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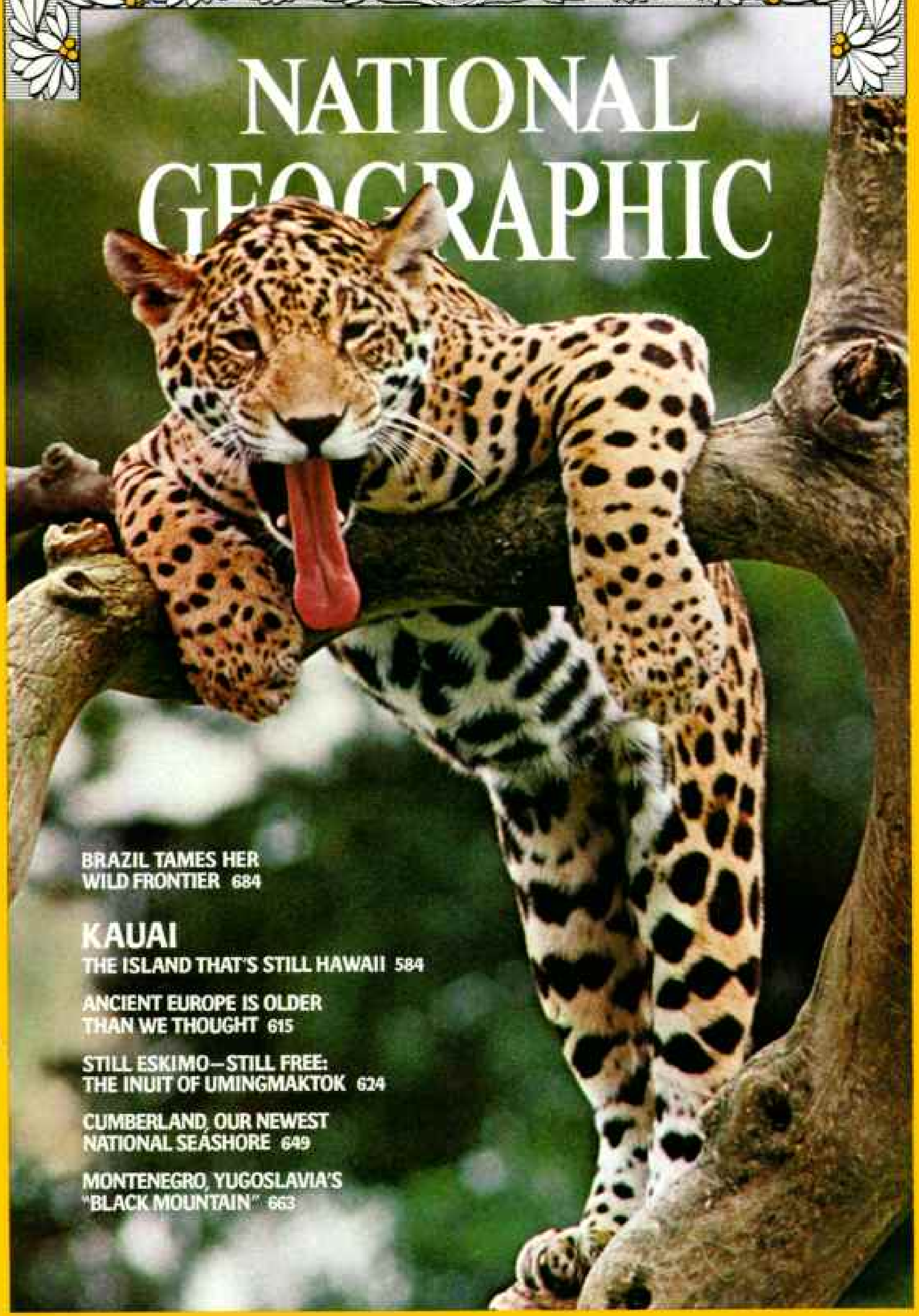
NATIONAL GEOGRAPHIC



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

LET YOUR EYE savor the spectacle of a rainbow soaring over Kauai on pages 598-9: a moody picture that captures the character of this most Hawaiian of Hawaii's major islands. A few months ago we would have thought twice about printing that photograph. The subtle detail and delicate color in those dark shadows would probably have stayed behind on the presses.

A small thing? Not at all. That rainbow reflects the biggest technical changeover in the history of your magazine. The move has been under way for four months now and won't be completed until January 1978.

Since 1960, the GEOGRAPHIC has been printed in Chicago—in recent years on eight presses—using a time-honored process called letterpress. By January every article will be printed in the quiet, pleasant town of Corinth, Mississippi, on only two giant presses, employing a technique known as gravure.

Effecting a smooth transition seems to us at times a little like moving an automobile plant from Detroit to Dallas without missing a muffler on the assembly line. The magazine you are reading was printed in *three* locations, using *three* different processes. The third, done in a plant outside Washington, D. C., is called offset. You can imagine the logistics of getting all of those pages together for binding and mailing.

The shift required our new printer, W. F. Hall Printing Company, to construct the world's most advanced gravure plant in Corinth. The two new presses stand four stories high and half a football field long. In only a minute, more than a quarter mile of paper zooms through each of them. Editorial content for a typical issue of ten million copies requires a ribbon almost six feet wide and more than 18,000 miles long! Automated lines can bind 24,000 copies an hour; the Corinth post office mails 14 trailerloads a day.

Why did we undertake this milestone change? Obviously for increased efficiency—it permits us to fend off for a while longer the ever climbing costs of producing your magazine. We are now planning to couple with the improved gravure printing process the speed and flexibility of computerized typesetting.

But even more important is our quest, over nearly 90 years, for better and better quality. This move permits us to raise our sights a notch—and give you a rainbow on Kauai.

Gilbert M. Grosvenor

NATIONAL GEOGRAPHIC

THE NATIONAL GEOGRAPHIC MAGAZINE, VOL. CLI, NO. 5

November 1977

COVER: *Endangered symbol of the Amazon Basin's rich wildlife, a jaguar finds safety behind the bars of a Brazilian zoo. Photograph by Loren McIntyre.*

THE ISLAND THAT'S STILL HAWAII

KAUAI

BY

ETHEL A. STARBIRD

PHOTOGRAPHS, INCLUDING A SPECIAL PORTFOLIO, BY

ROBERT W. MADDEN

BOTH NATIONAL GEOGRAPHIC STAFF

MAXIMINO CLAROS is a most happy fellow. Especially with the deck of a sampan beneath his bare feet and a fishline or two in tow.

Like many of his friends, this affable 70-year-old emigrated from the Philippines almost half a century ago to work the cane fields of Hawaii. He now lives on Kauai, northwest of the archipelago's four other major islands (Oahu, Maui, Molokai, and Hawaii), and speaks in the relaxed pidgin common to them all.

"Back when I come here, good man with machete he make a dolla' a day. But that dolla', missus, she sure roll one long way."

That Hawaii's sugar growers now pay the highest agricultural wages in the world—$4.19 an hour to start—makes no difference to Maxie. In 1947 he turned from soil to sea and the freer life of a fisherman.

Together we trolled for tuna along Kauai's southern shore. *(Continued on page 588)*

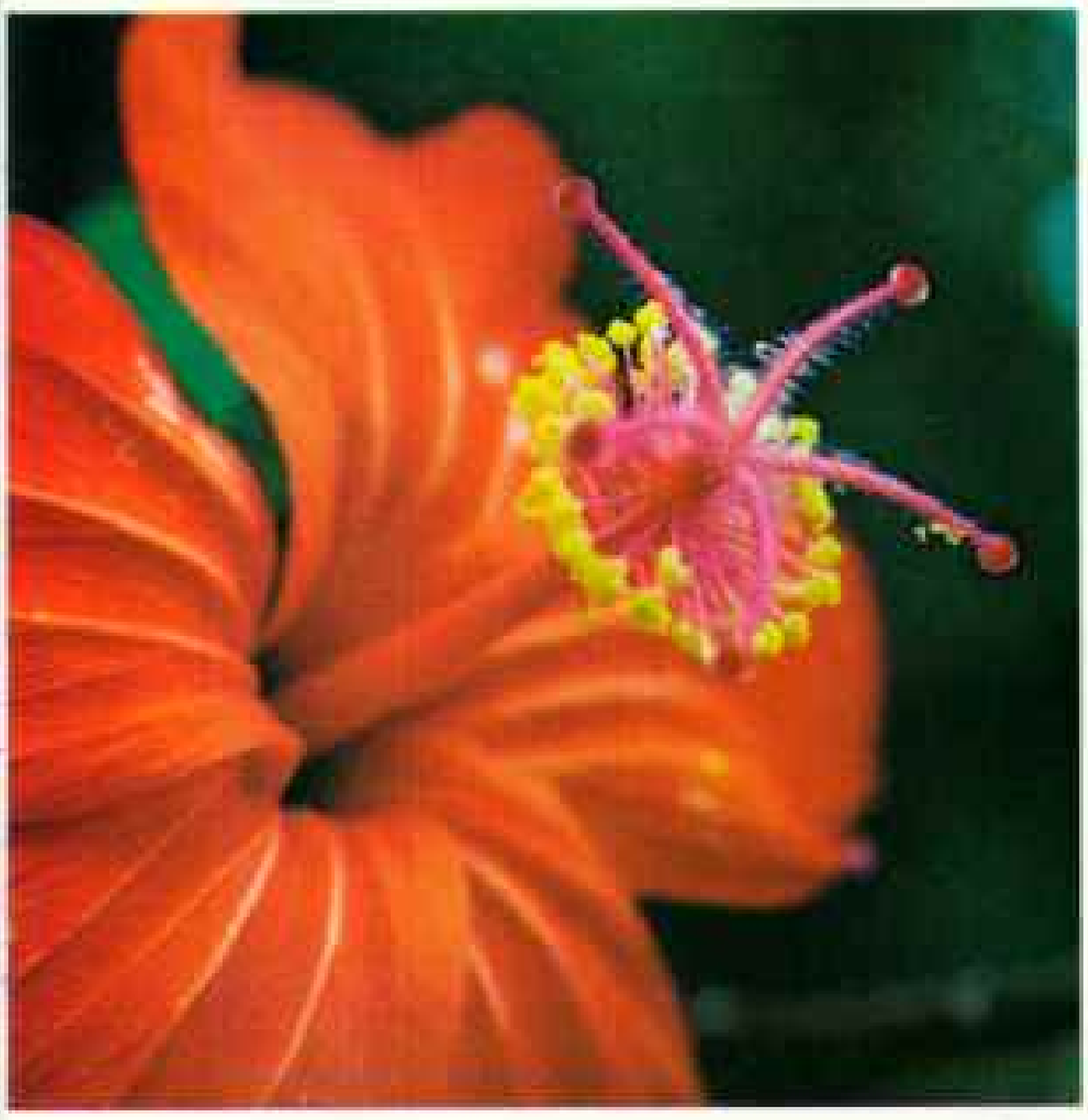
Emerald cane fields finger their way into Kauai's rugged terrain. Breathtaking parks and huge sugar plantations cover most of this Hawaiian island, where residents hope that a wave of development will not create another paradise lost.

AMID SHOUTS AND SPRAY, *canoeists tear from shore to start a flat-out 12-mile race from Kauai's Wailua River to Nawiliwili Bay. Called the "Iron Man," the event demands a stamina traditional among sea-bred Hawaiians.*

Where men seldom wander, imperiled plants and birds find refuge. Biologist John Sincock (**bottom**) of the U. S. Fish and Wildlife Service sloshes through Alakai Swamp in hope of spying the yellow-thighed oo (**below center**), one of the world's rarest birds. Steve Perlman (**facing page**) scales sea cliffs to locate the Brighamia plant, one of 222 endangered island species. Nurseryman for the nonprofit Pacific Botanical Gardens on Kauai, Steve helps rescue native plants, including the St. Johnianus hibiscus (**below**).

Winds, quickening as day dawned, crested the waves with fine, blowing manes of foam. Sheltering behind Maxie's ample back, I had ample time between bites and nibbles to admire the striking features of the most natural and verdant isle in Hawaii's golden hoard (map, page 593).

On this, its leeward side, the landscape lifts from bluff, ledge, and beach through tilted cane country to peak out in sharp-ribbed ridges that began as molten lava more than five million years ago. Happily, Kauaians keep a low profile amid this natural splendor. Very



few high rises blemish its inviting coastline or the few small towns beading its only major roadway.

At mid-island, Waialeale soaked in one of the frequent showers that make the mountain, with its average 460 inches of annual rainfall, the wettest spot on earth (page 597). Abundant runoff, sluiced onto thirsty terrain below, has nurtured world-record sugar crops—as high as 18 tons an acre.

Parks, plantations, and open space absorb a whopping 70 percent of Kauai's 553 square miles, certainly a splendid arrangement for keeping things green and pristine. But it's frustrating for residents unable to find or afford the high price of fee-simple house lots. Many truck farmers and homeowners must, of necessity, lease or rent the land they use.

BOISTEROUS SEAS bucked Maxie and me back to Port Allen with only four tuna aboard the sampan, hardly a profitable haul. But his new-moon smile was still riding high as he held up two of them: "Here, missus, you take." They were, of course, the best of his catch.

Islanders call it the "aloha spirit," this irrepressible, spontaneous urge to please. To be sure, not everyone has it. The most obvious exception: local goon gangs who have staged violent, unprovoked attacks on "Coast *haoles*," a term that has come to include any Caucasian from North America.

Although these bully boys blunt the island's Eden-like image, the aloha spirit is in no immediate danger of extinction. Folks like Maxie see to that. So does the fire department at Hanalei, a delightful northside community long patronized by film producers for its Bali Ha'i setting and idyllic bay.

Instead of checkers, Hanalei's firemen make a hobby of hospitality and haute cuisine, Kauai style, for which they personally supply only the best ingredients. Wendell Goo and Jay Herbert fish, David Sproat farms and ranches, others help stock the larder with that staple known as poi, and with wild goat, boar, and game birds hunted in nearby hills.

Capt. Gary Victorino's waistline suggests his specialty: He's the official taster. "How you say it? Rank has the privilege, no?"

When I dropped by early one morning, Jay was already at work on a tuna he had landed, paring off paper-thin strips of iridescent skin he would later use for lures. Then he moved on to meatier matters: platters of sashimi—raw fillet slices served with an eye-watering sauce of hot mustard and soy—followed by a huge fish fry of those choice chunks that lie closest to the backbone.

Tapering off on avocado and papaya, I thanked them for the feast. "Thissa feast? You gotta make joke. Mo' betta you stay and by'm'by we fix a li'l breakfast. Somet'in' solid do you good."

My hosts speak more conventional English when they want to. But to most islanders,

Back-bending hours in the cane fields make a cigar taste sweet to a Filipino woman (**above**). Following behind a machine laying irrigation hose, she covers bare spots by hand.

Ever since Hawaii's first successful sugar mill opened in Koloa in 1835, cane has dominated the landscape and economy of Kauai. But the island's oldest cash crop is taro, from which the staple poi is made. Mrs. William Haraguchi (**right**) harvests the tuberous stem bases, or corms, in a taro patch near Hanalei.

Like the bulk of island vegetation, most of Kauai's residents have native roots elsewhere. Lured by plantation work, successive waves of Chinese, Japanese, and Filipinos have come to the island. Native Hawaiians now comprise only 3 percent of the population.

pidgin is like a fraternity handshake, an insider's language that marks its users as *kamaaina*—homegrown Hawaiians.

Since, by station-house standards, I was missing a real meal, David packed me a snack: half a bushel of fresh fruits and vegetables from the garden. If there's a low-calorie aloha on Kauai, I have yet to find it.

But then, big eating has been big here for centuries. To early Hawaiians, fat was beautiful, and chief-class ladies were, like queen bees, stuffed with goodies a dozen times a day to bring them up to pleasing proportions. A 300-pound waddler who had to be rolled into her royal robes was just about right.

AROUND HANALEI, cattle graze and condominiums sit where pineapples and sugar held sway before their production became unprofitable. Elsewhere in the district is a crop not everyone considers beneficial: rootless and restless young from the mainland.

Although the cost of living on Kauai runs about 15 percent higher than on the mainland, they flock to the north shore with their backpacks, surfboards, and dreams of an endless summer. Those lacking in public and parental aid have devised interesting alternatives to support their casual life-style.

Some sift tidal sands for puka shells—small, round, and already drilled by nature's hand—stringing them into an endless inventory of necklaces. Others retreat to untamed reaches of the rugged, roadless Na Pali coast, where human needs are minimal. Here the island's fiery origins proclaim themselves in spectacular valleys and *pali*—cliffs that form jagged ramparts rising, in places, 4,000 feet above the sea. Misty days endow the region

with a dawn-of-creation look (pages 602-604).

When winter storms erase beaches, and boatmen wisely steer for calmer shores, Na Pali traffic has only two ways to travel: by helicopter, or by foot over a tricky, 11-mile path little improved since the first Hawaiians etched it into the sheer cliff face. I walked in with a likable six-footer named John Wehrheim, who works three jobs to pay for the joys he finds in Kauai living.

Above the valley of Hanakapiai, a long-limbed Godiva dressed only in a knapsack asked if we'd carry out some orange peels left over from her lunch; she didn't want to sully the scenery. "No danger of that," John assured her. Then, to me: "You've got to admit, she sure knows how to travel light."

