bones lie moldering in the waters below Urquhart Castle, in the background, they have been as elusive as the creature itself.

DAVID DOUBILET

AT A LITTLE PAST NOON on a summer day in the forty-third year since Mrs. Spicer shrieked at what she saw, thereby startling her husband, George, I looked out on the waters (dark they were, like iodine) of Loch Ness, and there before me. . . .

But first let me tell of the circumstances that brought me to those shores in the melancholy Highlands of northern Scotland.

The legend of Loch Ness has in recent times undergone the most serious and skilled investigations in 1,400 years—since the time when, as the story goes, St. Columba commanded a "fearsome beastie" in the waters to back off and behave itself. The past summer was a particularly busy season there. From Inverness to Drumnadrochit, and on south to Fort Augustus, scientists were at work to find something outsize and alive in that largest of the British Isles' freshwater lakes.

It involved much more than simply watching and waiting. They positioned highly sophisticated camera gear below the surface. They played recorded beeper sounds meant to attract even the most elusive of lake life. They set sonar to work, scanning the cold depths. They used mathematics and physics and electronic wizardry (diagram, page 762).

And when the summer ended—when they returned to their universities and laboratories—the legend had been invested with, if not reality, then a certain kind of respectability.

I was there to observe the search, and, in truth, I went not without hopes of seeing an unusual animal in the loch. Not that I believed in the existence of such a creature, and not that I disbelieved. Rather, standing beside those fabled waters, my thoughts teetered on a line of slack skepticism.

There were other observers: the Camerons and Campbells, the MacKenzies and MacDonalds, Mac this and Mac that—the good people of that good land, Highland born and Highland reared. Well, there were some among them who wouldn't have been surprised had something turned up. That's because they say they've seen the animal.

Alex Campbell: "It was mid-May 1934. I was looking across the water, and, heavens, there was this terrific upsurge about 200 to 250 yards distant. And then this huge neck appeared, six feet at least above the water, with a small head that kept turning nervously. Oh, the head was just going. I said, 'This

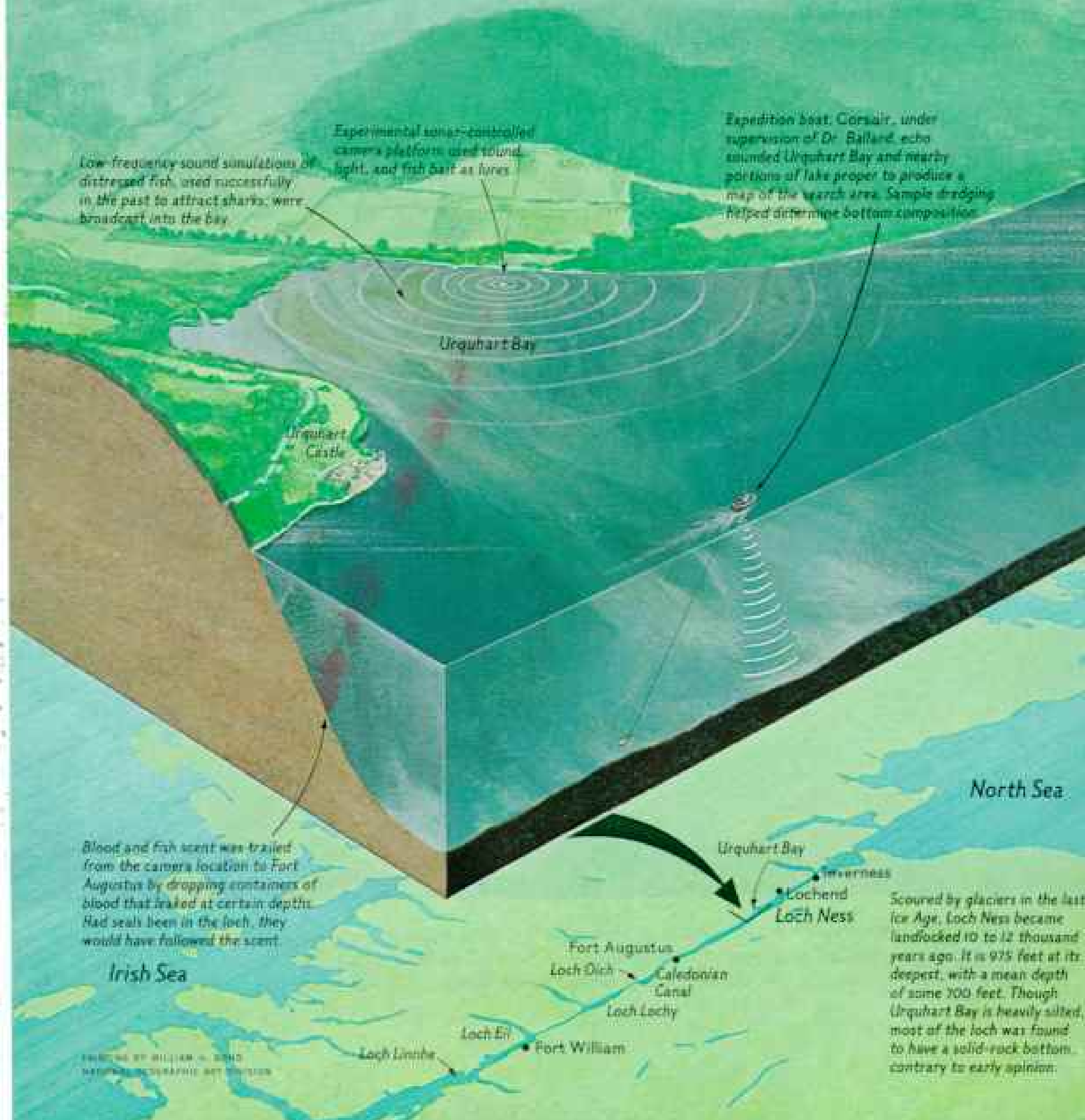
Monsters' lair or bonny lake? Sweeping southwest from Lochend and the River Ness, foreground, Loch Ness fills 24 miles of the Great Glen, a geologic rift cutting across Scotland. Owing to its depth, the lake holds more water than any other in Britain, and its

EMORY KRISTOF

dark waters never freeze—a safe habitat, perhaps, for reclusive water monsters. Along with heather on the hillsides, spring brings throngs of the curious to lochside, all hoping to glimpse a creature like the one first reported by St. Columba 1,400 years ago.

Ten years of effort fails to free "Nessie" from legend

FIRST SPOTLIGHTED by the world press in 1933, when a rash of sightings accompanied the building of a lakeside road, the Loch Ness monster was considered beyond the pale of science until the late 1960's, when serious research began. Early efforts utilized underwater tape recorders, submarines—even sex attractants. In 1970 Dr. Robert H. Rines of the Academy of Applied Science in Boston began using side-scan sonar and reported tracking large moving bodies in the loch. In 1972, and again in 1975, he obtained grainy photographs of large, seemingly animate objects—all enticing but inconclusive. Last summer saw the most ambitious efforts to date. Rines and his colleagues returned, sponsored by the *New York Times*. NATIONAL GEOGRAPHIC dispatched a team of underwater photographers and divers, together with Dr. Robert D. Ballard of the Woods Hole Oceanographic Institution. In addition to obtaining accurate data on the lake bottom, the GEOGRAPHIC team employed a number of methods, detailed on the diagram below, to attract and film the creature —all futile.



is fantastic,' and then I did this [blinking his eyes], just to make sure it wasn't imagination. Aye, it was there, all right. As soon as the bow of a trawler appeared, the creature saw it, and, *swoosh*, for heaven's sake, what a dive!"

That was his first sighting. He has had 17 others. Now it should be understood that Alex Campbell (page 767) is not a man given to histrionics. Soft-spoken and gentle of manner, he continues to live, at the age of 75, in the house where he was born, a cottage by the River Oich throttled by flowers. For many years he was the water bailiff in the area, with a chief responsibility of protecting the salmon that enter Loch Ness. And for many years too he has been the Fort Augustus correspondent for an Inverness newspaper.

"The phone once rang," he said, lighting the second of four cigarettes he smokes each day, "and it was one of the two ladies who used to live in the big house across the river. They were in what we call the wealthier class. Nicer ladies you never met. They weren't young, but they were still quite able and fit. The one who phoned said, 'Alex, Alex, we've seen him, upstairs from the bedroom window.' I asked her to tell me what they saw from the window—it's a gorgeous view of Loch Ness from there—and she said it was a huge hump in the water. Then within seconds another, smaller hump appeared, a hundred yards or so behind the other. And then she said, for heaven's sake, a third, even smaller hump was there. So we agreed that it was a family of them, with the huge hump being the daddy, the middle one the mother, and the wee one in the rear the baby."

"**No self-respecting beastie** will go near the pier with all those speedboats and God knows what going in and out," said Winifred Cary of the goings-on beyond her rose garden overlooking Urquhart Bay. A true believer, she claims to have spotted the "beastie" 15 times—often with friends, and first at age 11 while fishing with her brother.

EMORY KRISTOF

LONG NECK, small head, humps—the description runs like a litany through the catalog of more than 3,000 recorded sightings since the early 1930's. Length? Twenty feet or so. Dark in color. And fast moving. Many have said that it resembles an upturned boat in the water.

The animal has also been reported seen out of water. "Loathsome" might be the way to describe it then, and indeed, that's the word George Spicer used after he and his wife encountered something in 1933 on the loch-skirting road between the villages of Dores and Foyer. They said it looked like a monstrous snail as it lurched heavily down an embankment toward the water. A later version reported it was carrying something in its mouth—a lamb, maybe.

It was the next year, in 1934, that the legend took on substance. In that year a London surgeon, R. Kenneth Wilson, pointed his camera at the loch and recorded an image that would serve even until now as the logo for the mystery. It showed . . . what? A shadow, a bird, a mischievous play of sunlight on the rippled waters? Perhaps one of those. More than anything, however, it showed something resembling, yes, a long neck and small head (page 768).

Light from the Highland summer sun tarries close to midnight. During those late evening hours there is an embracing tranquillity in the green hills *(Continued on page 769)*

A Highland Hercules deftly flings 56 pounds of iron over a 12-foot-high bar (**left**). A diversion for monster-seeking tourists, the Highland games at Drumnadrochit feature other such trials of Scottish brawn as putting the shot, throwing the hammer, and tossing the caber, a tree trunk up to 20 feet in length.

At Fort Augustus, NATIONAL GEOGRAPHIC's chartered trawler and a cluster of pleasure boats lock through the Caledonian Canal (**above**). The waterway, opened in 1822, connects Loch Ness with the Great Glen's three other lochs, providing passage through the heart of the Highlands. In 1873, when Queen Victoria made a paddle-steamer excursion on the canal, tight-lipped locals only whispered to each other about fearsome kelpies and water horses. Now times have changed, as illustrated by an anti-litter poster and Nessie toys (**right**) in an Inverness shopwindow.

EMORY KRISTOF (LEFT AND TOP); ANNE L. BURNLEY

SNOWY BRISSON (ABOVE AND BELOW); DAVID DOUBILET

"**Like a pot of boiling water,**" said Sergeant Donald Nicholson and Constable Alexander Gray (**above**) of a disturbance in the loch seen by them on April 13, 1976, while driving along the shore. In the churning waters they saw no head, no body—just two fins. Though supposedly unable to enter the lake through the Ness River locks, seals are often suggested as an explanation for such sightings.

Highly regarded eyewitnesses have bolstered the convictions of legions of others who once had their sobriety and wits called into question. Tim Dinsdale (**left**), former aeronautical engineer, wrote three books on the loch and its monster after making the most famous of the films purporting to show the creature in action. Alex Campbell (**right**), a retired water bailiff and local journalist, has reported 18 sightings during his 40 years of working along the lake.

Eye-startling photographs, although causing tempests in the tabloids, have failed to sway skeptics. The most famous (**below**), made in 1934 by a London surgeon, might be of a deer or otter, they say. In 1953 a London bank manager caught two humps moving past Urquhart Castle (**above**). The picture (with scratches from the original negative) baffles even believers. Compared to the 50-foot-high tower, this body would greatly exceed the 20-foot length most often reported.

P. A. MACNAB (ABOVE); R. KENNETH WILSON, ASSOC. NEWSPAPERS GROUP LTD.

(Continued from page 763) that press down on both sides of the mile-wide loch. It is time then to go through the fields and up into the moors, there to walk through the misty breath of that peaty land. So I did, and looking down, I saw Loch Ness patched with polished scraps of the fading light.

"Looking for Nessie?" He was a short, frail man who had left the road and walked with an aged shelty at his heels to where I was standing. I answered by remarking on the splendid view of the loch. "Aye, if you say so," he replied, "but I canna see that far."

Nessie. Many Highlanders pronounce the name with inflections of endearment, for whatever astonishing wildlife resides in the lake, if any, it has come to be thought of as a shy thing, ugly but nice, a flippered Quasimodo. And smart. Certainly smart enough not to fall for the old balloon-and-bacon trick.

They tried it. Early one morning last summer a manned balloon appeared over the loch, trailing a line baited with a rasher of bacon. Nibbleless, the bacon was soon retrieved, but not before the effort had earned an entry in the Loch Ness chronicles of the zany, right along with the man who arrived on the scene with an evil-looking box full of dials. The device, apparently, was supposed to play the nerve ends of a Nessie like a xylophone, causing it to rush madly to the surface. There was much dialing, but no deliverance.

MEANWHILE, the scientists continued their work. Among them was Dr. Robert D. Ballard of the Woods Hole Oceanographic Institution. Working with a team of photographers and divers from NATIONAL GEOGRAPHIC, he found that the rock bottom of the loch was not V-shaped, as was widely believed previously, but more in the form of a U. Ballard also challenged the popular view that there are massive concentrations of sediments on the bottom.

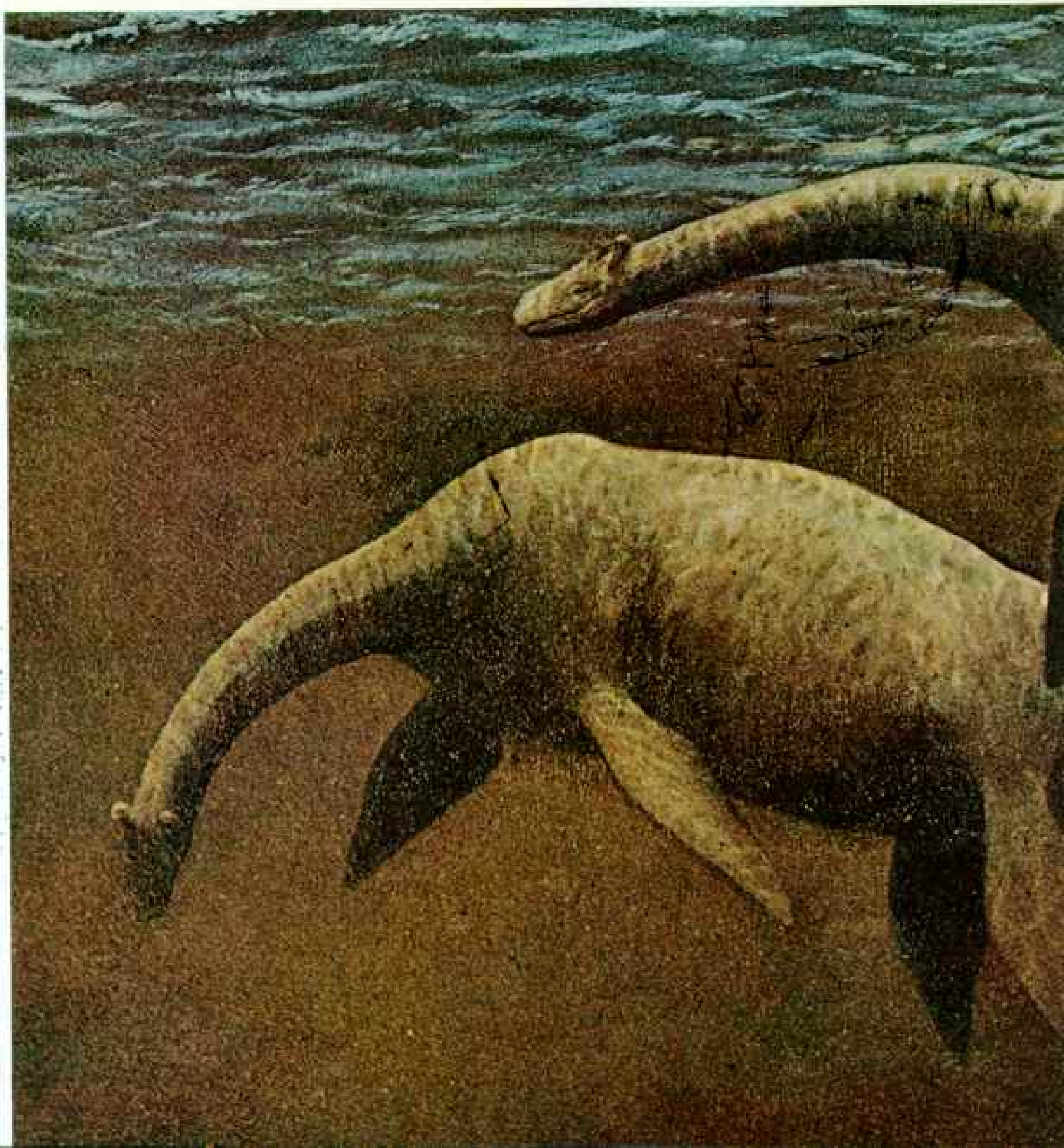
"Let's forget about the fact that we went out there and dredged and found that the bottom was hard and not full of muck," he said. "Let's say we never dredged, that we just saw the echo-sounding trace and said it was U-shaped. So we might say, OK, it's still V-shaped, but filled with sediment. Well, consider how much sediment it would take to do that, and you realize what nonsense that is."

Loch Ness, more than 900 feet deep in places, is part of the Great Glen, a fault line bisecting Scotland. "The Loch Ness area represents a major geological break," Ballard said. "In fact, there is good evidence that right now we are in North America. No, let's see. Which side of the loch are we on? We're on the southeast side, so we're right now in Europe. Get in a boat and go across that mile of water, and we'd land in North America, or a piece of North America left behind after the continents ground past one another and today's Atlantic opened up."

He went on to tell me that a glacier moved through the loch ten, maybe twelve thousand years ago, and that there wasn't—couldn't have been—any large animal there then. "That should tell you something," he said.

It told me, I think, that those who say that the plesiosaur has survived and is alive and well in the loch are flying in the face of some steely missiles of scientific data. The plesiosaur, an air-breathing marine dinosaur, dates

"**Courtship in Loch Ness,**" a painting (**below**) by Sir Peter Scott, one of Britain's leading naturalists and among the most respected believers in Nessie, depicts horned, bulbous reptiles resembling plesiosaurs. Though presumed extinct for 65 million years, they are the most popular answer to the Loch Ness puzzle. Sir Peter based his work on a highly publicized photograph of a fin (**left**) taken by Dr. Rines in 1972. Sonar and another picture made 45 seconds later indicate the object was moving.



Monster mania means money in the bank for merchants willing to trade on the times. Nessie T-shirts and bric-a-brac are popular with tourists, and a brew labeled "Monster's Choice" keeps imaginations fired. Though serious investigators find such commercialization demoralizing, many locals seem to enjoy the attention. Most are believers. Along the western shore, a "Monster Burger" wagon (**right**) offers fast food for those wishing to keep one eye on their sandwich and one on the lake.

JAMES SOURLES; ROBERT H. KING (FACING PAGE); PAINTING (BELOW) COURTESY OF DAVID JAMES

back more than 200 million years. It is believed to have vanished about 65 million years ago. Yet, many, if not most, of those who claim to have made sightings say the animal is a ringer for the plesiosaur.

Let it be allowed that when the black curtain of extinction fell on that blimpish beast, one—no, it would have to be at least two—may have survived. (The coelacanth, a primitive fish thought to have been extinct for 70 million years, was discovered off the east coast of Africa in 1938.) But surely, the glacier that moved through the loch ended any such miracle of endurance. As Dr. Ballard said, smiling puckishly, "I mean, most animals can't live in ice very well."

Visitors and townspeople gathered often last summer in the pub of the Drumnadrochit Hotel, where the lovely Fiona pulled pints of lager. Across the lobby, hotelkeeper Ronnie Bremner, kilt-clad and given to spontaneity of song, pushed the salmon and the sherry trifle as he greeted those who answered the summons of the dinner gong. And out back, where they used to stable horses, technicians worked late into the night assembling the search equipment.

THE NATIONAL GEOGRAPHIC camera rig was positioned at a depth of 30 feet in the loch (page 774). It took several weeks to get everything operating properly, and at one point, with frustrations rapidly ripening to anger, it seemed that those murky waters held nothing more monstrous than gremlins. Finally, though, the gauges on all the meters were at their proper stations, and the sonar-triggered click of the camera carried through the hydrophones. So did the sound of the engines of boats, the burping of bubbles, the scrunch of bunched piling, and this: Glablump, glablump, glablump, RMOOPH, RMOOPH, glablump, glablump.

The glablump, of course, was water in motion, but what of the other, the loud and bilious RMOOPH?

"It couldn't have been Nessie," I was told by a Highlander, as we waited for grilled-cheese sandwiches in the café of the BP service station in Drumnadrochit. "Nessie's a big worm, and worms canna make noises like RMOOPH. Worms canna make noises at all."

He said a worm. (Swims there a fish bold enough to approach a 20-foot-long worm with anything but respect?) Others have said a seal, a snake, a salamander, a sea cow. An eel. In support of the case for the worm, it can be pointed out that such a mutation could feed on silt.

It has long been argued that Loch Ness does not hold enough fish to feed colonies of large animals. One such beast with a weight of, say, 2,500 pounds would probably require up to 250 pounds of fish each day. In addition to trout and salmon, the loch holds sticklebacks and large stocks of eels.

And in the past summer David Doubilet, a photographer-diver working with the NATIONAL GEOGRAPHIC team, had a net dropped to 100 feet. It came up loaded with arctic char, confirming previous estimates that there are heavy concentrations of that fish at the lower depths.

NESSIE ASIDE, there were other finds made. Sonar scans recorded by a team under the direction of Dr. Robert H. Rines, a Boston attorney and president of the Academy of Applied Science, revealed the presence of stone circles in the loch at a depth of about 35 feet (facing page). Apparently man-made, they strongly resemble the circles found around ancient Pictish cairns, or burial chambers, in many parts of northern Scotland. In addition to their historical value, the discovery shows how much the water level of the loch has risen over the centuries.

It was Dr. Rines who, in 1972, obtained what is considered to be one of the most authentic pieces of evidence in support of the existence of Nessie. It was a picture taken below the surface, and it showed something in the shape of a fin (page 770).

In 1975 his cameras reported two more tantalizing images. One resembled a head at close range—a small head with nostril-like protuberances. The other could be interpreted as a full body, including a long neck and diamond-shaped fins.

The grainy photographs were widely published, studied, analyzed, and, alas, generally dismissed by the scientific community as falling short of being acceptable evidence.

Still, Dr. Rines is drawn back to the loch each summer for more planning, searching, and rushing off to London with exposed film in the hope that when the lights are raised in the darkroom, there it will be, etched in

detail enough to snuff out the sniffs of skeptics. For he believes.

So does Winifred Cary (page 763). "My first sighting was in 1917, when I was 11 years old," she told me. "My brother and I were out in a boat, fishing, trolling for salmon, you see. As we were going east along the pier, there suddenly rose up in the middle of the loch—not near the boat, fortunately—this colossal thing like a great whale. It was going fast against the wind and was only up for a second or so. Of course, no one believed us when we told them."

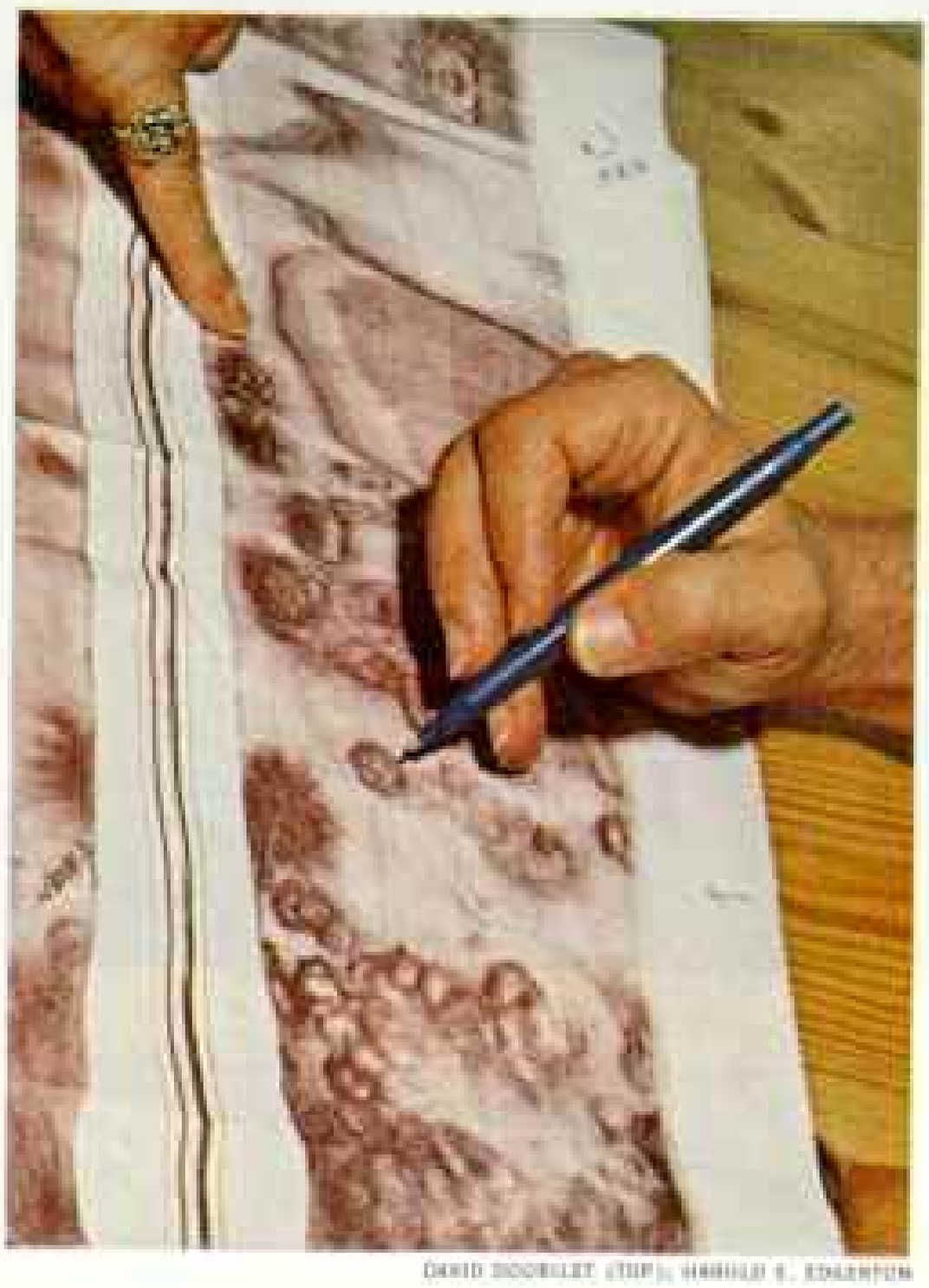
Mrs. Cary's house sits on the side of a hill overlooking the Urquhart Bay section of the loch, where the ruins of 13th-century Urquhart Castle rise from the shore in a stony, somber heap (pages 768-9). She recounted her sightings for me in a voice toned by English schooling and travels in India.

"I didn't have another sighting until 1954," she said. "We were having a very warm spell that July, and the loch was flat calm, like a millpond. I was standing on the hill there, feeding the hens, and I saw a thing on the far side of the loch a mile and a half away, and I thought it was a fishing boat with a mast. But I couldn't understand what a boat of that size was doing so close to shore."

Mrs. Cary's husband, Basil, a retired wing commander in the RAF, looked at her and nodded, as if to say he understood why she didn't understand.

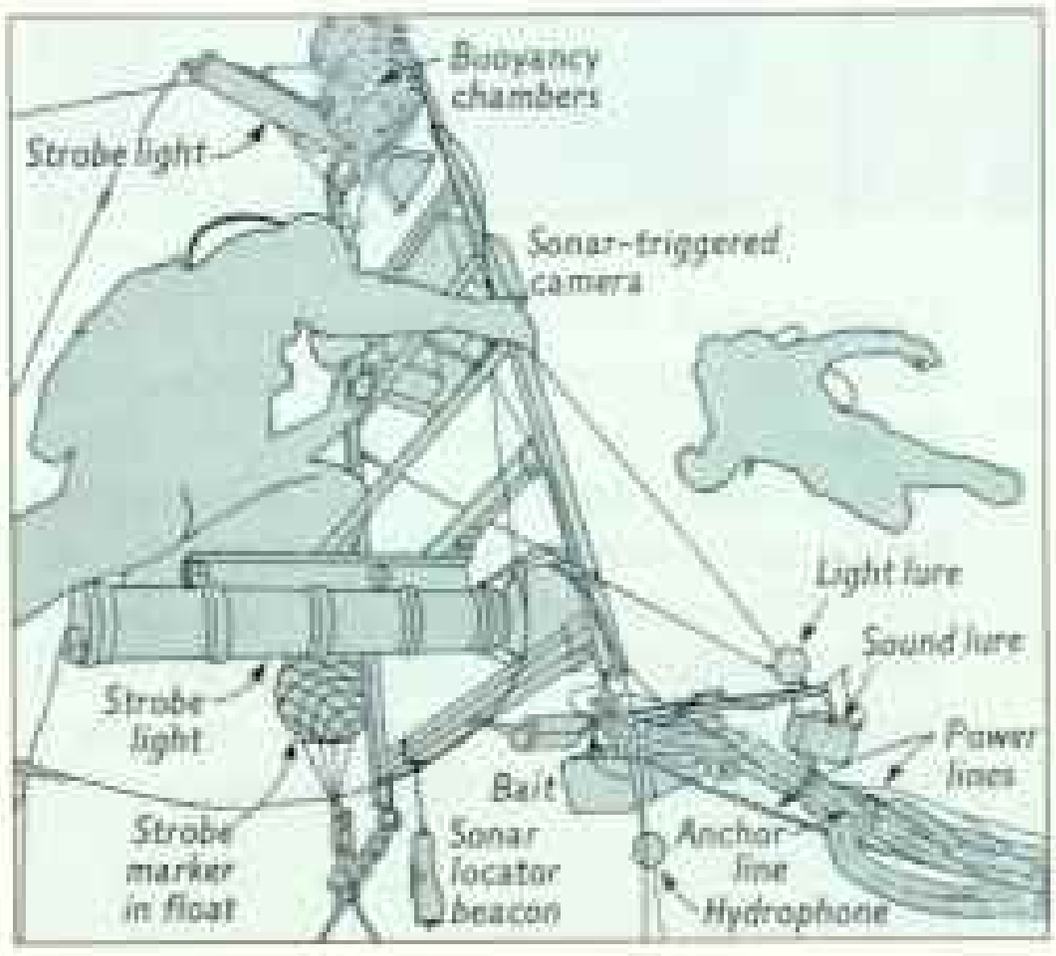
"It looked to be about 30 or 40 feet long, this thing," she continued, "and then it turned and came rushing straight toward me from the far side, right across the loch at terrific speed. As it came nearer, it was clear that there was no mast, so it must have had its head and neck up when I first saw it. As it came to the castle, I saw a very large salmon leap out of its way, so it had obviously been chasing the salmon. It had a great huge hump. I came in and got my husband—Basil, there—to come see it, but by the time he came out, there was nothing there but the wash. Well, then, I didn't have another sighting for a fortnight."