Na Pali dwellers are apt to vanish genie fashion if strangers descend by air but tend to stand their ground when walk-in visitors approach. I stopped at one makeshift shelter well camouflaged by trees to discuss the economics of bare-essential living.

"We make out OK," Ray from Michigan told me. "Most of us are, like, into agriculture. Herbs, that is; *specialized* herbs." Airborne or afoot, authorities have been unable to stamp out these uninvited guests or the high-grade "grass" they grow.

Officialdom had even less luck with a Na Pali holdout late in the last century. The leper Koolau escaped into remote Kalalau Valley rather than face separation from his unafflicted family. A small army, complete with cannon, failed to dislodge him.

ON MY NEXT TRIP to Na Pali, I took the easy way—aboard a U. S. Navy helicopter from Barking Sands Pacific Missile Range Facility on Kauai's far-west

frontier. Its mission: to maintain a wedge of adjoining ocean as a test zone for naval weapons. After making a sweep over restricted waters—where I spotted two torpedoes that turned out to be humpback whales—we clattered inland for a rare, clear view of Waialeale's usually cloudbound summit and a sweep through that gorgeous gorge called Waimea Canyon (pages 600-601).

Creased by waterfalls, the mountain's crumbling crater attests to a volcanic heritage the "Garden Island" shares with her younger but more sophisticated sister islands.

Given the edge of age, Kauai claims the birthplace of Pele, pagan goddess of fire, who still stirs up an occasional pot-au-feu on the island of Hawaii. Also pioneering here in legendary times were the first *menehune,* energetic "little people" who presumably busied themselves with ditching and damming. Some projects, thought to have been constructed before the Polynesian culture, are attributed to the menehune, and are now preserved as local landmarks.

When I asked a class of second graders if any of them had ever seen a menehune, six said they *were* menehune. Fact and fable keep very close company on Kauai, and no one would have it any other way.

This island was probably the first stop for Polynesians from the Marquesas on their earliest voyages to Hawaii more than 1,200 years ago. It certainly was for Britain's Capt. James Cook, who, in Western terms, discovered what is now the 50th state when he put ashore at Waimea in 1778. The captain estimated Kauai's population at about 30,000 at the time. According to latest reports the figure stands at 34,000, up considerably over previous years but still 1,600 less than in 1940.

"Of course we can stand some growth. But not on our precious shoreline and agricultural lands." Island-born JoAnn Yukimura, an activist lawyer, has led an impressive revolt against an increase in "uncontrolled growth and devastation of our natural resources." She campaigned for the County Council, the local governing board, as an opponent of any further development "that does not directly benefit the living and working conditions of our own people."

A majority of the electorate evidently agreed. In 1976, on her 27th birthday and first try for public office, this pocket-size Portia won one of seven hotly contested council seats with a runaway margin over all the other candidates (page 595).

"Too much resort development has already buried much of Hawaii in concrete," JoAnn asserted. "If we want to push tourism, we should not destroy the very things that bring tourists to these islands."

WHAT MAKES the Kauai story noteworthy is that public and private resistance to those who would subdivide and conquer came before any extensive alterations to the countryside.

First, a group of tenants at Nawiliwili, the island's principal port, rebelled against losing lands they long had leased for homesteads to a proposed resort complex. Through strong organization they have avoided eviction for five years, though their position becomes more uncertain every day.

Next, southside citizens opposed a mammoth resort planned for 1,260 shoreline and agricultural acres near Poipu, and won. The group also slowed the spread of hotels and vacation homes, which, they claim, have already made an exclusive preserve of lands and sands that once were open to everyone.

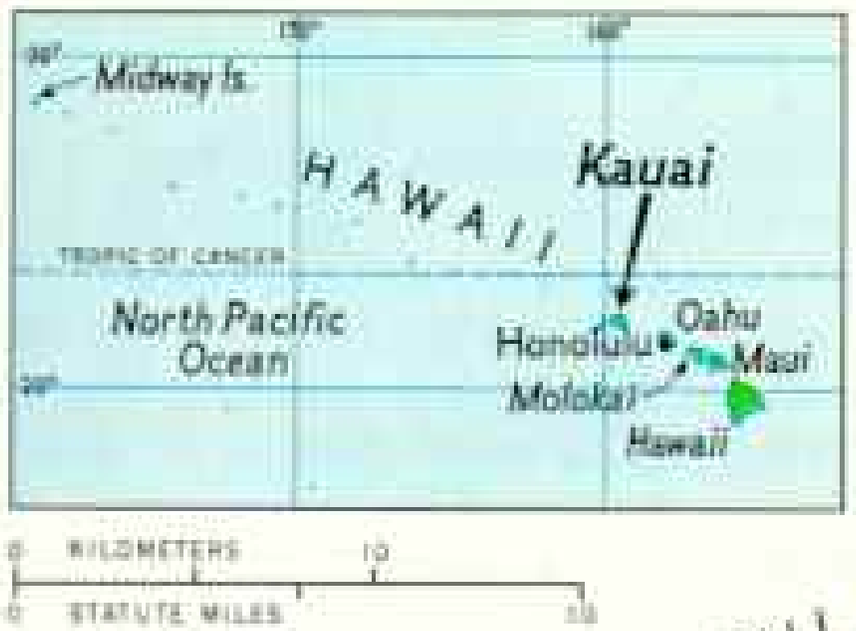
Tamara Wong wants no more changes in her Poipu-Koloa neighborhood: "By'm'by, mebbe they put all Kauai people in a park where tour buses go to see real live natives perform. You smile? It happened on mainland, and now you haoles sorry for what you did. Betta we take care of those a'ready here than those who've not shown up yet."

Despite impressive resistance, more and more rezoning permits—many tailored exclusively to off-island trade—are nibbling away at the once pastoral coastline. Height limits inch skyward and showdown time is now. With some 30 million dollars' worth of construction under way and visitor occupancy hovering around 75 percent on an annual average, some islanders question the need for more tourist accommodations.

Proponents of development, including the county government, wholeheartedly agree that whatever is built should do no violence to the beauty of the island, but argue that jobs generated by growth are vital if Kauai is to reduce its unemployment, now about 8 percent of the labor force.

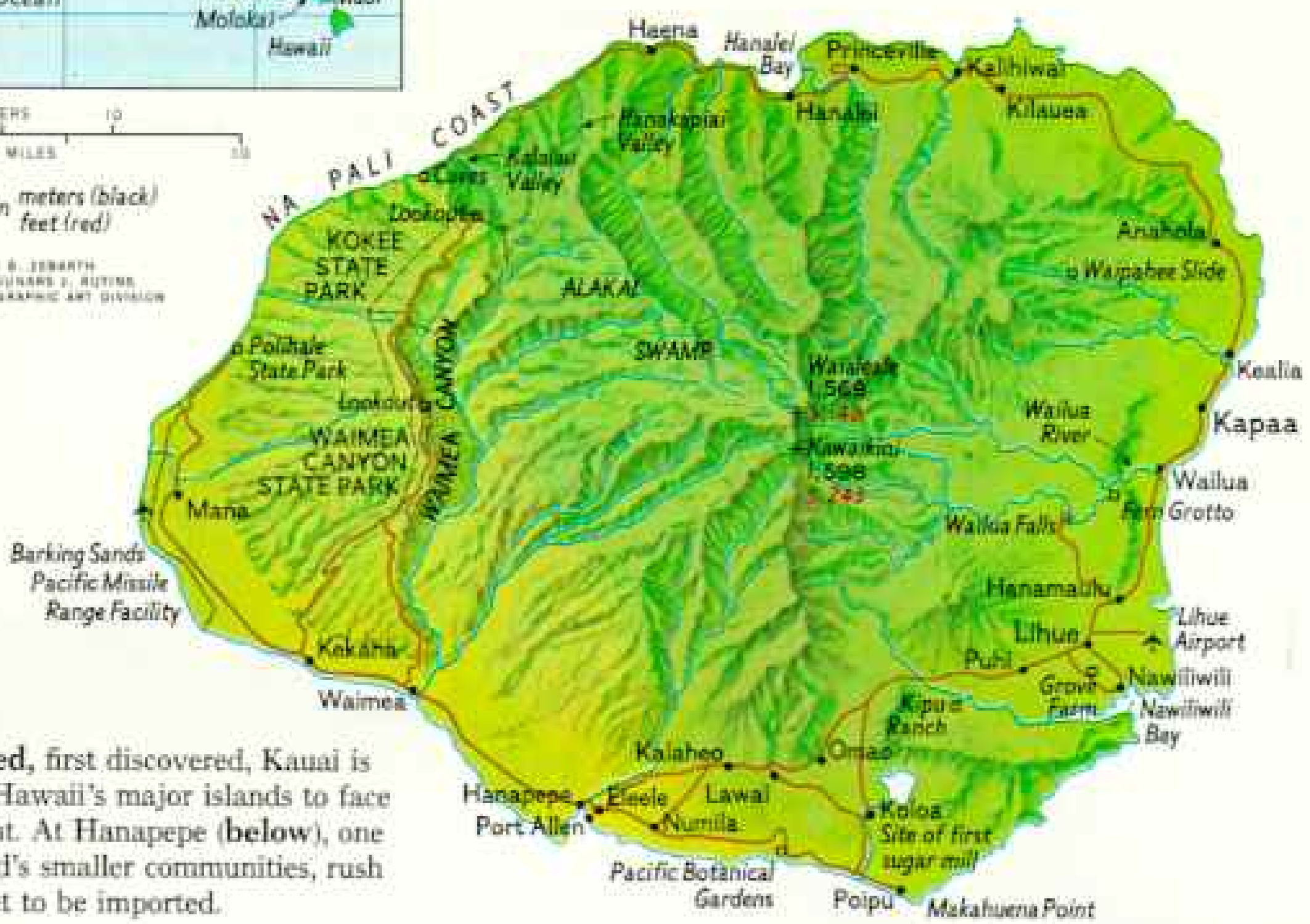
Still bee-busy at *(Continued on page 596)*

KAUAI



Elevations in meters (black) feet (red)

DRAWN BY LEO B. ZEBARTH
COMPILED BY GUNARS J. RUTINS
NATIONAL GEOGRAPHIC ART DIVISION

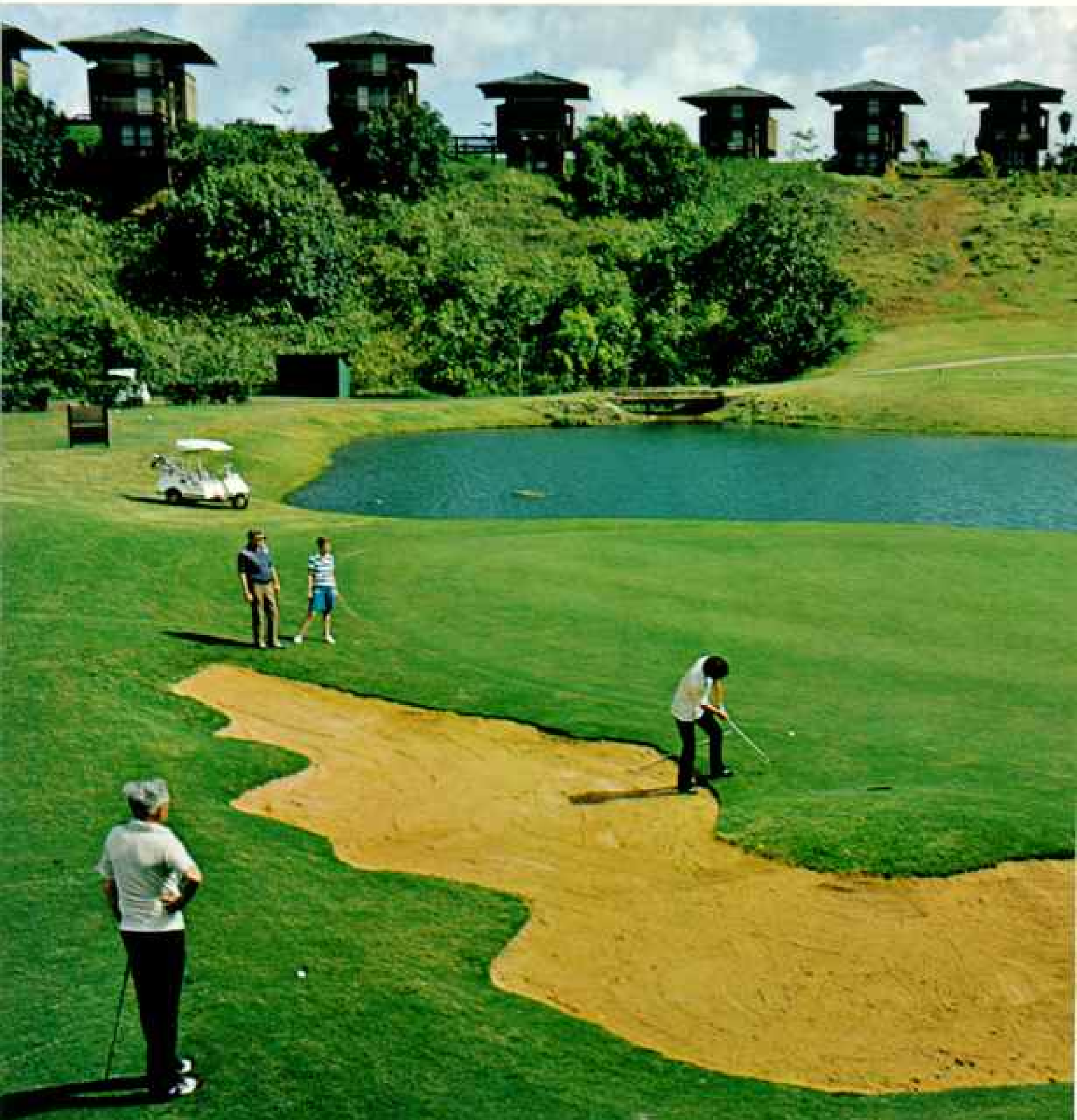


First formed, first discovered, Kauai is the last of Hawaii's major islands to face development. At Hanapepe (**below**), one of the island's smaller communities, rush hour has yet to be imported.

Horizon of condominiums and the swatch of a golf course become part of the scenery on Kauai as developers discover the island's inviting spaces. Harbinger of the trend, a Denver-based corporation in 1969 purchased 11,000 acres of sugar and ranching land and began building the largest planned community on the island. Called Princeville-at-Hanalei (**below**), the project includes a shopping center, an airstrip, and more than 600 housing units.

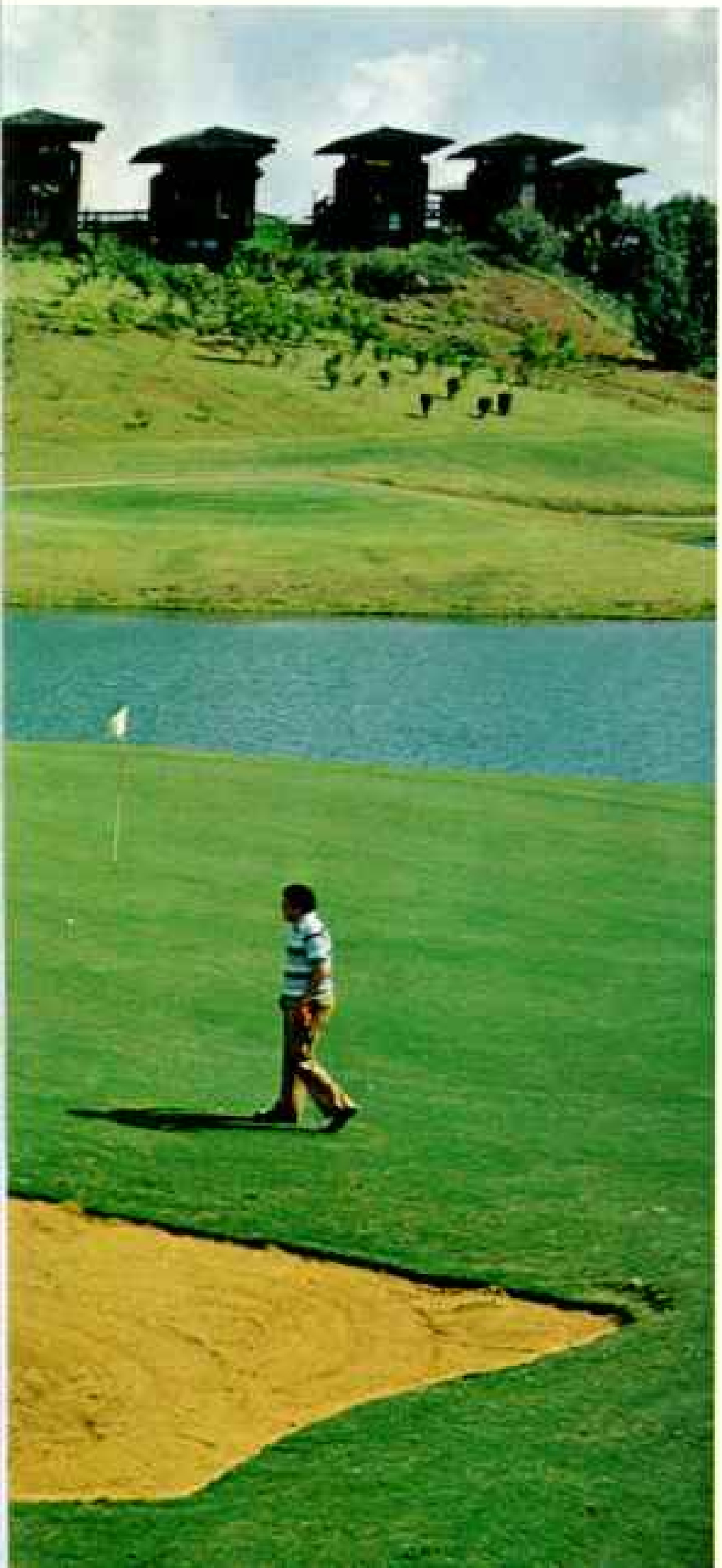
With four traffic lights and few structures higher than four stories, Kauai can still claim exemption from the kind of large-scale development that has occurred elsewhere in the islands. Yet construction starts have jumped, requests for commercial rezoning continue, and the population faces a projected climb from 34,000 to 43,000 within the next decade.