It happens. Listening to Winifred Cary and Alex Campbell, the skepticism wanes. And then a priest appears to say that he's seen the animal. Father Gregory Brusey, of the Benedictine Monastery at Fort Augustus, made his sighting of a *(Continued on page 778)*



DAVID DOUBILET (TOP); HAROLD E. EDGERTON

Unexpected dividend, a number of stone circles were found about 35 feet down off Lochend by the Rines expedition. Diver Alan Hunter (**top**) examines a formation pinpointed (**above**) by Martin Klein, developer of the side-scan sonar used to make the chart. Similar to other ancient circles found in northern Scotland, they may indicate a rise in loch level over the centuries.



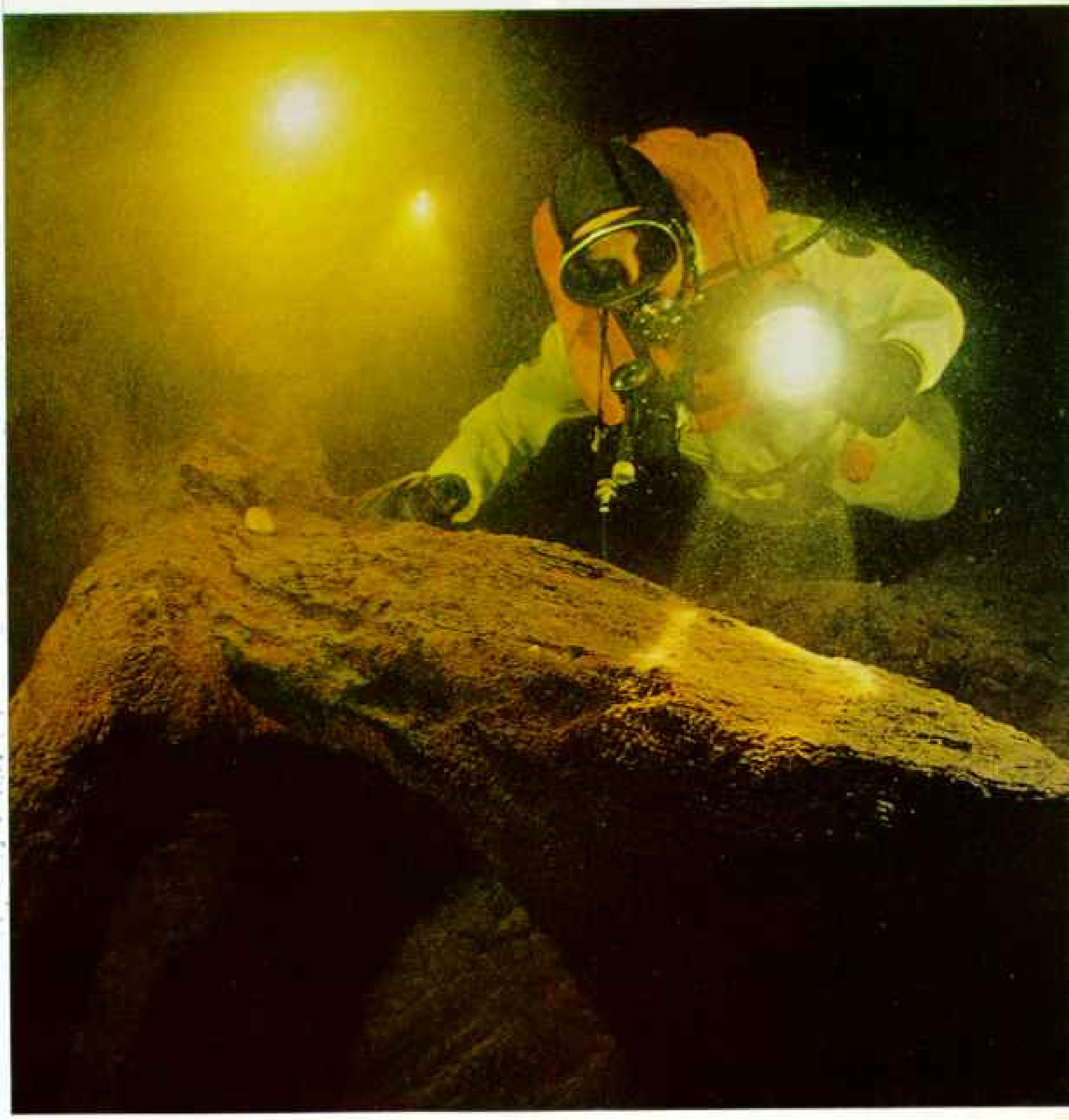
Ready for Nessie, GEOGRAPHIC photographer Kristof, in blue (**above**), and Gordon McKenzie of the British Sub-Aqua Club check out a battery of camera equipment and monster lures 30 feet deep in Urquhart Bay. Anchored to the lake bottom and held aloft with buoys (**diagram, left**), the rigging boasted a number of stratagems for attracting Nessie: stroboscopic and steady-burning lights to catch the eye, low-frequency sound simulations of distressed fish to catch the ear, and several species of dead fish (**bottom right**) to whet the appetite. For onshore surveillance, a hydrophone system was emplaced to pick up noises, and a sonar locator attached to the rigging, should the whole thing be hauled off by an angry monster.

All that came of this ambitious plan was a chance to test a number of underwater photography innovations, such as a new sonar-triggering mechanism. Sensitive enough to release the camera shutter at the slightest nearby movement, this device managed to capture several images of small eels (**top right**) and other fish. Stained with peat from the surrounding hills, the lake's waters, when lighted, bear resemblance to Scotch whisky. But without lights, and more than 40 feet down, "it was like being lost in a coal mine," said Kristof. In these forbidding waters, goes a story from the 1930's, a team of divers brushed against something huge lurking on the bottom and surfaced with their hair turned snowy white.

DAVID DOUBILET (ABOVE AND UPPER LEFT) ENORY KRISTOF

In ghostly limbo, a trove of odds and ends found strewn across the bottom of Urquhart Bay included a saltshaker (**left**), lots of shoes, algae-wreathed wine bottles, and many teakettles (**right**). What was rumored to be a monster's skeleton turned out to be only a log (**below**). Since at least a few bones would go far toward establishing the creature's existence, bottom searching—using sonar in waters too deep for divers—has become a major facet of Loch Ness research.

If real and not myth, where do the monsters go



to die? And why don't their carcasses rise to the surface? Scientists say low temperature and acidic water retard buoyancy; a carcass would naturally sink. But some observers suggest the monsters struggle to secret graveyards—underwater caves, perhaps. Others say they may swallow stones and, thus weighted after death, remain on the deep bottom to decompose. Local citizens point to the loch's reputation for never giving up its dead. Still others fear this inquisition may only end in an epitaph for one of man's most lovable legends.

ALL BY DAVID GOODALL

(Continued from page 773) neck five years ago. That, of course, offers no ecclesiastical seal to the legend, but considering Father Gregory's line of work, it certainly adds credibility.

There were sightings in 1976 as the search continued. Two policemen said they saw the thing, and so did Billy Kennedy, a service-station attendant from Inverness. He was in a boat with a friend, he told me, when they suddenly noticed five humps in the water. "Three of them stuck together, and two were completely separate. It definitely wasn't one thing, but more like two, with the three humps belonging to one and the other two to another. A lot of people have made frightful jokes about this, but it doesn't bother me. I've seen something that they haven't."

The underwater cameras missed Billy Kennedy's five humps. But the sonar was picking up a reading of something large in the loch. It turned out to be an airplane, a PBY flying boat that sank during World War II. Divers, meanwhile, were finding junk: dozens of teapots, tires, and so many shoes that someone quipped, "I've solved the mystery. Nessie's nothing but a big Florsheim."

IT WOULD BE A MISTAKE to assume that Highlanders have seized on the obsession with the Loch Ness mystery for profit. Commercialization has been limited more or less to the sale of Nessie-emblazoned T-shirts and a few souvenirs. There is a "Monster Burger" wagon (page 771), featuring cooked patties of something that may well indeed be ground plesiosaur. Otherwise, the towns and the villages and the people are as they were before the legend drew technicians to those shores.

"We really can't assess the value of the Loch Ness mystery in attracting tourism to the area," an official of the Inverness tourist organization told me. "Of course it must have some effect, but if the legend is proven true or false, it wouldn't make much difference. But it is a lovely story, isn't it?"

It is. It's a story to fill a vacationing store clerk from London with sparkling anticipation as he stands on the side of the road overlooking the loch, eyes pressed to binoculars, scanning the surface for hours on end. He sees something, but it's neither long-necked nor humped. Rather, it's just Kevin Murphy churning up the water as he heads for a new record of ten hours and 30 minutes in swimming the entire 24-mile length of Loch Ness.

Murphy, a London journalist, twice before tried to complete the marathon swim, but he had to quit both times because of the cold. "Last time I wound up in the hospital to thaw out," he said. "Yes, I was thinking about Nessie during the swim. Once my hand hit a floating milk carton, and I thought I had run into the monster." He set the record under the auspices of a swimming club with a name to call down the blessing of departed poets: "Ye Amphibious Ancients Bathing Association."

The night after the swim we assembled in the hotel pub, and there we were, adults all, raising glasses to the basic goodness and decency of an alleged 20-foot-long animal with humps for allowing Kevin Murphy to pass unmolested in his Australian crawl.

Had I come to believe?

BY EARLY AUGUST the heather was in bloom, rolling up in pink-and-purple waves to the doors of abandoned crofters' houses in the hills that lift a place called Abriachan to the shoulders of the Great Glen. I drove there, past fields once stained with blood let in the battles of clansmen, past Gordon Sutherland's trout farm, and up to the post office, the smallest post office, some say, in all Scotland.

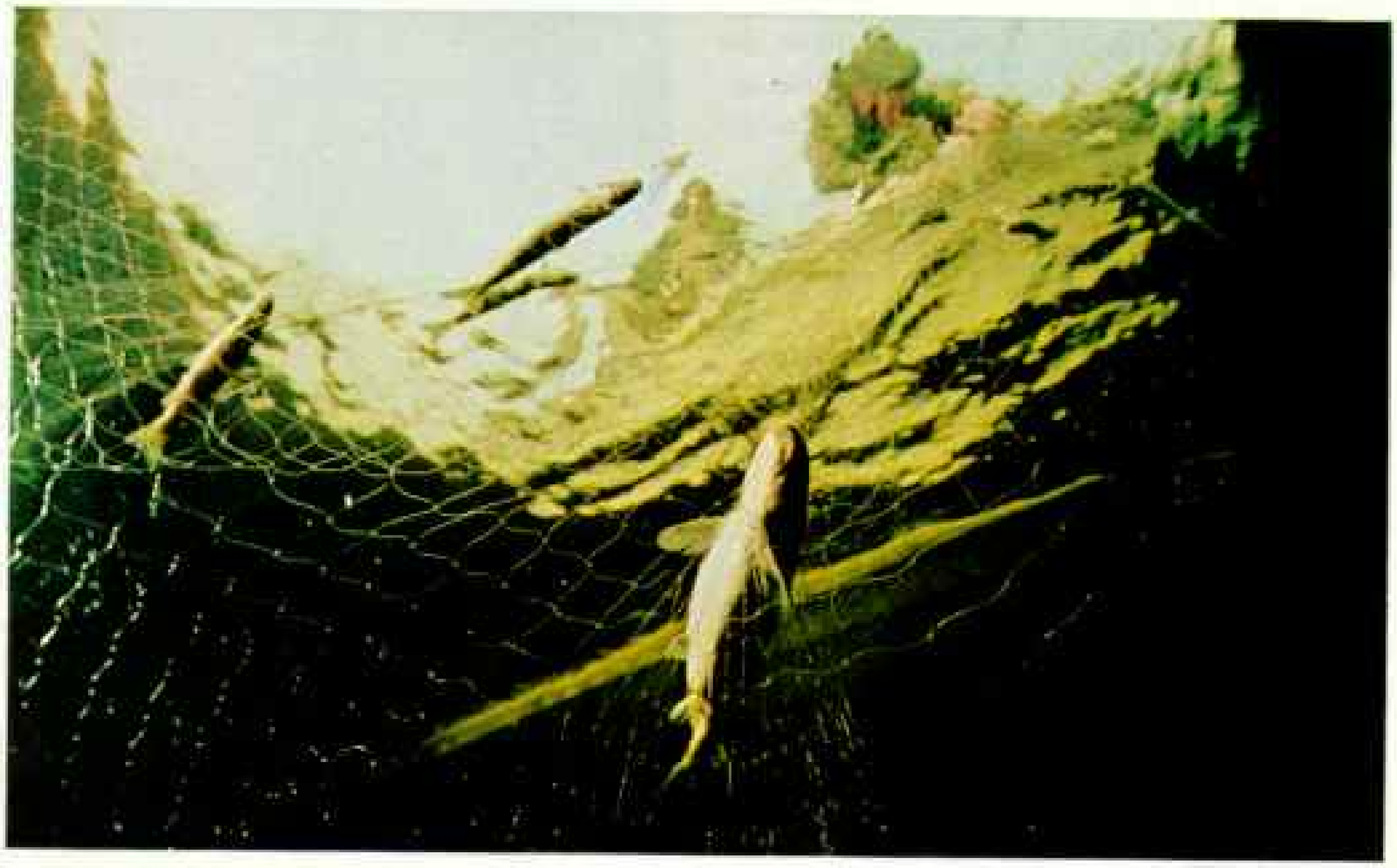
It was good to be there on that day of breezy warmth, when the sappy musk of August carried in the air. Soon the summer would end, I knew, so I looked around me and tried to visualize what it might have been like with the track of Highland cattle in the snow and the yellow stain of light in the windows of a cottage heated by a peat fire.

Looking down at the loch, I wondered about that too. And that's when I saw it.

It wasn't a long neck, or small head, or even an enormous hump. What I saw was a mirror reflecting the human need for mystery at a time when the moon is being explored, when the oceans are spanned in less than a day, when men probe the icy secrets of the South Pole.

For myself, I saw in the mirror a reflection of a need for at least wanting to believe that something outrageous swims in the darkness of Loch Ness. □

More food for thought: To have survived through the ages, there would have to be a viable population of monsters in the loch, needing ample food. Some think the lake's thousands of migratory salmon (**above**) might be enough. Working with Scottish biologist Ronald Greer, photographer Doubilet discovered through netting tests of the lake's depths that the arctic char population (**below**) was much larger than previously shown. Hope still glimmers for those who believe.



WITH BY DAVID DOUBILET

South Africa's Lonely Ordeal

By WILLIAM S. ELLIS

Photographs by
JAMES P. BLAIR
BOTH NATIONAL GEOGRAPHIC STAFF

SPRING COMES LATE in the year to South Africa, and on an October day textured with the glory of new life stirring in the earth, an old woman spoke to me of dreams and death. She was a Zulu and a diviner, and she lived in a solemn place called Nondweni.

"Three times a man on a white horse has appeared to me in dreams," she said in a voice that seemed drawn from a well of fear. "He says that Shaka is angry and that is why there is so much trouble in South Africa today. He instructs me to tell the chief of our tribe that Shaka will talk to him if he will come to a certain place and bring 15 head of oxen for sacrifice. But I do not have the courage to approach our chief, and so the man on the white horse says I must die."

Shaka, the Zulu warrior-king whose barbaric genius won him an empire, was assassinated in 1828. Among his last words, legend has it, was a warning to his slayers that they would never rule after his death because the "swallows" had started to arrive. The reference was to the white man, who, like the swallow, used mud to build his house.

"What is it that Shaka wishes to tell the chief?" Without answering my question, she rose from the grassy embankment where we sat and walked away, squinting her eyes as she turned to face the gritty wind.

In the course of six weeks in that tense and troubled, but still lovely, land at the bottom of the African Continent (map, pages 786-7), I would encounter other nightmares. There

The reality of everyday life overwhelms Esline Shuenyane, a social worker, as she views conditions in a home in the all-black township of Soweto. Ten adults and 11 children crowd the three-room house. Yet the scene mirrors only half their lives. The other half takes place in nearby Johannesburg, where they work and where they must obey

a litany of restrictions—but where they may not reside.

This is apartheid—literally "apartness"—South Africa's policy of separation of the races. The government is taking apartheid a giant step further with its plan to create independent nations out of the black tribes' traditional homelands, which together comprise 13 percent of the land, including half of the most fertile. The remaining 87 percent will be in the hands of the 4,300,000 whites, whose enterprise has made the country the richest and most powerful in Africa. This policy of separate development of the nation's 16,500,000 blacks lies at the heart of the turmoil affecting South Africa.

Mother city of the nation, in one of the world's most striking settings, Cape Town nestles beneath Table Mountain, center, and neighboring peaks. In 1652 the Dutch East India

was raging anger and riot, fear and confusion. And there were young people falling—dying—in the streets of Soweto.

It is called a township, but Soweto is more than that. It is Fortress Black Africa in a nation grown wealthy on black labor and white-minority rule (pages 798-9). It was in Soweto that the troubles started last June with a student protest. It was in Soweto that a black workers' strike was organized. It was in Soweto, more than any other place, that youngsters gave form and expression to a new militancy that has astounded their parents.

Perhaps a million people live in Soweto. All are black, with the largest single tribal group being Zulu. Most of those who work do so in Johannesburg, 15 miles away, and in the suburbs of that largest of South African cities. At night, when they return to the workers' dormitories and small houses, there is outrageous crime. Indeed, few cities, if any, in the world have a higher crime rate than Soweto

Company founded South Africa's first white settlement here. Today the city serves as the seat of Parliament. The administrative capital, Pretoria, lies 800 miles away.

(in September 1976 there were 145 reported murders), and certainly none is more tightly primed for combustive mob violence.

"It's like having a bomb in your backyard," a white businessman said. "But what can we do? Without the manpower we draw from there, Johannesburg would not survive."

Soweto is a creature of apartheid, which means "apartness" in Afrikaans, the language of the Afrikaners whose Dutch forebears settled this land. Apartheid: keeping the whites in one place and the nonwhites in others. The word has become a linguistic melanoma. It had brought widespread condemnation down on South Africa, but not enough to crush the resolve of Balthazar John Vorster, Prime Minister of South Africa (page 790), who once said to me, "Thank God I sleep well."

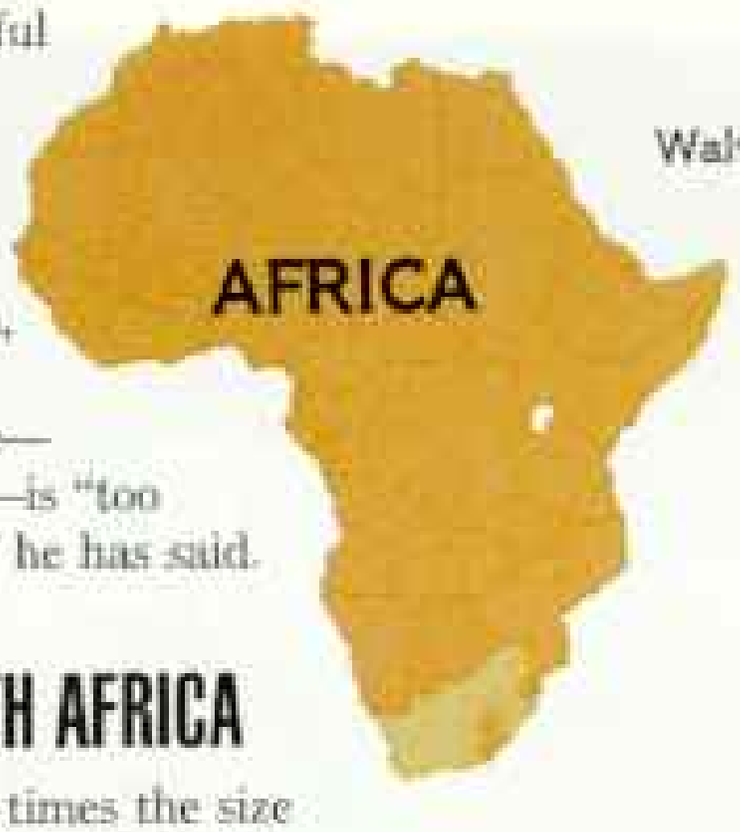
Many Afrikaners say that apartheid—it is now sometimes referred to as "plural democracy"—is not fully understood outside the country. There is *(Continued on page 788)*

"**The white tribe,**" Afrikaners sometimes call themselves, to underscore their role in Africa. Speaking a Dutch-based language called Afrikaans, they are descendants of Dutch, German, and French Huguenot settlers who arrived some 300 years ago. To escape the rule of the British, who acquired the Cape of Good Hope in 1806, the settlers organized the Great Trek into the interior in 1835. Today's Afrikaners maintain that their forebears, unlike other white colonizers in Africa, took over essentially empty land, and that they encountered black tribes migrating southward as they drove east and north. Thus, they say, "We have as much right to the land as the blacks."

An Afrikaner in Bloemfontein, Sophy McLaren, reverently awaits the beginning of the service in a Dutch Reformed church (**left**). In Bethlehem three families sharing Sunday dinner enjoy one of South Africa's excellent wines (**above**). Robbie Blake, in the 200-year-old house at his Stellenbosch vineyards (**right**), reflects the flinty pioneer spirit of the Afrikaners.

Turmoil in southern Africa

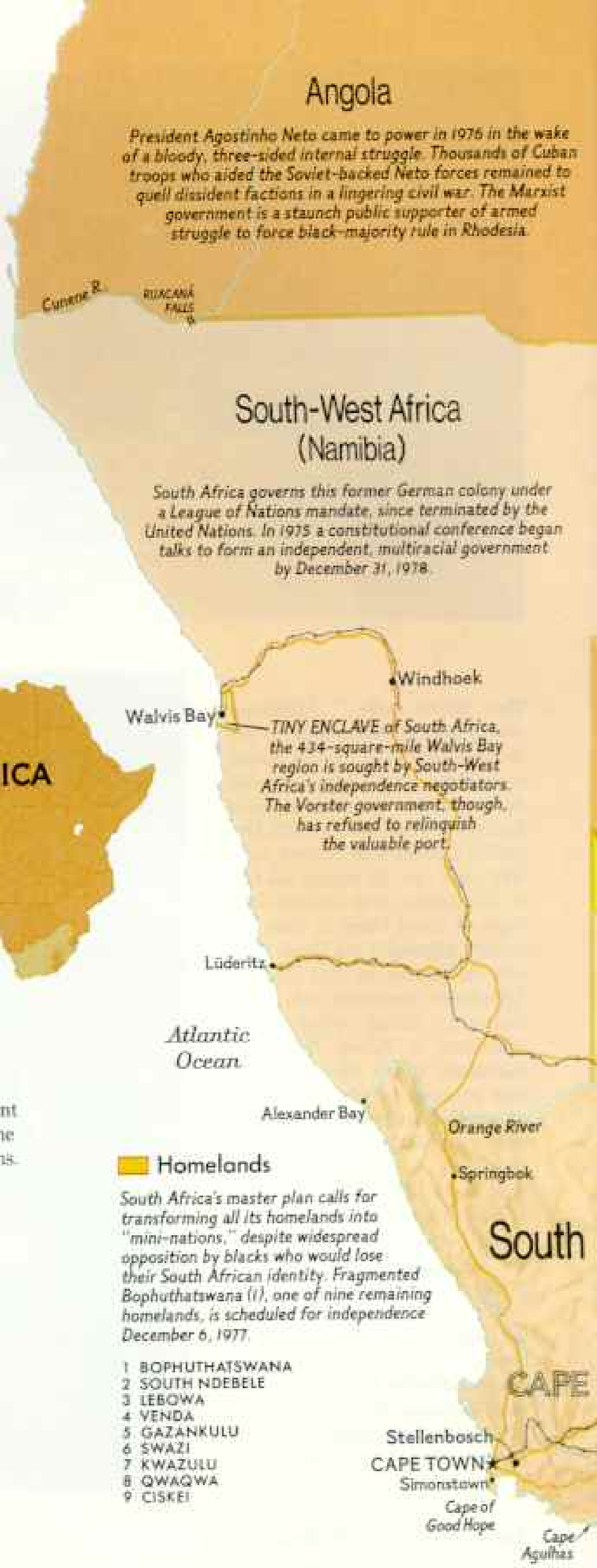
THEIR BACKS TO THE SEA, white South Africans stand besieged in a continent intent on ridding itself of the last vestiges of white-minority rule. In 1975 Portugal, fighting political upheaval at home, granted independence to Mozambique and Angola to end a costly guerrilla war. Last fall, under pressure from the United States, Britain, and South Africa, white-ruled Rhodesia bowed to the principle of black-majority government, although initial consultations to achieve this collapsed. At the same time John Vorster, South Africa's Prime Minister, agreed to the creation of an independent Namibia, or South-West Africa, within two years. In 1975 Vorster, seeking a peaceful climate in Africa, pursued a fence-mending policy with several black-ruled nations, notably Zambia, the Ivory Coast, and Senegal. The alternative—a full-blown racial war—is "too ghastly to contemplate," he has said.



SOUTH AFRICA

Three times the size of California, South Africa sits atop a treasure-house of underground wealth. It sells to the rest of the world 54 different minerals, including three-fourths of all the gold produced by non-Communist nations.

GOVERNMENT: Parliamentary republic. **AREA:** 454,443 square miles, only 15 percent arable. **POPULATION:** Approximately 24 million, 69 percent blacks, 18 percent whites, 10 percent Coloureds, and 3 percent Asians. **ECONOMY:** Minerals, corn, wool, sugar-cane, wheat, steel, and textiles. **RELIGION:** Christian, Muslim, Hindu, animist. **CURRENCY:** One rand equals about 1.15 U. S. dollars. **MAJOR CITIES:** Johannesburg (pop. 1,500,000), Durban (837,000), Cape Town, parliamentary capital (818,000), Pretoria, administrative capital (614,000). **CLIMATE:** Generally temperate.



Zambia

President Kenneth Kaunda has dealt with both South Africa and Rhodesia, seeking a peaceful solution for the latter's racial problems. Nonetheless, Zambia is a base for Rhodesian and South-West African rebels.

Malawi

★Lusaka

CABORA BASSA DAM

Zambezi River

KARIBA DAM

CAPRIVI STRIP

VICTORIA FALLS

Rhodesia

★Salisbury

A bastion of white power, the former self-governing colony broke away from Britain in 1965. Last year Prime Minister Ian Smith reluctantly accepted the concept of black-majority rule, but initial progress was hindered by hard-line bargaining positions by both black and white negotiators. Antigovernment guerrilla warfare continued.

KEY RAILROADS funneling Rhodesian products to South African ports represent Rhodesia's only remaining economic link with the rest of the world.

Bulawayo

Beira

Botswana

All formerly British protectorates, Botswana and Lesotho gained independence in 1966, and Swaziland followed two years later. Early in 1977 black Rhodesian rebels began using Botswana as a way station en route to guerrilla training camps in Zambia.

Mozambique

Since gaining independence from Portugal in 1975, this avowed Marxist-Leninist nation has served as a sanctuary for several thousand black Rhodesian guerrillas. Yet Mozambique, like Botswana and Lesotho, still has thousands of workers in South Africa.

Messina

Limpopo River

Louis Trichardt

Pietersburg

KRUGER NATIONAL PARK

Gaborone

TRANSVAAL

Skukuza

KALAHARI GEMSBOK NATIONAL PARK

Mafeking

PRETORIA

Krugersdorp

JOHANNESBURG

Maputo

Deelpan

Ga-Malaka

Witwatersrand

Mbabane

Swaziland

Vereeniging

Ermelo

Vaal Dam

Amersfoort

ORANGE

Indian Ocean

Upington

Blood River

Nondweni

Ulundi

Bethlehem

Ngutu

Kimberley

FREE

Ladysmith

Richard's Bay

Dukuza

ROYAL NATAL NATIONAL PARK

Bloemfontein

Maseru

NATAL

STATE

Lesotho

Pietermaritzburg

Botha's Hill

Durban

Umzimkulu

Africa

De Aar

Transkei

Umtata

Beaufort West

Graaff-Reinet

Queenstown

OF GOOD HOPE

Alice

Dimbaza

King William's Town

East London

Oudtshoorn

George

Grahamstown

Knysna

Port Elizabeth

Mossel Bay

Transkei, on October 26, 1976, became the first black homeland to be declared independent by South Africa. Thus far no other country in the world has recognized the new entity as a separate nation. The 17,000-square-mile region remains economically dependent on its parent country.

0 KILOMETERS 250

0 STATUTE MILES 250

DRAWN BY JAIME QUINTERO
NATIONAL GEOGRAPHIC ART DIVISION

(Continued from page 783) truth in that. For one thing, apartheid, as official government policy, is less than thirty years old. It was with a mandate to institute the practice that the National Party came to power in 1948. Since that time, in order to give legality to almost all forms of racial separation, the government has legislated as heavily as any government in history. South Africans of all colors order their lives from a catalog of acts.

Thus there are complexities, and they are compounded by certain anomalies involving the role of the white man in early South African history. The Dutch came to the Cape—empty then except for a scattering of Hottentots and Bushmen—not as 19th-century colonialists, but as 17th-century settlers. They regard themselves as no less an African tribe than, say, the Zulus. From their ancestors, the Voortrekkers who pushed northeast from Cape Colony to claim the land with its wealth of beauty and natural resources, they have drawn lessons in strength and courage.

Most Nationalist Afrikaners of today are convinced that those hard-won gains must be preserved, just as many are convinced that what they do to preserve them carries the seal of Biblical righteousness. It was the Lord, they say, who planted this new nation in Africa, and it was He who decreed that there be racial purity within its bounds.

Allied with Deity or not, the white stewardship of South Africa and its 16.5 million blacks (white population: 4.3 million) is now faced with a serious internal challenge. It may be that developments over the past year have set the stage for the last stand of racial-minority rule in Africa. This is a voice from Soweto: "We are the last generation [of blacks] . . . who will ask for dialogue, and if it does not come about, we can expect something worse than the riots."