Despite the lure of jobs, many islanders strongly oppose a growth spurt. They fear the loss of Kauai's unhurried life-style and the spiraling prices of what limited land exists. In 1974 a group of citizens led a successful fight against plans to build a giant resort near beaches at Poipu. Last year voters elected to the Kauai County



Council a 27-year-old activist lawyer, JoAnn Yukimura (**left**), who campaigned to slow uncontrolled growth and preserve the magic of the landscape.

Most factions admit that some growth is necessary and that the tourist (**below**) is needed to sustain the economy. "But we won't see a random betrayal of the island's natural beauty," promises Donn Carswell, development coordinator at Princeville. In the view of a county spokesman, "Growth can be beneficial, but it must not damage the very beauty that brought people here in the first place."



66, Sarah Santos sees both sides: "I like Kauai the way it's always been—peaceful, neighborly, easygoing. But I also know our young people need more opportunities at home or they will keep on moving away. My own children did. We're becoming an island of the old. Already there are more of us over 50 than under 30."

Sarah never lacks for work. Her house overflows with feather hatbands, delicate shell leis, appliquéd quilts, and crocheted afghans—all of her own making.

Center of attraction at a senior citizens get-together in Hanapepe, Sarah taught an overflow class advanced sewing, then helped serve an excellent international buffet prepared by the multiracial gathering.

"So many here have worked always with their hands. Now gadgets and age make them feel useless. Coming out like this limbers them up a lot. Especially their appetites."

I praised whoever prepared the octopus for beating it to such tenderness. "Me no beat," chirped the sparrowlike lady across from me. "Put in washing machine. Paddles go bang-bang. Come out real good."

SARAH AND I never found an answer to Kauai's unemployment, but we agreed there seem to be few choices should the shaky state of sugar totally collapse.

Raising cane has been little Kauai's main occupation since 1835, when Hawaii's first successful sugar mill opened in Koloa. The Oriental majority of both island and state stems from waves of Chinese, Japanese, and Filipinos recruited from abroad.

This input began with the Chinese in 1852, after death, disease, and a basic dislike for field work decimated the ranks of native helpers. Managerial and maintenance jobs later attracted lesser but significant numbers of Portuguese and Germans. The island's polyglot population is currently 27 percent Japanese family origins, 23 percent Filipino, and 18 percent Caucasian. The Chinese found Kauai less compatible; very few remain.

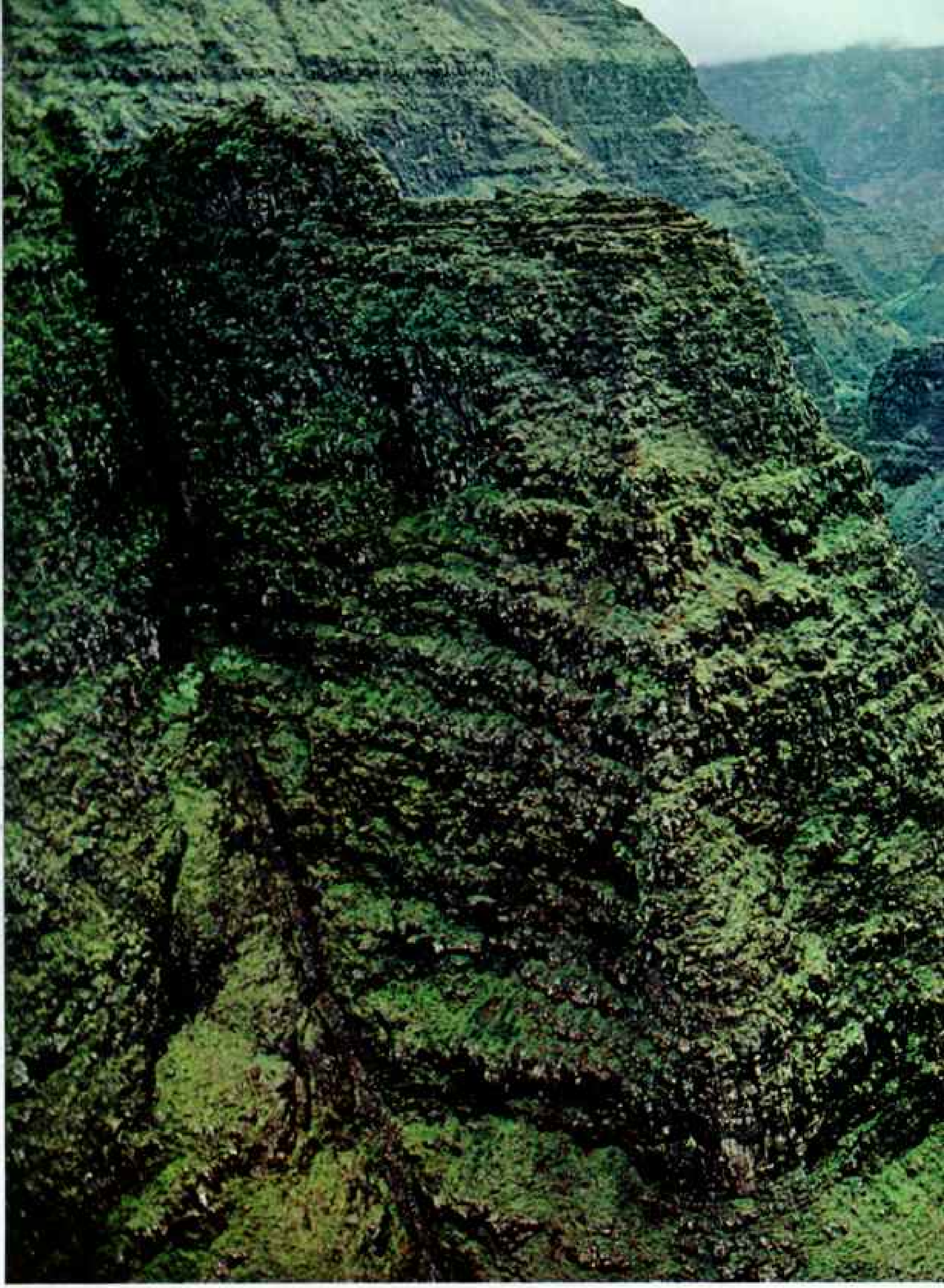
Always a boom-or-bust business, sugar made both millionaires and paupers. Those who prospered expanded, adding acreage that often reached to water's edge.

No longer able to compete with low-priced sugar from foreign cane and other sources like beets and *(Continued on page 605)*

SIRED BY VOLCANOES, SHAPED BY RAIN: A KAUAI PORTFOLIO

WHERE CATARACTS of lava boiled, threads of icy water now nourish the lower slopes of Waialeale (**right**), covered with thick vegetation such as yam vines (**above**). Smothered by clouds virtually year round, this mile-high extinct volcano is the rainiest spot on earth. An average 460 inches a year soak its marshy top—a fountainhead for the island's rivers and streams.

Painting the sky with bold strokes of color, a rainbow arches over ripening fields of cane on Kauai's eastern side. The fertility of the landscape prompted Capt. James Cook to declare upon his crew's landing on the island in January 1778, "We . . . found our selves in the land of plenty." Coming ashore at Waimea Bay, Cook and his crewmen became the first Europeans known to visit the Hawaiian Islands. The explorer spent several days on Kauai, trading nails and pieces of iron for much-needed water, hogs, and potatoes.



Goat's-eye view reveals the chiseled expanse

of Waimea Canyon, which coils 14 miles across Kauai's western end.

WRINKLED FACES *to the sea,*
precipitous lava cliffs spill down
Kauai's Na Pali Coast. Within its
lush hidden valleys lived early
Hawaiians, whose temples and
house platforms still exist.

(Continued from page 596) corn, growers now look to real estate holdings with an ocean view. These days, raw land is a safer bet than raw sugar.

When Honolulu-based C. Brewer and Co., Ltd., closed sugar operations in Kilauea six years ago, tenant farmers launched a drive to divert most of this land from development to parcels they could afford to buy. Diversified agriculture would, they contend, decrease expensive imports of food and feed, provide surpluses for export—and create jobs.

C. Brewer, however, prefers large-scale development for such produce as guavas and pond-bred prawns, and the sale of 10-to-150-acre holdings that owners may subdivide only after twenty years. The company feels its program would better serve the economic diversity of the island. But that leaves little room for today's small farmer.

WILLIAM "BOY" AKANA lives in Kalihiwai, a seaside cluster of cottages near Kilauea, where his family has fished and farmed for five generations. He currently cultivates land largely owned by others and does not know how long the pressures of development will permit him to do so.

I joined his "cucumber crew" one Sunday, picking by the pailful, packing by the box, and refueling myself at midday with his wife's good soup. Cucumber.

Later, Boy climbed to an overlook high above Kalihiwai's gem of a bay to scan its waters for *akule*, mackerel, which sometimes school inside the reef. Fishing in much the same manner as early islanders, he sets his nets from quietly rowed skiffs to prevent spooking his prey, then hauls them shoreward, entrapping his catch.

Those who help with the *hukilau*—and some who just come along to watch—never go away empty-handed.

This sharing doesn't make much of a dent in landings that may run as high as ten tons. But Boy is no wastrel of Kauai's resources. "The chiefs who parceled out rights to these waters demanded good conservation. So we release what we can't market within a few days. Keep akule in the nets any longer and sharks become our best customers."

Early Hawaiian rulers handled property matters sensibly: They segmented the island into pie-shaped pieces fanning from mountaintop to sea. Thus, each chief had a fair share of forest, farmland, and fisheries.

From the highlands came koa logs for canoes, sweet-scented sandalwood 19th-century Yankee traders prized—and the makings of a potent brew called *okolehao*. Bonded bottlers finally ended the ancient art of converting wild ti roots to "oke," but Harry Ho of Hanalei still gets a kick out of just remembering.

"We'd hunt around till we found a big old ti plant, preferably on a hillside. Some roots weighed a hundred pounds or more, so a slope helped when you were digging and rolling them into a fire pit. Then, it was cook, cool, cut, mash, add water, ferment, distill, bottle, age six months—and WOW!

"Every time a revenuer landed at Nawiliwili, it was a race to see if we'd get the word first or he'd get us. To play safe, we cooked after dark, moved our operations every few months, and made our own copper tubing so some storekeeper wouldn't squeal."

Harry reached for the hand of Rebecca, his merry-eyed bride of fifty years. "I'm full Chinese, but she's chop suey. A little bit of this and a little bit of that. Including royal Hawaiian." Which, in Rebecca's case, proves a winning combination.

ACROSS from Harry's pastures, plows till the largest taro lands left in the state. From these paddies, where rice once grew, come tons of purplish tubers that stoke the islanders' insatiable appetite for poi.

Rose has other tastes. I'm sure this motherly hitchhiker flags rides because she likes to talk, not because Kauai lacks public transportation—which it does. Drivers become a captive audience, and she's not the least particular about which way they're heading.

Delighting in nature's waterworks, a visitor to Kalalau Valley showers in a mountain cascade. In the background stands a forest of rocks, once part of a Na Pali ridge, but whittled into towering cones by erosion. Kalalau now attracts multiplying numbers of campers, many of whom jettison modern trappings, including clothes, and live contentedly on wild fruits and greens.

"That's not rain, folks. It's just pineapple juice." Imparting what islanders call "aloha spirit"—the unquenchable desire to please—Cecilio Dacay (**below**) merrily diverts attention from a shower as he guides his tour bus past the sights.

Tourism itself has grown to a deluge on Kauai. Lihue, the county seat, is home to 3,400 people, yet an average of 42,000 passengers a week pass through its airport.

One of the most popular stops for visitors, many of whom are day-trippers from Oahu, is Fern Grotto (**right**), located on the Wailua River, the only navigable waterway in Hawaii. Ancient Hawaiians are thought to have worshiped in this cave, with its luxuriant eaves of vegetation, on nights of a full moon. Today sightseers marvel at a 50-foot waterfall dropping from the top of the grotto; then they file down the path to the swaying tune of the "Hawaiian Wedding Song."

In my case, it was toward Lihue. With a population of 3,400 and two of the island's four stoplights, it ranks as Kauai's most important town. Ongoing modernization and government buildings distinguish it from the usual Kauai hamlet: a collection of balconied, two-story frame structures reminiscent of Dodge City in the good old days.

Settling in, Rose told me her antecedents came in many colors. Then, pointing to her brown Polynesian skin, she admitted that was her favorite shade. "But in here," she patted her midriff, "me all American. Maybe you likee poi, but me say mo' betta French fries any day."

Hiroshi Tateishi let me form my own opinion about Hawaii's "national dish." I never knew until I visited his Hawaiian Fruit Preserving Company in Kalaheo that poi was served in so many ways: thin, thick, fresh, fermented, with sugar or salt. Hiroshi scraped the sides of a simmering kettleful soon to be bottled and offered me the spoon. "This is the best kind of all," he said. To me, the chewy mixture looked and tasted remarkably like used bubble gum.

Most households keep plenty of poi on hand, but not many cupboards hold real okolehao as Harry Ho once made it. Strictly in the interest of scientific research, I sampled a bottle that has been gathering dust and authority at Grove Farm in Lihue for more than sixty years and found it quite similar to one of the better, mellow brandies.

Also mellowed by time is Grove Farm itself, oldest and one of the last of Kauai's fine plantation homesteads. Here, in airy rooms scented with plumeria, 94-year-old Mabel

Uprooting a community, workers demolish some of the last tree houses and other jerry-built structures at Taylor Camp (**left**), a haven for young dropouts from the mainland. Some sixty people were forced out when the state began clearing its land near Haena for a long-planned park. Officials now wish to remove all squatters from the state-owned western valleys. Most young visitors, however, are just passing through (**below**).

Wilcox oversees the refurbishing of 12 buildings on 78 acres that have been her home since birth. As is her wish, the property will be preserved in perpetuity as a reminder of Kauai's great sugar pioneers, specifically her enterprising Uncle George.

LIKE MANY a missionary offspring, George N. Wilcox felt no urge to teach or preach. Instead, he built Grove Farm, amassed a fortune from his cane fields, and became one of Hawaii's most respected sons.

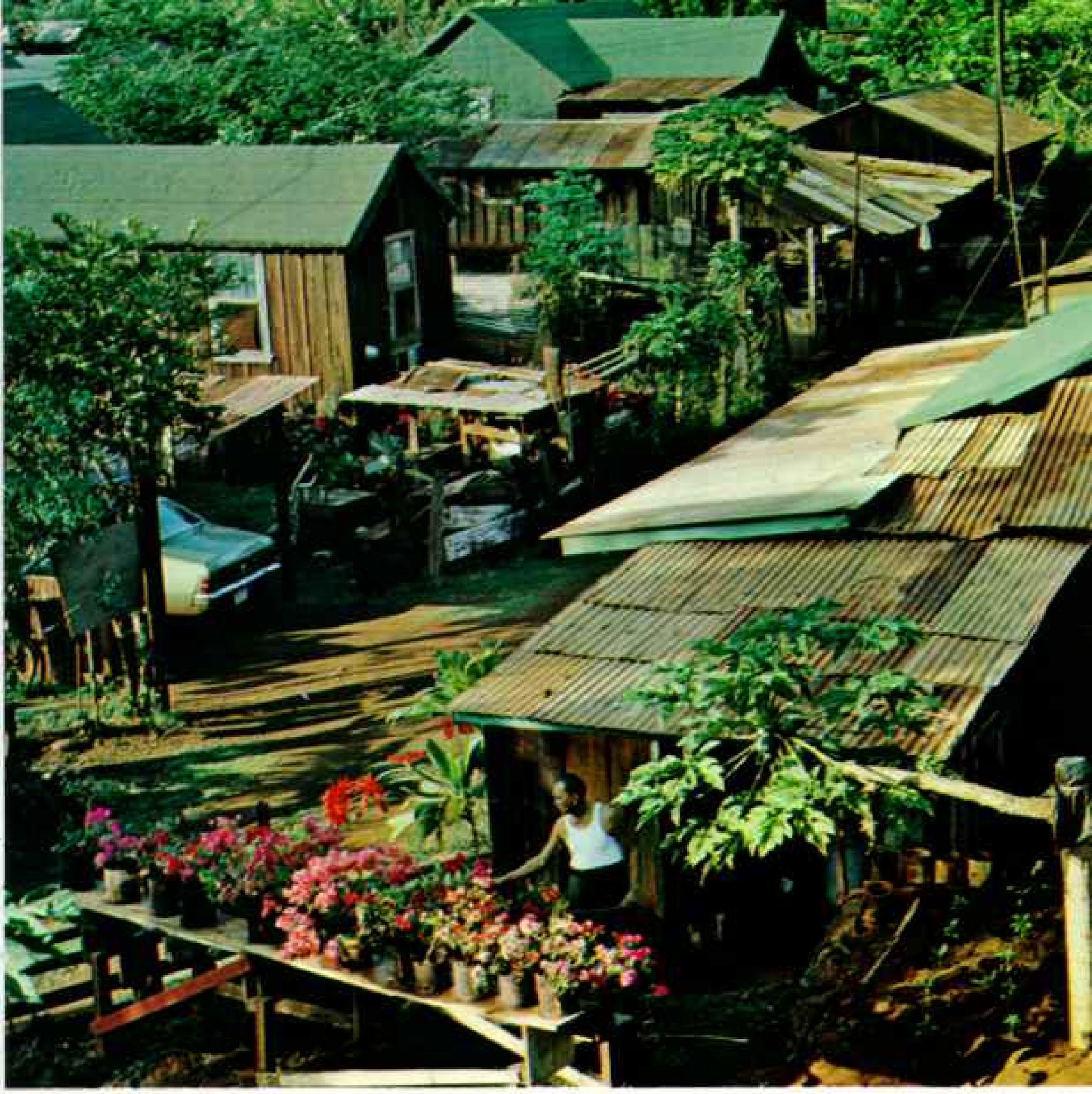
Miss Mabel, who sprouted like ratoon from the same hardy rootstock, is a highly accomplished Wilcox in her own right. Now slowed by age, she shares her involvement in the administration of Grove Farm affairs with Sophie Judd Cluff, who also descends from a distinguished missionary family.

"Fortunately for this entire state, George Wilcox gave *and* saved." Sophie checked the draft on the wood-filled kitchen range that still heats water for the household. "He personally financed dozens of worthy causes. And, thankfully, he never tossed out any of the artifacts or tons of records that account so fully for his life and times.

"Wilcoxes have lived here since 1864. None of them ever moved out, so very little has been *re*moved."

For this reason, calabashes keep company with Waterford crystal; tapa beaters share a corner with scrimshaw; and the laundress may choose a stove-top copper boiler, sinks of soapstone, or modern machines for her washhouse chores.

Not everyone who launched Hawaii's sugar bonanza was a missionary's son. And not




WE NOT
GOING
MOVE
TRESPASS

Splash of garden color lends freshness to an aging sugar camp (**above**) on the McBryde Plantation near Eleele. Many homes are substandard, yet residents stay because of the low rents. Since most of Kauai is state- or plantation-owned, the majority of islanders live on rented property. Resisting eviction to make room for a resort at Nawiliwili, Eddie Panui and his family stand guard by their house (**left**). A few months later the structure mysteriously burned. Tense negotiations between developers and residents continue in the five-year battle.

every major landowner on Kauai invested totally in cane. Charles A. Rice was also a cattleman; his 65-year-old widow, Pat, who can outride and outwork far younger cowboys, runs some 2,000 grass-and-molasses-fed head on a 5,000-acre spread named Kipu.

While haughty peacocks milled around, walking as if their feet hurt, Kipu's top hand rolled up the sleeves of her faded fatigue jacket and coaxed a balky jeep back to life.

"I came to Honolulu for the Hula Bowl in 1938, doing nurse duty for the University of Denver's football team. Somehow, I never got around to going home. Never expected to end up forty years later nursing a bunch of livestock. Or jeeps, either, for that matter."

After a grueling day of cowboy work—corralling, culling, and repasturing part of the herd—this supercharged redhead said she wasn't sure she was cut out for ranching. "But I promised Charles I'd keep Kipu in cattle as long as I could. Our son's an entomologist; he's not much interested in cows. I really don't know what will happen to this place after I'm gone."

Her young foreman grinned: "Dat lady gonna be up in dat saddle makin' other folk hustle way after dis crew ridin' rockin' chairs."

A MAINLAND REFUGEE of more recent date, Jerome Wallace arrived by way of Australia, where he was almost run off the continent for offering to knit a bikini for Queen Elizabeth in "Betty Windsor purple" if Prince Philip would send her measurements. (He wouldn't.)

Some 14 years ago, this slightly outrageous, Ohio-born Bohemian settled down, Gauguin fashion, in a cottage near the east-coast hamlet of Anahola to create batik paintings that have earned him international acclaim.

Besides his art, and a life built around meditation, yoga, and a strict daily regimen, Jerry was moved by concern for the future of the island to go into politics: "Figured a change was in order, so I ran twice for County Council. Won both times. Last place."

Jerry divides his work time between a backyard atelier and a converted schoolroom where he paints immense acrylics that barely fit through the door.

On a day off from both, he and I hiked into the island's mountainous midlands to cool off

in the mossy, stream-fed chute of Waipahee Slide, slippery remnant of an ancient lava tube. Had we kept on walking westward—nearly impossible in this accordion-pleated wilderness—we might well have reached Na Pali on the opposite shore without seeing another soul. For Kauai's tangled, precipitous interior discourages intruders, claiming—as do her unpredictable waters—several unwary victims every year. But in these hostile haunts, eight native species of birds with gargle-sounding names like oo, ao, and nukupuu survive as the last of their kind (page 588).

Possible boon to local birdlife was Kauai's refusal to import mongooses, loosed last century on neighbor islands to kill cane-eating rats. Instead, the mongoose played havoc with ground-nesting birds and is blamed for eradicating rare species now found only on Kauai, in Alakai Swamp's jungled safety and wetlands along the coast. Sadly, recent sightings and the recovery of one dead mongoose indicate the arrival here of yet another unwelcome outsider.

TWO WELCOME OUTSIDERS who moved in 18 years before the mongoose: Kauai's leading lady of letters and the good friend who inspired her most noted work. I called at the Wailua Heights home they share because I had long admired Kathryn Hulme's bestselling book, *The Nun's Story*, and wondered how she could construct such a moving, intimate portrayal of convent life, which she had never known.

"Ah, but Lou has. It took me ten years to get her talking about it, and then she talked me right into a best-seller." Seated beside me, Lou Habets shyly acknowledged her identity: She is that nursing nun from Belgium the story calls Sister Luke. Or was, until 1944 when she decided she could better serve her war-torn country and her conscience by returning to the "outside" world she had renounced 17 years before.

"I left in the ill-fitting clothes of some incoming novitiate and was too embarrassed to shop for any others. How could I explain to strangers that I didn't know the size of anything I wore?"

Now in their late and lively 70's, these two have led anything but sedentary lives. "About the time Lou was breaking in her first post-convent shoes, I was tacking Liberty ships together for Mr. Henry Kaiser. Believe me, watching your welds slip down the ways can be as satisfying as launching a novel.

"Probably the main reason we moved to Kauai is the weather; we've never found better anywhere. However, it makes sticking to the typewriter darn difficult at times."

Conversion, not climate, propelled the first missionaries to heathen Kauai, where they immediately shrouded the women in tentlike muumuus and began preaching the Gospel. These days, going muumuu-clad is somewhat tempered by the multitudes who favor the opposite extreme. Religion, however, is still going strong—and under more exotic headings than I ever knew existed.

When it comes to faith, Herb Holland plays no favorites. I occasionally gave him a lift to the church of his choice—a different one every time.

"Turned everything over to my kids back in Connecticut in '63 and took off around the world to witness for the Lord. Doesn't take much to get by out here if you're not set on living fancy, so I reckon I'll stick around. There's plenty of folks who need doing for, even by an old fellow like me.

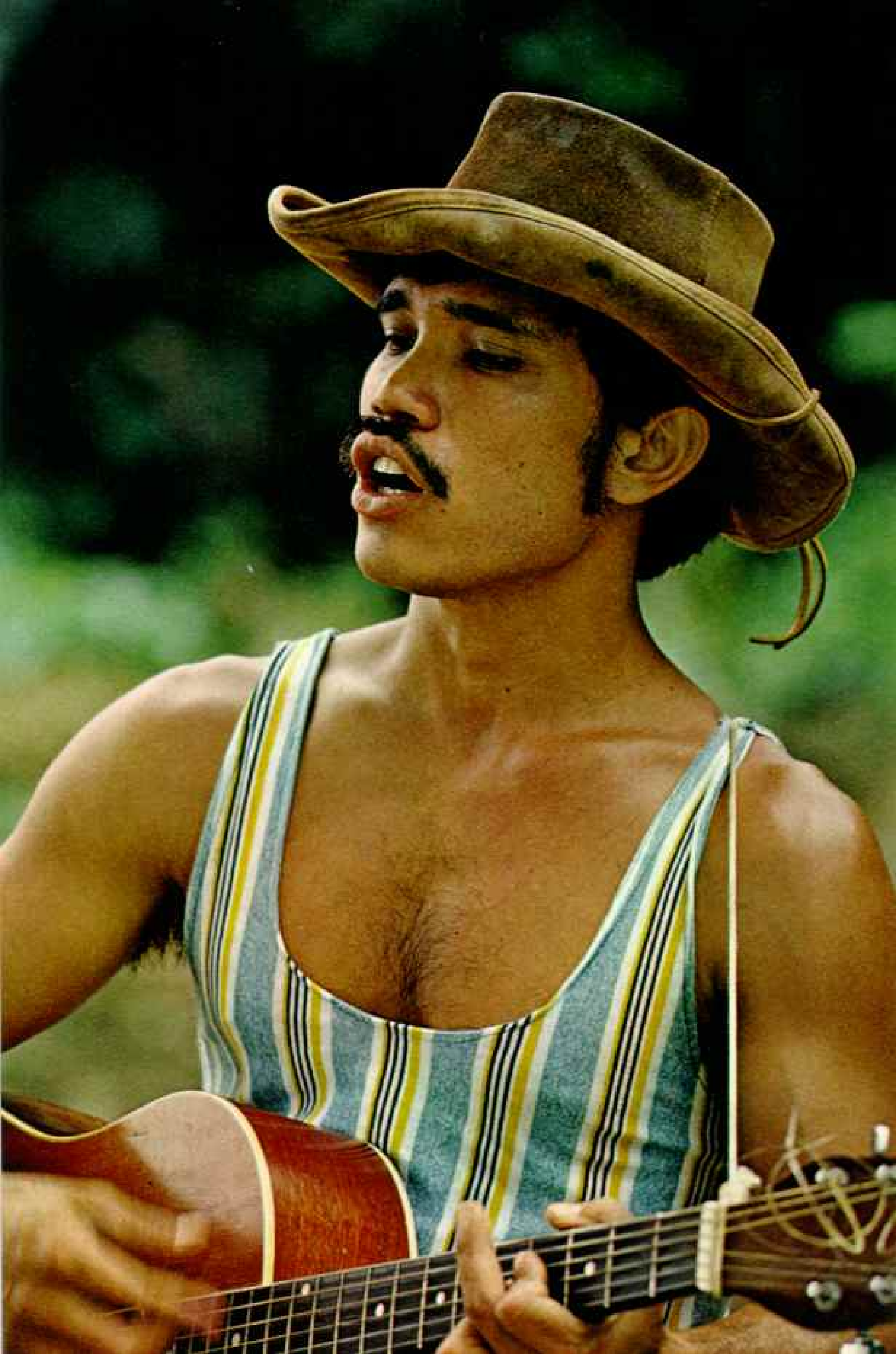
"Fact is, today's my birthday. Lucky one, too. Found me a good golf ball, a writin' pen, and a 25-cent piece while walkin' into town. Got no use for the ball, but two out of three isn't bad for any birthday, especially your 83d.

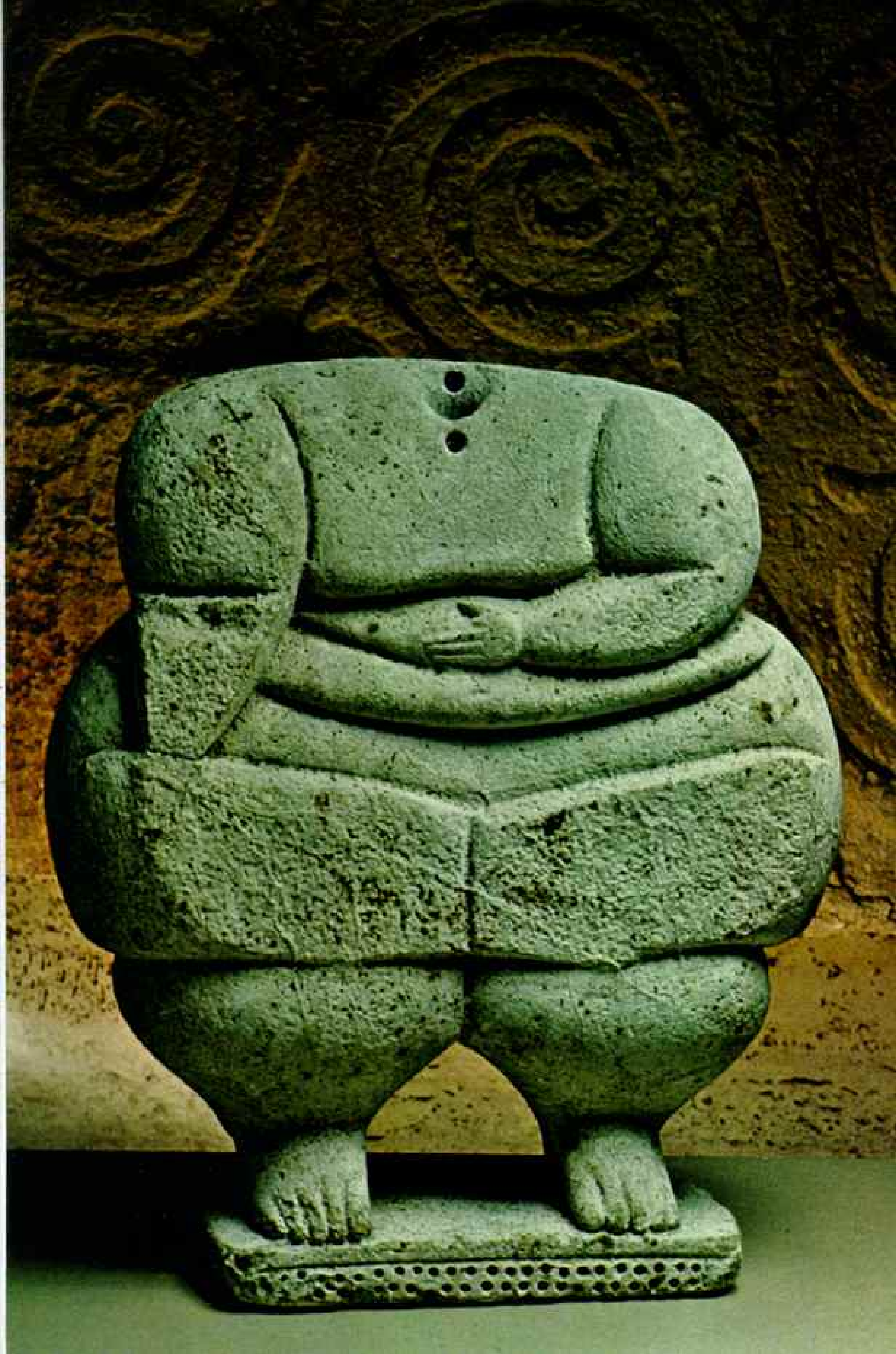
"Say, you wouldn't know a needy golfer would you? Sure would be happy to have him have this ball."

I said I'd check around and meant it.

When a newcomer, a Coast haole like myself, makes that kind of commitment to a stranger, there's only one conclusion: Anyone can catch the aloha spirit in Kauai. □

Celebrating his island's past with traditional music, David Sproat is reminded of the beauty and spirit he hopes Kauai can retain. A full-time fireman, David farms during off-hours, consciously keeping close to the land and to old Hawaiian ways. Kauai will never again be "safe from the turmoil of life," as Mark Twain described it. Yet even with growing pains, it remains an island deserving of song.





Ancient Europe Is Older Than We Thought

By COLIN RENFREW, Sc.D.

Photographs by ADAM WOOLFITT

ON THE SMALL Mediterranean island of Malta there stand some ruined temples, built of huge stones, that have long been a mystery.

Certainly they were built before the time of the ancient Greeks and Romans. But archeologists have found these enigmatic structures with their great courtyards difficult to date. There is nothing like them anywhere else, and the artifacts found in them, including some rather attractive statues of very fat ladies (left), don't help much.

Like everyone who has seen them, I was greatly impressed by these strange ruined buildings when I first went to Malta as a student in 1959. And charmed by those stone sculptures with curves worthy of Matisse or Modigliani. One of the figures was larger than life size. I did not then imagine that this might actually be the world's oldest larger-than-life statue. Or that these Maltese structures might be the earliest temples still standing anywhere on earth.

We now know, through radiocarbon dating, that such temples were under construction in Malta before 3000 B.C., before the Pyramids of Egypt. And in just the past few years it has become clear that the great stone tombs dotting Western Europe are even older. Some, built around 4000 B.C., are quite simply the oldest buildings in existence.

We now know, too, that three thousand years before the Greeks, the Romans, or the Celts, European farmers had discovered the principles of copper metallurgy and were using gold to make precious objects.