Student Protest Ended in Violence

The first riot occurred last June 16 when black students protested against the use of Afrikaans as an additional teaching language. It didn't stop with that, even after the government rescinded the requirement. After bullets from police guns tore into the ranks of demonstrating teenagers, buses and buildings took fire from petrol bombs. Work stoppages were called, and some of those who chose to ignore them returned to Soweto after a day on the job to find nothing but smoldering rubble where their houses had stood.

On the first day of the first strike the trains and buses that shuttle more than 250,000 persons daily between Soweto and Johannesburg ran all but empty. The job-absentee rate reached 70 percent. The great, gleaming city built on gold slowed. The streets, suddenly, were devoid of the mass of blacks sweeping sidewalks, washing windows, moving from building to building as bearers of goods and messages, waiting, always waiting, for slow-moving freight elevators and dispatchings of boss men.

Strike Was a Double-edged Sword

Appraisals of the impact varied. Some businessmen admitted to hardships. Prime Minister Vorster said the action served only to harm the black worker. "Not only did businessmen and industrialists find they were overstaffed, but they started to make changes," he told me. "And that is the danger as far as the black is concerned. If he doesn't look after his work, employers will make changes."

Black labor is cheap in South Africa, and some employers use it in saturation quantities. Without question, jobs could be abolished in rather large numbers before the economy would start to totter. Such a move would affect not only South Africa's blacks but also many from neighboring countries. There are 150,000 citizens of Lesotho employed in South Africa, together with 60,000 from Mozambique and additional thousands from Botswana and Rhodesia.

"For generations to come," Vorster said, "the main export of African countries will be labor, because they cannot create the job opportunities in their own countries. At the moment they can find work only in South Africa. If we were to tell Lesotho tomorrow, 'You must take back your 150,000 workers here,' can you imagine what would happen to the economy there?"

Whatever harm or good they caused, the fact that strikes came off at all was something of a triumph for those who participated, for the protest movement among blacks in South Africa is without clearly defined leadership. No Shaka exists around whom tens of thousands rally for the soul-firing fuel of his words and presence—no one, even, to cast saintly spells over the downtrodden with the magic

of the liturgy. Attorneys Nelson Mandela and Robert Sobukwe are two South African blacks who might have assumed such leadership roles, but the government has imprisoned the former and banned all political activity by the latter.

There are only shadows of leadership. And they are cast, more often than not, by teenagers assembled in casual conspiracies. Their generation is the first to grow up in an Africa no longer completely dominated by whites. They themselves, however, like their counterparts in Rhodesia,* have lived under the harsh restrictions of white-minority rule since birth. The thought of living under them until death gives rise to a certain desperation. That in turn has made them militant, and they have become that way without parental blessing.

"The parents in Soweto have lost control," Mrs. Esline Shuenyane said. "They do not understand the grievances of their children." Mrs. Shuenyane is a social worker, and the burden of her activities since the disturbances began has at times been difficult to bear (pages 780-81). Talking with her, I sensed despair, as if she had gone through her manual of case studies and failed to find precedents for dealing with revolution as a puberty rite.

Many of the parents were born in rural villages where there were no jobs, no way for a man to earn money for the cattle he would need to become someone of importance. There was little to eat, and surviving marasmus as a child brought no immunity against tuberculosis as an adult. So the men left. More and more of them went away to the cities, until today there are maleless societies along the back roads of South Africa—along a road, for example, that leads out of Nqutu.

Village Life Lonely for Women

It's good that I knew the way to Nqutu and didn't have to ask for directions. The name is difficult to pronounce. It's done with a click of the tongue against the roof of the mouth, as one might do to urge a horse to move: *Nuh*(click)*tu*.

The town is in Zululand, in northern Natal.† It is a brown and parched place most of the year. And noisy too, with the gassy wheezings of the old buses that come and go through most of the day. There is a small, but clean and comfortable, hotel run by whites for whites only. There is also a hospital, and that is for blacks only. Though the law suspends apartheid in dire emergencies, it is not unknown for a person to die in South Africa because hospital personnel let their fears of violating the law override medical concerns.

The hospital, which provides treatment for a basic, minimal fee, serves an area of almost 700 square miles in which 95,000 persons live. One of them is Khathazile Thusini, a 65-year-old woman whose home is among a group of traditional Zulu huts that sit on a slight rise a hundred yards or so back from a dirt road. When I first saw her, she was hunkered down, chipping at a large stone with a mallet. Her five daughters were there, and grandchildren too, one of whom, a young boy, clung to her neck in a throttling embrace.

Of the 15 members of the family present, not one was an adult male. The husbands and brothers of the daughters were away in the cities, working. They wouldn't be home until Christmas, if then. Meanwhile, money was being sent back, but, most likely, the letters would become more and more infrequent with the passage of time. And also with the passage of time, the seductiveness of the city would spread like lichen, choking off loneliness and the longing for home.

Stringent Laws Control Movements

Under the plan of things for South Africa, as drafted or amended by the Nationalist government, the more than five million blacks living in urban areas are not to be in permanent residence there. The government holds the power to order the urban black back to the native homeland of his or her tribe. It's all legal under Section 10 of the Bantu Urban Areas Consolidation Act. (Bantu is the government's name for tribes, such as the Zulu and Xhosa, who first came to southern Africa as migrants from the north.) Of all the laws of apartheid, none is more feared by blacks with city jobs than Section 10.

It is South African law that a black who is 16 or older must carry a passbook at all times. The information on those few grimy, well-fingered pages is meant to establish the right of the bearer to be in the area. There is no winking by authorities at Section 10; in

* "Rhodesia, a House Divided," by Allan C. Fisher, Jr., appeared in NATIONAL GEOGRAPHIC, May 1975.

†See "The Zulus: Black Nation in a Land of Apartheid," by Joseph Judge, GEOGRAPHIC, December 1971.

The official view

Resolute Prime Minister John Vorster (**right**) defends and implements the "separate development" of his nation. "As far as the blacks are concerned, it *is* a question of one man, one vote—but in their own countries, among their own peoples," he told the author.

Newly appointed Foreign Minister Roelof F. Botha, South Africa's former Ambassador to the United States and the United Nations, feels that much of the information disseminated about his country "is completely unsubstantiated and unbelievably one-sided and distorted.

"Critics of the South African Government," Botha says, "refuse to admit that a just political dispensation can be achieved . . . by a division of political power which can accommodate black and white nationalisms while at the same time introducing far-reaching . . . changes in discrimination based on color." His government, he adds, is "committed to moving away from discrimination based solely on the color of a man's skin, but we cannot abandon our right to self-determination. . . .

"All other African black nations govern themselves. . . . We have been in Africa 300 years and have the same right to govern ourselves as they. This right we cannot and will not forfeit."

Thus, in his view, the search for "human rights and values, dignities and freedoms" by South Africa's tribal blacks will end successfully—but in their own homeland nations, not as citizens of South Africa. He also voices the opinion that "the alternative of forcing disparate peoples into one system will cause untold misery to both black and white."

The vocal few

Cries against apartheid come from vastly outnumbered white reformers. Alan Paton (**right**), author of *Cry, the Beloved Country*, believes that "the supreme irrational axiom is that . . . you can in fact *compel* people . . . to develop separately." Helen Suzman (**right, center**) of the Progressive Reform Party calls for voting rights for nonwhites. Another critic of apartheid is gold and diamond magnate Harry Oppenheimer (**far right**).

The voiceless

Silenced for dissent, about 150 persons are banned by government pronouncement from leaving the city or township they live in, talking with more than two people at a time, publishing anything, teaching anyone, having visitors at home, or being quoted by the press. Among the banned are Fatima Meer (**left**), an Indian and a strong voice for nonwhites, Steve Biko (**left, middle**), former leader of the South African Students' Organization, and Winnie Mandela (**below**), a founder of the Black Parents' Association. Many of the banned were also among some 700 people detained last year under the internal security laws, which permit indefinite confinement without trial.

Dressed to the nines for the wedding of his son, a wealthy industrialist (**above**) shares a moment with a cousin of the groom. In a well-to-do Johannesburg home, black servants prepare for a dinner party before putting the family's children to bed (**facing page**). The youngsters' parents are English-speaking, the group that dominates industry and banking and comprises 38 percent of the white population. Black domestics may live on the grounds of white households, but may not have their families with them.

some years arrests for violations of the passbook laws have averaged more than 1,500 a day. If found guilty, the person is "endorsed out"—ordered back to the tribal homeland.

"They have the right to appeal within seven days," Mrs. Sheena Duncan said. "We help them do that." Mrs. Duncan, a white woman, is president of Black Sash, an organization that has been helping nonwhites and bedeviling the Nationalist government for more than twenty years. "At first we were known as the Women's Defense of the Constitution," she said, "but the press gave us the name Black Sash. That was because we wore black sashes as a sign of mourning for the rape of the constitution."

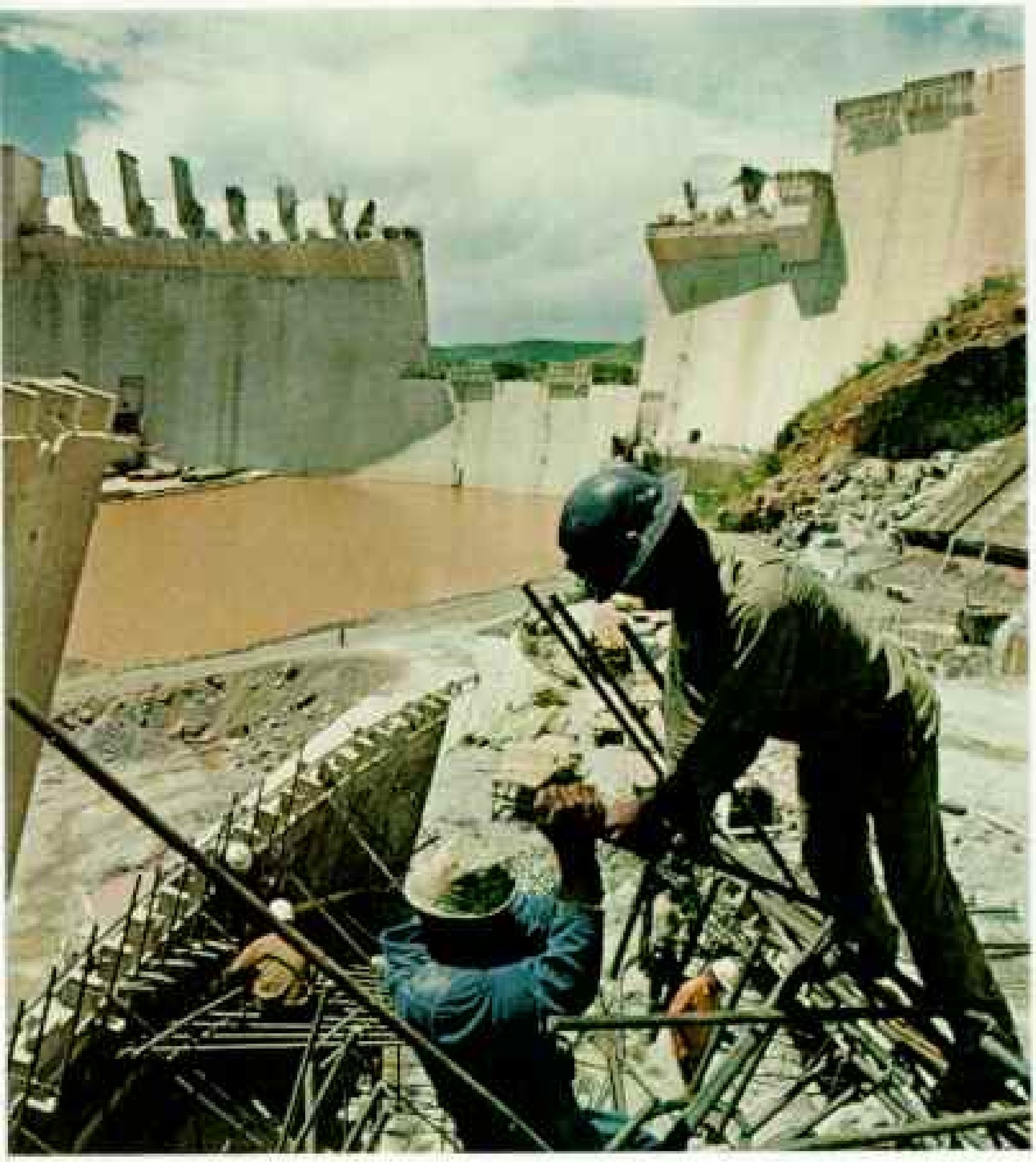
Black Sash headquarters is in an office building on Marshall Street in Johannesburg. On most days blacks are there in large numbers to seek assistance. Mrs. Duncan pointed to one, a young, frail woman, and said:

"She comes from Amersfoort in the Transvaal. She has no legal right to be in Johannesburg, and there is no way we can get around it. She's unmarried but has two children to support. She must work. She can either go back to Amersfoort or stay illegally in Johannesburg. I would be very surprised if she went back, because she can't afford to do that. She can't afford to go back and sit there and watch her children starve."

Toys Mark Dimbaza's Graves

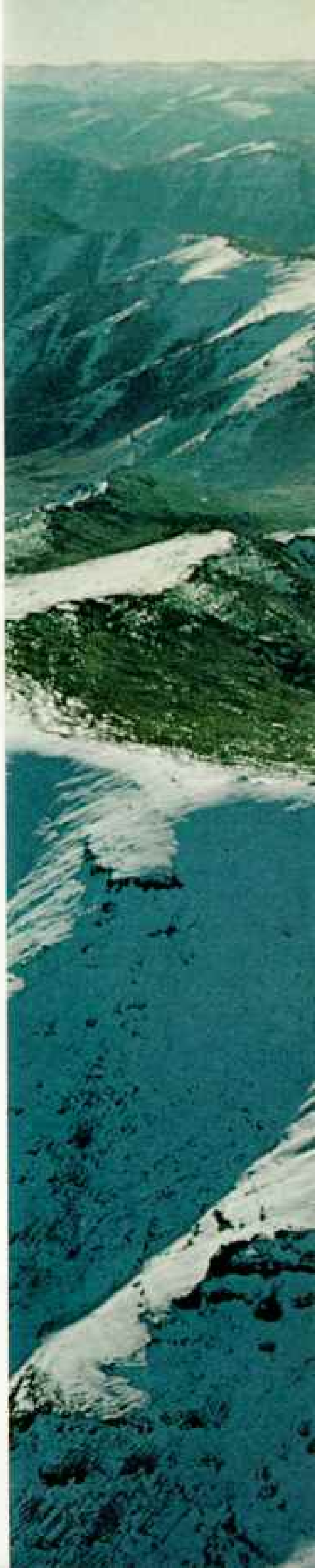
It is an ugly truth that children have starved in South Africa because of this herdlike control of people. At Dimbaza, it is only when you come close that you see the narrow, short mounds spread out in rows. Each has a steel rod at one end, bearing a name and a number. The last rod in the last row is number 908. And that's the number of children buried in a field behind the houses of Dimbaza.

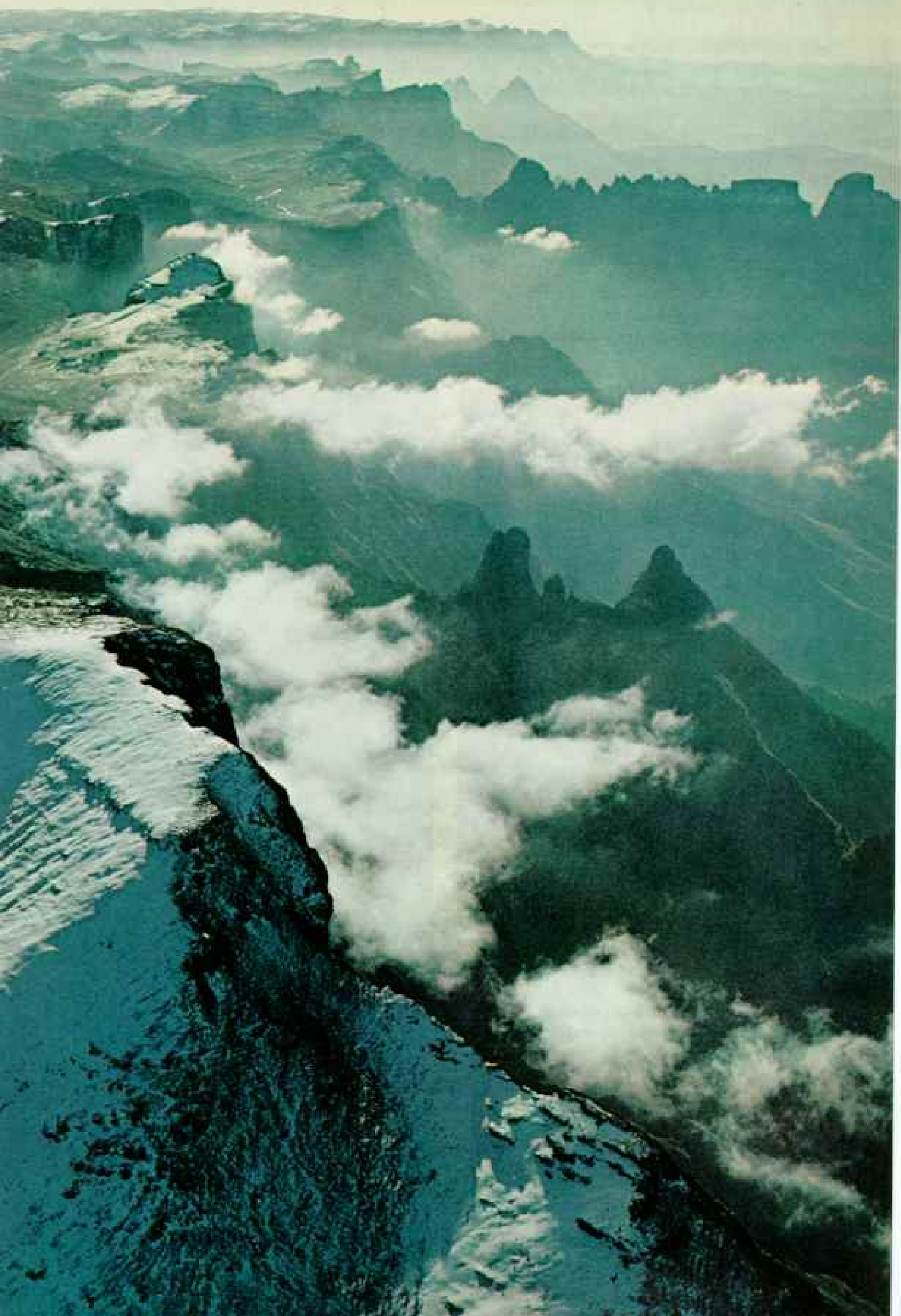
They started dying in the late 1960's, shortly after Dimbaza was created as a resettlement area for thousands of blacks. It was a forced move. Uprooted and thrown into a new environment where there was no way to make a living—where, at first, there wasn't even a supply of drinking water—the people experienced hunger and suffering. Fresh graves were dug for the children each day, and sometimes, when one was buried and the last spadeful of earth was added to the mound, the mother would *(Continued on page 796)*



"**Spine of a dragon.**" Thus these craggy peaks seemed to the Afrikaners who trekked over the vast escarpment (**right**); they named it the Drakensberg range. Beyond the snow-capped ridge lies part of the 20,000-acre Royal Natal National Park. After taming such rugged country, Afrikaner and British pioneers laid the foundations for the nation that has become today's economic colossus.

Workers bend reinforcing rods into a concrete mold for the massive P. K. le Roux Dam (**above**) on the Orange River, the nation's largest and longest. The dam will harness rampaging floodwaters to provide 770 billion gallons for irrigation. The project reflects South Africa's usually booming economy. However, recent double-digit inflation and fluctuating gold prices have slowed the pace.





kneel and place one of the child's toys on the site. Most times it was a doll. A white doll.

A puppy lurched along at my side as I walked through the field, reminding myself that I mustn't be maudlin when writing about the graves of Dimbaza. So rather than say that I wept when I set a toppled toy straight, I'll say that I laughed when the puppy tried to spear a butterfly with his art gum eraser of a nose.

Amid the Turmoil, Beauty

Riots, hunger, uncertainty.... Yes, all of that, but the jacarandas continue to bloom in Pretoria, and the blue-purple shawl that falls over the city is a distraction from the unpleasantries. South Africa is like that, like a zitherist plucking on the emotions to draw chords of pain and delight. If there is a Soweto, there is also a Cape Town, in a setting often called one of the most spectacular in the world (pages 782-3). There is the Drakensberg range, and the coast at Durban, where the Indian Ocean rolls in with a fierce and wonderful slap of surf. The gold of the Witwatersrand, and diamonds in the earth at Kimberley. And Kruger National Park in the north (pages 808-809), where impalas are everywhere, thousands of tawny-skinned impalas dancing on the veld.

PETER MAGUBANE (RIGHT)

As gold goes, so goes the country. South Africa produces more of it than anyone else, in excess of two billion dollars' worth a year. Krugerrands, each worth about $120, glitter in the South African Mint (**above**). To mine its mineral treasures, the nation depends largely on blacks, like these workers in a dormitory at the City Deep Mine in Johannesburg (**right**). The industry also draws thousands of blacks from Lesotho, Botswana, Rhodesia, and Mozambique.

There is nothing quite like it in the rest of Africa. The Afrikaner has become one with this land, and that is why peace is not likely to come soon to South Africa. More than three hundred years of history have laminated soul to soil. Any loosening of the bind, even for purposes of reason and fairness, is both painful and frightening.

In April of 1652 the first mate of the Dutch ship *Drommedaris*, three and a half months out of Texel, sighted Table Mountain at today's Cape Town. On board was Jan van Riebeeck. His mission was to establish a way-stop at the Cape of Good Hope for the Dutch East India Company. It would be a station where trading vessels could put in for provisions and medical care. Other people were there before the *Drommedaris* docked. They were called Hottentots and Bushmen.

Before the turn of the century many new Dutch settlers had arrived, as well as black and Malay slaves and French Protestant Huguenots. Also, a new color classification had been added. Lighter than black and darker than white, offspring of master and slave, they would become known as Cape Coloureds. Today there are nearly 2.5 million Coloureds in South Africa, most of them in the Cape Town area. They too have become militant in demanding

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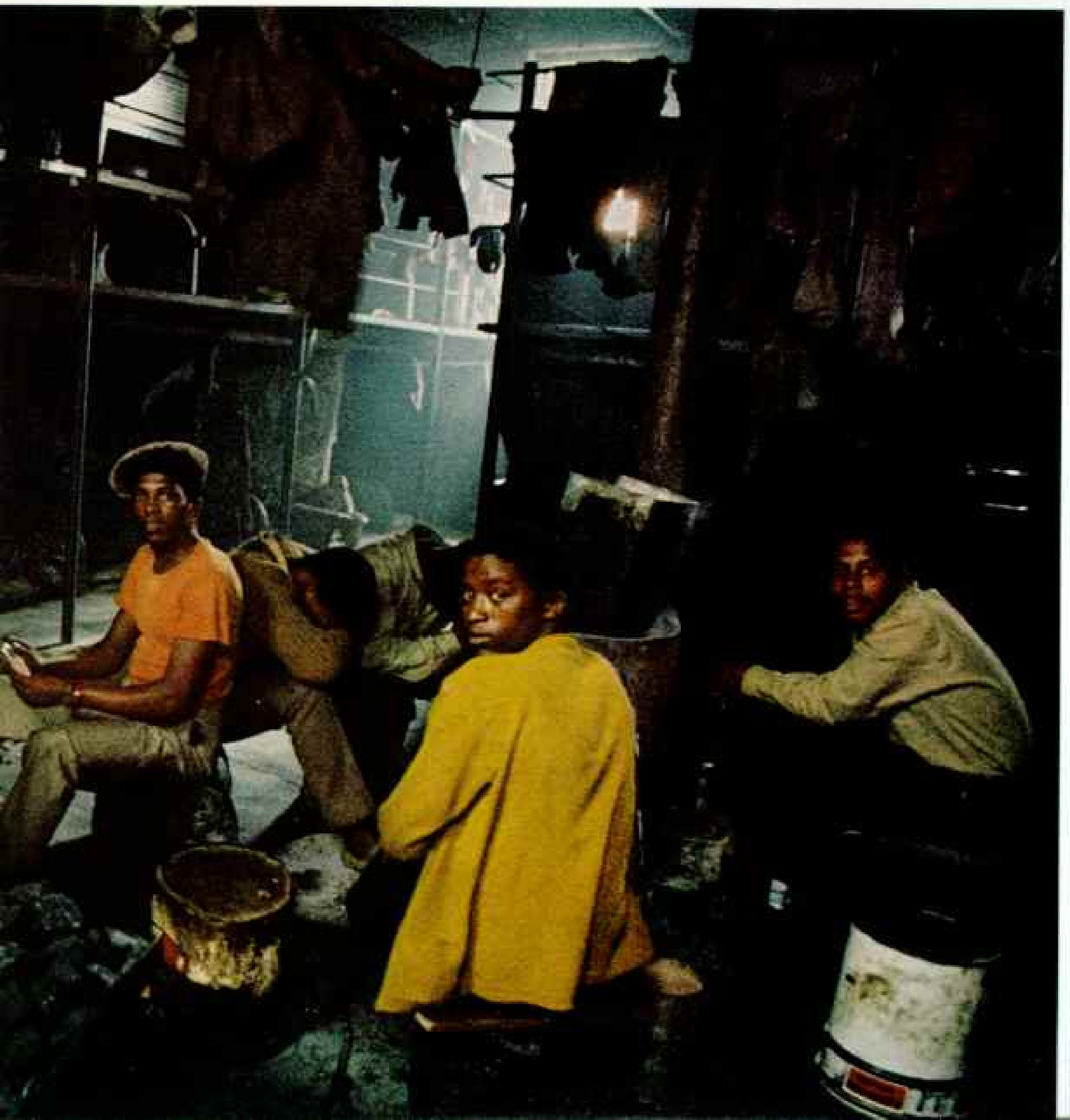


Brooding pallor caused largely by cookstoves fogs the Johannesburg suburb of Soweto at dusk (**left**). Most homes lack electricity. Estimates of the population of the overcrowded township range from 800,000 to 1,500,000, or one in five of all urban blacks in South Africa.

The nation's largest medical facility, Baragwanath Hospital, serves the community; its 2,400 beds often are not enough. An intensive-care unit provides model treatment for a patient connected to an artificial-kidney machine (**above**).

In a vocational center, a white instructor trains blacks as primary-school teachers (**top**). South Africa devotes roughly 10 percent of its national budget to black health, education, welfare, and economic development.

In June 1976 riots exploded in Soweto and other black townships, initially in protest against the compulsory use of Afrikaans as well as English in black schools. Some 500 persons—two of them white—were killed. The government subsequently rescinded its edict.

Uprooted people, members of the Bakalobeng tribe ride by bus from a village that was theirs for a hundred years to the new town of Deelpan in the homeland called Bophuthatswana. The chief of the 45,000-member tribe, Kelly Molete, calls the relocation site "a swampy, uninhabitable wasteland. Our future is bleak." He charges that his people's new home lacks potable water and that the nearest hospital is ninety miles away.

The government says it will provide the homelands with all the economic aid they need to become viable, independent

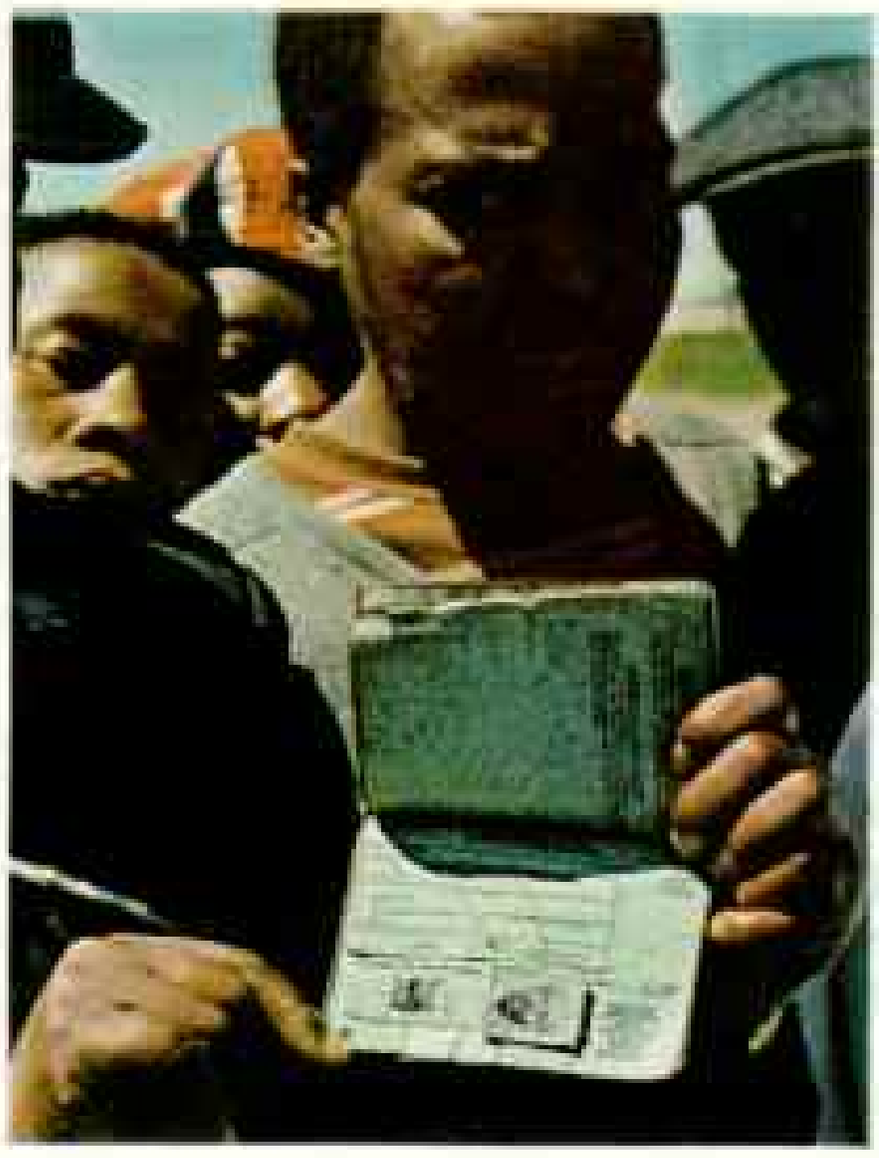
states. Even after they are declared independent, however, the enclaves could long remain pools of inexpensive labor for white South Africa. About eight million people now live in such reserves, including more than a million moved from former locations.

Makeshift housing gives temporary shelter to 800 Zulu families in Nondweni, a township in the KwaZulu homeland (**below**). After the people move in, they will build permanent homes. The government plans to construct two schools and a clinic here, as well as a reservoir to supply water. The Zulus' chief minister, Gatsha Buthelezi, steadfastly opposes the homelands policy.