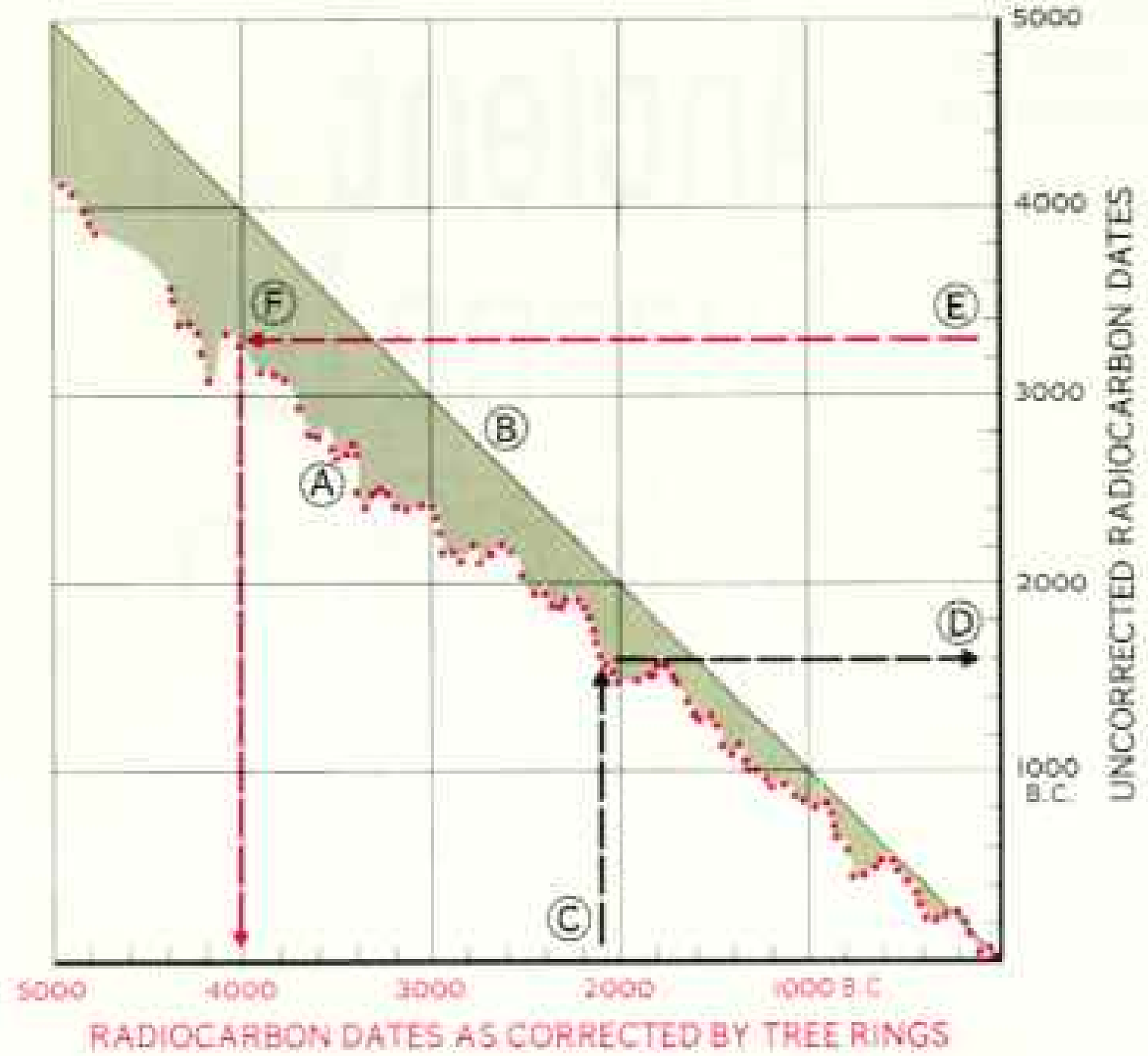
All this contradicts long-accepted theories which held that the earliest stone tombs and temples and the practice of metallurgy began in the great cultures of ancient Egypt and Mesopotamia, the traditional "cradle of civilization." Europe, one still reads in textbooks, was something of a barbarian fringe.

From the Near Eastern homelands of civilization, the theory went, new ideas were carried north and west by colonists and traders until they gradually diffused throughout Europe. This "diffusion theory" has been described as "the irradiation of European barbarism by Oriental civilization."

Now this framework for European history has collapsed, and the study of prehistory is in crisis. Not lightly have some archeologists spoken of a "radiocarbon revolution."

FIGURE, FACING PAGE, 18 IN. TALL, COURTESY NATIONAL MUSEUM OF MALTA; DAVID MUENCH (ABOVE)

Her age revealed, a headless "fat lady" from Malta (**facing page**) was once linked with Greece's Mycenaean civilization of 1500 B.C. Now, by matching radiocarbon dates with growth rings of the world's oldest living things—bristlecone pines (**above**) —archeologists date the lady at 3100 B.C.



when scientists measured carbon 14 in bristlecone pine rings of known ages, they found startling discrepancies. Dr. Hans E. Suess of the University of California at San Diego plotted radiocarbon dates for hundreds of years (A) and saw that beyond 1000 B.C. the dates tended to fall increasingly short of the actual ages (line B). A tree ring known to date from 2100 B.C., for example (point C), yielded a radiocarbon date of only 1600 B.C. (point D)—500 years too young. Conclusion: Carbon 14 has, in fact, fluctuated, and radiocarbon dating has to be revised.

Using the chart, other radiocarbon dates can be calibrated, although such corrections are limited by the length of the bristlecone pine ring sequence, presently to 6270 B.C. By plotting an uncorrected date from Brittany (3300 B.C.) at point E, for instance, the extension intercepts the plot of a pine sample dated from 4000 B.C. (point F). Brittany's megalithic sites are 700 years older than we thought.

While original radiocarbon dates had already cast doubts on theories of Europe's chronology (map, **right**), the new dates make them untenable.

Tree rings alter radiocarbon dating

ALL LIVING CELLS contain radioactive carbon 14 in proportion to the amount in the atmosphere. When cells cease to absorb radiocarbon, the quantity trapped within them begins to dwindle at a known rate through radioactive decay. Thus bone, wood, and other organic material can be dated by measuring the carbon 14 that remains.

When radiocarbon dating was developed in the 1940's, it was assumed that the proportion of carbon 14 in the atmosphere, and hence in all living things, had remained constant. But

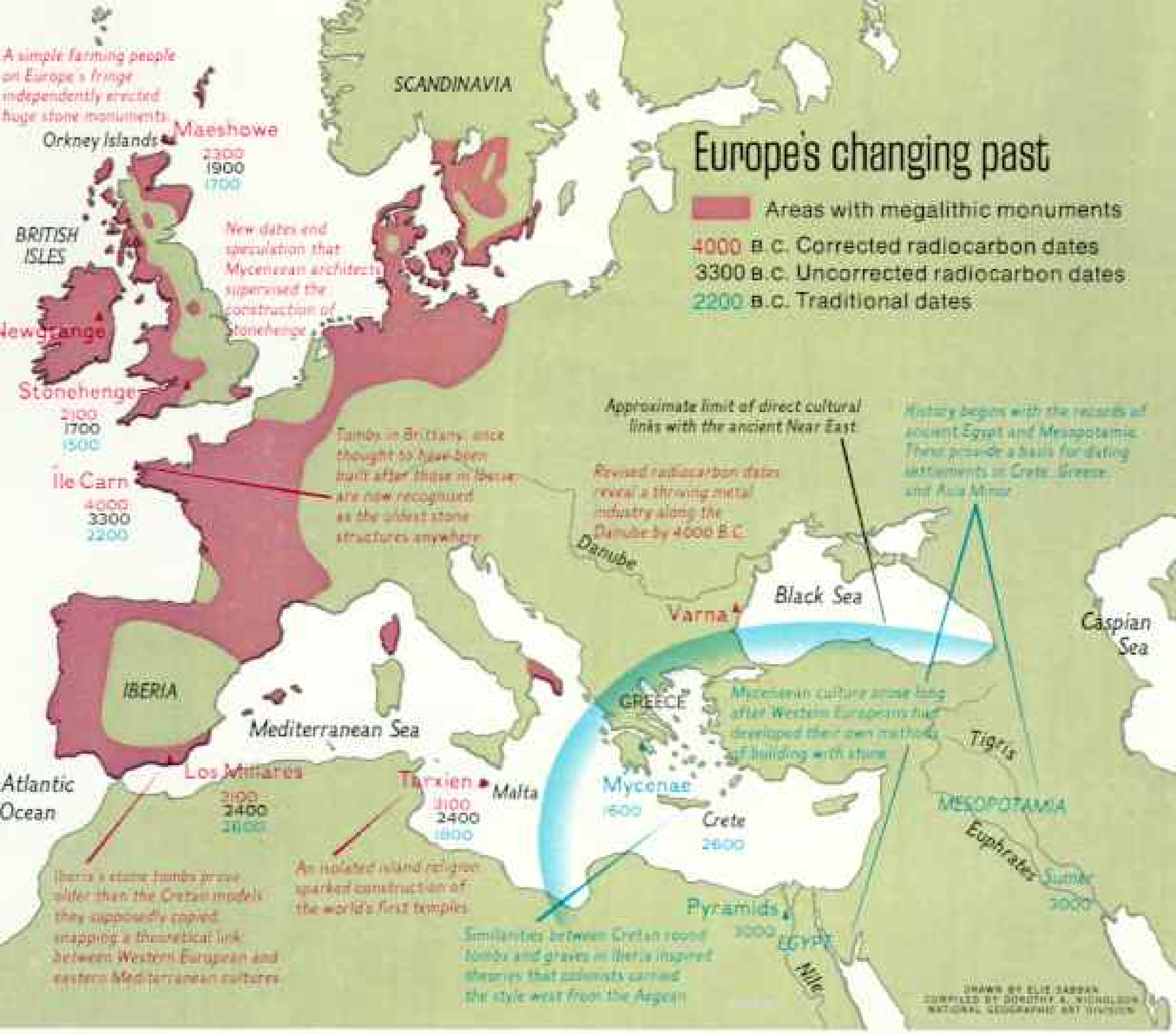
At the time of that first visit to Malta two decades ago, the traditional dating for its puzzling temples—about 1800 B.C.—was still unchallenged. Radiocarbon dating, pioneered in the 1940's by Dr. Willard F. Libby, had not yet been systematically applied there, and before it was developed, there was no valid scientific method of dating such structures. The only reliably dated early cultures were those of Egypt and of Sumer in Mesopotamia, which had written records, including lists of kings and the lengths of their reigns. It was possible to work out their chronologies, based on the records, back to nearly 3000 B.C.

But for Malta and prehistoric Europe, the only feasible way to get a sound date was by comparison. So generations of archeologists studied all the detectable similarities between the undated cultures of Europe and their possible contemporaries in the Near East.

For instance, the largest of the Maltese temples, at Tarxien, contained a number of stone slabs decorated with a design of running spirals. A closely similar design decorates grave slabs at the important Bronze Age site of Mycenae in Greece (page 619). The Mycenae spirals could be dated to around 1600 B.C. by means of several close links with Egypt (which are still accepted today). It seemed reasonable to suggest that the slabs at Tarxien might have been carved around 1500 B.C., and so the temples themselves could hardly date before 2000 B.C.

Similar Tombs From Spain to Scotland

After Malta I went to Spain to see its remarkable stone-built tombs, often called "megalithic" (from the Greek *megas*, large, and *lithos*, stone). Stone Age tombs somewhat resembling these are found along the Atlantic



coast from Spain and Portugal to France, to the British Isles, right up to the Orkneys off the tip of Scotland, and to Scandinavia.

The Spanish ones were particularly important to the traditional theory of the tombs' origin. There are round tombs in Crete probably once roofed in the same way as the Spanish tombs, which could reliably be dated back to 2600 B.C. through their Egyptian connections. It was thought, therefore, that the Spanish tombs were the work of colonists from the eastern Mediterranean, who might have arrived in Spain a little after 2600 B.C.

The theory held that the tombs of France could be modifications of those of Spain and Portugal, and the British and Irish ones would have followed the French ones, beginning around 2000 B.C. The great tomb of Maeshowe on Orkney, on the fringe of Europe, would come last, around 1700 B.C.

But there was a problem here. The theory was clear and simple, and the evidence at times persuasive; those spirals at the temple of Tarxien on Malta *did* resemble the spirals on the grave slabs at Mycenae. But the Spanish tombs did not resemble their supposed predecessors in Crete all that closely.

Further, when I really studied the artifacts of the Aegean early Bronze Age, of around 2600 B.C., I would find only very superficial resemblances to objects from the tombs in Spain. And a growing and disturbing number of radiocarbon dates indicated that many of the European structures were built not long after their supposed predecessors in the Near East, shrinking the time gap in which diffusion could have occurred.

I began to wonder if the theory of an independent invention of the European tombs might not be *(Continued on page 621)*

COLIN RENFREW

Massive testaments, the enduring walls of Mnajdra (**left**) manifest the skills of Maltese masons who 5,000 years ago shaped native limestone for the world's first temples. Scholars once believed that spiral carvings on Malta's temple of Tarxien (**above, right**) were derived from designs such as those on a 3,600-year-old Mycenaean funeral stela (**above, left**), thus dating the temples as 1,500 years too young. Carvings on an Irish tomb at Newgrange (**below**) also suggested contacts with Mycenae, but calibration of radiocarbon dates proves that the Irish "barbarians" built this monumental structure well before any comparable achievements by the Greeks.

right after all. Could the tombs of Spain, and of France and Britain, have been developed and built by local craftsmen, quite independently of whatever might be happening in the Near East or the Aegean? And if so, being independent, might they not be even earlier than the tombs of Crete?

At this point radiocarbon dating stepped in again, together with the aid of a strange tree, the bristlecone pine.

These gnarled trees, which grow high in the White Mountains of California, are earth's oldest living things. Tree-ring counts show some are actually more than 4,000 years old.

By matching the annual growth rings of both dead and living specimens of these ancient trees, Dr. C. W. Ferguson of the University of Arizona patiently built up a continuous tree-ring sequence back to 6270 B.C. This is extremely useful: Wood from each ring of a very ancient tree, whose age has been determined, can be analyzed in a laboratory to measure the radiocarbon present. In theory, the radiocarbon dates should be the same as the tree-ring dates. But they aren't.

As soon as bristlecone wood was measured in the lab, it became clear that for any time before 1000 B.C. the tree-ring dates were older than the radiocarbon dates. As a result, some assumptions of the radiocarbon method have been shaken. Happily, the tree-ring dates also provide an invaluable scale for correcting radiocarbon dates.

New Dates Sever Cultural Links

In 1967 Professor Hans E. Suess of the University of California at San Diego produced the first tree-ring calibration chart, converting radiocarbon dates to calendar dates.

The bristlecone pine calibration at once set the dates of some European temples and tombs back 800 years. In a single breathtaking sweep across Europe the traditional links between the early civilizations of Crete and Mycenae and the cultures of early prehistoric Europe were severed.

The Spanish tombs, for example, now dated from 3100 B.C., centuries earlier than the tombs in Crete from which they were supposed to derive! Tombs in Brittany suddenly went back to an astonishing 4000 B.C.

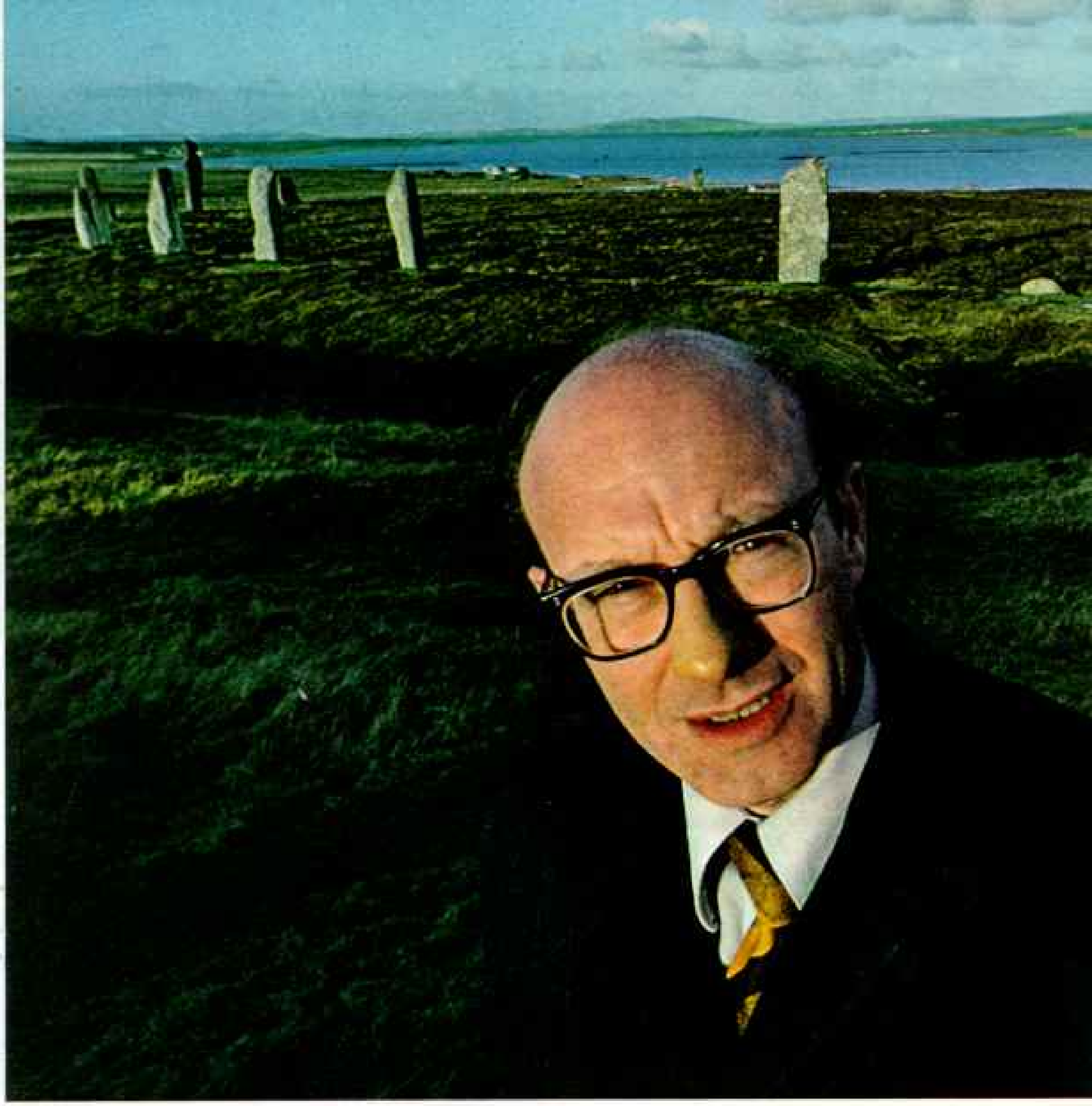
On Malta, buildings whose spiral decorations supposedly derived from Mycenae in Greece about 1600 B.C. acquired corrected radiocarbon dates putting their origin before 3000 B.C. In Eastern Europe we know that copper tools—which had been cross-dated with Greek finds to 2300 B.C.—were being made in what is now Romania, Bulgaria, and Hungary as early as 4500 B.C.

Apparently metallurgy was independently invented in southeast Europe, not many years after its first appearance in the Near East, and may have evolved independently again in Spain not long after.

Recent finds from a prehistoric cemetery at

LARGER HORNED FIGURE ABOUT 2 1/4 IN. TALL, COURTESY ARCHAEOLOGICAL MUSEUM, VARNA, BULGARIA, ERICH LESSING, MAGNUM (BELOW); IMPLEMENTS COURTESY ASHMOLEAN MUSEUM, OXFORD UNIVERSITY (FACING PAGE)

Oldest gold jewelry yet known was buried in a Bulgarian grave about 3500 B.C. As much as 1,000 years earlier, prehistoric European smiths in the Danube Basin created sophisticated copper tools (**facing page**). Scholars once thought that metallurgy spread here from the Near East, but revised dating of sites proves that a metal industry was fully developed in Europe when it was just starting in the Aegean.



Who built the mysterious Ring of Brogar on the Orkney Islands 4,300 years ago —and how? We may never know. But the author, above, professor of archeology at

Varna in Bulgaria brilliantly illustrate the vitality and originality of the European smiths. There, from graves dating from around 3500 B.C., rich finds of gold as well as of copper have been made—in fact, the earliest golden treasures so far found anywhere in the world (preceding page). The craftsmanship is naturally simple, but that is not surprising since it carries our knowledge of goldsmiths' work back nearly another thousand years.

What does this new dating and the eclipse of the diffusionist view really mean? Of course it is exciting that the Malta temples are older than the Pyramids, and that gold metallurgy was so early in the Balkans.

But what really matters is that we no longer seek to explain European prehistory by reference to the early civilizations of the eastern Mediterranean. In the right conditions, prehistoric men anywhere in the world were capable of ingenious inventions and impressive achievements. It should be the archeologist's job to study in just what economic and social conditions such things occurred.

England's University of Southampton, has shown that this megalithic monument on the fringe of Europe arose without the influence of the ancient Mediterranean civilizations.

Thus when I excavated recently on the Orkney Islands, it was not to find out where their monument builders had come from. It was to learn something of their way of life and their society.

Excavations in the ditch surrounding the great tomb at Maeshowe produced radiocarbon samples now dated to 2300 B.C. So there, at the far north of Europe, the inhabitants of these remote islands were capable of the most skillful work in stone, entirely without the use of metal tools, just about the time the Pyramids were being built. Only a little later they were setting up stones and cutting a deep circular ditch in the rock to form the Ring of Brogar (above), still today, after 4,300 years, one of the most evocative and romantic of religious monuments.

There on Orkney the stones are still upright, and in some of the tombs the dead sleep on. The radiocarbon revolution shows us that they rank among the world's earliest architects, and their handiwork still stands. They have earned that rest. □

THE INUIT OF UMINGMAKTOK

Still Eskimo, Still Free

ARTICLE AND PHOTOGRAPHS BY
YVA MOMATIUK
AND JOHN EASTCOTT

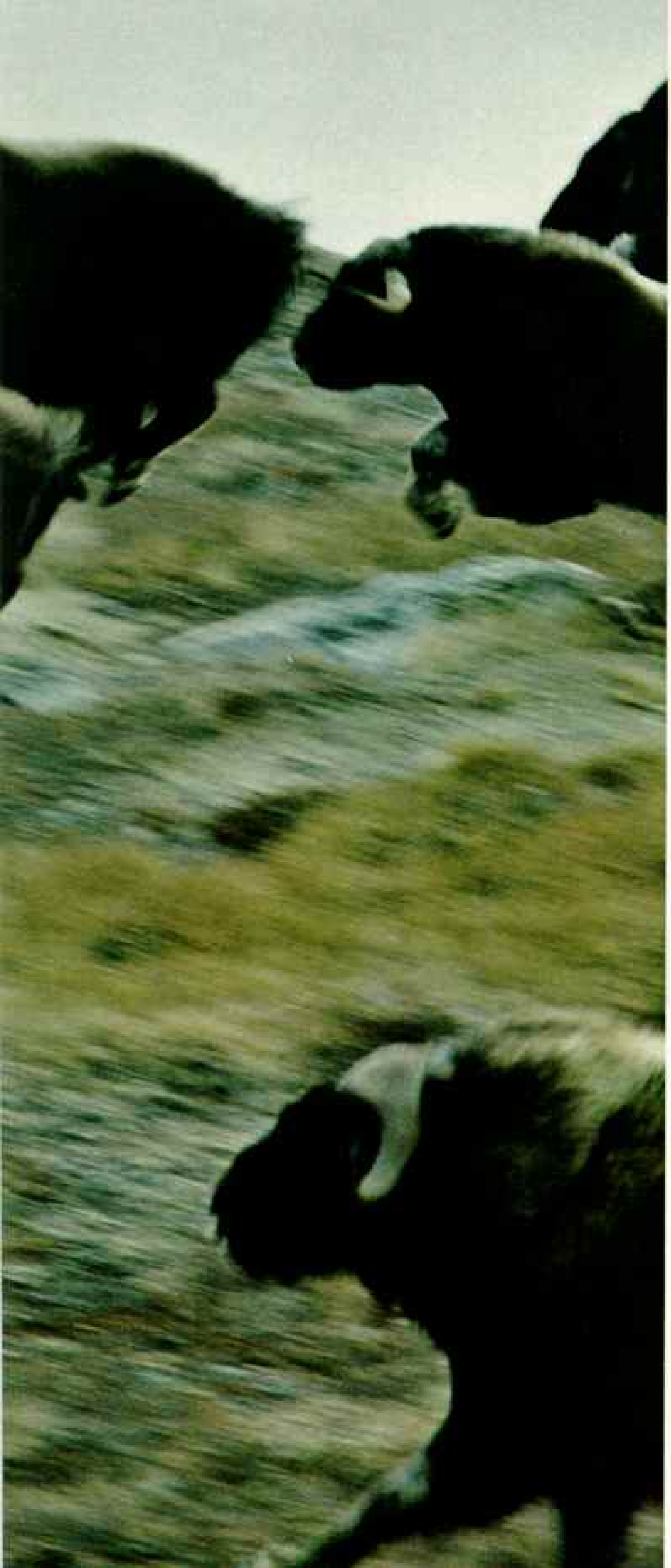
A SINGLE-ENGINE OTTER sneaked in between foggy banks on the Canadian Arctic coast and deposited my husband and me and our white, part-Samoyed pup, Miś, on nine feet of sea ice near the Inuit settlement called Umingmaktok. Two Inuit families came roaring from the shore on snowmobiles and clustered around us curiously.

In the old days a stranger would be expected to say, "I am a friend; I have no knife," and to show goodwill by holding his hands out with palms up. But greeted with broad smiles on this cold May evening, we shook hands all around, telling them we were John and Yva, and had come to live in their country until winter. Could they show us a good place to camp?

With amazing speed men, women, and children piled our 650 pounds of gear onto a sled they had towed behind a snowmobile and raced off, leaving us standing on the ice. As the silence shattered by our arrival returned, we looked about the horseshoe harbor, bordered by rocky hills and snow-filled ravines, dipped in the glow of the midnight sun. Then John and I collected our pup, and off we went in pursuit of the Inuit of Umingmaktok, roughly "where the musk-oxen are many."

Airborne fish signals a good catch for a woman of Umingmaktok as she unloads silvery char from her family motorboat. The

60 residents of her close-knit community preserve a hunting-and-fishing way of life that is fast disappearing elsewhere in Canada's Arctic. Known to the outside world as Eskimo, they call themselves Inuit, meaning simply "the people."



"**Glorious it is** to see the great musk-oxen gathering in herds. . . . Glorious to see. Yai—ya—yiya." Thus the Inuit sang a hundred years ago, when herds spread across the tundra near Umingmaktok—"where the musk-oxen are many."

Hunters for the carriage-robe trade decimated Canada's gentle beasts until the government outlawed the slaughter in 1917. With herds growing again, officials recently eased the ban in some areas; Umingmaktok hunters are allowed a collective total of three kills a year. The Inuit still fashion scimitar-shaped horns into tools and spearpoints, as well as carvings for collectors. A hide brings as much as $500; the meat goes into the larder.

Polish-born author Yva Momatiuk and her photographer husband, John Eastcott, a New Zealander, stayed for five months among the people of Umingmaktok, feasting in times of plenty and going hungry when "nature didn't deliver."

We found them on a gravel beach. Laughing at the nylon daintiness of our tents, they brought boulders to secure walls and guy lines against Arctic winds while the children found fresh ice to melt. John started the stove, and standing amid mounds of gear, we shared the first of many gallons of tea.

We tried to explain why we had come. But the Inuit—compact, sturdy people with lean faces dominated by high cheekbones—seemed to pay little attention to the words. Instead they stared at us with dark, alert eyes as if wondering what kind of people we were. Then suddenly they left, women like sunflowers, carrying high their crowns of wolf and wolverine fur, men lean and weather-beaten, children running with a rolling gait like fuzzy baby bears. They hopped on their snowmobiles and were gone.

Next morning I unzipped our sleeping tent and looked out. The day was sunny and windy. Our pup was dragging a caribou backbone up the snowbank; a large ringed seal catnapped on the sea ice. Beyond it sprawled Umingmaktok, an old Hudson's Bay Company store and a dozen simple, prefabricated houses resting on wooden blocks; permafrost prevents excavation. Of some seventy settlements in the Canadian Arctic, this was one of the few with no resident whites and almost no services. No airstrip, not an inch of road, no telephone, school, TV, electricity, or sewer system. No

nurse, policeman, administrator, priest. Its location provides an acceptable harbor for the yearly supply ship, but for the hunting Inuit, it is less than ideal. The main herds of caribou usually migrate along the opposite, western shore of Bathurst Inlet; only the stragglers pass here. Its little muddy river is almost useless as a source of water.

Opened in 1964, the Hudson's Bay store closed in 1970 with losses. But when the people chose to stay, the government reopened the store. Tikhak, a local hunter, managed it more by common sense than regulation. He did not restrict store hours to 20 a week; when somebody wanted to shop, he was there. If he *(Continued on page 633)*

Death calls at bright midnight for a ringed seal (**above left**). Veteran hunter Kaniak wounded the animal, resting on the ice, with a first shot. When it disappeared down its breathing hole, he waited, and here makes the kill as it resurfaces. Another hunter hauls his seal home behind a snowmobile (**above**), the family tractor of the Far North.

In summer, seal and caribou are cached under rocks refrigerated by permafrost. Flippers, however, are wrapped in blubber and allowed to turn rancid, a flavor favored by the Inuit. "Our friends said we'd get sick if we ate it, but we think they just wanted it for themselves," joked the authors.

TRAVEL INUIT STYLE: *a boat powered by an outboard motor, a teakettle heating on a stove, a box of food and ammunition, and a sleeping berth for baby on mother's back. Kiyok and his family set off across Melville Sound to visit friends on a spur-of-the-moment 60-mile jaunt.*

Vast open spaces of the North are home to the estimated 97,000 Eskimo of Alaska, Canada, and Greenland. In stark contrast to many larger Inuit settlements, the tiny winter outpost of Umingmaktok in the Northwest Territories (**inset**) has no phones, roads, or plumbing —only a dozen one-room cabins and a single store. From May through November families spend much of their time in hunting-and-fishing camps located as far as 70 miles away.

Scourge of summer, mosquitoes keep Margo Kadlun and her fellow Inuit in their parkas despite 70°F daytime temperatures. Undaunted by their harsh surroundings, the Inuit of Umingmaktok still face life with the "infectiously bright spirits" observed by Danish explorer Knud Rasmussen in the early 1920's. He found a people "more enterprising . . . than other natives I have met with in Canada. The very manner in which their implements . . . were finished showed that this was a people that lived up to high standards."

happened to be out on his trapline, people could walk in, take what they needed, and pay him later.

"I am not going to keep it locked and have somebody go hungry because my snowmobile broke down and it took me a week to return," decided Tikhak. It worked, the books balanced every year, the store prospered, and the settlement around it became permanent.

UMINGMAKTOK lies above the Arctic Circle in the central, coastal part of Canada's Northwest Territories, which, with its islands, is more than twice the size of Alaska. Yet the scattered population of 45,000 would barely fill a small corner of Manhattan. Roughly one-fifth are Indian. About a third are white. The remaining 20,000 are the Inuit: "the people." Their more familiar name, Eskimo, is what Algonquian Indians called them: "eaters of raw flesh." Dwarf willows, lichens, mosses, flowers, and Arctic grasses briefly paint their barren homeland, furrowed with countless lakes and flat rocky ridges. Most of the year the land is frozen white. Canada's Inuit are famed for adaptability to this brutal climate.

The Inuit of the Umingmaktok region first encountered white men around 1910, later than most Arctic native groups. It was not an easy experience; fearsome rumors had preceded the white strangers, called *qablunaat*. But the practical Inuit accepted the impact of the newcomers' arrival with "*Ajurnarmat!*—It cannot be helped!"

And now we came and pitched our tents across the bay from their village. Ajurnarmat! Did they consider it yet another invasion? We decided to sit tight and let the Inuit admit us into their daily lives at their own pace. We had come to this country not so much to document whatever was left of their old way of life as to learn something about the spiritual survival of a people who in a mere 60 years have jumped from Stone Age self-sufficiency to contemporary consumer society.

We waited all day without any signs of neighbors. Finally curiosity prevailed. Our first visitor arrived. Young Etokana had spent three years in the south and returned equipped with English and a crash helmet. The other families, he told us, were out fishing or hunting for seal and spring caribou, which were lean but better than canned meat. Besides, the store was nearly empty. Until the supply ship arrived in the fall, people pretty much had to fend for themselves.

If we liked to fish, he could take us to a camp down Bathurst Inlet where two Umingmaktok families lived from May until December. We soon found ourselves holding on for dear life while Etokana's heavy 18-foot sled jumped open-water leads, climbed ice hummocks, and fishtailed behind his snowmobile. How I wished I had his crash helmet!

That day I was asked two of the total of five questions we were to be asked during our five months with the Inuit. Sitting on the floor of a canvas tent at the fishing camp, I was fighting my first battle with a raw, tough-skinned trout, gnawing at it vigorously, when the young wife of Tikhak, the Umingmaktok store manager, blurted out:

"Where do you live?"

Hesitation. Where *did* we live? On Great Slave Lake, where we had summered with Cree and Dogrib Indians the previous year? In the Utah ranch cabin where we had spent the winter? In our pickup truck, left 400 miles south as a raven flies? In my native Poland? In John's New Zealand? I pointed in the direction of our camp: "We live here."

Her sparse eyebrows shot up in astonishment, and I thought of the old Inuit song: "... the beautiful one ... with the flat cheeks ... the one with a small nose. ..."

Suddenly everyone grabbed caribou-skin bags, hand-carved ice-fishing implements, and knives, and dashed off. We followed at a run. The snow was melting, and the tundra's ankle-breaking tussocks wobbled under our gum boots. White Arctic hare fled; a flock of ptarmigan flew up with a strange, rattling cry. We reached a lake, hidden between eskers of glacial rubble. The ice was still strong, except for a strip of open water around the shore. At water's edge, fish came to meet us. Handmade hooks with caribou-antler lures kept disappearing between floating ice. Fluid wrist movements jigged lines that large trout chased madly.