A mother's memorial: The cherished doll of a child marks her small grave in Dimbaza, a resettlement village (**above**), where since 1968 more than 900 children have died of disease and malnutrition. Government funds have now turned the village into a showcase community.

Neither black nor white, a group of the nation's 2.4 million Coloureds—descended from the intermingling of white settlers, Hottentots, and black and Malay slaves—gather in their village on the outskirts of Cape Town (**above**). The relative few who have escaped such poverty can buy land and property through 30-year mortgages. About 1,000 Coloured doctors, lawyers, teachers, and businessmen live in the government-built subdivision of Bel-Har (**right**).

The government is resettling more than 100,000 Coloureds in farmlands that their families had left for better jobs in the city.



"The document of my existence," black poet Oswald Joseph Mtshali calls the passbook (**above**), the instrument that controls the movement of blacks throughout the country. All blacks 16 or older must carry the booklets. They must identify the holder's tribal group and place of residence, and also contain employment records and monthly signatures of employers or guardians as well as tax receipts. Blacks must pay a poll tax even though they may not vote in national elections. A special stamp signifies whether the person has official permission to be in a specified urban area. Without it, he or she is ordered back to a tribal homeland. Lesser irregularities in the documents result in fines or jail sentences. Last year 250,000 blacks were arrested for pass-law violations.

(Continued from page 797)

changes.

The British captured the Cape in 1795, restored it to the Dutch in 1803, then took possession again in 1806. Colonialists arrived from Britain by the thousands, and the Dutch, many of whom were calling themselves Boers, or farmers, began to feel threatened. The abolishment of slavery in 1834 throughout the British Empire hastened the break. The following year the Boers started the Great Trek. Thus began the making of South Africa.

They moved north in small groups, borne in ox wagons. The rifle and Bible were always at hand. These were men, women, and children driven by Calvinistic zeal toward fulfillment of a destiny that was, they were certain, assigned in Heaven.

At times of danger the Boers would retreat into what was called the laager—positioning their wagons into a protective circle and locking them together at the wheels. It was in this position that 500 Boers met the onslaught of 12,000 Zulus. The year was 1838, and the place was along a bank of the Ncome River in Natal Province. The Ncome is now called Blood River, for the waters ran red as wave after wave of Zulus were annihilated when they attempted to cross and penetrate the circle of more than fifty wagons. True to their vow, the trekkers built a church in commemoration of their victory, a victory still celebrated as a national holiday on December 16, the Day of the Covenant.

Conflict Hardened Boers' Resolve

Wagons trundled over the veld for nearly twenty years as the Boers sought out new land where they could enjoy peace and security. They were not to escape the British, however. Natal fell into the reaches of the empire, as did the Transvaal. In 1899 British and Afrikaners went to war. The Anglo-Boer War lasted more than two years, and although the British won, it was in some ways a Pyrrhic victory. The Afrikaners were members of a highly disciplined tribe, and the discrimination and humiliation they were subjected to after the war only served to strengthen the spiritual laager into which they had withdrawn. They would survive and build a nation. That they knew.

And so they did. Together with English settlers, they built a nation unlike any other in Africa, a nation of wealth and orderliness. As farmers they drew bountiful crops from the earth. They took South Africa's meager supply of water and worked miracles. They constructed homes of beauty and durability. They developed their own language and made it work (not an easy thing to do when standing in judgment before the Oxonian voice of British colonial authority).

The Union of South Africa was formed in 1910, but even then there were stirrings of discontent among nonwhites. In Durban, for example, a nonviolent civil rights protest campaign was under way. The leader was an Indian attorney named Mohandas Gandhi.

A Ray of Hope at the Cape

Soon after my arrival in South Africa, I went to where it all began, to Cape Town. There are few cities in the world, to my way of thinking, with depth of both character and visual appeal. Cape Town is one. It sits at the bottom of that great continent, a city cleansed with the sparkle of seas and rouged with the shadow of mountains. It is where proteas bloom in a convention of floral splendor unsurpassed on earth.

Atop Table Mountain I watched a woman, a white South African with hints of Teutonic ancestry, as she looked down on the city and then out to the Cape of Good Hope. She stood there for the better part of an hour, unspeaking, and when she turned to leave, her face carried an expression that seemed to have been singed by the fires of emotion. We talked as the cable car, lurching like a wind-kicked kite, started down the mountain.

"I can't tell you how I feel when I'm up there," she said. "The views bring my love of this country into sharp focus. And I *do* love it—as much as any black, as much as any Coloured, and as much as any *verkrampte* [close-minded one] Afrikaner. There is enough time left to work out peaceful solutions to our problems. There has to be."

But time seemed to be running short in Cape Town. Only a few weeks earlier crowds of Coloureds had stormed through the center of the city, breaking windows, setting fires, challenging police guns with rocks and bottles. In days to follow, tension in the Coloured townships flared into violence. In one 24-hour period, the death toll reached 16.

The troubles came as something of a surprise to the whites. Passivity, apparently, had

been misread as contentment. In 1968 representation for the Coloureds in Parliament was abolished, and that, I was to hear over and over, was one of the most damaging mistakes the Nationalist government has made. For one thing, the number of Coloureds in South Africa will probably double by the end of the century, to approximately 4.7 million.

Acting quickly to deflate Coloured unrest, the government announced certain concessions it was willing to make, such as the opening of previously closed areas to Coloured businessmen and entrepreneurs. Meanwhile, the whites of Cape Town were lining up at gun shops to purchase weapons, and thus boost their distinction as the world's most heavily armed civilian population.

There were no disturbances, though, on that limpid Sunday morning when I followed the purple-toned wall of the Twelve Apostles mountains, along Victoria Road, to the beach at Llandudno. And I thought that this might be the beach that Sir Francis Drake saw from the deck of the *Golden Hind* as it rounded the Cape in 1580. Having looked, he wrote: "This Cape is a most stately thing and the fairest cape we saw in the whole circumference of the earth."

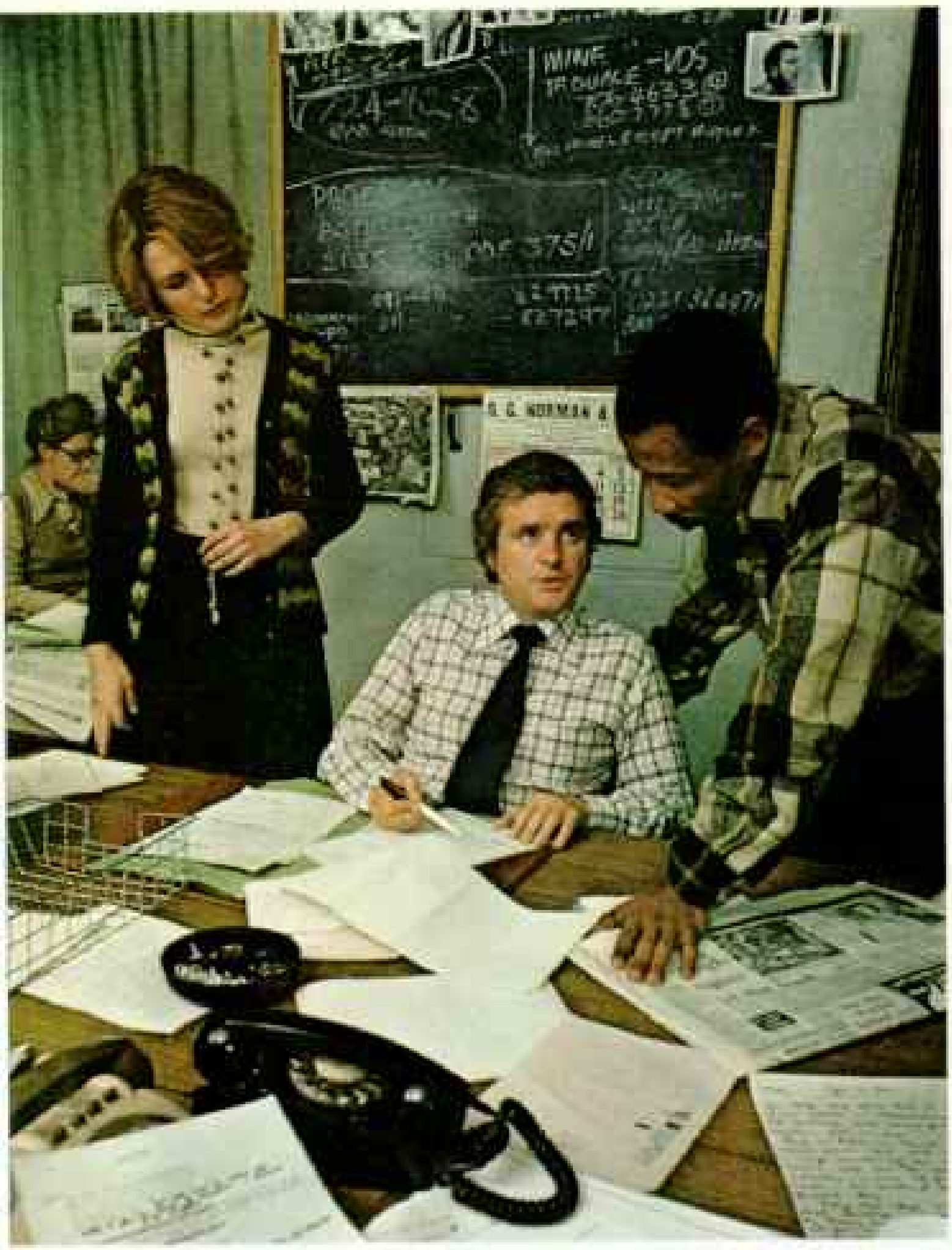
It is that, all right—stately and fair. On the west the frigid waters of the Atlantic funnel through the mouths of bays to wash up on talc-colored beaches. On the other side, the protected waters invite swimming. And there are flowers everywhere, more than 2,500 species of plants to robe the peninsula in vivid color.

Farms and Vineyards Grace the South

Unlike much of South Africa the Cape region is not blessed with minerals or other natural resources. The economy there is based largely on agriculture, including the growing of grapes for wine. Jan van Riebeeck planted the first vine, and by 1659 he could make this entry in his diary: "Today [February 2]—God be praised—wine pressed for the first time from Cape grapes . . . truly fine bouquet and taste."

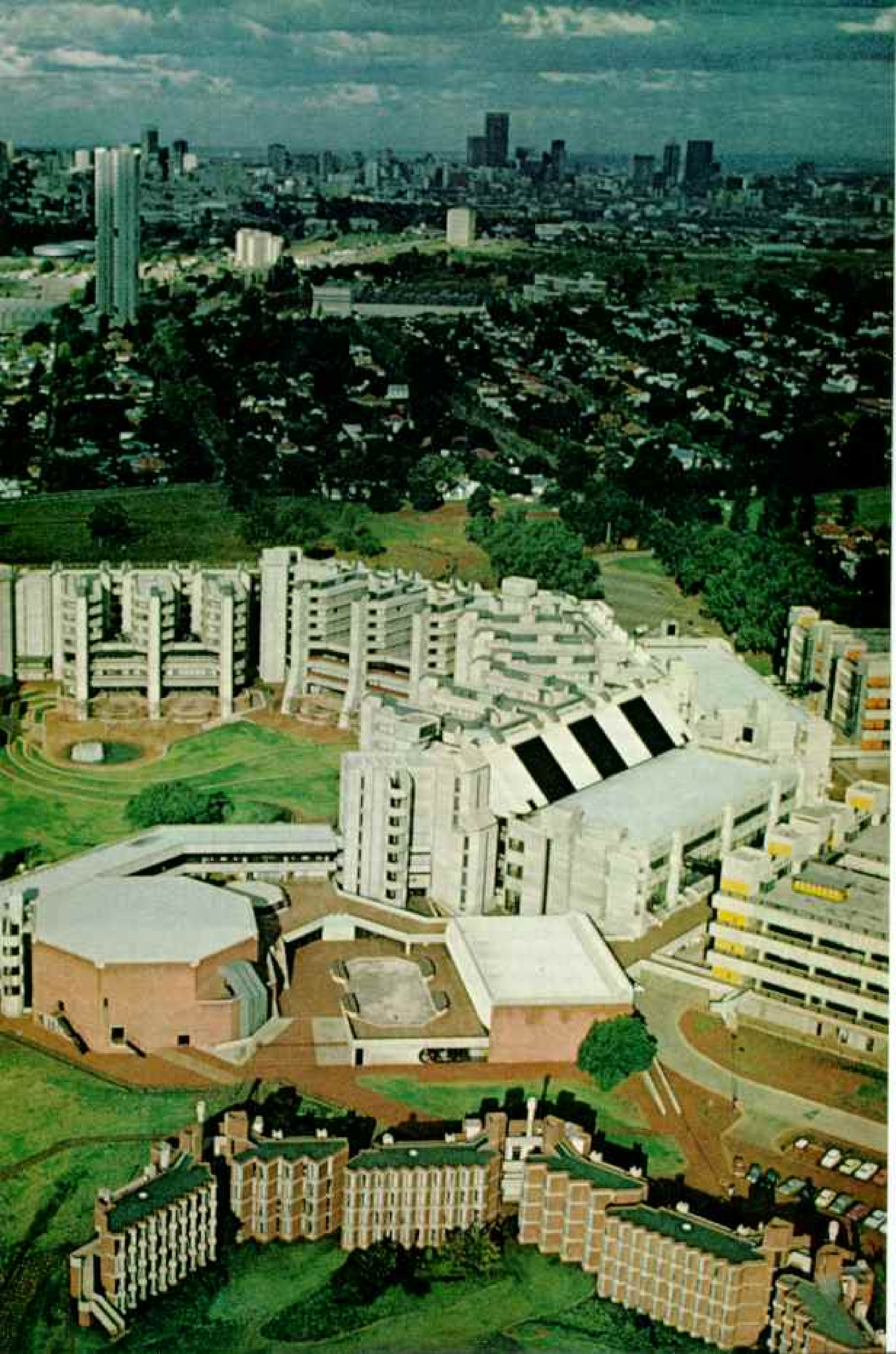
It was the Huguenots, however, who were responsible for establishing the tradition of excellent wines produced in South Africa.

Do-it-yourself health care created the Zanempilo Health Centre, developed with private funds by the Black Community Program to serve 15,000 people near King William's Town. Nurse Beauty Nongauza holds a healthy baby to emphasize the benefits of breast-feeding. Mothers come once a week for counseling and to have children examined by the center's two doctors and seven nurses.



City that gold built. Johannesburg was born in 1886, when rich gold ore was discovered here on the Witwatersrand Reef. Today the nation's biggest city is a nerve center for engineering, manufacturing, and communications as well. Reporters Helen Zille and Nat Serache confer with news editor Chris Day in the newsroom of the *Rand Daily Mail* (**above**). One of South Africa's most widely circulated English-language papers, it employs both blacks and whites as reporters.

A hub of learning and culture, the newly completed Rand Afrikaans University (**right**) in Johannesburg is one of eleven reserved for whites. South Africa also maintains three universities for blacks, and one each for Coloureds and Asians.



(Has it not been written that Napoleon died while calling for a glass of Cape-made Constantia?) The cuttings they brought from their native France thrived in the surrogate and sandy soil of the Cape, and today many thousands of acres are given over to vineyards.

There is a farm of 320 acres near the town of Stellenbosch, and it is the type of place that must be seen if there is to be full understanding of the Afrikaner's attachment to the land. The main house, a Cape Dutch colonial, is at least 200 years old and has been scrupulously maintained in its place of shade under blue gum trees. An old wagon sits in a side yard like a memorial to the trekkers. A patio looks out on rows of grapevines, green with the new shoots of spring.

Manpower Is Cheaper Than Horsepower

Barry Schreiber, son of the owner of the farm, says that there are about 25 Coloureds employed on the place. "In this area, a farmer would rather have a hand [a Coloured worker] than a machine," he adds. Here, as on most farms in South Africa, the nonwhite worker earns little money, but he is given food and a place to live. His children are born and raised on the farm.

Agriculture is the largest single employer of black labor in South Africa. "Any black who can't find work anywhere else can go to a white farm," C. J. P. Cilliers, director of the South African Agricultural Union, said. "But with wages for miners increasing, agriculture has started to find itself in competition for black labor."

Up until eight years ago some imprisoned blacks were assigned as laborers on white-run farms. The practice was stopped because of objections by countries to which South Africa exports agricultural products.

"It was never the idea to use forced labor," Cilliers said, "but rather to rehabilitate the prisoners."

There are several hundred farmers in South Africa who annually gross in excess of one million dollars each. And they do it in a country where only about 15 percent of the total area is arable. They are as skilled as any farmers in the world, or, rather, as skilled as any farmers in the world who have vast reservoirs of inexpensive manpower.

Frans Grobler runs cattle on his acreage in Natal Province, near the sites of great

Thundering over the veld, Cape buffalo (**above**) flee a helicopter used by officials to count the herd in Kruger National Park. Named for the Cape of Good Hope, 26,000 of the animals roam the 7,340-square-mile park located along South Africa's border with Mozambique. The famous sanctuary is prized for its vast variety of wildlife—"You never know what's going to pop up," says photographer Blair. A nonchalant pair of impalas and a rubbernecking giraffe provide the surprise for cruising tourists (**right**).

Zulu battles both won and lost. I was miles away when I first saw the tall pillars of smoke rising from his land. Driven by the wind, fires were tumbling through the sweet grass (pages 816-17). Grobler was on a hill, beating at the flames with a blanket. He said that the fire had been deliberately started by blacks.

"I can't understand why they're turning against me," he said. "I treat my workers well. I give them two and a half rand [$2.90] a day each, plus food, clothes, and a place to live. I let them use my land to graze their own cattle. But it seems like if you try to help them, they think you're weak. It's a beautiful country and there's room for everybody, but they don't appreciate it."

He wiped the sleeve of his shirt across his soot-streaked face. "You know who's behind it, don't you?" I said I didn't.

"Communists. It's a Communist plot."

Besieged by Communist Neighbors?

It has become commonplace among many whites in South Africa to lay the blame for current unrest on "the Communists." They point to neighboring Angola, where, a year after independence, Cuban troops are still very much in evidence, where pictures of Lenin look down from buildings, and where the shelves of bookstores are heavy with volumes on Marxism. They point too to another former Portuguese territory, Mozambique, and its Marxist government. Rhodesia is the remaining buffer country on the north, but a commitment to majority rule has been made there. And South-West Africa, or Namibia, the former German colony controlled by South Africa since 1920—that is also pushing toward independence.

Suddenly South Africa stands fully exposed to those clichéd winds of change.

"I do not believe that South Africa can cope militarily or economically with concerted pressure from so many hostile neighbors. The liberation of Mozambique and Angola has had a great impact here."

Alan Paton scowled, causing his thick eyebrows to bunch and run together (page 790). The famed author of *Cry, the Beloved Country* was making it clear that the years—74 for him—have not made broth of his lavalike outspokenness. He remains a stern critic of apartheid and the Nationalist government.

As we sat in the study of his house atop

South Africa feeds itself, although only 15 percent of the land can support crops. A worker slashes sugarcane (**facing page**), generally the country's fourth biggest moneymaker, after minerals, corn, and wool. He earns two to four dollars a day, plus room and board. The feed corn filling Ben Pieters's harvester (**top**) will sustain his cattle. Pickers in the Stellenbosch area (**above**) each fill a hundred boxes a day with grapes, most of them destined to become wine.

A life apart is endured by millions of black women, such as these in a Transkei village. The only man in the house is their retired father, left; their miner husbands live far away. The men send home a meager $12 a month. When they return—once a year—to the family hearth, they often find sadness as well as warmth. In the impoverished homelands, 60 percent of all children are malnourished, and many die each year.

Botha's Hill near Durban, he repeated some thoughts he had put down earlier on paper: "There is one future for South Africa over which we would have no control. That would be if the Soviet Union, Cuba, Mozambique, Angola, and the revolutionaries in South-West Africa attempted by force of arms to impose majority rule upon us. If the West did not intervene, that would be the end of the white tenure of South Africa."

His anger rose when he talked about the Afrikaner Nationalists and their attempts to

ensure racial separation and white superiority through legislation. "It is quite clear that whatever else Mr. Vorster does, he will stick to separate development. For a white person to be too militant in demands for social justice means almost certain restriction under the Internal Security Act."

To Stifle Dissent—Banning

He told me that many of his friends—40 at least—had been banned.

"Do you know what that means? It's kind of a living death, really. You're restricted in traveling. You can't enter a school or factory. You can't associate with more than two people at a time, meaning you can't even play a game of bridge. I was never banned. Why? I would say because I have too many friends in the outside world."

Of the many prophetic passages in his most famous book, written almost thirty years ago, none is more haunting now to Alan Paton than this concern voiced to the Zulu parson who journeys to Johannesburg in search of

his sister and his son: "I have one great fear in my heart, that one day when they [the whites] are turned to loving, they will find we are turned to hating."

I asked him if there would be a place for whites in a South Africa under majority rule.

"It will depend entirely on how majority rule is achieved," he said. "If it comes about by consultation, the threat will be minimized. But if the unitary state is imposed by war or revolution, it will result in grief and desolation. If the white army and white air force get wiped out, then obviously the power is gone, and you'd get a tremendous migration of white people out of the country. The poor whites will probably be absorbed, but you wouldn't have any way of lasting here as a rich white. None.

"As for me—well, if I came to the conclusion that the Nationalist government couldn't adapt itself to change, I wouldn't see much point in staying here to witness the desolation. I did my best to stop it and no one paid any attention. Is it my duty to stay here and see it out? I think I would say 'no.' That would be the first time in my life that I would have said that to myself. In all my years I have never given serious thought to leaving South Africa."

Black Exclusion = White Majority

If the Nationalists have their way, there *will be* majority rule. The whites will be in the majority. The ultimate goal of apartheid, other than survival of Afrikaner tribalism, is for evolvement of a Republic of South Africa in which there are no black citizens. Rather, the millions of blacks—who are now considered only "subjects" of South Africa—would be assigned citizenship, according to tribal identification, in the ten areas called "homelands." Each homeland, according to the Nationalist plan, is to become an independent nation. The first, the Transkei, achieved independence late last year.

Therefore, if the homelands policy progresses as planned, there will be 11 nations—ten black and one white—within the present boundaries of the republic. The white slice will encompass something like 87 percent of the land. "But you must remember that our portion includes the desert," Prime Minister Vorster told me.

Critics of the government claim that the black nations are to be nothing more than labor pools for the whites. They also see the nations being set up as buffer-zone appendages dependent on Pretoria for economic survival. Finally, there is condemnation of the policy on the grounds of gross violation of human rights, for it is possible—indeed likely—that millions of blacks will be stripped of their South African identity in exchange for citizenship in a country in which they have no desire to live.

Homelands Plan Faces Resistance

Opposition to the plan is not confined to South Africa. In fact, no other country recognizes the Transkei as an independent country.

The denial of recognition draws a sharp reaction from Prime Minister Vorster. Leaning forward in his chair, cigarette cupped in hand, he said: "If you refuse to recognize the Transkei, then I can't understand how you can recognize any other country: *(a)* It has defined boundaries; *(b)* it is bigger than ever so many countries that are independent; *(c)* its per capita income is higher than about 20 or 30 members of the United Nations, its rate of literacy higher than 40, 50, or 60 members.

"The Transkei is independent in the true sense of the word, as independent as Britain or France or Germany or Ghana, or any other country for that matter. So on what grounds you refuse to recognize the Transkei, I wouldn't know. It would be sheer hypocrisy to refuse to recognize it and still recognize other countries that are far worse off from every angle that you look at it."

The Transkei is in southeastern South Africa, bounded by mountains and the sea (map, page 787). The earth there, while scarred by erosion, is rich and fertile, and the hills are green. The coast is jeweled with lagoons, and the white sands of the beaches spread so wide that they spill into the corridors of heavily treed woods. However it is received politically, the Transkei cannot be denied recognition of its beauty.

There are about two million people living in the Transkei, the great majority Xhosa-speaking blacks. Another two million members of the group (to be accurate, Xhosa is a name for a language, not a single tribe; however, it has come to be accepted as identification for a segment of the black population) live outside, and most of them, like it or not, are to be given Transkei citizenship.

The Prime Minister of the Transkei, Kaiser Matanzima, pursued independence. Gatsha Buthelezi, chief minister of KwaZulu, the Zulu homeland, vows that he will never agree to the emergence of an independent nation for his people under conditions laid down by the Nationalist government.

"I'm very distressed, you know, about the Transkei," he said. "Those people are my brothers and sisters, and for them to be cut out of the world that was theirs is a very tragic thing. That they should have, at the insistence of Pretoria, only crumbs of the world that they've built up is something I lament very, very much. They will become economic hostages of the white-minority regime, in that they will have to depend on financial transfusions from Pretoria.

"That, to me, limits their independence. So one asks whether such independence is worthwhile. I cannot see independence for KwaZulu under these conditions. No Zulu in his right mind would even look at it, would even touch that kind of independence."

Century-old Village Uprooted

But the mechanics of the homelands policy grind on. People are being moved from here to there in an effort to consolidate scattered settlements. "They're erasing the black spots," a non-Nationalist Afrikaner told me. Sometimes the eraser grates like sandpaper.

"Our hearts are very sore."

Elijah Molete said that as he watched half a dozen men tear his house apart with hammers and crowbars. He was being moved, as were the other 973 families of the village of Ga-Maloka. It was a government-ordered, government-directed operation. Police were there, along with several of their attack-trained dogs. However, the villagers, members of the Bakalobeng tribe, were offering no physical resistance.

"We will move because we will abide by the laws of the country," Kelly Molete, tribal chieftain, said. "But there is no willingness on our part to do it. This village of ours has been here more than a hundred years, and we're given just three months' notice to move. What can we do?"

They were being moved to Deelpan, a swampy, desolate area about 45 miles away, in the homeland destined by Nationalist decree to become the independent nation of Bophuthatswana. Their new homes there, until they could build something better, would be single-room corrugated-metal shacks measuring 12 feet by 12 feet. They would be paid for the houses they must leave. Many of the villagers claimed the compensation was not enough. The government said it was overly generous. "They can take any part of their house they like to the new location," a police colonel told me. Dressed in battle fatigues, he was in charge of security at the site. "In addition, we will give them a month's free rations."

So they were pulling down roofs and prying out window frames. And no one was smiling. Certainly not Mrs. Buernica Thale.

She stood in front of the house, the house where she was born and had lived all her life. It wasn't large—no more than three rooms—but to her it was a coliseum in which the lions of youth ran free. It wouldn't take long to pull the place down so that Mrs. Thale could salvage what she wanted. She was scheduled to be moved late that evening, and now, at midmorning, the truck was backed up in the yard. The first thing they loaded was a board, a four-foot-long rough board with a single rusty nail stuck in one end.

By five o'clock all her possessions, including a crate of chickens, were on the truck, except one: a large mirror. She held that in her arms, held it closely and with care as a crucifer holds the Cross. When the truck left, Mrs. Thale laid the mirror on the ground and ran after the vehicle, for that was to have been her ride to the new location. It didn't stop, so she turned and came back to her dismantled home. And there she stood in the yard, alone, watching as the right front tire of the last car to leave the site passed over the mirror.

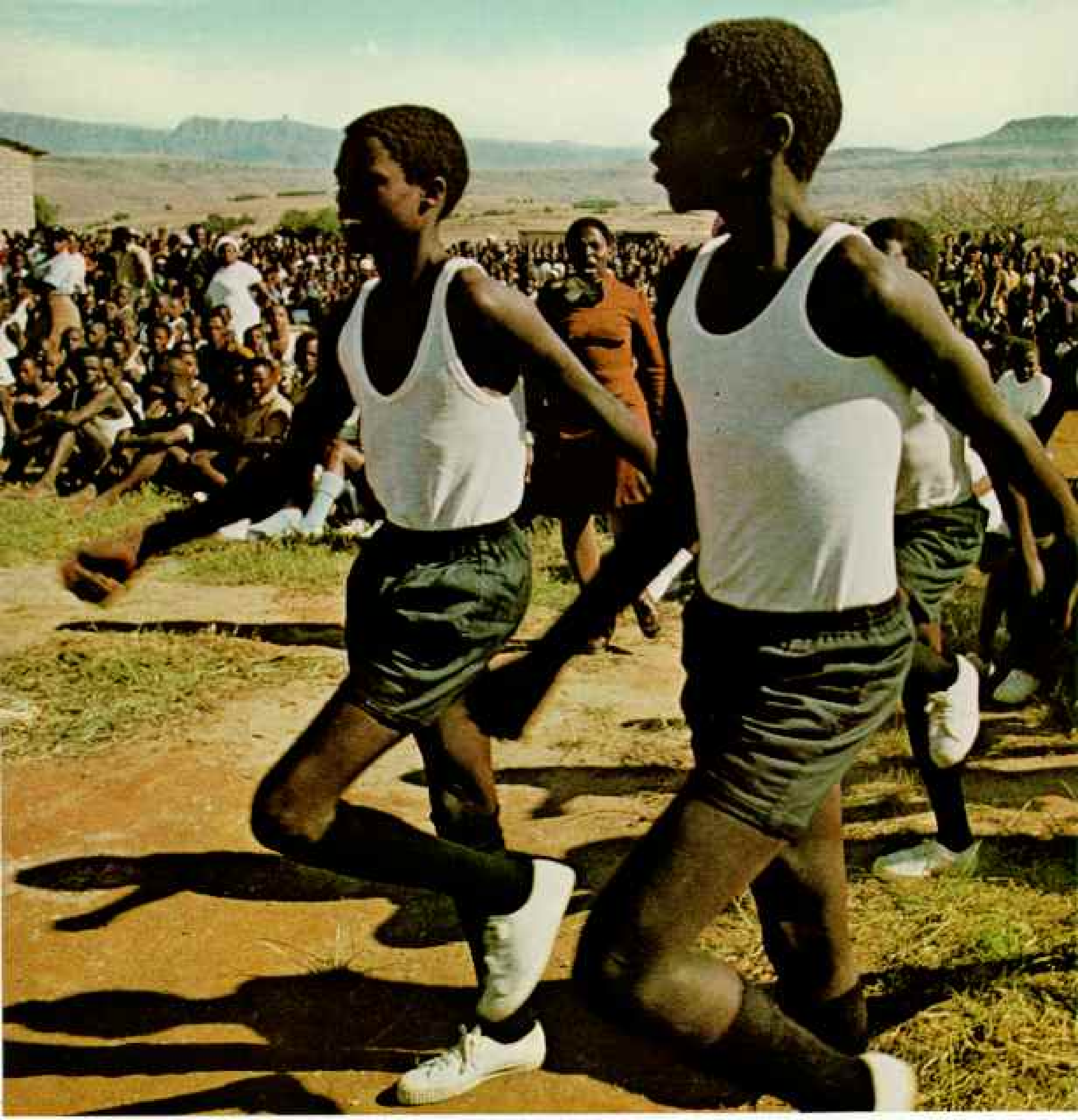
Press Criticism Brings Retaliation

Incidents such as the move to Deelpan seldom escape critical comment in the English-language newspapers of South Africa. John Vorster and his government are regularly attacked in editorial columns, especially those of the *Rand Daily Mail*, a morning newspaper published in Johannesburg (page 806). Perhaps more damaging to the Nationalists are the reports that the *Daily Mail* publishes on the excesses of reaction by police to tense situations in black townships. But that may change. In March 1977 the Prime

Their boss's fields afire, workers beat out burning grass (**right**) on a cattle ranch owned by Frans Grobler (**below**), 30 miles south of Nqutu. He believes the fire was deliberately set by blacks "egged on by Communists," reflecting the widespread fear among whites of the growing number of leftist governments in southern Africa. "Grobler was completely mystified," the author says. "He just couldn't understand why anyone

would want to do this to him."