This was food. Food for people and dogs, today and tomorrow. I saw John and Tikhak's young brother laughing happily together as they inspected their catch. Not that life was always so easy. Feast or famine—one never knew when days of plenty would end and hunger begin. It could have been Tikhak's

In nature's supermarket, Tikhak spears a char (**right**) for friends during a visit to their Naojak River camp. Youngsters on summer vacation at Hope Bay (**below**) splash in chilly northern waters. In the Inuit's accepting society, children know occasional taunting but seldom physical punishment—and enjoy almost total freedom.

grandfather whose song Danish explorer Knud Rasmussen translated, for it was here among our friends' ancestors, the Kiluhiturmiut and Umingmakturmiut, that he heard:

Glorious was life
When standing at one's fishing hole
On the ice.
But did standing at the fishing hole
bring me joy?
No! Ever was I so anxious
For my tiny little fishhook
If it should not get a bite,
ayt, yut ya.

But today we shall feast. We started back, the caribou bags heavy with fish. All is going well, I thought. We have shown that we can fish and enjoy it. They will accept us. Then I caught up with Etokana's 15-year-old sister. Doe-eyed, shy, but unfriendly, she left me with the second of those five questions we were to be asked: "When are you leaving?"

THE NEXT DAY, back at Umingmaktok, brought a cold spell. Basking seals disappeared; tidal cracks froze. Etokana came again, watched me cooking lunch of freeze-dried food, and found it inadequate. "One needs a little meat," he declared and returned with *nipku*, thinly sliced dried caribou meat. It tasted strong and good. The rest of the day we spent holding our tent against the wind and asking questions.

"Why did you return from the south?" inquired John.

"I don't know. I came home for a vacation and stayed," answered Etokana.

"Do you feel like going back south?"

"I don't know."

"Will you stay here now?"

"I don't know." The reply was uncomfortable. Later John hinted we would like to visit all the family camps; perhaps Etokana wouldn't mind taking us to them. Without a word our guest picked up his helmet and left.

"That was silly of me," admitted John.

"Back to the drawing board," said I.

From Vilhjálmur Stefánsson's *My Life with the Eskimo*, written more than 60 years ago, John read again: ". . . on their part they showed the greatest delicacy in asking questions. Were they not interested, I asked them, to know why I had come and where I was going? Yes, they were interested, but they knew that if I wanted them to know I would tell them. Asking many questions of strangers was not their custom, but they considered that I asked many because that was no doubt the manner of my people. . . ."

Etokana returned the next afternoon. "It's getting cold," he announced. I poured him tea. "Everything is freezing really well," Etokana continued. I nodded agreement.

"Good day for travel," said he. My eyes met John's.

"Maybe I will go to Arctic Sound camp." Ask no questions! Hold on! He rose.

"I will get the sled," and then he was gone.

That first trip to Arctic Sound took us across forty miles of dangerous glare ice that obscured pools of melted slush. The sled ran smoothly, spanning cracks and rocking sideways over rough spots. Etokana's traveling kit consisted of a tent, two guns, fishing line, knife, camp stove, fuel, kettle, matches, tea, and tools for the snowmobile. Our gear, cameras, and pup were lashed down atop caribou-skin bedding.

TODAY there are few true Inuit nomads. Most Inuit live in government-built settlements. But the people of Umingmaktok, among the last to establish regular seasonal camps, still employ ancient skills. The men can build snow houses, and women use their crescent-bladed ulu knives like virtuoso conductors. Etokana's sled, with its bare essentials, was packed in the best Inuit fashion.

Our journey lasted for many cold hours.

What joy to see everybody run for the shore as soon as they heard the snowmobile! Kadlun, the camp patriarch, invited us to his shack. Everybody piled up on the family's sleeping platform—15 of us, standing, sitting, lying in that 8-by-12-foot shelter. *"Tiiturit!"* came the invitation to have some tea. Then attention focused on Etokana, who brought news from other families. The unknown world we came from held little interest.

AFTER VISITING all night, Etokana left in the morning with a plane that arrived unexpectedly to recruit seasonal workers for a mining exploration outfit. No apologies, no farewells. The Inuit have no verbal equivalent for our good-bye. "I am going now," they say. Others reply, "Yes, you are going."

For the Inuit, survival has meant flexibility. Long-range planning is impractical, since only fools pretend to know what marvelous happening or calamity will occur tomorrow.

The day was foggy and gray, and the pace at Arctic Sound relaxed. Kadlun carved soapstone chess figures (pages 642-3); younger men scanned the hills with binoculars for caribou; women called at the top of their lungs, "Tiiturit!" Whoever was near would follow these cries in the mist, unhurriedly. Inside the tent, mugs were already filled with fresh-brewed tea. If you felt hungry, you could go through a pile of nipku and dried fish, finish off some fried bread, called bannock, drink several cups of tea, then rise and leave without a word. There are no regular meals; you eat whenever you want. In hunting camps, the Inuit share their game, and it does not matter whose supplies are consumed first.

Kadlun and his wife, sitting on their sleeping platform like old birds perching, often engaged in dual monologues, telling stories, laughing, and amusing themselves separately. They belonged to the generation of great storytellers. Theirs was real Inuktitut, a language fit for hunting, poetry, and shamans' prayers, so specialized that it has dozens of words to describe varieties of snow and ice, but only one word for tree. Their children knew little of it, for English had spread quickly in the wake of white men.

John and I found communication with most people over 35 difficult, but old Kadlun made it easy. I sometimes told him stories in my native Polish, letting my fingers walk through the golden evening air or drooping my eyelids sadly, as the story required. Kadlun listened. Then he would parallel my tale with a monologue in Inuktitut.

In the old days when "life became heavier than death" and they no longer felt useful, aging Inuit parents often asked their children to help them die. This has changed. Kadlun was enjoying his old age. He had a market for his carvings. He also could still hunt and travel, thanks to rifles, snowmobiles, and outboards, less demanding physically than harpoons, dogsleds, and kayaks.

"Were you often hungry, really hungry?" asked John once. Kadlun looked at his wife

Stockpiling for winter, Tikhak's father dumps fresh char at his drying yard (**right**), where the fish are split, boned, and racked. Filleted fish in foreground go to the sled dogs. Penknife in hand, Aitoak (**left**) munches the salmonlike char, now dried but still raw. Inuit rarely have regular meals, preferring to snack whenever hungry.

and mother of their six children, some born with his help. She slowly closed her eyes and nodded, remembering.

In the spring the Inuit often travel all night, sleep during the day, visit, play cards, and eat until the following morning, resting when they feel tired. Guests would flock to our tent at three o'clock in the morning, saying as they entered, "Somebody is coming to visit." No one was surprised if around noon I yawned, "Somebody needs rest," and retired to my sleeping bag. Life was to be enjoyed in these little freedoms. John and I took late evening walks just to watch the sun touch the horizon, hover there, then climb again.

There is joy in
Feeling the warmth
Come to the great world
And seeing the sun
Follow its old footprints
In the summer night
Iyaiya—ya—ya.

ETOKANA'S FATHER, Kaniak, arrived with Tikhak to take us back to Umingmaktok. Halfway there, Tikhak's machine quit. It was bitter cold. Back came snowmobile stories about 60-mile walks for life, hunters frozen to death beside their machines, Tikhak's swim for the snowmobile he woke to find separated from him by a lead opening in the sea ice.

Even though snowmobiles are taking over in many parts of the Arctic, Umingmaktok people consider four-pawed traction more reliable and keep their teams in top shape on the traditional diet of fish and seal. "Dogs don't stall uphill," said Hakungak. Shortly after he married, he and his bride went for a several months' walkabout, pack dogs carrying all they needed.

We were lucky: Tikhak was a marvelous mechanic. We returned to Umingmaktok thoroughly frozen, ate some dry caribou, and tumbled into our sleeping bags. Our pup rolled in a dead seal carcass and returned proudly coated with stinking blubber. It was hopeless, and we slept.

ONE EVENING early in June, when blue puddles on the sea ice froze once more, Kaniak came to visit us with his daughter. We sat, drank tea, and smiled to fill the void. Kaniak addressed his daughter.

"He says it is getting cold," she told us. I nodded. Kaniak spoke again.

"He might want to go to Brown Sound camp," she translated. I got up to pack.

Brown Sound tents squat on terraced beaches created after the last ice age, when the land rose after glacial ice melted. One family lives there year round, going to Umingmaktok to visit, to trade, and to take part in Christmas drum dances, but having no desire to give up their isolation.

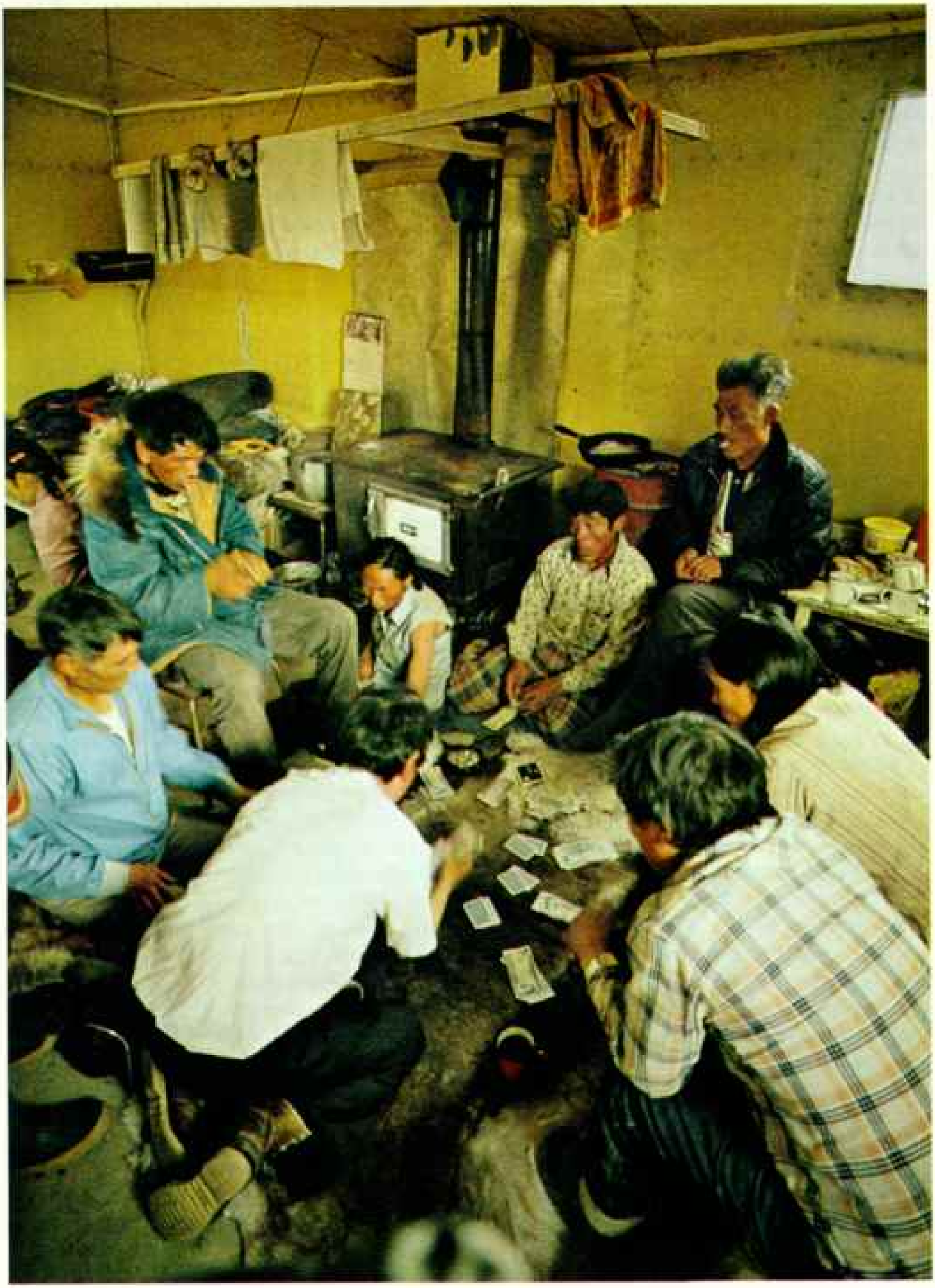
In the morning the family's three girls took us for a walk with Koput, their 4-year-old brother. He was retarded. He ran along the shore, hurling stones into ice cracks, striking the half-wild chained sled dogs, pursuing a destructive course until one of his sisters quieted him by picking him up and placing him in her parka. She caught up with us, her 10-year-old frame bending under his weight, yet her face smiling and serene.

I cooked some fish soup, and everybody came to eat and visit. Koput played in our tent, the other children taking turns watching over him and pacifying him. I saw no resentment or impatience. Ajurnarmat! It cannot be helped, and he was loved.

Inuit children, who may nurse as long as four or five years, fascinated me. Once they start walking, they come and go with amazing freedom. If a 5-year-old chose to visit our camp for several hours, he wouldn't ask or say where he was going. The children learn not by do's and don't's but by imitating those who appeal to them most, often an older brother or sister. Once we observed 4-year-old Palvik pick up an ulu, walk down to the beach, and fillet a fish without asking for help or permission. Unseen by Palvik, her mother watched proudly.

Just as they share food in camps (spouse sharing is largely a thing of the past), the Inuit share their young. If you have a number of children and your sister has none, you let her

Breakup of ice in a lake near the settlement promises fresh trout to a family jigging handmade hooks with caribou-antler lures. During a summer food shortage, the authors taught the Inuit to gather and cook mushrooms that briefly flourish in the rocky hills.



Poker-faced from fatigue, villagers play blackjack while waiting to unload Umingmaktok's overdue supply ship; their nonstop session lasted 72 hours. The freighter's annual delivery ranges from calico to candy, pickles to gum boots. Umingmaktok's finest, a prefabricated home (**right**) features heavy insulation, a chemical toilet, and an oil stove. The family sleeps on caribou skins atop a raised platform. Ships periodically remove empty fuel drums under Canada's strict no-dumping laws.

New game in town: fashioning chess figures and boards from soapstone. Fine craftsmen by tradition, the Inuit easily mastered the new art form, an important cash source

adopt some of yours. If your children are growing up and you want company, you can adopt younger ones. Corporal punishment does not exist. Except for pointed ridicule, I never saw anybody scold a child, even for vicious tantrums. One boy threw stones at anybody who opposed him. His parents shrugged it off: Children are born with no sense, and only years of experience can teach them maturity, goodness, and manners. To be mad at them would be unreasonable.

I have to admit that this patience, tolerance of mistakes, and lack of possessiveness, seldom seen in our society, seemed to work. The children are loved and feel they belong. Their bond with parents is one of independence and mutual trust.

During our stay we feasted on caribou tongues and a range of other foods. Eating all parts of an animal—back fat, raw bone marrow, liver, and intestines—as well as seagull eggs, fish heads, and other marvels, gave us a balanced diet and provided us a new world of flavors. The Inuit are true hunters and do not waste. If a hunter has more meat than he can carry to camp, he will cache it. Burying it under rocks on top of permafrost to keep it fresh and protect it from scavenging wildlife, he will memorize the terrain so he will be able to return to it.

WHEN WE WENT with Tikhak to Buchan Bay camp for a brief visit, Kaniak came with us. No one in Umingmaktok likes to travel alone. We started late. Slush covered the ice. We pushed, pulled, and freed swamped snowmobiles, black smoke blowing from the exhausts. Progress was snail-slow and extremely risky. No crash-helmet bravado here: Tikhak, his face so taut with little muscles you could use it for an anatomy lecture, would often walk forward in hip waders and test the ice with the caution of a man whose life was a tentative proposition. The period of grace for a person in Arctic waters rarely exceeds about five minutes. It was time to abandon ice travel. The breakup had arrived.

John and I decided to proceed to Buchan Bay camp on foot. We asked Tikhak how to get there. Although he wanted to see us safe, he would not describe the way. Over and over

for many. This set earned $500 for three months' work. Seal and fox pelts, however, remain the major source of family income, which averages about $5,000 a year.

he said, "I don't know," which meant: "How can I tell you? There are so many ways to get there. I do not know which is best for you."

This is a common trait. If I tried to encourage someone to show me a task I knew he performed well, I was often informed that yes, there were people who could do it, but he was certainly the last person to ask. Once, after a day of caribou hunting, John returned to camp with Hakungak and his brother, Akana. I served some food, saying: "I am sure you know that John has a worthless wife. My bannock falls apart, the seal is overcooked, and the tea cold. I cannot cook or sew. I do not know why John keeps me. And look at this fish: Is that any way to cut it? It is a disgrace! I am ashamed!"

John enjoyed my game, especially when I wailed: "And look at this man! Home he comes with empty hands! While other hunters bring good meat and fat seals, he plays with his cameras like a child and is of no use at all. It must be my fault that I couldn't get a better man, being as ugly as I am!"

Akana smiled, leaned toward my disgraced mate, and said, "Sweet girl." Both brothers looked pleased. This was the way to talk.

We found Buchan Bay camp on our own. The single family there—parents and one son—spoke no English, but received us gracefully and cheered every fish we caught and shared. When you hunt or fish around someone else's camp, you leave your game and fish there, except what you need for your return journey.