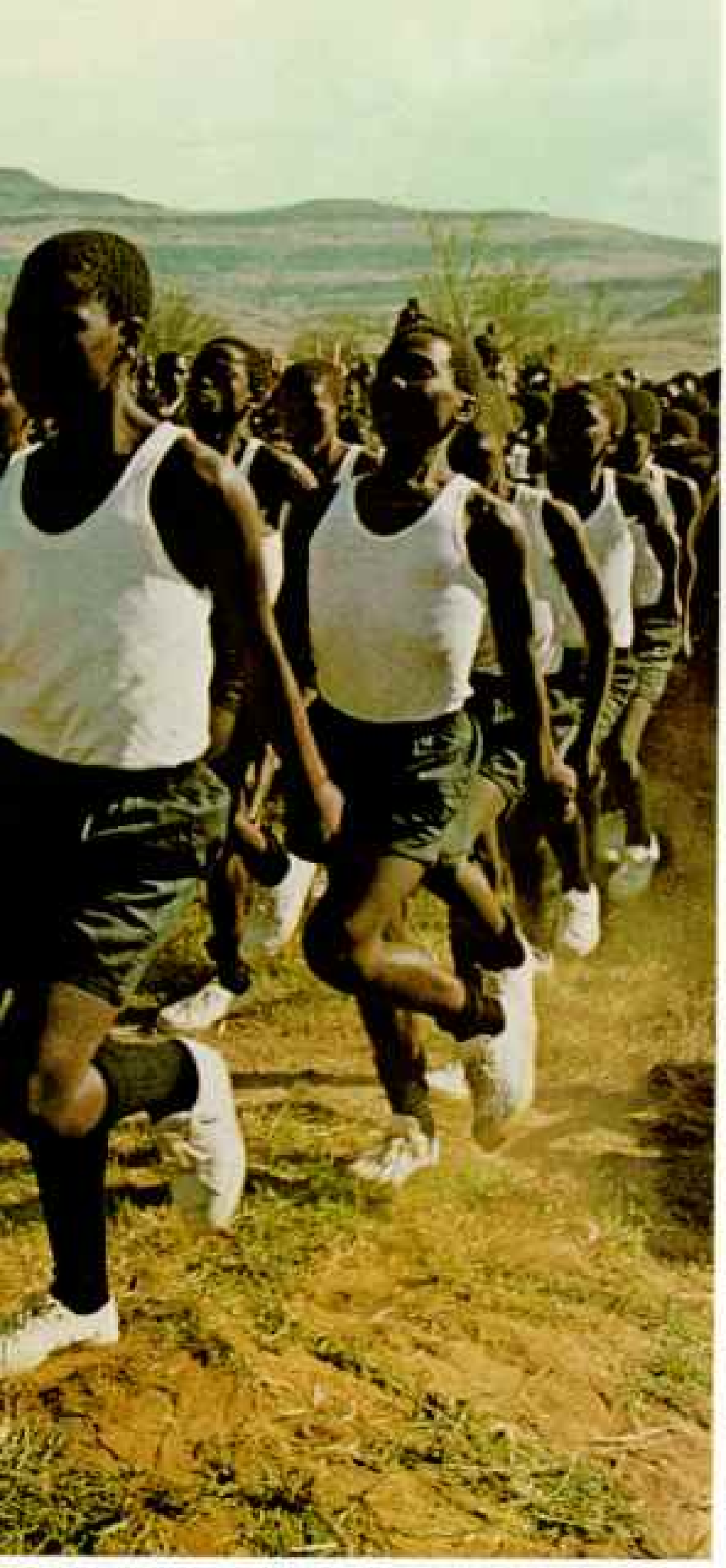
Although no foreign guerrillas are known to operate in South Africa itself, militant members of the South-West African Peoples Organization (SWAPO) have carried on low-level insurgency in South-West Africa, or Namibia, mining roads and pressuring villagers to join them. Three miles inside Angola, South African soldiers looking for SWAPO guerrillas inspect a group of Mahimbya tribesmen (**right**). The troops suspect that a dam above nearby Ruacaná Falls, a joint South African-Angolan project, provides an inviting target for rebels. According to a United Nations report, South Africa maintains 50,000 men in the Caprivi Strip, a narrow tongue of land running along South-West Africa's northern border.



Minister gave South Africa's newspapers a year to test self-disciplinary measures in lieu of immediate legislation for more rigid government control.

An earlier response by the government was to arrest and confine to jail more than a dozen journalists, all of them black, after the troubles began last June. They included five staff members of the *World*, South Africa's leading black newspaper and the primary source of information during the Soweto riots. White reporters were barred from the township, and the black newsmen working for white papers were among the first to be detained. One such black, a professional photographer, has been in and out of jail so often that he has come to expect the click of his camera to be followed by the clank of the cell door.

Also being heard are criticism and demands for change coming from businessmen. Harry Oppenheimer (page 791), chairman of Anglo-American, the corporation that controls a sizable portion of South Africa's economy, continues to call for an easing of apartheid to accelerate such things for urban blacks as home ownership and improved education.



High-stepping young Zulus from 60 schools jog through Dukuza in an annual sports show. Increasingly, young blacks—even 11- and 12-year-olds—reject the traditional passiveness of their elders. Says one older man, "The black youth of today are unlike our generation. They want it all—right now."

Chambers of commerce across the country are joining in a campaign for equality in the treatment of workers. They are pushing for equal pay for equal work, equal employment benefits, and job advancement without regard to race or color.

The concern of leaders in commerce and industry, most of whom are whites of British descent, may have been prompted in part by the fact that South Africa's economy is ailing. The decline in the price of gold was damaging, of course, since 75 percent of the gold supplied to the non-Communist world comes from South Africa. But a new factor has emerged in recent years: The international banking community, fearful of increasing unrest in South Africa, is reluctant to make financial commitments to the country without changes in the social structure. In effect, the end or modification of apartheid is being asked as collateral for loans. Then too, the United Nations General Assembly continues to apply pressure in the form of resolutions calling for embargoes and other actions aimed at isolating South Africa from the rest of the world.

But to all of that John Vorster says he will not be swayed by outside "meddling." That, at least, is what he says in public, to those of his party who still hear the voices of their ancestors preaching vigilance and racial purity as a means to survival. What he says in private, many suspect, are the words of a more flexible politician.

Even now cracks are starting to show in the granite wall of apartheid. Signs designating this for blacks and that for whites are coming down. Sports are becoming integrated. Some hotels are accepting blacks.

When I asked Prime Minister Vorster about that, he replied: "It's not a question of cracks at all. It's a question of a logical consequence of the policy of separate development. And as the policy is translated into practice, more and more of what you have observed will come about. I have said many times that the underlying thought behind the policy of separate development is not that one man is better than another, or richer, or more learned. But that peoples are different. It is for that and that reason only that there is a policy of separate development. You have to deal with the actual facts, and you can't wish them away."

No, you can't wish away the facts of South Africa. But you can wish that some facts were fiction, and be thankful that some are. □

Mont Saint Michel

By KENNETH MACLEISH
SENIOR ASSISTANT EDITOR

Photographs by
COTTON COULSON

BIBLIOTHÈQUE NATIONALE, PARIS

MAJESTY ON HIGH, the abbey at Mont Saint Michel crowns an island just off the Normandy coast. Tourists now replace medieval pilgrims, who, faithful as the tides, flocked to this fortress to pay homage to the archangel Michael (**above**).

THERE ARE PLACES on our planet destined by their form and their location to stir the emotions of man and so to be held sacred. They share no physical qualities, no geographic situations. But they have this in common: They are essentially different from all that surrounds them; they are special and therefore wonderful. Ideally, they are unique.

The small island off the north coast of France, a couple of kilometers out from the Normandy-Brittany border, is such a place. One glance tells you that never before have you seen its like, nor ever will again. Through the centuries before our own, millions of people walked from all over Europe to visit the island and pray in its shrine. In recent decades millions more have come from all over the world.

What is this islet, this Mont Saint Michel, this magnet to man's imagination? A single tooth of stone, upthrust in the midst of featureless flatness, an island when the great tides roll in, a bastion on an infinity of sand when they withdraw.

It is a granite rock, formed in primordial heat, surrounded by soft sediments on a cold seafloor; a natural monument of granite, God's work if you like, topped and completed by a man-made monument of that same all but unworkable stone.

The abbey is a magnificent presumption: a church balanced on a summit one-fourth its size; a monastery clinging to naked cliffs. Yet, to the faithful, no presumption at all. The archangel Michael had decreed the shrine; Michael, captain of celestial armies, God's great avenger, golden angel of fire and death. Men accomplished miracles in his name for the glory of God. They did so here.

For centuries people walked across the sand, guided by islanders around invisible quicksands, or sailed to the island when the tide decreed. Now a ribbon of road on a causeway lets you drive to the mount.

I had crossed over as the October sun sank beyond the western sea and stood now, back to the battlements, watching, waiting.

"A few minutes only," said the guardian, glancing at his watch.

Beyond the mainland from which I'd come, the risen moon hung fat and golden over the regimented poplars on the dikes that protect the reclaimed lands from the sea. And now the sea, responsive to the moon's command, swept in across the current-sculptured sands, drowning them under its wall of white water.

"Listen to it," the guardian said. "How it rumbles and hisses! It has come in ten miles from the low-water line. Risen fifty feet. Soon our mount will be an island again, all except for that great dike, the causeway you drove across. That's our lifeline to the Continent."

The Continent? The coast of Normandy, two thousand meters away? Still, why not? It's not distance that makes an island or an islander. It's separation, isolation.

The guardian's face glowed suddenly in the warm light of a cupped match.

"*A demain*—until tomorrow," he said. "My little wife awaits." He shook my hand and vanished into the shadows of the great gate.

I stood alone for a little while, sensing the irresistible rise of the tide-driven sea beneath the silver-sequined bowl of night. Then I, too, walked slowly into the village where 107 people (at last count) do what Mont Saint Michel's villagers have always done: They purvey food, lodgings, and such souvenirs as each generation fancies.

Now the shops were shuttered. But from a dozen restaurants rose the savory smell of the obligatory omelet—the great, fat, foamy one, invented some decades ago by Mère Poulard, whose stone in the nearby churchyard asks God to receive her soul as warmly as she did her guests. No tourist or pilgrim dares fail to sample her renowned creation.

Hostesses greet the passing stranger. Neatly aproned, they stand in their doorways and compete for his custom.

"Would monsieur not care to dine? Would he not enjoy a little glass?"

Not this monsieur. Not now.

I climbed the village's Main Street, a narrow alley some 300 meters long, flanked by handsome timbered houses and spared by its medieval dimensions from the curse of motor traffic. The roadway steepened into a stairway and led at last to the abbey's massive gate. In all its long history, no enemy had ever forced this portal. It opened at a turn of the big iron key the curator had entrusted to me.

I stood now in the ancient guardroom of

the abbey, from which rose a splendid staircase completely open to the sky. From the terrace at the top, beside the silent church, I watched the sea stir, current driven, in the silver moon path. The mount had indeed become an island again.

As my eyes registered the three dimensions of the magnificence around me, my mind drifted down the fourth into the time when legend and history merged.

In the early eighth century, it is said, the peak was not an island but rose out of the low and level forest of Scissy. At that time the archangel Michael appeared in dreams to Aubert, the bishop of nearby Avranches, and bade him build an oratory on its summit. The church and the peak would be dedicated to Saint Michael, as were several other sites in Europe, most notably that on Monte Gargano in southern Italy, where a cavern divided into two chambers served as a shrine.

Aubert climbed the mount and located the site specified by the archangel, just below and to the west of the summit. But within the area indicated stood an immense menhir, a monument of the pagan past. The men of the countryside assembled, bringing with them all their children, to remove the un-Christian structure. But they could not.

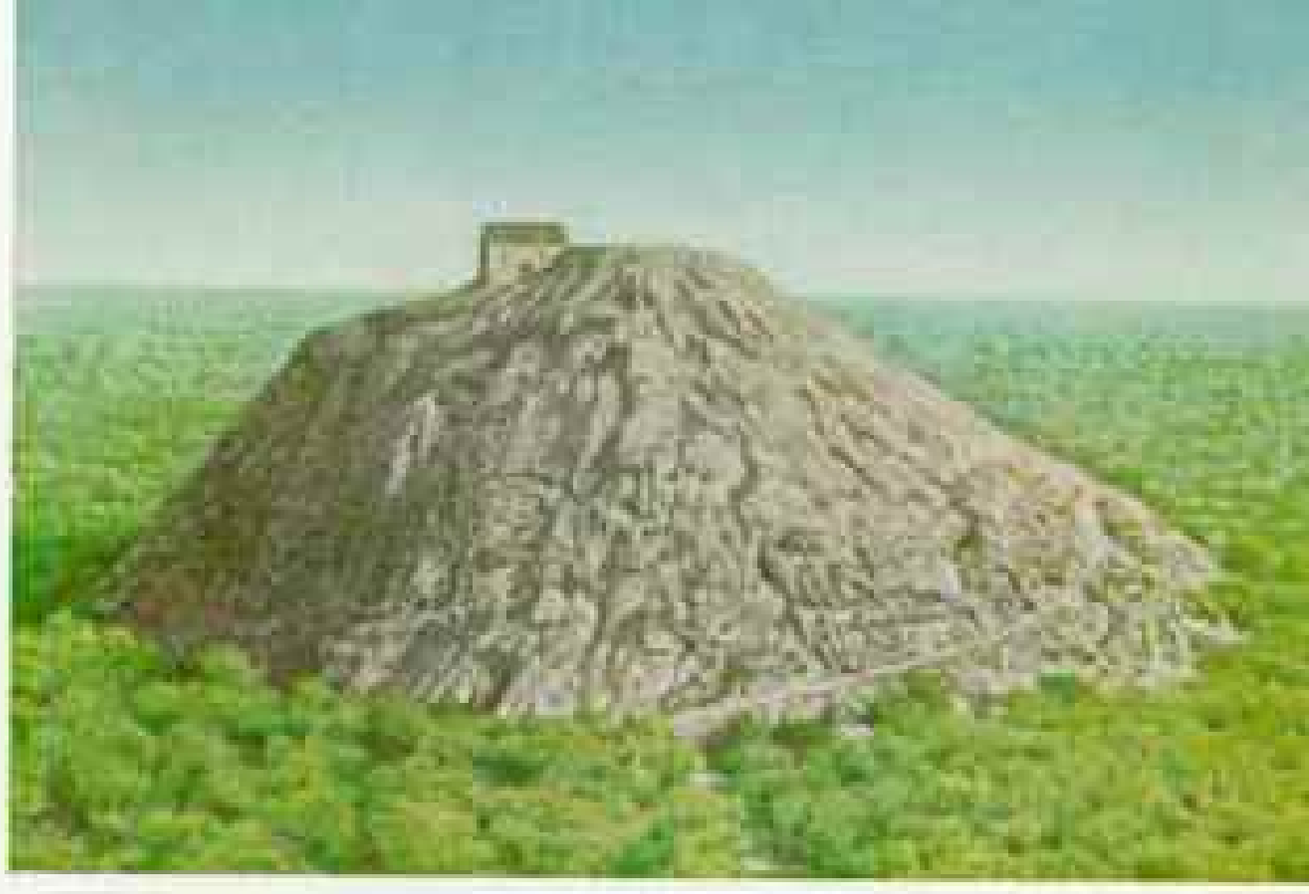
"Is every child here?" asked Aubert.

All the men nodded save one, the father of 16. "Mine are here, my Lord," he said, "except for the last one. He's in his cradle."

"Get him," said the bishop. And when the baby was brought, he held him near the great stone. With one kick of his tiny foot, the infant sent the mighty monument crashing down the slope.

A tenth-century document declares that the oratory was built in A.D. 709. No such building exists today. But in the hollow west of the summit—on the spot selected by Michael—a curiously shaped successor survives, beneath the nave of the great church. The chapel is Mediterranean in style and has two apses, as had the cave on Monte Gargano.

After the oratory was completed—so say the bards—there occurred the one ultimate alteration in its site that could make matchless the magic of Saint Michael's Mount: Its surrounding forest was swept away by a tremendous tide, leaving it a special and singular entity. Twice daily, following the rhythm of the sea, it became an island.



NATIONAL GEOGRAPHIC ARTIST RED GRIDLER

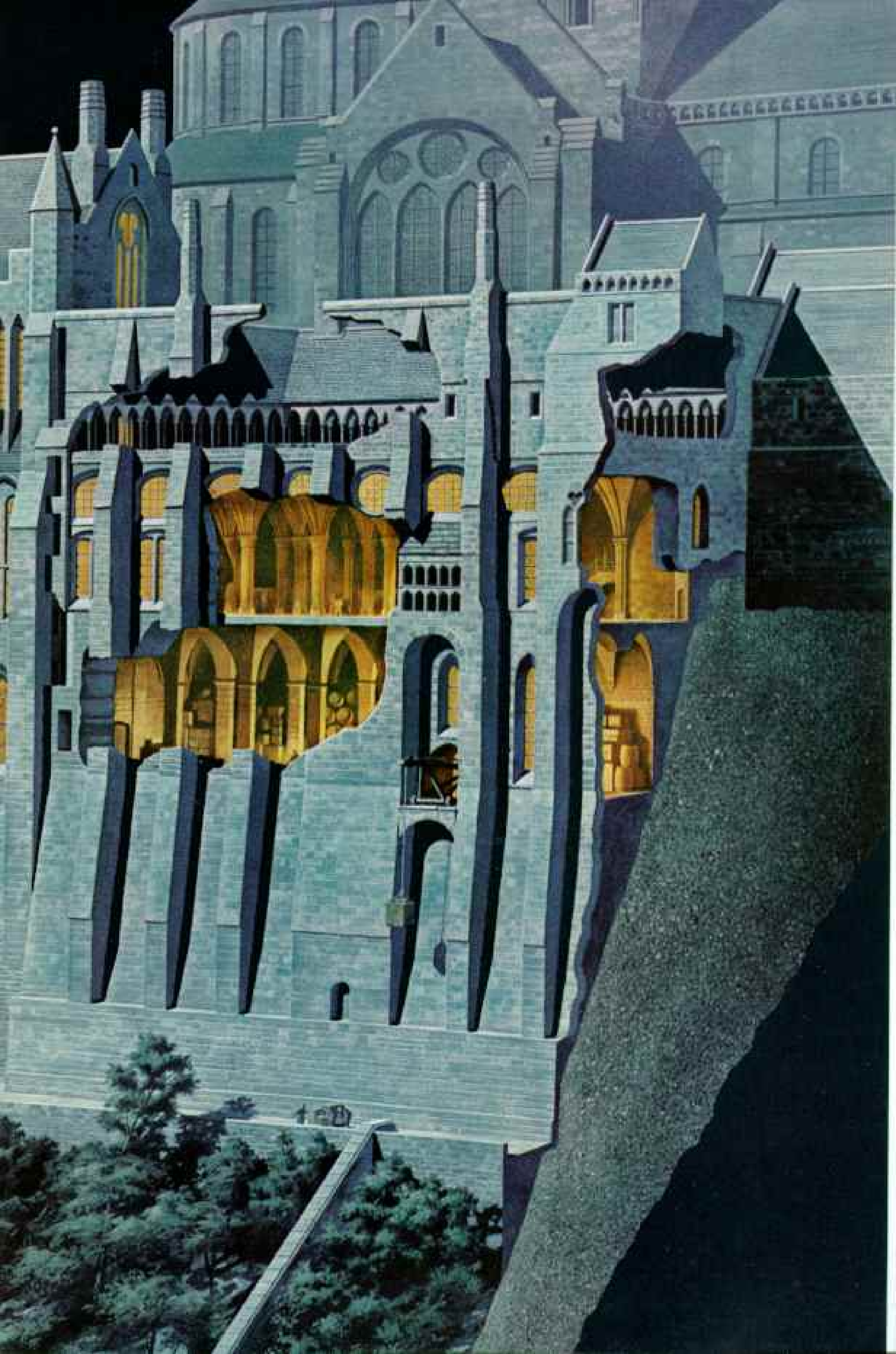
"BUILD ME A SHRINE!" commanded the archangel Michael in a dream to Aubert, bishop of Avranches. And so the cleric in A.D. 709 raised a chapel in the saint's honor atop Mount Tombe (**top**). As years passed, the surrounding forest gave way to the sea, and before 1000 a simple church had replaced the oratory on the new island (**center**). To this dramatic site, now known as Mont Saint Michel, came the Benedictine monks. Working with native granite, they created a spectacular Romanesque church and monastery, completed in 1058 (**bottom**).

"The Marvel"

EXPRESSIVELY *named* la Merveille, *the Gothic monastery at Mont Saint Michel, built between 1203 and 1228, stands as a symbol of medieval man's architectural genius.*

Hundreds of pilgrims seeking the blessings of St. Michael fill the chambers with activity, as seen in this cutaway. In the first-floor alms hall, left, the poor receive charity from the monks, while laborers hoist supplies into an adjacent storeroom. On the second floor, visitors end their fasts in the graceful guests' hall. Next door in the scriptorium, Benedictines prepare books for their extensive library. The monks dine in the top-floor refectory, while the arched cloister awaits those who wish quiet meditation.

NATIONAL GEOGRAPHIC ARTIST
NED SEIDLER



IN THE SUN OF MORNING the granite mass and its crown of granite masterworks glow warm and welcoming against a polished sky. The church rises in its majesty, and the eye understands and delights in it. It is all of a piece, a great structure standing alone, exposed on all sides to sun and wind.

The builder of the church might have cut down enough of the mount to support the entire edifice. Instead, he built on the narrow apex of the rock (the archangel, it was understood, appreciated heights), which gave him a solid base for the center of the transept alone. That meant four substructures—crypts—were needed to support the church. One was already there: the chapel of the Twin Altars, buried beneath the great church.

Dark stairs and chill corridors led me there, to an appointment with the man who knows the ancient structure best.

"Everything else grew out of this," explained Yves-Marie Froidevaux, architect in France's Department of Historical Monuments and himself the chief restorer of the hidden shrine.

"It is far older than any other structure on the mount, and it differs from all of them. It tells us that the cult of Saint Michael came here from afar."

He paused, and the silence of the place closed in on us. I stood quietly in the serene simplicity of the entombed chapel, trying to dream my way back to its beginnings. I saw the walled-up windows open to the sky, and the light of day bringing warmth and brightness to painted walls, now gray and cold as old bones in a catacomb. Rooks called, and the sea wind's song would not be stilled. White-robed Benedictine monks prayed before its twin altars, and the name Michael was often on their lips.

But who is Michael, for whom this church was raised? Unlike most saints, Michael was never a human; he is pure spirit. He is an archangel, and he stands in God's inner circle, for it was he who defeated Satan.

The cult of Michael, the warrior angel, first entered the Western world through Italy, where his most important shrine was the cave on Monte Gargano. It reached France in the eighth century, and there Aubert's humble oratory became the most celebrated center of the archangel's worship.

"The original shrine was built on this spot in 709," said M. Froidevaux. "This little church replaced it perhaps a century or two later, when the destructive Norse chieftains had become constructive Norman dukes. Here is the root from which all the magnificence of the mount has grown."

The crown of granite structures that girdle the top of the peak, and the church that caps it, reflect a thousand years of loving labor. They have echoed the songs of medieval minstrels, the commands of kings from Charlemagne to Louis XVI, the sermons of bishops and abbots. They tell the story of France to those who can read it.

Waiting for me at the abbey's entrance was one who could. Cynical and agnostic, humorous and eloquent, Nicolas Simonet is making a profound study of Mont Saint Michel and a bare living by serving as a guide.

Nicolas's extraordinary knowledge of the mount centers on the two monasteries built to serve Saint Michael's church. These amazing structures cling to the north and west sides of the rock. They are three stories high, their upper chambers at the level of the church floor. The first, built in the 11th century in the simple, robust style called Romanesque, has massive columns and round arches. Some of its great halls have fallen away forever.

The second monastery, built in the 13th century, is in the lighter, more graceful Gothic style. Its arches are pointed, its vaulted ceilings elegantly ribbed. Its outer wall, rising some 40 meters from the sloping bedrock below, is an architectural tour de force. The whole is justly called la Merveille—the Marvel (preceding pages).

"It is truly one of the wonders of the world," Nicolas insisted. "Even now with its great halls empty and undecorated, it lifts the heart. But first let us explore what's left of the older monastery. One wonders how the builder ever thought he could execute the plan he was given. Faith, I suppose. And inspiration. The faithful might include the help of Monsieur Saint Michel, as they called him then."

Few buildings in France are so old and so precisely dated as the Romanesque abbey. Completed in 1058, it was built as beautifully as craftsmen of its day knew how.

Henry Adams, who understood Mont Saint Michel as well as any man of our time, felt that the 11th-century monastery is to

architecture what the *Chanson de Roland*—still known to every Frenchman—is to poetry. And with that thought, the chill dim halls come to robust life. We can be certain that the great epic of Charlemagne's campaign against the Moors was sung in the abbey's refectory. More, that it was probably sung there one day in 1058 by Taillefer, the minstrel of William the Conqueror, while William and Harold the Saxon dined and listened.

In 1066 William would conquer England and Harold would die, much as Roland, Charlemagne's nephew, dies in the poet's tale. But on that day they ate together as friends. Harold had won praise by saving others from the quicksands as they crossed from the mainland to beg Michael's blessings. Later, with the abbot and other notables, they listened to the tale of Roland's fight to the death.

Nicolas and I walked in silence. The words of the great ballad, faintly remembered, returned me to that warm and festive scene, that meeting of noble knights, that singing of the great song by Taillefer in the pulsing light of the fire's crumbling embers. At Hastings, eight years later, Taillefer would die as nobly as brave Roland. And, as with Roland, Michael most surely led his soul to paradise.

"No questions, Ken?" asked Nicolas.

"I was thinking of the *Chanson de Roland*."

"Then you need no answers," he said.

BATTLE. FIRE. Angelic apparitions. Themes of the *Chanson de Roland*, and of the lively, deadly 11th century. Michael goes where danger threatens. There one finds his shrine and his spirit. But Michael's appeal was not to soldiers alone. From all over Europe pilgrims came to the mount called In Peril of the Sea because of those formidable tides. Suddenly, as if compelled by superhuman force, farmers laid down their scythes, blacksmiths their hammers, woodsmen their axes, and walked westward to the Channel coast. *Miquelots* they were called, after their patron, Michael. Children, too, left home and frantic parents.

"All these came to the mount to ask Saint Michael's blessing," Nicolas told me. "They were lodged in the village, and were overcharged for food—omelets, no doubt. But they had to be received by the abbey and given food there too.

"At the lowest level of the 13th century abbey were the *aumonerie*—the alms hall—for those who came begging, and the *cellier*, or storeroom. Above were a magnificent hall for the entertainment of visitors, and a lovely, wonderfully lit scriptorium, where the monks did their work of copying and writing books for the abbey's library, one of the most famous of its time.

"The upper level was the exclusive territory of the monks; a superb cloister, open to the sky, and a refectory perfectly designed. La Merveille is complete, and you will see it in its marvelous entirety."

"Are you saying that it survived 700 years of wars and fires without damage?"

"Far from it." Nicolas grinned sardonically. "The reparations were so extensive that it is sometimes cynically referred to as the greatest creation of the 19th century. But don't worry. Nothing was repaired by guesswork. All is precisely as it was."

Empty and unadorned rooms are usually difficult to appreciate. Nevertheless, these six extraordinary chambers of the Marvel enchanted me as fine works of art would have done. Here no expertise is required to experience pure delight; only open eyes, open heart, and an open mind.

"I have found a way to keep la Merveille's chambers straight in my mind," Nicolas said. "The halls for visitors are easy. Cellar, almonry for the poor, guest hall for the pilgrims. The three remaining chambers were for the monks alone: The scriptorium nourished their minds, the cloister nourished their souls, the refectory nourished their bodies.

"And now that I think of it, it is time for me to go and nourish mine. Will you join me?"

"Thanks, but not today. I'm to lunch with Father de Senneville after midday Mass."

"You will fare well then. The prior is a brilliant man and also an excellent cook. I often regret that we differ so on matters of faith. He is doubtless the most intelligent man in these parts."

From the sun-warmed cloister where Nicolas left me, I entered the abbey church. Set as it is upon the summit, it seems almost an integral part of the natural rock. And as the forms created by human hands here coexist comfortably with those shaped by the forces of earth and atmosphere, so do the styles of 500 years live graciously together, spanning the religious architecture of the

WHERE PILGRIMS feared to tread, Robert Bellon calmly stakes his shrimp nets, hoping that the evening tide in the Bay of Mont Saint Michel will deliver him a worthy catch. In the Middle Ages guides were often needed to steer visitors around pockets of quicksand. The French Government in 1877 built a causeway to the island, but the restless sea remains formidable, as on this day when the tides swept away Bellon's boat. During the spring and fall equinoxes, the sea encircling the mount can rise as much as 50 feet.

Middle Ages. The 11th-century nave was built in the earliest of medieval styles; the soul-lifting 15th-century choir in the latest—the flamboyant Gothic.

Officially the church is bereft of its religious community. The French Revolution emptied the abbeys and monasteries, including this one. Worse, the mount became a state prison. Its buildings were dirtied and desecrated. Seventy-five years later the nation regained its traditional respect for all things ancient and beautiful, and the abbey was gradually restored. The crowds returned, but to admire rather than to worship.

There were no monks in the great church for another hundred years. Only in 1965, at

the time of its thousandth anniversary, did Benedictines once again take possession—but *temporary* possession—of the abbey. Two remain.

On an ordinary weekday the congregation at noonday Mass may be as few as ten. The church is undecorated. The walls are of bare stone. Even the altar is a plain stone table bearing a Bible, two brass candlesticks, a chalice and plate of pewter, and a simple cross. The eye is free to follow the lovely lines of arch and vault. The prior and his associate approach the altar and bow low. They wear sandals despite the cold, and plain white vestments. Their Mass is as simple and as stirring as its setting.

WHEN MASS IS OVER, Father de Senneville undergoes a dramatic transformation. In seconds he is out of his priestly robe and into a workman's blue sweater and apron. In minutes he is at his stove, busily preparing a meal for his guests.

The 13th-century dining hall, built for the use of the abbot and his staff, still serves its original purpose. "For ourselves, Father François and I would be happy to eat in the kitchen," said Father de Senneville, "but guests of the abbey have always been well received. Why not now?"

And well received we were, a handful of visitors and I, at a long table before a fireplace in which logs blazed. Brown stoneware, plain and handsome, graced the board laden with sliced lamb, potatoes, mounds of fresh green salad, jugs of pickles and mustard, and pitchers of plain red wine. And, of course, baskets of bread, crusty and fresh.

"Forgive the inexpert slicing of the lamb," the prior said. "We are unaccustomed to roasts. But eat! Eat! And when you have eaten, come back for more. Nothing pleases me more than to satisfy our guests, since I am, after all, the cook."

Bright, incisive conversation flickered around the long table as the monks, like their medieval precursors, matched wit and wisdom with their guests. "One need not be solemn to be devout," said the prior. How thoroughly the great abbots of the past, who entertained crowned heads and ruthless reivers, would have agreed.

Later that evening, in his tiny study, Father de Senneville summarized the spiritual history of the mount.

"Mont Saint Michel was a holy place and a sanctuary for the local people against the Vikings long before the tenth century, when our Benedictine Order was installed here. It stayed 800 years, until the revolution closed the houses of God in France.

"When our order returned to the monastery —briefly—in 1965, the cabinet minister in charge of cultural affairs asked us to be gone in a few months.

"I answered most genially, permitting myself to suggest that it seemed odd that the monks of the order that had impregnated every stone of this holy place with their voices, their souls, and even their blood

THE NEEDS of body and soul are looked after on Mont Saint Michel. Breton women exit from the parish church (**above**). Other visitors pay heed to shops and restaurants (**facing page**).

The mount's history is also double-edged. The abbey became a prison during the French Revolution. But since 1965, when a few monks were allowed to return, the chambers ring again with the sound of daily Mass.

should be treated as intruders. Nevertheless, we left. Four years later our bishop arranged for our return, on condition that we confine ourselves to limited quarters and do not interfere with tourism.

"At first our villagers were worried. Most are businessmen from other parts of France who have bought shops and restaurants here to run during the season, after which they go home. But they soon saw that our services disturbed no one. In truth, our Masses brought life and spirit to the venerable structures the visitors climb the rock to see."

THUS SACRED ANTIQUITY holds the heights on the archangel's mount, and commercial modernity remains respectfully below. I took my leave of the prior and ascended to the 11th century, captured forever in the church's massive nave.

Alone in that stonebound silence, where emperors and kings and noble knights had knelt in prayer, I felt myself seized by a conviction long held by pilgrims to the mount: that Saint Michael's fortress church, where medieval man's devotion to his God is so magnificently revealed, should be the last stop in life's long journey into death. No chilling premonition, this. Rather, an intense awareness that in the archangel's abbey, whose very creation was a supreme act of faith, a tired and fading spirit may better understand, before all senses fail, the bond between man and his Maker.

How sure men were of their God, when this great nave was new! How safe in their faith were those who built this miracle in masonry. In our time, when dedicated officials rescued and restored Mont Saint Michel from defilement, they did so because they recognized it as a national treasure, rather than a prayer told in stone. But no matter. It is both.

The lovely structure that crowns the rock is a church again, and not solely an array of medieval architecture. Two tireless monks have restored the abbey to its thousand-year-old destiny—and so gently, so unobtrusively, that the visitors in their millions need never be inconvenienced. The single modest bell calls to the village below, and out across the empty sands and the tide-driven sea. Few respond, but many hear. And some among them feel that God has returned to the house His captain, Michael, ordered for His use. □


Aux
Armes
Reunies

THE HUICHOLS

Mexico's People of Myth and Magic

By JAMES NORMAN

Photographs by
GUILLERMO ALDANA E.

A painted prayer blooms on the cheeks of a Huichol woman (**facing page**), who uses lipstick to form a background for flower petals, symbols of fertility. Emblems of a sacred bird march across her headdress.

In the solitude of the Sierra Madre Occidental, Mexico's Huichols still heed a pantheon of deities who rule their hearts—while the government introduces modern ways to help their bodies and minds.

HILARIO raised his sparkling dime-store prism and peered through it. "What do you see?" I asked.

"Wirikúta—the sacred land. Home of our ancestors," he replied.

Although we were in the Sierra Madre Occidental of western Mexico, and the desert Hilario saw in the glass lay nearly 300 miles northeast, I didn't doubt him. He was a Huichol Indian shaman, a *márá'akáme*, and magic thinking was a part of his day-to-day life.

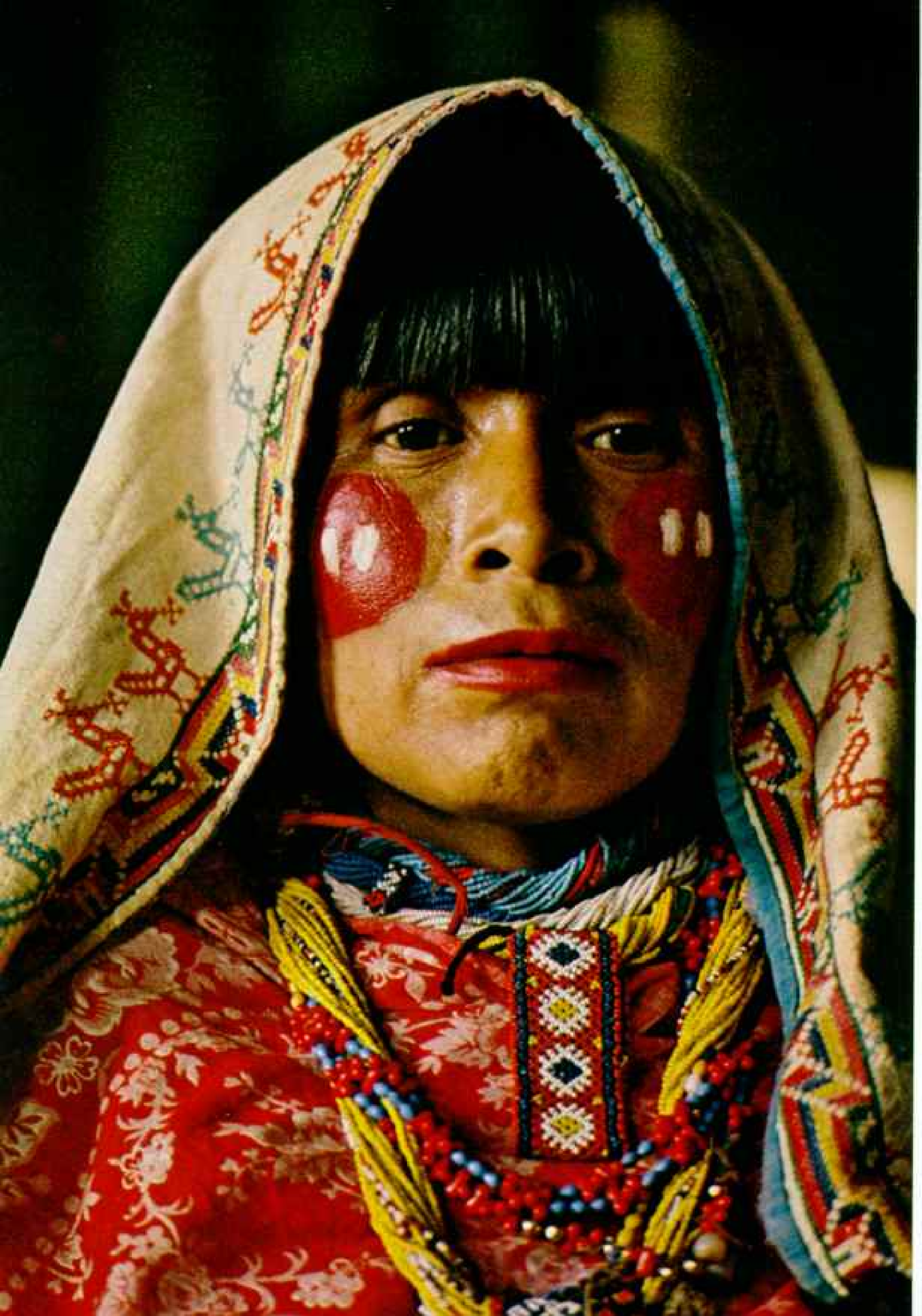
The 9,000 Huichols, scattered across a rugged, virtually roadless region (map, page 841), are a people apart. They speak a tongue related to that of the ancient Aztecs. Even today, Christian missionaries have little influence; the Huichols practice a religion beyond history. Only since the 1960's has the Mexican Government moved in with programs that may, for better or worse, ultimately change their proud ways.

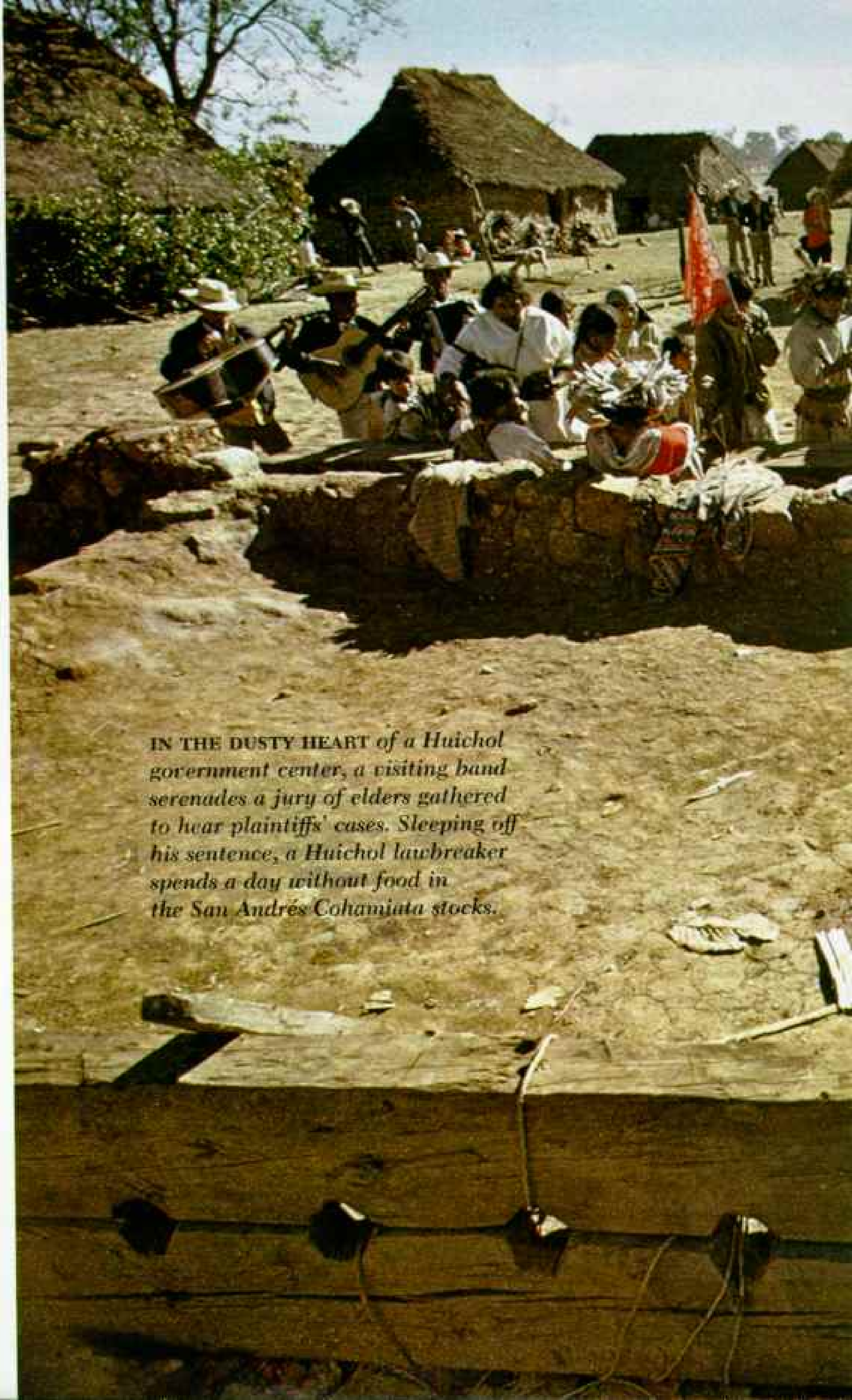
I had first found Hilario by following a slippery footpath to Las Guayabas, a rancho in the heart of the Huichol country. Hilario was wearing the traditional everyday dress of his people: coarse white cotton garments—puffed-sleeve blouse and calf-length pants, the borders embroidered with fanciful animals and flowers. His thick waist was girded by a wide, colorful sash of wool and a belt made of tiny, square, purselike woven bags. His stiff-brimmed, cactus-fiber sombrero was decorated with a felt cross, the feathers of birds, and danglers that jiggled with every movement.

He was a solid, boxy Indian, 70 years old or more, with an agile, inventive mind and great dignity. I could well believe, as I had been told, that he had achieved most of the honors to which a Huichol could aspire—a respected elder and márá'akáme, a famous healer, powerful temple singer, and an astute governor of his community.

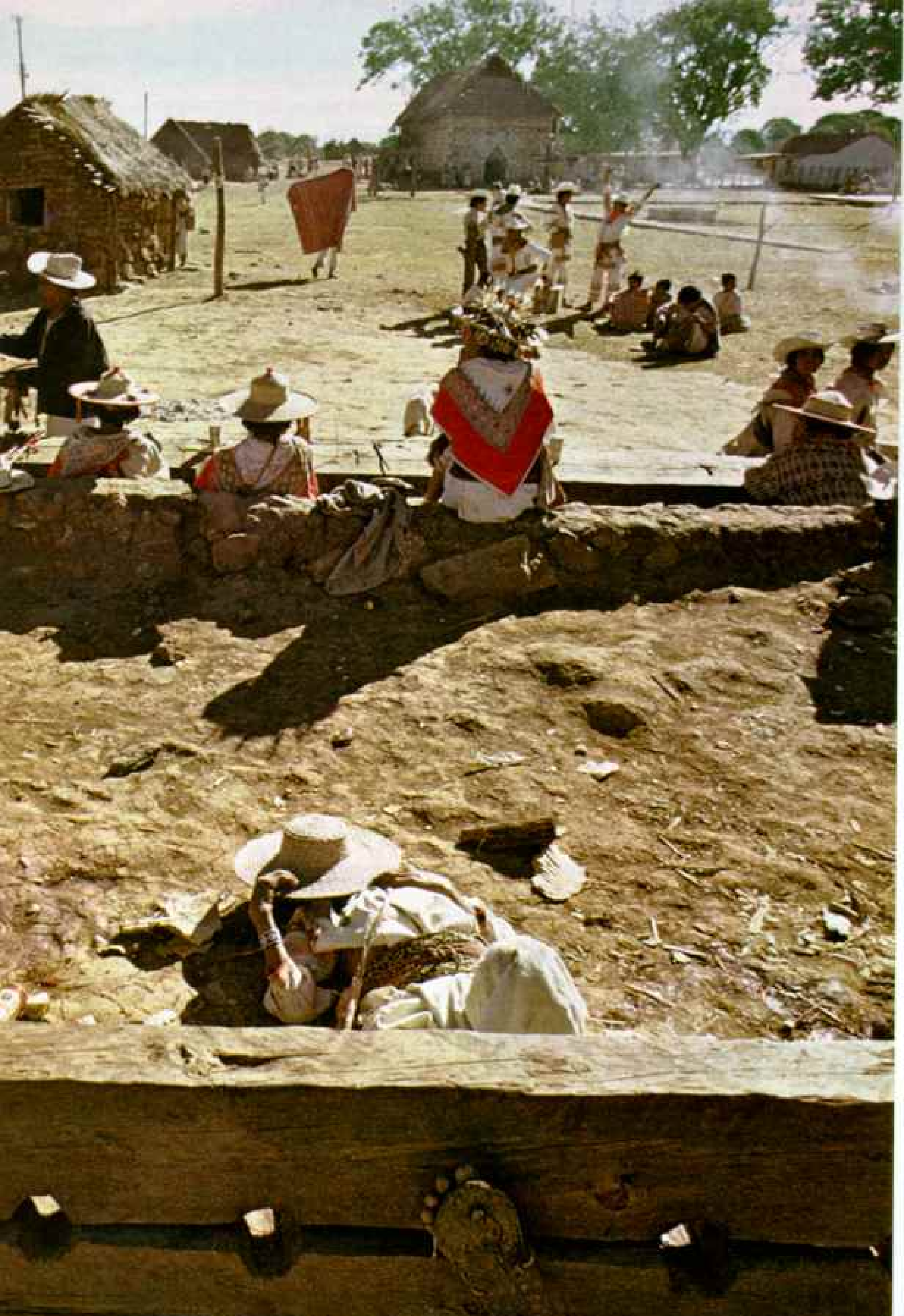
We were talking while sitting outside one of the several thatch-roofed huts of his rancho. Two younger men sat nearby, listening. Unlike other indigenous people of Mexico, the Huichols rarely seem ill at ease when strangers visit their homes. In many ways they maintain that no outside culture is superior to theirs.

At my request Hilario displayed his shaman's pouch of woven palm strips, which held candles, *(Continued on page 836)*





IN THE DUSTY HEART *of a Huichol government center, a visiting band serenades a jury of elders gathered to hear plaintiffs' cases. Sleeping off his sentence, a Huichol lawbreaker spends a day without food in the San Andrés Cohamiata stocks.*



bits of a mirror, rock crystals, the dried head of a sparrow hawk, the dime-store prism, and a sacred stick called a *muwiéri*.

The muwiéri is bound with bright yarn. It usually has one or more feathers tied loosely at one end. Symbolic objects are added for ceremonial offerings: snake rattles, tiny deer snares, mirrors. Hilario took a muwiéri by its shaft and delicately moved his wrist until the feathers quivered as though alive. He raised it toward the sun.

"Through the muwiéri a márá'akáme can talk to the deities," he said. "We pray for their blessing, and for rain to nourish our crops and feed our cattle."

Hilario Hears Call Through a Dream

For centuries shamans like Hilario have played the most important role in the Huichol struggle against the encroachment of outsiders. In addition to serving as priests, they frequently hold high civil posts in their society. They are elders, counselors, doctors, psychologists.

"How or when did you decide to become a márá'akáme?" I asked.

"Our Elder Brother Káuyúmarie, the intermediary to the deities, told me," he said. Then Hilario recounted how, as a boy, he had had a strange dream. Káuyúmarie, patron of shamans and a semidivinity in the complex Huichol pantheon, had appeared as a newborn deer. The deer brought a message from Tatewari (Our Grandfather Fire), one of the most important deities. Hilario described his long apprenticeship: fasts, meditations in the mountains, periods of sexual abstinence, learning the sacred traditions of the Huichols in order to chant for days at ceremonies, and many pilgrimages to sacred places.

The Huichols revere the small peyote cactus they call *hikúri (Lophophora williamsii)*, which when eaten helps ward off exhaustion and thirst, enables them to communicate with the deities, and produces psychedelic dreams. They use it in most of their religious rituals. One of their most important annual events is the arduous 300-mile trek from the Sierra to the desert region near Catorce in the State of San Luis Potosí to gather peyote.

I had been to this Huichol holy land they call Wirikúta and had watched the small bands of peyote pilgrims arrive. From late fall to early spring, men, women, and children set out from Huichol ceremonial centers, guided by a márá'akáme. En route they pause at sacred places to offer sacrifices, confess, and perform purification rites. Their kin perform similar ceremonies at home, sharing in the pilgrimage by a kind of telepathy. On the traditional walk, the group at home and the group on the trek each have a rope with knots in it to tell them what day and place it is, and what should be done.

Arriving at last in the peyote region, the márá'akáme sees and follows Káuyúmarie, also known as the peyote deer, and finds the first peyote. The small cactus, growing mostly underground, scarcely reveals itself. Sometimes the lead shaman shoots an arrow at an angle over it, then other arrows crossing it.

"The peyote is captured then," Hilario told me. "He cannot escape. Then many more are taken back to use in ceremonies."

During the late spring and summer the Huichols' thoughts turn to rain. They are dependent on heavy, frequent rainfalls. Most Huichols clear small slopes by burning off brush; then they drop seeds into holes made with a stick. The rain runs off quickly, so only weeks of continuous soaking can benefit their sparse crops of corn, beans, and squash.

When rain is needed, the Huichols actively petition their deities. I heard that such a ritual was about to occur at a place called San José. I tried backpacking there alone, but after seven hours I was lost. I backtracked, and soon met the first *(Continued on page 840)*

Molding young minds: Tenderly, a father anoints his son's face with symbols of the blossom of peyote (**upper right**), a cactus sacred to the Huichols. Later the boy will eat a small piece of the bitter plant.

The squash ceremony teaches young children the importance of the hallowed trail to the desert where their parents gather peyote. Chants of a shaman (**right**) symbolically transform the children into birds for the imaginary journey. To the pounding of his drum, they visit the sacred places just as their elders do in real life.

Colorful stick-and-yarn "crosses," used in the ceremony, represent the four cardinal directions—north, south, east, and west. Each woven diamond stands for a journey; they were named "God's eyes" by Carl Lumholtz, first outsider to study the Huichols.

"To find our hearts in Wirikúta," desert home of their ancestral spirits, Huichols make a 300-mile pilgrimage (**left**) to gather peyote. By eating the hallucinogenic top of the cactus, they believe they can communicate with their deities. Their guide must be a *mara'akame*, a shaman who has made many such treks and proved his supernatural powers. Harvested peyote hangs in a heavy garland (**below**). In a ceremony, pieces of the plant cling to the lips of a participant (**bottom**).

ERNEST HOHOK (LEFT AND TOP)

humans I had seen all day—a Huichol man and a young boy.

The man, Juan López, spoke some Spanish. He offered to guide me to San José. Before we set out, however, he pointed to my camera and asked if it could take a picture of his boy, a shy, handsome lad. This surprised me because I knew that many Huichols resented having their pictures taken.

I focused the camera and let the father look through it at his son. After I took the picture, the father said, "You will send it to me. You will not sell it." When I asked why he wanted the photograph, he replied, "I'll keep it. If he dies, I'll have something of him."

Temples Face the Rising Sun

After more than an hour's walk, I heard distant music and voices. Then, topping a rise that commanded a view of mountains and canyons glazed golden by the afternoon sun, we approached San José. The temple, called a *túkí*, was large and ovular, with a steeply pitched roof of thatch sloping down to an adobe-and-stone wall. All such temples are windowless and have only one entrance, which faces east, where Táwéxíkïa, Our Father Sun, rises each day.

The temple doorway opened on a circular patio rimmed by small adobe huts called *xiríki*. Some of these were dedicated to forces of nature such as rain and sun.

I was hesitant about breaking in on a strange ceremony already in full swing. "Come," Juan López said. "Don't be afraid." He was right. No one seemed to object.

In some other regions Huichols plainly let you know you're not wanted. If you enter their area without permission, you might be tried by a native court, have your cameras impounded, or be asked to leave. This Huichol suspicion of outsiders is best revealed in their ancient taboo against marrying or courting non-Indians.

In the patio men and women, brilliantly dressed, their faces painted with symbolic designs, danced back and forth in what reminded me of a conga line. They were led by a man carrying deer antlers. At times the movement slowed, the dancers wobbling from side to side like a serpent.

Juan López led me into the crowded túki. The men were gathered on one side, the women on the other. It was hot and smoky. The sloping ceiling was blackened by countless fires, and numerous ceremonial arrows were stuck into the thatch as prayer offerings.

A fire blazed near the entrance. Jacinto, a shaman, sat on a ceremonial chair facing the fire, the entranceway, and the east. Juan López told me that Jacinto was beginning a dream in which he prayed to the deities of the east, the west, the north, the south, and the deity of the center.

Many things within the temple had unexpected symbolic meaning. The crackling fire was Tatewarí. Two tall posts and a crossbeam that supported the roof were considered sacred and were festooned with deer antlers. A cavity in the earthen floor contained the crudely sculptured figure of Our Grandmother Nákawé, Goddess of Life. The hole was filled with offerings, such as beaded votive bowls and colorful wands with diamond-shaped patterns of yarn called "God's eyes" by outsiders. Toward the rear of the temple there were a low wooden dance platform and an altarlike ledge covered with more votive offerings and candles.

The shaman waved his feathered muwiéri, and chanted:

My prayers fly, my prayers rise
with the wind;
They were born in the place of the
rain message,
They were born in the blue space.
We are the seed of people,
And the gods remain among us in
the abode of the gods. . . .

The song seemed without end. Then suddenly there was a pause. Several Indians entered the túki. They brought gourd bowls filled with a greenish gruel, a mixture of ground peyote and *nawá*, a thick, sweetish beer made of sprouted corn. It was offered first to Our Grandfather Fire, then passed around. I was handed a bowl. Everyone watched me. In order not to offend, I took a swallow. It was not as nauseating as it looked, but a bitter peyote taste lingered. Then, a bit too late, Juan López grinned slyly: "You didn't have to take it. Some Huichols refuse peyote. It makes them sick."

Shortly before sunset we went outside to share in the communal feast: tamales, tortillas, plums, mangoes, and a ceremonial beef broth. A young bull (since the traditional deer

have become scarce) had been sacrificed with great pomp at the beginning of the festivities.

Although rain began falling, five men, their arms loaded with firewood, marched around the compound. They were led by a shaman who carried a piece of green wood in his palms as though it were a baby. He presented it to the five sacred directions, then laid it carefully on the ground while the other men arranged their sticks of firewood over it so as to point east and west. Soon an enormous bonfire blazed. I asked the shaman if his contribution made a special smoke. He shook his head, saying, "It is the pillow for Our Grandfather Fire."

The activities continued into the night. Along with dancing and singing there was considerable drinking of both nawá and a much stronger distilled liquor made of a small agave plant. The drinking, the dancing, and the flickering light made me feel as if I had been caught in a Dionysian revel.

Lightning forked the sky and the chilling rain became a downpour, but the festivities went on. The music and chants grew louder; it was as if the Huichols were intensifying their dialogue with the deities to prevent the precious rain from stopping.

Missionaries Keep General Store

The ceremony echoed pre-Columbian days. Curious, now, to see how Christianity fared among the Huichols, I hiked to Santa Clara, six miles southwest of San José, one of the three Franciscan missions in the region. Here two priests and several Mexican nuns conducted a free boarding school for Huichol children. They also maintained the regional general store, where Indians could purchase batteries, candy, matches, and soft drinks.

Although most Indians accept both native and Christian forms of baptism, and almost all Huichols adopt Christian names, their suspicion of missionaries harks back for several centuries. *(Continued on page 845)*

Virtually self-governing, about 9,000 Huichols till isolated ranches in 1,500 square miles of Mexican mountains. They gather in ceremonial centers for religious celebrations.

Taut with suspicion, a boy brandishes his toy weapon. The Huichols lived by the bow until about fifty years ago, when they began using guns for hunting deer, rabbit, and squirrel. But children still learn to use the bow, for with it the peyote is ritually "captured" in the sacred hunt.

Their stamina fueled by doses of peyote, dancers at the ceremonial center of San Andrés Cohamiata (**above**) celebrate the onset of planting season.

A violin, its design influenced by early Spanish contact, draws pensive memories from an aged Huichol during an Easter ritual (**left**). The Huichols took what they pleased from the aliens—rudiments of Spanish carols, several saints, some holy days—and incorporated them into their own culture.

Secular Huichol affairs are tended by officials selected annually in each of the five governmental districts. Gifts of cigarettes, cheese, and fruit from the spouse of an outgoing governor crown his successor's wife (**right**). Leaders and their families must often leave their ranchos to live in such centers, unpaid, during their tenures.

KAL MULLER (ENDING PAGE)

Hymns of the hands praise the deities through Huichol art. Using a back-strap loom stretched between her waist and a tree (**left**), a woman weaves a sash for her husband. A yarn painting depicts the relationship between man and woman (**below**). Crafted for sale to outsiders, the designs (such as the one on the cover) are pressed into sun-warmed beeswax spread over wood. Handmade candles (**bottom**) will glow in Huichol temples.

The earliest contact between Huichols and Spaniards may have been in the 1500's, but probably not until the mid-18th century did Franciscan friars penetrate the mountains as emissaries of the foreign God.

Non-Indian settlers are often unwelcome in Huichol areas, and the missionaries at Santa Clara, I felt, had to soft-pedal their evangelistic role. The mission focuses on educating children in Spanish and maintaining a persistent, if tenuous, contact with Huichol elders. In the tiny chapel I noticed that the altar faced the Huichols' sacred east; on each side of the altar there was a shaman's ceremonial chair, also facing east.

I was amused by another melding of the Mexican and the Huichol worlds when I watched a soccer game in the mission yard. In place of shorts, T-shirts, and cleated shoes, the boys wore their embroidered garments, feather-decked sombreros, and thonged sandals. When one boy decided to return a ball with his head, he whipped off his elaborate hat, returned the ball smartly, then plopped the hat on his head again.

Government Brings In the 20th Century

The Huichols have never been entirely untouched by European influences since the time of the conquistadors. Gradually, they have adopted elements of Spanish culture: domestic animals, metal implements, certain parts of the Roman Catholic religion.

In recent years the Mexican Government has intensified attempts to bring remote Indians into the national orbit through the Instituto Nacional Indigenista. One program, Plan Huicot (an acronym formed from the names of three Indian groups—Huichols and the neighboring Coras and Tepehuans), was devised in the 1960's to develop the resources and improve living standards in isolated areas of the Sierra Madre Occidental.

The Huicot effort is controversial. Ramón Mata Torres, a student of Huichol customs, told me, "I fear it may destroy the traditional culture of the Indians."

Such government projects have already brought noticeable changes. An increasing number of dirt airstrips scar the lonely mesas. Outside experts demonstrate modern methods of farming and animal husbandry. Schools sprout in remote areas, although many Huichols keep their children home to help

with the crops. A new road now links once inaccessible areas to the outside world.

To see how these innovations are affecting the Indians, I flew to San Andrés Cohamiata, one of the principal Huichol ceremonial and governmental centers. It sits on the edge of a 6,000-foot-high mesa overlooking the surrounding canyons. Beyond its dirt airstrip lies the ceremonial center, a bleak collection of thatch-roofed huts (pages 834-5). The Mexican Government's tin-roofed installations—including a carpentry shop and an agricultural station—are clustered less than half a mile to the north.

Huichols Prefer Solitary Ranchos

I called on Mariano Pereida, a Spanish-speaking Huichol familiar with the federal school for Indians in this area. "This is final-examination week by the school calendar," he told me. "But these students go by the weather, not the calendar. Last week many of them went home to help prepare the fields and take part in rain ceremonies."

Mariano patiently showed me San Andrés Cohamiata. It seemed strangely deserted. "It's not a village. It's a meeting place," he explained. "Only a few families live here."

Rather than forming villages, Huichols traditionally prefer to live on solitary ranchos, where the nearest neighbor may be several hours' walk away. Others live in *kiekári* (several ranchos together, where families are often linked by kinship). For religious and civil celebrations the people of a district gather at centers such as San Andrés Cohamiata.

Mariano showed me the unimpressive thatch-roofed mission church built for Franciscan friars during the mid-19th century and abandoned shortly afterward. "My people still use it," he said. "But they have retained only some aspects of Catholicism. They perform the rituals in their own way."

A member of the community, most often a márá'akáme, is chosen to lead such ceremonies. The Christian saints and the ancient native deities are honored in the church as well as in Huichol temples.

Mariano led me to a long, narrow building with a sloping grass roof that extended over one side like a porch overhang. "This is the Huichols' government house," he said. "The authorities meet here when gathered for religious ceremonies." He pointed toward an

Power of exorcism finds a believer in a woman racked by pain, as a márá'akáme appears to draw the source of her illness from her abdomen (**above**). As he prepares to hurl it over a cliff, the patient suddenly, dramatically relaxes (**right**). Unable to eat or walk the previous week, she recovered and took part in a festival the next day, according to photographer Aldana.

Huichols accept medicine dispensed by Mexican physicians to allay illness, but believe the supernatural cause must be divined by a márá'akáme if a malady is to be cured. Often he commands a victim to make special restitution to a deity offended by neglect of an act of homage.

overturned, rough-hewn table. "When the table stands upright, the officials sit behind it to conduct community business and hear court cases. We have a government house for each Huichol district."

The Huichol world is divided into five political-geographic districts. Each is autonomous; each has its own governmental center; each is administered by Indian officials who are selected annually. Even dialects and mythology often vary from district to district, and people in one district have few dealings with their neighboring areas.

The selection of officials, a legacy of Spanish contacts, is done in the Huichol way. In each region a handful of old men, who embody the wisdom of the community, consult with former officials and members of the community before choosing the leaders. Such an elder statesman is called a *káwiténu*.

Buses Ease Pilgrimage

I later made a journey of contrasts to Rancho Ratontita, at the edge of a barren mesa in the area of Tuxpan de Bolaños. My companion, a young Huichol, Miguel Chivarra, made certain I learned and respected his native name, Matsüa, which is the traditional word for an archer's protective wristlet.

While waiting for someone to guide us to a nearby sacred cave, I watched a pretty Huichol woman cranking a store-bought food grinder in her adobe-walled hut. Her child, a naked 3-year-old boy, armed with a diminutive bow and arrow, stalked a squealing piglet. Finally when Matsüa and I were taken to the sacred cave by a márá'akáme and a younger man, the latter carried a battery-powered radio and a bamboo pole with a long antenna attached to it. We marched to the un-Huichol beat of a bamba tune broadcast from Tepic, the capital of Nayarit.

The márá'akáme complained about the changes among his people. "Many Huichols," he said, "still make the holy pilgrimages to

Our Father Sun wakes his children for breakfast at San Andrés Cohamiata, where families gather to celebrate Holy Week. In this hut, used for living quarters, corn and beans bubble over the fire, as a woman slaps her hands to make tortillas.

Learning to deal with a strange new world, a Huichol girl studies Spanish in one of three mission schools (**above**) founded by the Franciscans, who began returning to the mountains twenty years ago. In addition, the government has built schools in four of the five governmental districts. Miles from their homes in the hills, many of the Huichol children who attend the schools live in dormitories. During planting and harvesting they often return home to help in the fields.

Since the 1960's government programs to develop this part of the Sierra Madre Occidental have introduced modern technology to the Huichols and their neighbors, the Coras and Tepehuans. With a hard hat for a sombrero, a Huichol instructor who attended special agricultural classes explains the mysteries of a tractor to two Indians (**below**). More than a dozen dirt airstrips now dot Huichol country; planes bring supplies to begin the building of water and power lines, roads, and centers for medical care. With these mixed blessings has come a familiar curse among native peoples: cheap alcohol, stronger than the drink Huichols brew from sprouted corn.

Above the forces of change rising to meet them from distant cities, father and son follow simpler ways with oxen and wooden plow (**right**). The superior view of the Huichols toward their own ways remains unshaken, much as explorer Lumholtz found it some 80 years ago. "If Christians pray to saints that are made by the carpenters," one Indian asked him, "why should not the Huichols pray to the sun, which is so much better made?"

Magic bird? No, just another airplane, by now a familiar sight to these Huichols unloading construction metal (**above**) to expand a government school in Tuxpan de Bolaños. Some fear that such 20th-century inroads will rob these Indians of their traditions; already some of the population has settled in lowland cities. Yet, witness a schoolboy thumping a volleyball (**facing page**). Though he plays a game brought by *téiwárisi*—outsiders—he still proudly wears his Huichol belt.

Wirikúta. But when they leave the mountains, they ride on buses and trucks instead of going on foot. Many, especially here in the south, no longer honor the peyote."

Some Indians Migrating to Cities

I, too, had seen signs of the traditional ways being challenged by modern innovations. In the San Andrés Cohamiata and Tuxpan de Bolaños areas, new techniques of agriculture and the introduction of vaccines to prevent cattle plagues (a potent leveler of Huichol property) may be increasing personal wealth.

One element of change, perhaps as inexorable and erosive as governmental programs, is that of the silent minority—about 1,000

Huichols who have left the Sierra and their culture behind. Each year many Huichol males come down from the mountains for seasonal work on lowland plantations. Most return, but some have stayed and are becoming urbanized, settling in Tepic, at Zapopan near Guadalajara, or even in Mexico City.

I asked a Huichol lad in Guadalajara why he had traded the serenity of the Sierra for the bustle of a big city. He replied simply, "I can make money here."

Some of the city Indians are still dependent on traditional skills for their livelihoods. They have developed an extensive artisan business making vivid Huichol souvenirs, mostly yarn paintings, beadwork, and woven belts and bags, for the growing tourist trade.

Before leaving Matsüa and the Huichol country, I asked him if he were uncomfortable about having a foot in each world. He gave me a sad smile and replied, "We're people too. We're realists."

I recalled another answer I had heard from Valeriano, both an elder and a respected márá'akáme in remote Popotita. I had asked him what he thought of the new roads being built, the airstrips, the schools. "Do you oppose them?"

He gave a shrug of resignation, saying, "Can we halt the wind? The young will have new ideas, but the young will grow older. Someday *they* will be the elders." □

Fabled bearer of happiness, an eastern bluebird brings a beetle to her 15-day-old. The songsters have dwindled in number as imported species such as starlings usurp nesting sites or man destroys them. By building nesting boxes, bird lovers foster a comeback.

Song of Hope for the Bluebird

By LAWRENCE ZELENY, Ph.D.

Photographs by MICHAEL L. SMITH

THE BLUEBIRD popped out of the nesting box carrying a single pale blue feather. He flew toward my wife, Olive, and laid it gently on a post within a foot of her face. After a minute or two he winged back to the box and brought another feather, depositing it beside the first.

What message was Little Brother—an orphan that had grown up in our care—trying to convey?

The day before, Olive reminded herself, when Little Sister came to the door, she seemed out of sorts and wouldn't accept her share of ground beef.

The two birds had been feeding a second brood of nestlings. Now, alerted by Little Brother's bizarre performance, my wife hurried to the nesting box—I was out of town at the time. Beside the cheeping babies lay the body of their mother.

Coincidence or not, the faithful father had managed to make his appeal to the human foster parent he had learned to trust. Olive gently removed his mate's dead body from the box, which the young birds would have to occupy for at least another ten days.

Little Brother and Little Sister had won our hearts, brightening the garden of our suburban Maryland home with their cheery presence. They were recent additions to the long roster of bluebirds I have studied as an avocation almost all my life. Since retirement in 1966 from a long career as an agricultural biochemist, I've devoted full time to the nationwide effort to save the bluebird. One fruit of that study is a book, *The Bluebird*, published last year by Indiana University Press for the Audubon Naturalist Society.

The eastern bluebird—now so scarce that most people under 30 have never seen one—surely is one of the loveliest and most appealing of North American birds. Its extinction remains a real possibility, but a determined rescue campaign has been mounted in this country and in Canada.

Concern for the bluebird's plight coincided with the species' tragic decline throughout this century.

Unflagging patience helped capture this picture of a male feeding his eight-day-old brood (**right**). The wild bird and his mate nested in a hollow log placed by the photographer in his suburban Maryland backyard (**page 862**).

Peeking out the door, a baby opens wide for breakfast (**top**), followed quickly by lunch (**middle**). Another hungry nestling seems to glare at the world (**above**). Parents feed the babies from dawn to dusk for about the first month of their lives.

As a boy in Minnesota, nearly sixty years ago, I tried to entice these birds, then common, to boxes I built for them. But English, or house, sparrows claimed most of my boxes, usually evicting bluebird occupants. Everywhere in the United States the alien and persistent sparrow, and that other aggressive immigrant, the European starling, pose a double threat to the milder-mannered bluebirds. These interlopers like to nest in the same natural or man-made enclosures that bluebirds require.

During the past forty years, the population of the eastern bluebird *(Sialia sialis)* may have plummeted by as much as 90 percent. In this catastrophe the starling and house sparrow have played important roles. The mountain bluebird of the Rocky Mountain region and the western bluebird have suffered less, but gradually they are succumbing to the same pressures (map, facing page).

Man, too, has sped the decline of the bluebird, which favors garden, orchard, and pasture habitats. In city and country, dead trees with cavities that used to provide bluebird nesting sites are now largely cut away. Likewise, old wooden fence posts where bluebirds could find cozy hollows have gradually given way to metal posts. Unable to find proper places to bring forth its young, the bluebird faces disaster.

Bluebirds of one of the three species nest in every state except Hawaii, and in every Canadian province except Newfoundland. On farms and in gardens the birds have always been an asset. Much of the year their diet consists almost entirely of insects, including many injurious kinds such as cutworms. In winter they live largely on wild berries. They almost never damage cultivated crops.

Since colonial times, the bluebird has been a national favorite and a welcome harbinger of spring. Featured more frequently than any other bird in American poetry and in the lyrics of our popular songs, it has now in the days of its scarcity become almost a creature of legend.

OUR ASSOCIATION with Little Sister and Little Brother started unexpectedly one August morning when I was checking late broods on my trail of bluebird boxes near Beltsville, Maryland. Opening one box, I was dismayed that the ten-day-old nestlings appeared to be dead. But three showed faint signs of life. They were cold and limp, too weak to utter a sound or open their mouths to be fed. Both parents must have perished, leaving their helpless young to die of starvation. I tucked the clammy babies inside my shirt, holding them close to my body, and drove one-handed the nine miles home.

Though the effort seemed futile, my wife and I force-fed the orphans every few minutes with bits of raw beef. Within an hour they were opening their mouths and chirping weakly, and by day's end clamoring for food. A miraculous recovery!

We now felt morally obligated to serve as foster parents to the birds. Kept in a tissue-lined berry box, they were fed every 20 minutes from dawn to dusk. Just before offering them their food, my wife or I whistled so that our adopted youngsters would associate our whistle with food. The birds became part of the family and even kept us company on auto trips as long as 150 miles.*

We released the husky young bluebirds at the age of 21 days. Reveling in their freedom, they flew into the trees but at feeding time responded to our whistle even if out of sight. If we were in the house when a meal was due, they would call insistently at our back door or fly from window to window, peering in to gain attention. Impatient for breakfast, they would wake us at dawn by clamoring outside our bedroom or would flutter at the bathroom window while I shaved.

After three weeks they learned to find their own food, but even then the sprites came to our hands daily for snacks. When we were sitting in the garden, they would snuggle under our chins for short naps and sometimes peck at us ever so gently as if caressing us.

Our adopted bluebirds stayed all winter, but much to our sorrow a neighborhood cat killed one of the male birds.

We called the two survivors Little Brother and Little Sister, and we couldn't break the habit when spring came and the male bluebird began to see his female companion in a new light. He sang his most appealing songs to her and brought her choice insects. He coaxed her to a nesting box in the garden, where she built her nest and produced two broods of young birds.

When tragedy struck, the male unhesitatingly assumed full responsibility for the nestlings. Then, to our amazement, the fledglings that had survived from the earlier

*Federal permits—usually issued for research only—are required to hand-raise native wild birds. Application may be made to a regional office of the U. S. Fish and Wildlife Service.

LAWRENCE ZELENY (ABOVE) AND OLIVE L. ZELENY

Morning ritual: Little Brother and Little Sister await breakfast at the author's Maryland home (**above**). The orphans were starving ten-day-olds when Dr. Zeleny revived them with force-feedings of ground beef. Here he offers the unusual fare to a healthy fledgling (**below**). Insects, including crop-ravaging grasshoppers and cutworms, are bluebirds' favorite food.

Native only to North America, bluebirds breed from Nicaragua to Alaska and in much of Canada, where 8,000 were fledged last year on the world's longest nesting-box trail (above).

brood, both males, pitched in to help their father with his doubled duties.

There is no way of knowing what prompted the immature male bluebirds to share in the care of their siblings. Were they "told" to help by their father? Did they "understand" the seriousness of the emergency and volunteer from a sense of loyalty? Or was it simply coincidence that they felt the urge to feed and tend the younger brother and sisters just when the need arose?

Be that as it may, the three male birds pulled it off. The two females and one male of the new brood left their nest on schedule and survived the dangerous period when they perfected their flying skill and learned to find their own food.

The father bluebird with his five youngsters remained with us the rest of the summer. Then, as winter approached, we saw less and less of them. One day they were gone.

AS LONG as they can find sufficient food, bluebirds tolerate cold weather. But if the wild berries that form the bulk of their winter diet are exhausted or become covered with ice or snow, the birds' fires of life burn low, and in severe cold they may quickly perish.

Nesting boxes and specially made roosting boxes offer bluebirds protection at night from severe weather. During this past January's record-breaking cold spell, Michael L. Smith, whose pictures illustrate this article, photographed 13 bluebirds piling into a single nesting box in his Maryland backyard for a warm place to spend the night (pages 862-3).

(Continued on page 865)

Feathers fluffed against the cold, a female and her

colorful mate perch on a dummy camera, which accustoms them to the real one.

Surviving the freeze

LETHAL TEMPERATURES last winter—one of the coldest east of the Rockies since the 1880's—brought untold suffering to animals as well as to man. In this first-of-its-kind photograph, 13 adult bluebirds (**right**) huddle to conserve body heat in photographer Michael L. Smith's backyard nesting log (**below**). Two birds had died the week before, probably from suffocation, when an incredible total of 16 tried to cram inside. "They were just piled on top of each other in no apparent order," he observed. To get this picture and many of the others for the article, Smith mounted his Hasselblad camera and strobe lights above the hollow log, which he fitted with a removable top. The birds entered a hole in the side, and after dark he lifted off the lid, exposing his subjects.

Song of Hope for the Bluebird

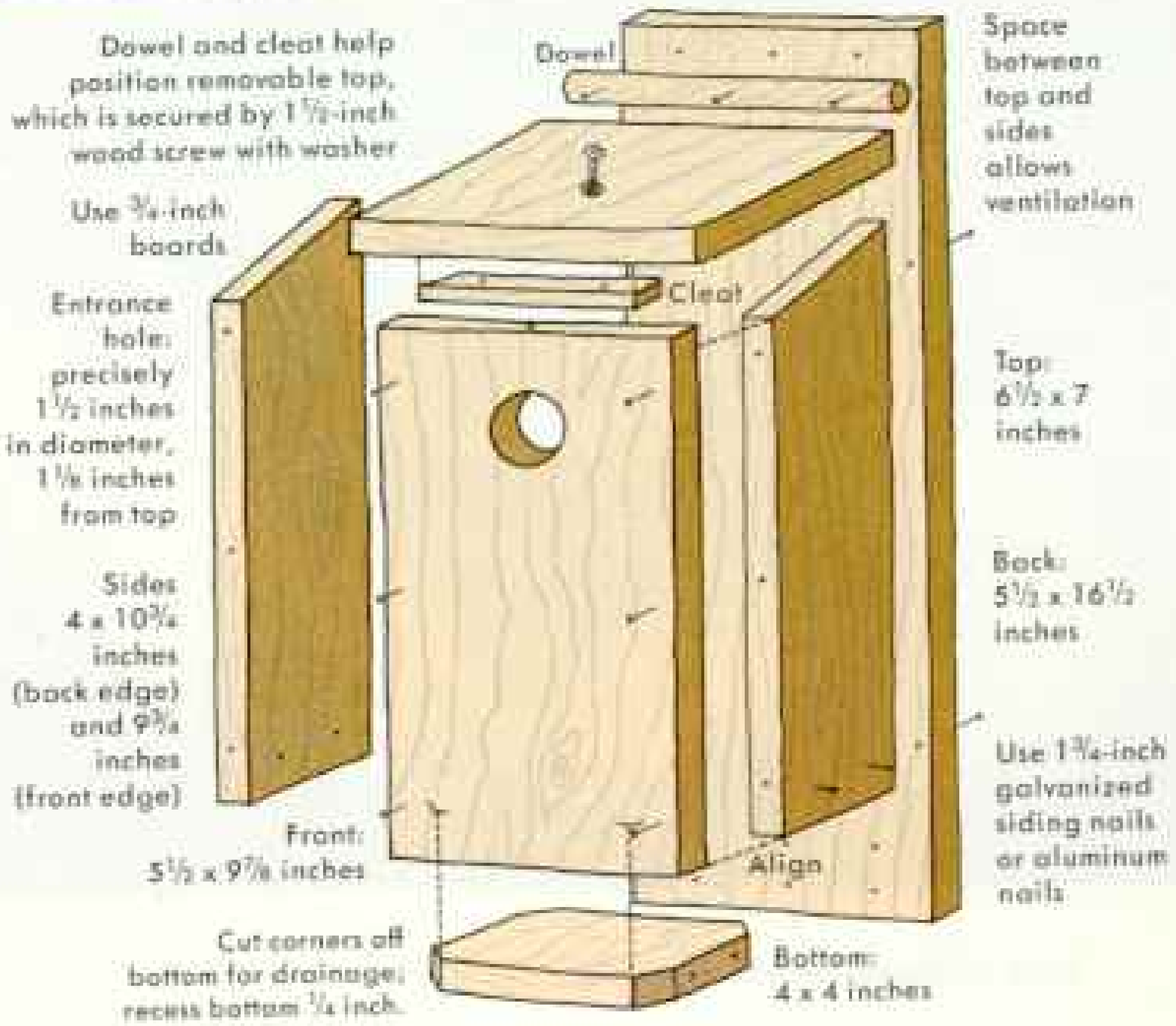
Build your own bluebird nesting box

"HOW READILY the bluebirds become our friends and neighbors when we offer them suitable nesting retreats!" wrote 19th-century naturalist John Burroughs. His observation seems even more relevant today as aggressive house sparrows and starlings take over bluebird nesting places, and man with his disdain for tree stumps and dead branches saws them down.

Thus pressed, bluebirds take quickly to boxes, such as this large one (**right**) on the author's bluebird trail near Beltsville, Maryland. Its extra depth protects against raccoons and other marauders. Where predators don't threaten, shallower boxes suffice (**diagram below**). In the past five years nearly 1,000 bluebirds were raised in 85 boxes along Dr. Zeleny's trail, one of scores in the U. S. and Canada. His success—just seven miles from the Nation's Capital—proves that even near urban areas bluebird populations can be restored.

Bluebirds prefer open areas with scattered trees. Boxes may be constructed of almost any type of wood, and they should be mounted three to five feet off the ground for convenient monitoring. Fence posts make practical supports; greased metal poles help thwart predators. Spacing boxes at least a hundred yards apart prevents fighting among highly territorial bluebirds.

An entrance hole 1½ inches wide will bar starlings but not sparrows, which must be evicted. The persistent squatters have been known to return eight times or more before giving up.



(Continued from page 860)

Throughout the north and northeast, where bluebirds migrate seasonally, the sparkling males return from the south a few days before the females. What excitement follows when the ladies arrive!

I WATCH a welcoming cavalier search for an unoccupied cavity or nesting box. Next he must select a mate and sell her on his choice of a home. The male sings his heart out, breaking off to dart in and out of the entrance to the chosen dwelling, imploring his loved one to try it. Now and then he brings her a juicy insect, which is passively accepted.

Finally relenting, the female flies to the cavity or nesting site and examines it with the thoroughness of a persnickety housewife. To the male this is outright acceptance of his proposal. His ecstasy then knows no bounds. His wings quiver with excitement, and his soft but alluring love song swells in a great crescendo, a rhapsody of joy and passion.

The honeymoon over, the female builds a nest of dry grass or sometimes of pine needles. She then lays her clear blue eggs, one a day for three to six days—occasionally more in the case of the mountain and western bluebirds.

The 85 boxes of our Beltsville bluebird trail have yielded hundreds of healthy fledglings, dramatic evidence that the most practical way to help these azure-and-russet songsters is to supply them abundantly with nesting boxes.

A bluebird trail may consist of any number of nesting boxes. Usually spaced a hundred yards or more apart, the birdhouses should be set up where they can be monitored on foot, by bicycle, or by car. A circular trail saves time in checking the boxes. They should be cleaned in the off-season, and nesting sparrows should be removed. Starlings can be excluded by cutting entrance holes with a diameter of precisely one and a half inches.

Canada boasts the world's longest bluebird trail: Through Manitoba and Saskatchewan, this incredible string of nesting boxes with its spurs now covers a distance of approximately 2,000 miles. In the trail's 7,000 nesting boxes more than 8,000 young bluebirds (mostly mountain bluebirds) and 15,000 young tree swallows were raised in 1976.

Of the United States' numerous bluebird trails, most lie east of the Mississippi River. Each year new ones are laid out. Bluebirds have increased dramatically along many of these trails, which Dr. George E. Watson, Curator of Birds at the Smithsonian Institution, praised as "a network of hope across our great continent." Still, the total area the trails cover is small in relation to bluebird habitat as a whole, so their impact has probably not yet been very significant.

Hundreds of people of all ages and from all walks of life —farmers, doctors, Camp Fire Girls, school groups, even admirals and barbers—have written to me expressing their joy in watching the daily lives of bluebirds that have accepted their nesting boxes. Anyone with access to rural or semi-rural property can take the same simple steps to help this troubled bird in its struggle for survival. May we yet see the bluebird of happiness fully restored to our land! □

ROBERT W. PRESCOTT (ABOVE) AND LORNE SCOTT

Next to suffer? Pressures that depleted eastern bluebirds are beginning to affect the more common western (**above**) and mountain species (**below**). Nesting boxes help them too.

Four new books to help you Know

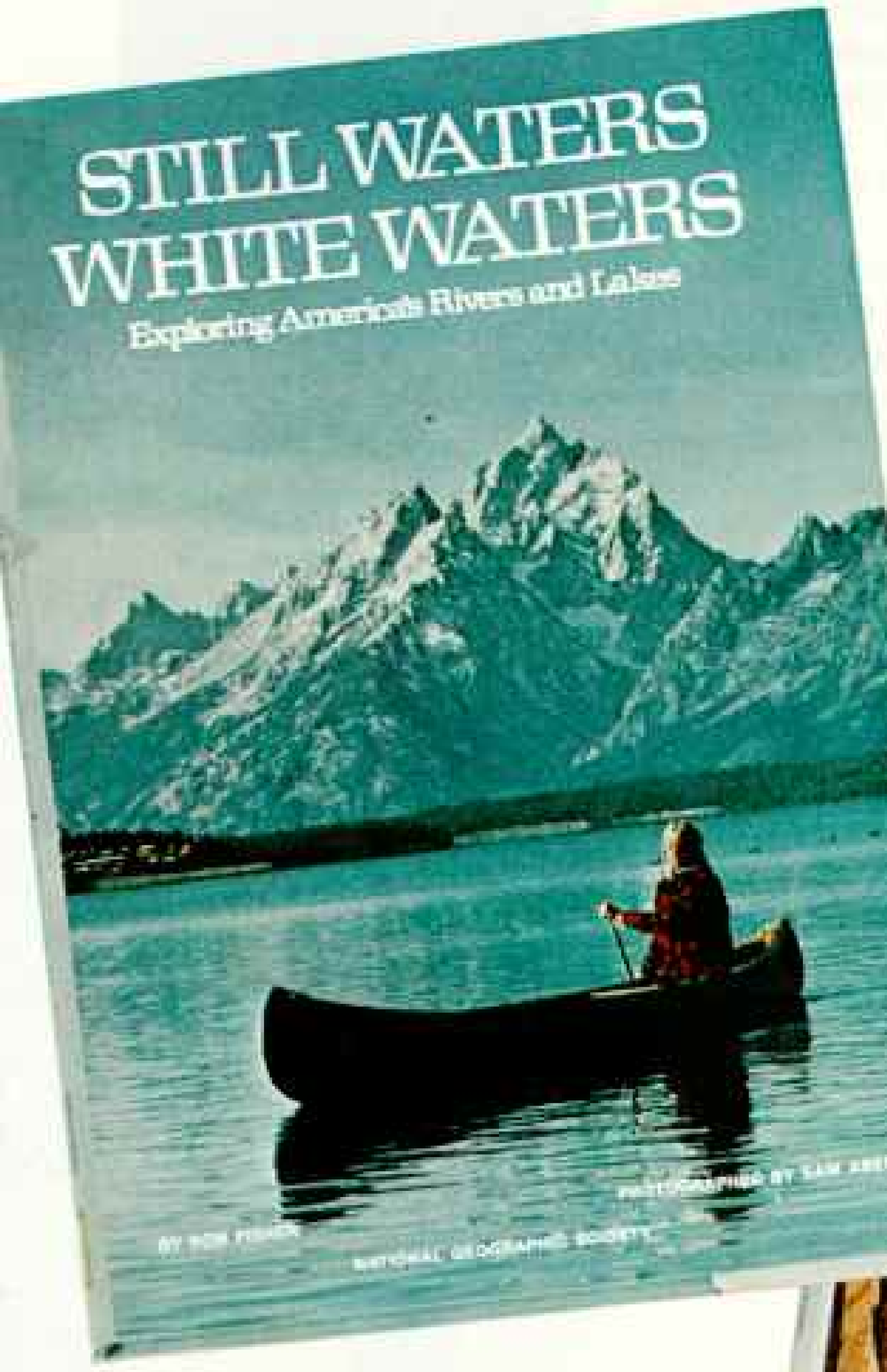
IN THIS CLAMOROUS, crowded world, there still are places where nature reigns and man is a quiet visitor. Eagles fly there, and the sounds of beavers at work break the evening stillness.

The world was filled with such places once; now they are rare. But seek them out—the memories you find will last a lifetime.

Still Waters, White Waters takes you there. With two enthusiastic outdoorsmen as your companions, you will experience the soul-soothing charm of some of North America's most fascinating waterways.

Treasure memories of the Boundary Waters Canoe Area in northeast Minnesota along the Canadian border. There'll be autumn nights when you huddle close to your campfire and watch its tiny sparks spiral up toward a Milky Way packed with stars.

But if you'd like a warmer journey, try the serpentine channels of Georgia's Okefenokee



Your World

Swamp. You will see egrets, raccoons, deer —and alligators half as long as your canoe. A gator won't bother you, they say, as long as you don't paddle between him and his den. Still, how do you know where his den *is*?

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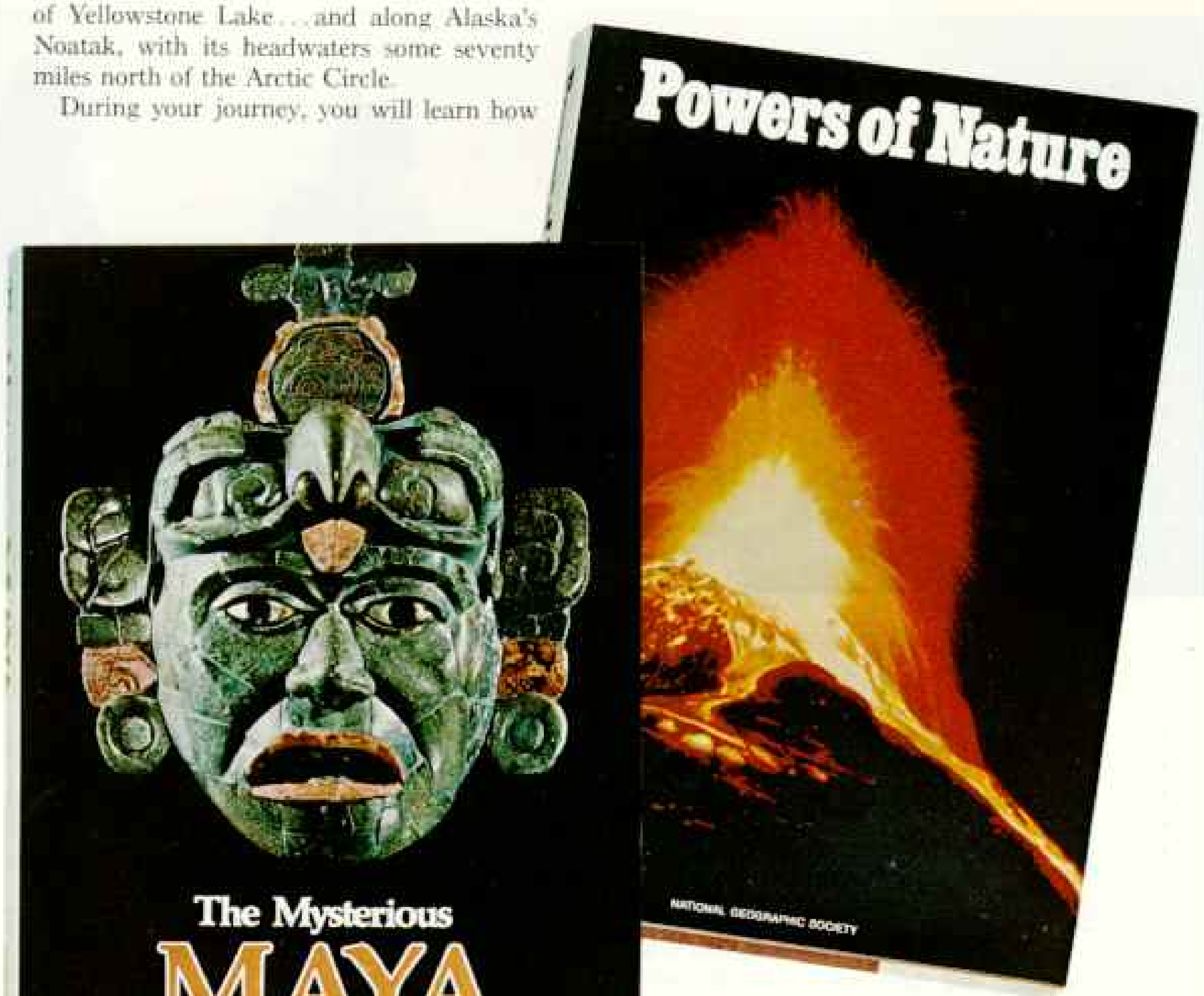

"cures"—turning one's shoes upside down beside the bed to alleviate cramps—but there is no doubt that many old remedies have led to modern drugs.

Nature's Healing Arts explores the intriguing subject of natural medicines from many parts of the world. The "snakeroot" of ancient India produces reserpine, one of the first of today's tranquilizers. Madagascar periwinkle fights childhood leukemia and Hodgkin's disease. Ma Huang, a Chinese plant, has been used for many centuries to treat respiratory infections; its active ingredient, ephedrine, is prescribed today for asthma sufferers. There is, in fact, a growing medical science —pharmacognosy—concerned with natural

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SAM ABELL

DAVID BRILL

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Splendor of an ancient civilization rises from the tangled forest at Tikal (**below**), a major city during Middle America's golden age. A descendant of the temple builders (**below, left**) preserves the rituals of *The Mysterious Maya*.

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DAVID GILLISON

Getting along in a Stone Age culture

TO THE GIMI PEOPLE of Papua New Guinea, there was a logical explanation for the arrival of David and Gillian Gillison and 6-year-old Samantha (**above**, center): They were the visiting spirits of dead relatives.

"I explained over and over, but I couldn't convince them," says Samantha, here crowned with a baby possum by her playful friends. Called Fitome—the name of a light-colored wood—she soon became fluent in Gimi and helped her parents learn the difficult language.

A tortuous six-hour hike led the Gillisons to the remote Eastern Highlands village of Ubaigubi, where they lived for nearly two years in a thatched house. Gillian, with grants from the U. S. National Science Foundation and the Canada Council, conducted one of the first anthropological studies of the region's women. Artist and photographer David, who had lived among Australian Aborigines as a teenager, witnessed sorcery trials during a survey of Gimi customs aided by a City University of New York grant.

The Gillisons' remarkable report will appear in the July issue. Share such important research with your friends; nominate them for membership on the form below.

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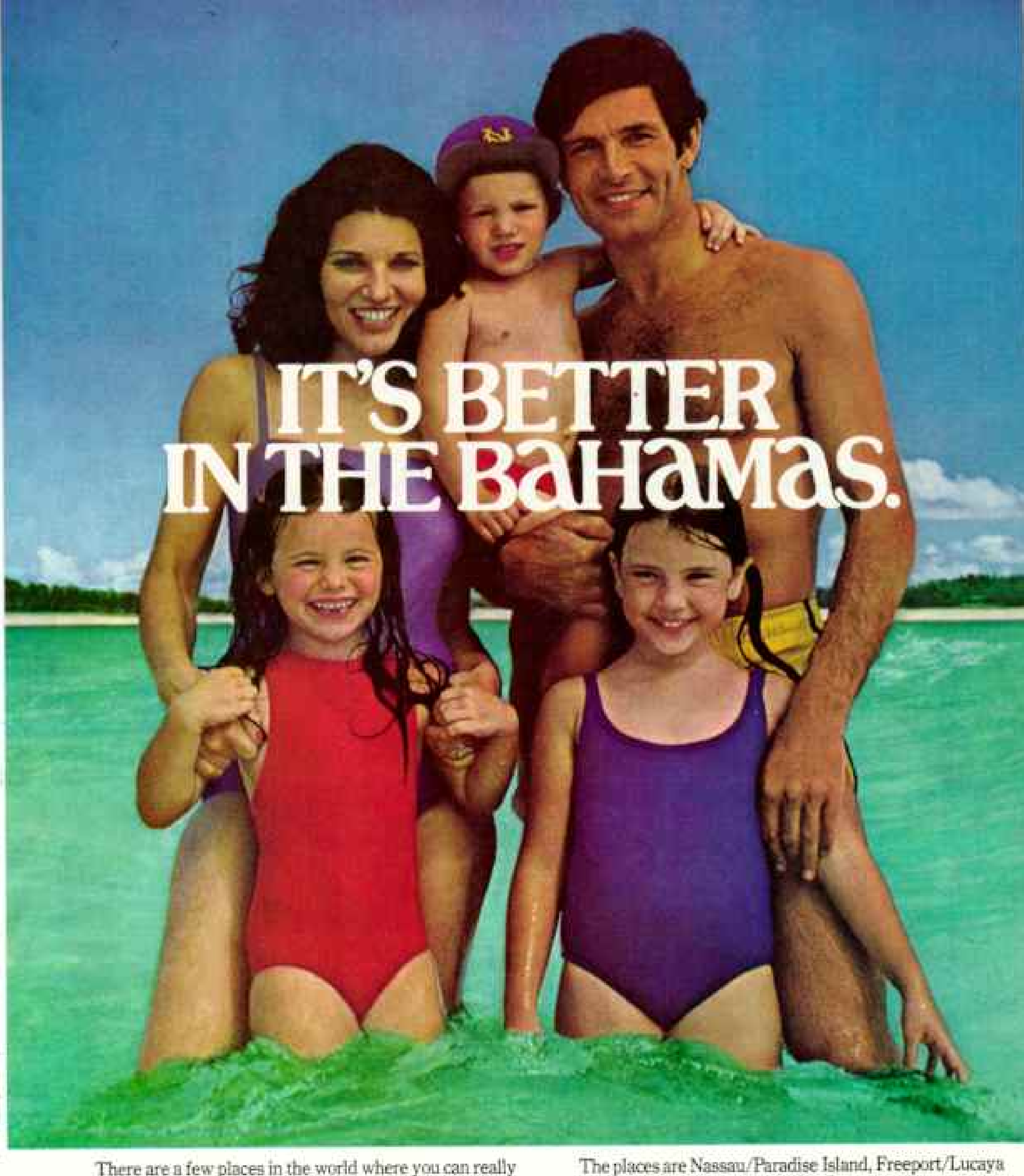

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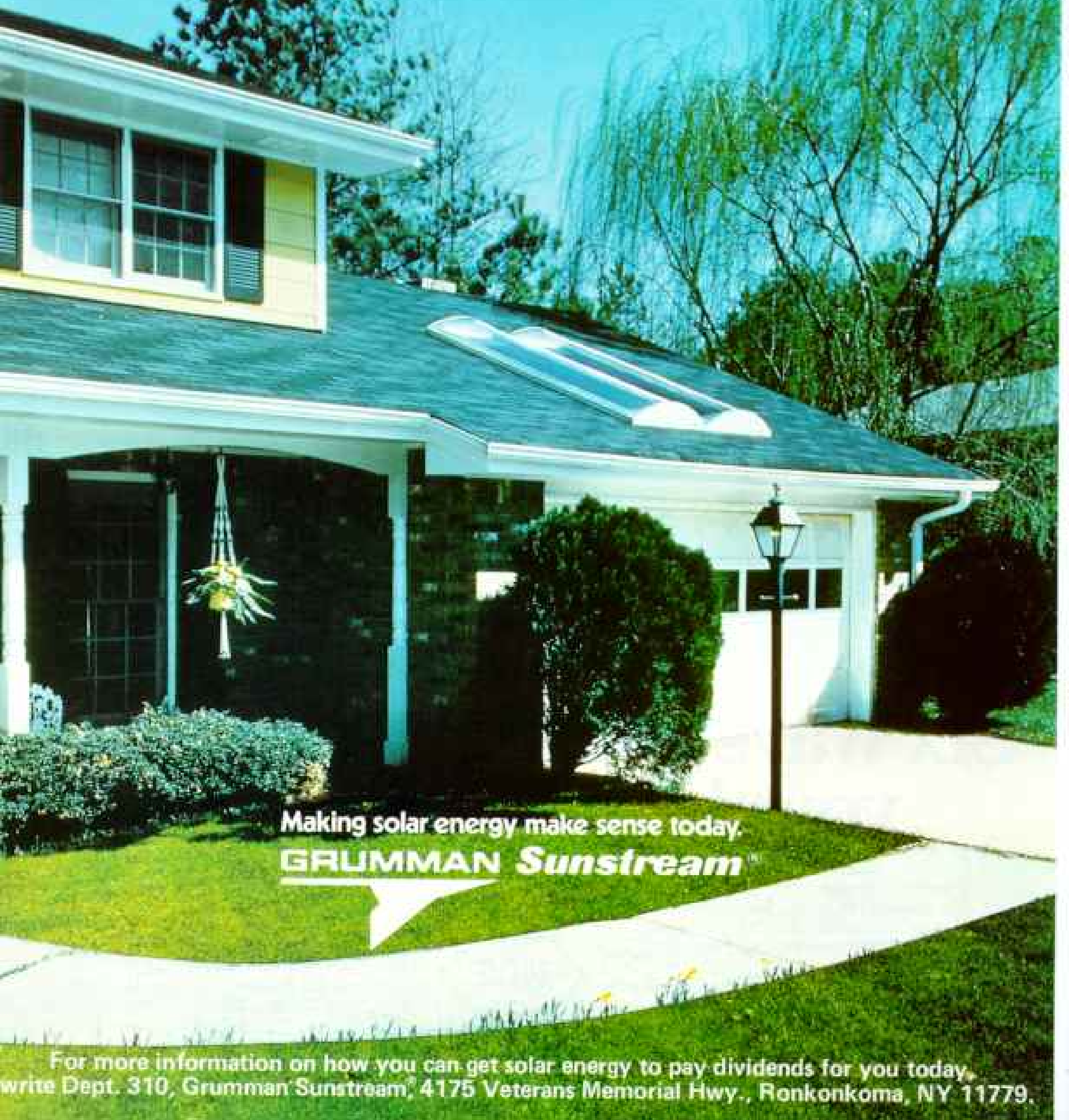

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Scientific evidence suggests that many conditions and stresses of everyday life increase the body's vitamin needs.

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For a free booklet: "Are you robbing your body of vitamins?", write Vitamin Information Service, Department N-37, Hoffmann-La Roche Inc., P.O. Box 288, Nutley, New Jersey 07110.

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"Trucks make city driving miserable!"

"Trucks keep our cities alive."

Trucks. Bane or boon of our big cities? Opposing views. Who's right?

Trucks can snarl downtown traffic. Noisy and ponderous, they obstruct your view. Block intersections. Clog alleys. Park in traffic lanes. Pound up the streets. Crowd urban freeways. Jam the ramps. Some people feel trucks should be banned from many streets. Restricted to certain hours and days on others. And some visionaries see completely truckless cities, served by high-speed, underground rail systems.

Others view trucks as an indispensable "public servant." Bringing the inner city its food, supplies, materials, equipment. Hauling away wastes. Delivering essential purchases 258 billion miles a year to homes and businesses. Stocking outlying stores. Most cities require one truck trip per day for every two people. To one degree or another all of us depend on America's 25 million trucks. Statistically almost everything we use or consume travels at least part way to us by truck.

What's the answer? Do away with trucks? Hardly! Our lives would be difficult without them. Certainly we should work to reduce their shortcomings. But, they'll probably continue to be big and unnerving to some people.

Surely we can all be more courteous drivers, and it will help to upgrade our roads and streets. Widening lanes, improving on/off ramps, extending some city freeways, building bypass roads around congested areas—all can help make sharing the road easier, safer, more agreeable—and better serve the transportation needs of today.

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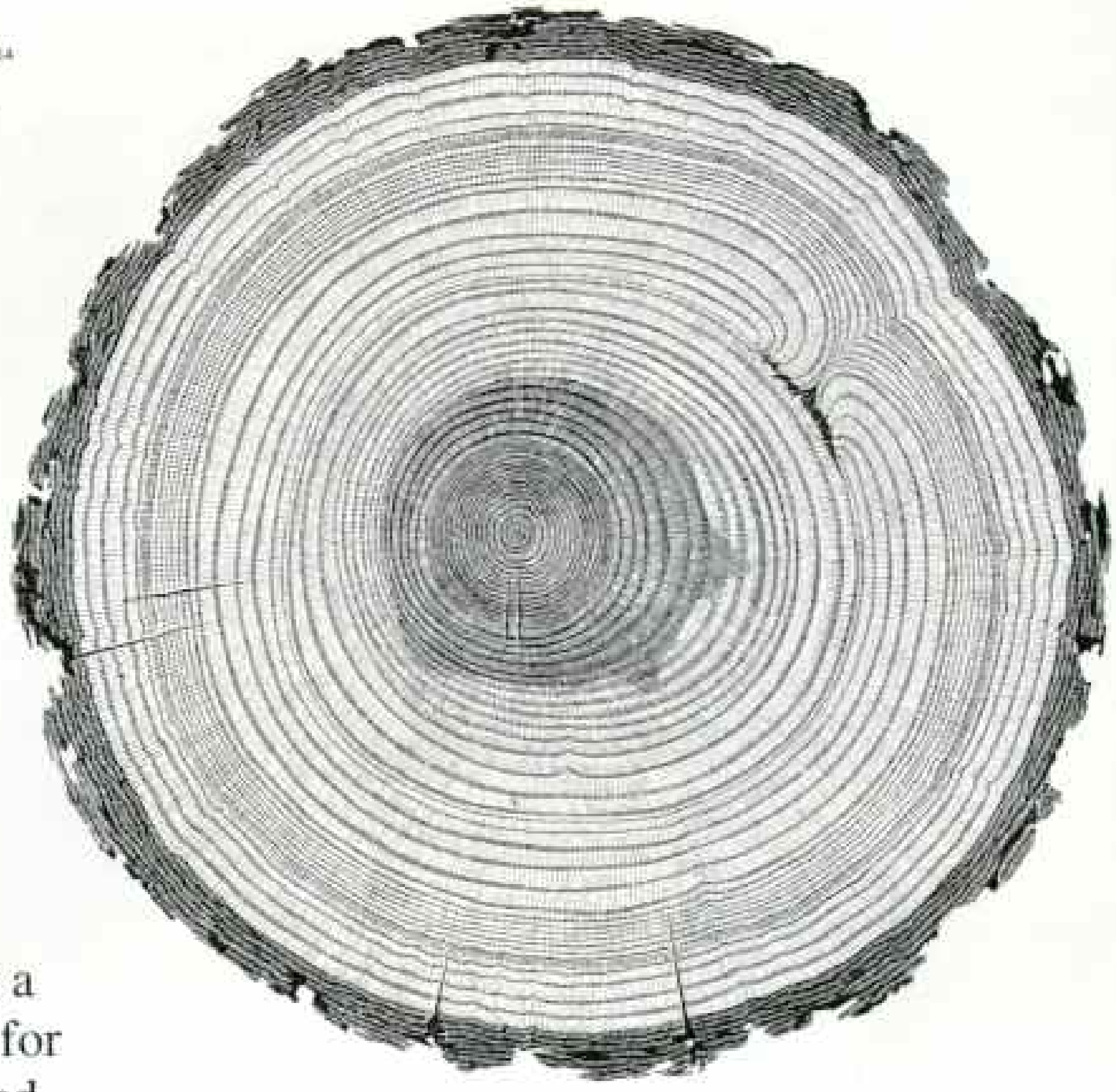
CROSS-SECTION OF PINUS PONDEROSA



This tree kept a lifelong diary for all of us to read

Each year a tree grows a new layer just inside the bark. Early in the season, fast-growing, light-colored cells form. Then growth slows, leaving a thin line of darker cells to mark the passing year.

This cracked and drying stump of a ponderosa pine reveals in its annual growth rings much about its 53-year life.

Its center rings, evenly-spaced, show 14 years of steady, normal growth. Then came four years of drought, indicated by crowded, narrow rings.

Fire crackled through the forest, searing one side of the maturing pine, and leaving an open wound that took seven years to heal.

As neighboring trees competed for sunlight, the tree's rings narrowed, until in its 46th year a series of very narrow rings tells of perhaps more drought, an insect blight, or a period of heavy cone production. By studying nearby trees, experts can pinpoint the cause.

Scientists study tree rings to find ways of improving timber growth, to gain greater understanding of the weather, and even to date archeological ruins.

Around 1900 astronomer Andrew Ellicott Douglass turned from his study of sunspots to examine tree stumps. Douglass thought that if he could link ring width to weather he would find a chronology of climatic changes written in the wood of fallen trees.

His studies gave us a valuable history of weather going back many hundreds of years. It also gave archeologists a unique tool for dating ruins.

Experts had long puzzled over the age of the pre-Columbian ruin of Pueblo Bonito in northwest New Mexico. Douglass, working under a National Geographic Society grant, drilled cores from the house timbers at this long-deserted site, matched sequences of thick and thin tree rings with his "yardstick" of ring patterns, and was able to date positively the pueblo's earliest construction at around A.D. 900.

In establishing a relationship between tree ring variation and climate, Dr. Douglass *pioneered* a new science now known as dendrochronology. He also founded the Laboratory of Tree-Ring Research at the University of Arizona, where today's dendrochronologists, by cross-dating living and dead specimens of California's bristlecone pines, have pushed back a continuous chronology of over 7,000 years. They have precisely dated hundreds of archeological sites, and have vastly improved our picture of the paleoclimate of western North America.

Not every reader shares the dendrochronologist's enthusiasm for reading tree rings. But many do share the scientist's enduring curiosity about the wonderful world around us. And to help satisfy that curiosity, they turn each month to the pages of NATIONAL GEOGRAPHIC.

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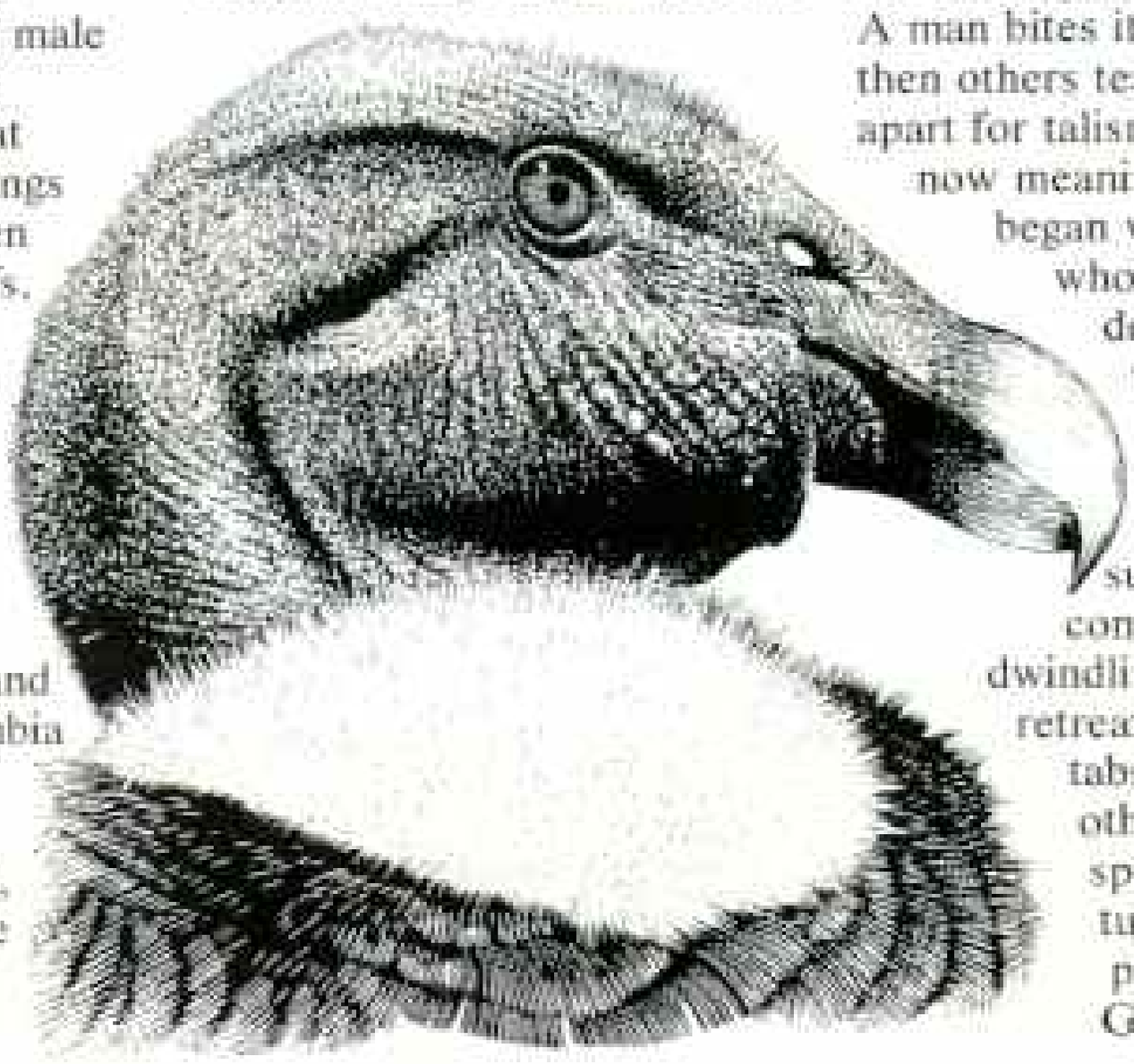
Is time running out for the mighty condor?

Profile from the past, the Andean condor has changed little since prehistoric times. Beady red eyes, hooked beak, and white ruff mark the female. The paler-eyed male wears a crinkled crest. Giants among birds that fly, condors soar on wings spanning as much as ten feet. Leaping from cliffs, condors ride updrafts to three-mile altitudes, attaining speeds of 35 miles an hour. Wings flap sparingly, mainly for takeoffs and landings. Andean condors haunt coasts and mountains from Colombia to Tierra del Fuego, feeding mostly on carrion. Once plentiful, their numbers decrease as humans encroach on their wild domain.

Hunters bag them for trophies. Guardians, hired to protect guano birds on Peru's offshore islands, wantonly slaughter condors on the mainland. One village ceremony also takes a grisly toll. A captive bird is swung from arched poles, and Cashapampa's fist-swinging horsemen pummel it to death. A man bites its tongue out, then others tear the creature apart for talismans. The rite, now meaningless, apparently began with the Spanish, who symbolized destruction of the Inca's pagan culture by killing condors. Their cousins, the few surviving California condors, cling to dwindling mountain retreats. Readers keep tabs on these and other endangered species by regularly turning to the pages of NATIONAL GEOGRAPHIC.



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Hatchback	4-Speed	50 (46)	39 (35)
	Hondamatic	37 (34)	32 (28)
5-Speed	Hatchback	54 (51)	41 (34)
Wagon	4-Speed	41 (37)	30 (28)
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Ford LTD Wagon holds more and is rated to haul more than Chevy, but is priced about the same*.

Dual-facing rear seats, one of many popular Ford options

3-way Magic Doorgate, for convenient cargo access

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Again this year, The Wagonmaster—Ford—gives you more of what you buy a wagon for. Some wagon makers, like Chevrolet, have cut down their "full-size" wagons, making them narrower and shorter, so they hold less. But not Ford.

The 1977 Ford LTD is the full-size wagon that's kept its size. Compared with the "down-sized" Chevy, Ford LTD Wagon

- **has more room to hold things,**
- **more hip and shoulder room to carry 6 in comfort,**
- **an optional extra half ton rated towing capacity.**

**With optional heavy-duty trailer towing package, Ford LTD is rated to haul more than Chevy. Yet based on sticker price comparisons of comparably equipped vehicles, Ford LTD is priced about the same.*

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New Kodacolor 400 film has a speed of ASA 400, has fine grain and is color balanced for daylight, blue flash, and electronic flash. In fact, you can get pleasing pictures in almost any type of light without the need for filters.

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New KODACOLOR 400 Film

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It'll be a while before a lot of Americans thaw out and forget the Winter of '77.

One thing it made clear was that our country has a real energy problem. Natural gas, the fuel that heats more than half of America's homes, is in short supply, and meeting demand is difficult.

And, we've got problems with our domestic oil supply. We now have to import over 40% of our oil needs. In three years, this figure is expected to reach 50%.

What's going to ease the situation? A combination of things.

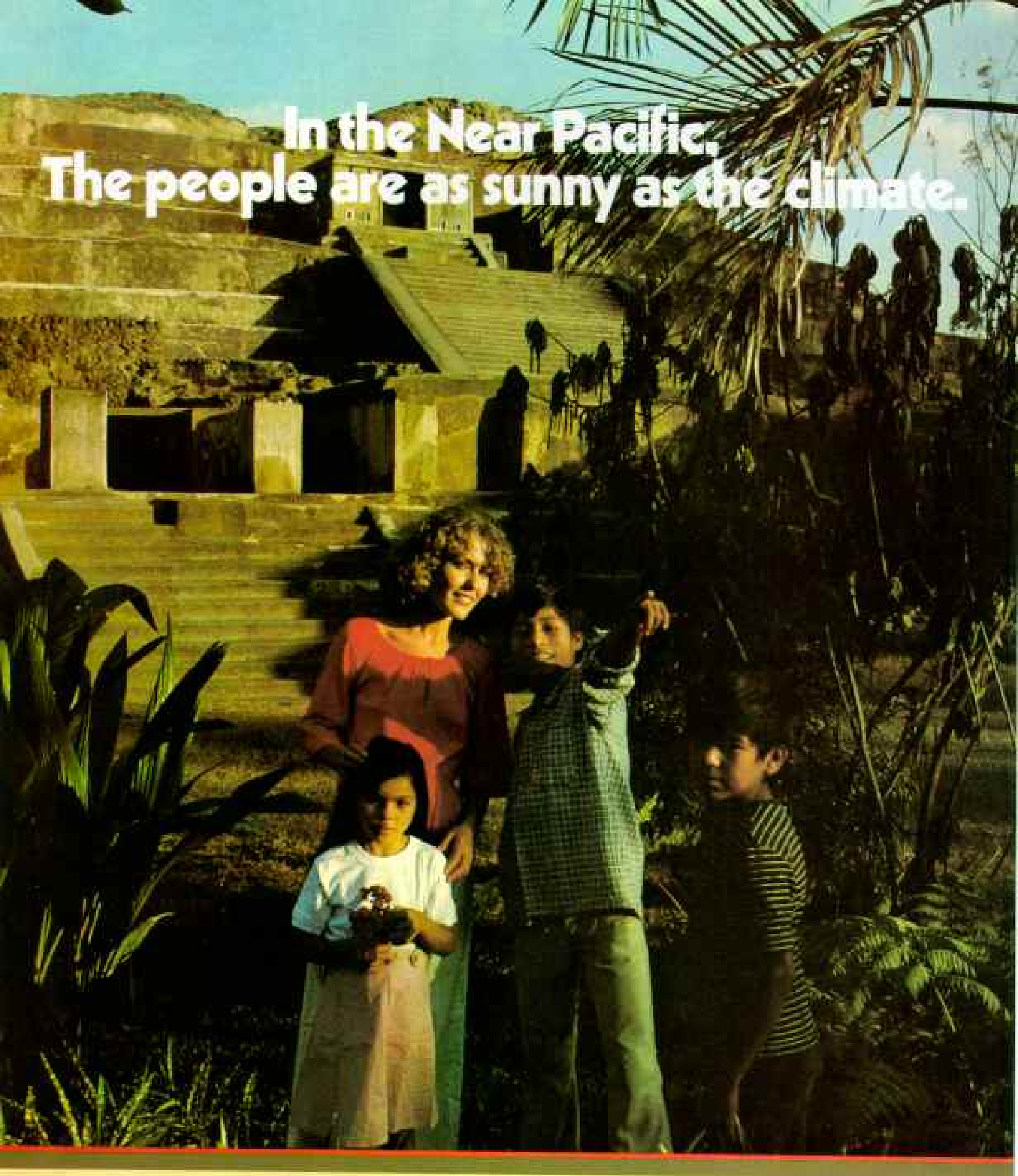
We've got to find and develop more domestic oil and gas. That's top priority. But, we've also got to get busy expanding and developing other sources of energy.

America has more coal than any other country in the free world. It's a logical candidate to help ease the burden carried by oil and gas. Nuclear energy can be a big help, too. And solar power can make a contribution.

And while we're developing all of these, we can't overlook another source of energy that's readily available to us—our conservation efforts. The National Petroleum Council has estimated that American families could save 14% of the energy used in their homes. Over the course of a year, that would save as much oil as our country imports in one month.

And that's a lot of energy for a strong America.

Energy for a strong America



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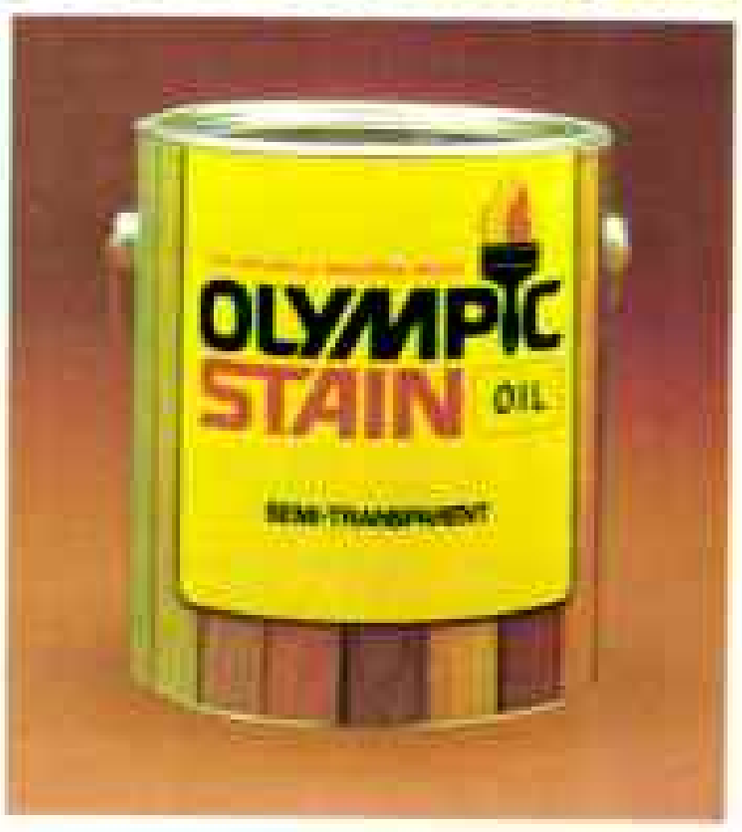

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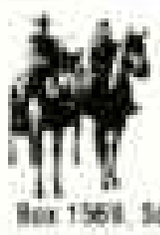

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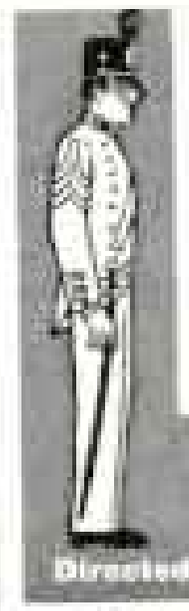

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