We found this family's existence perfectly tailored for its needs. One could buy some modern implements and still enjoy the Inuit concept of life on the land. Problems, however, were rising. The family's hunting had depleted game in the immediate vicinity. In the old days a hunter had to paddle his kayak for days to find caribou on Bathurst Inlet's western shore. Today, with outboards, it takes only a few hours. Modern technology has altered the traditional balance of work, rest, and play. The days grow longer and sometimes boring.

Umingmaktok faced a crisis several years ago. An inexperienced civil servant arrived and, since no one but Tikhak was holding a job, concluded that everybody needed public

assistance. Welfare checks arrived. This new situation was attractive at first; self-sufficiency no longer seemed necessary. But when their carving and fur output began dropping, they decided they would be better off if the payments were ended.

The people are tough and proud and their spirit prevailed. Tikhak lives fast, hunts, travels, takes excellent care of his family. We admired his drive. He tried to live in Cambridge Bay twice but left, disgusted. "Nothing to do there but sit, drink, and gamble. Too many drunks and fights," he told us.

Cambridge Bay, 160 air miles northeast, has all the troubles that plague some northern settlements. Some children flatly refuse to go to school there, although it is well equipped and has teachers' assistants speaking Inuktitut to ease the transition from camp life to the Western concept of learning and discipline. Many children, out of touch with their families during the long school months, do not learn how to live on the land.

Kadlun's bright 20-year-old daughter, who finished tenth grade in Yellowknife, wanted to teach in Inuktitut those children who otherwise would not go to school. The territorial Department of Education had offered her class materials, furniture, even a salary, which she did not really expect. She was to start in the fall and teach in their native language whatever her students wished to learn.

LATE IN JUNE birds nested, the tundra blossomed. Caribou and seal grew fat, and the hunting was good. Fish came to the nets and filled the drying racks. The hot, dry days of summer arrived, and the Inuit loved it. The children splashed in the chill water, women cooked outdoors, and men rested on skins spread on the ground, blowing mosquitoes from their faces with masterful jets of air.

People visited in their boats, first pulling them across ice floes, then enjoying open, calm water as summer progressed. We followed the Inuit, learning to cope with their unaccountability, so alien to our question-and-answer culture. Now we knew that if we asked, "Will you go hunting today?" the answer was usually, "I don't know." We learned to watch hip waders, lying in front of the tents. If they were moved, somebody was going somewhere. We chased Tikhak to watch his spearfishing, trailed others to caribou hunts. The Inuit did not mind.

Between two August storms we went to the camp of Avalak, whose caretaking job for the Hope Bay silver mine had led his family to near starvation the preceding winter. Promised money did not arrive, yet he would not forsake his post to go on extended hunting trips. Dehydrated potatoes saw the family of 12 and their dogs through the worst dark month, until he managed to get help from Cambridge Bay. Later he moved to the coast, where the whole family subsisted on an average catch of three fish per day.

If Avalak would take us back to Umingmaktok, we could offer him all the extra food and fuel we had. He agreed. We planned to leave before our food ran out. We did not. High winds and heavy seas prevented it. The children waited for the school plane to take them to Cambridge Bay and the plentiful food there, but the pilot couldn't get through. They swam in little rivers, played with pups, and gathered berries.

One morning I followed the familiar call of "Tiiturit!" to the family's tent. Avalak was lying across the bed, staring at the ceiling, worried. Once again the day was stormy, impossible for travel.

"Did you have your meal?" he inquired. Several years of work at a Royal Canadian Mounted Police post and a railroad in the south made it easier for him to ask questions.

"No," I replied.

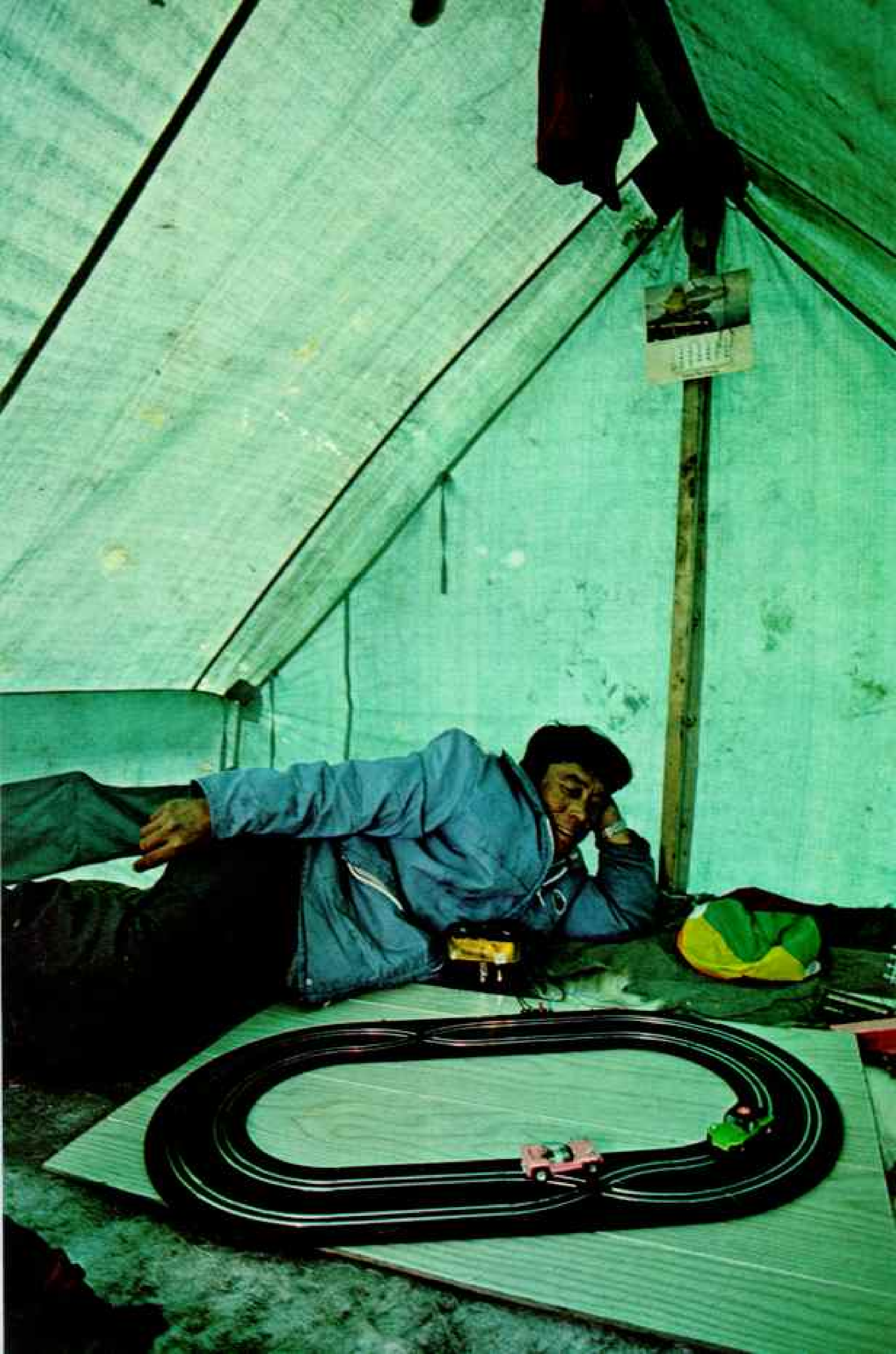
"Why not?"

"We are out of food," I said simply.

"Get some fish from the rack and eat. You must eat." And, sensing that it would take many hungry days before I'd cut into their short supply, he told his wife, "Get it. We will all eat now."

We did, and it altered our relationship. No longer were we passing birds with no ties. Avalak's decision to feed us was an act of adoption. When he later left with John to check the seal net, his wife poured me more

Youngster at heart, Kiyok plays with battery-operated model cars at his Parry Bay summer camp. He ordered the toy track and race-car set from a mail-order catalog.



tea, sat closer, and expressed her doubt whether one of the couples I knew was having a good marriage. I praised her perception, and soon we were having the most productive gossip feast north of the Arctic Circle. From then on John and I contributed mushrooms and berries, and willows for fuel—dwarf willows that hug the ground and take decades to grow an inch thick. Plants and fish grow slowly in the Arctic, while people seem to age fast.

Avalak walked the hills, looking for game:

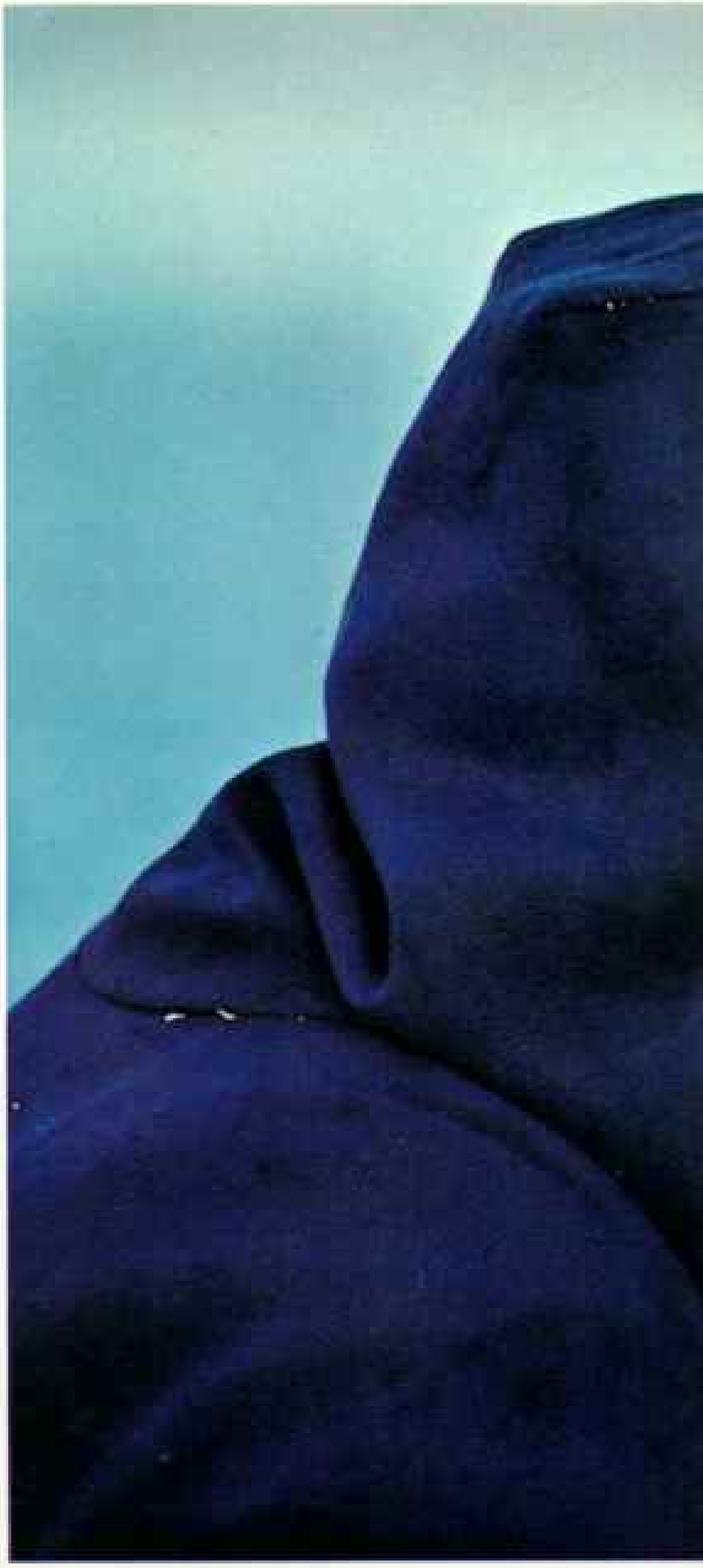
Hungry and starving
I staggered in over land,
For ever stumbling forwards. . . .
I did so wish to see
Swimming caribou or fish in a lake.
That joy was my one wish.

The school plane finally arrived. Avalak's little son brightened. "When I grow up, I am going to be a bush pilot," he told me. "Being a policeman is too dangerous."

Soon we were back at Umingmaktok, where Avalak could load his boat with basic necessities. He did not mind an occasional lack of food, and life on the land was best for him, he said. But it was good to have a choice. His fluent English, mechanical skills, and sense of responsibility would make him a most desirable employee.

We talked to Avalak about the future of Umingmaktok. Pressures were mounting on this settlement of sixty people who had opted for the kind of life they wanted. This was no longer the old, traditional existence, and the changes were generally welcomed. But how would they react to new turns of fortune? Mineral exploration camps mushroom around Bathurst Inlet; there is talk of a proposed national park; the owners of a naturalists' lodge 60 miles down the inlet have purchased the old Hudson's Bay Company buildings in Umingmaktok; the Inuit wonder if tourists might start showing up. The first electric generators have arrived on the supply ship. What, with these encroachments, will become of the Inuit's freedom?

"I used to worry," said Avalak. "Some changes happened too fast, and the people were not ready for them. But they are learning. We are getting along without welfare. We have enough money from trapping white foxes, from selling sealskins and carvings, and from the federal child's allowance. The



Though a Western-style kiss supplants traditional nose rubbing for Tikhak and his wife, the Inuit of Umingmaktok still hold to their heritage. Rejecting settlement in larger communities rife with alcoholism and unemployment, they proudly remain on their ancestral lands, sustaining life by hunting and fishing.

Inuit Tapirisat, the Eskimo Brotherhood, sent the Inuit land claims to the government. We hope it will control development of the land and protect our rights. The people have started to know what is good for them."

JUST BEFORE WE LEFT with the southward-migrating caribou, Tikhak elected to go hunting. Chasing his hip waders for the last time, we caught up with him as he was about to push off from shore.

"We are going now," announced John. The hills were already snow covered, and I tried to look at them without blinking.

"Yes, you are going." Tikhak tugged on the ignition cord, and the motor, old devil, refused to obey.

Then he asked quickly, "Next spring—will you come back?" and tugged again. The motor started. The hills were very white.

Five questions in five months wasn't bad. It wasn't bad at all. □


~PERKINS~
COOK
MrFadden
CHIMNEYS
SPRAGUE
R.W. FERGUSON
PLUM ORCHARD
HIGH
POINT

Cumberland, My Island for a While

By JOHN PENNINGTON

Photographs by JODI COBB

IN CAPRICIOUS MOMENTS, I try to think up ways to keep people away from my island hideaway. I speak of discomforts and dangers: ticks and mosquitoes, rattlesnakes and water moccasins. I quote the complaint of an old farmer who has no use for swamps and live oaks and dunes. "This island is hell-struck," he said. "It ain't fit for man or beast."

But I always confess my true feeling: that Cumberland Island, on the Georgia coast, has been blessed by benevolent powers.

Its isolation and unspoiled character were reinforced in my mind one winter day. I had walked the beach for hours, breathing deeply of the moist air, listening to the surf and gulls calling to the wind. Empty and wild, the beach invited intense solitude. I picked up a conch and heard its echo of the sea. When I tossed the shell away, it landed by a track.

A track? Was I not alone in my primeval setting? Then I came to my senses, stepped in the track, and laughed. Like the late Loren Eiseley in *The Night Country*, I had been startled by my own footprint.

Until recently it was possible to *feel* alone, even though two or three dozen people shared the island. Now that feeling is gone. But I should not be sorry: In the future many more people will know Cumberland's beauty, if not its solitude. Hell-struck or blessed, this island is passing into the public heritage as our ninth national seashore (map, next page).

At 40 square miles, Cumberland is the largest of the "Golden Isles of Guale," as the Spanish called the Georgia barrier islands after the Indians they found along this coast. Much of Guale remains unspoiled because, nearly a century ago, it became fashionable among the superwealthy to own an island retreat. Cumberland until very recently was substantially possessed by two families: heirs of Thomas Carnegie, brother of Andrew Carnegie, the Scottish immigrant who amassed a fortune in steel, and of Asa Griggs Candler, the Atlanta businessman who introduced Coca-Cola to the world.

Twenty-two years ago the National Park Service described Cumberland as "one of the two most outstanding undeveloped seashore areas along the Atlantic and Gulf coasts." (The other was Cape Cod in Massachusetts.) In 1972 Congress established Cumberland as a national seashore; 85 percent of the island

Symbols of a passing era, postboxes on the back porch of Greyfield Inn present a tall order for Gail Hammond, who sorts mail for Cumberland Island's handful of remaining families. As a retreat for the well-to-do, this largest of Georgia's Sea Islands slumbered in unspoiled isolation for nearly a century. Then in 1972 the island began passing from private to public hands, after being designated by Congress as a national seashore.

LOVELY and lonely strand, 18 miles of beach provides a hospitable nesting ground for loggerhead turtles. The cool, oak-canopied twilight of Cumberland Island's interior is a home for hundreds of white-tailed deer. Abutting the west shore, broad bands of marsh offer a refuge for myriad birds and fish.

Cumberland Island National Seashore

has now been acquired by the Park Service. That remaining in private ownership includes High Point, the Candler family retreat, where my job as caretaker allowed special insights into a unique environment.

For more than three years I made my home on this isle, which has no bridge to the mainland and no pavement to wear out shoes or spirit. I was immersed in the island's moods and rhythms, student and lover of its wildness—and witness to the passing of an era.

I got there before Cumberland was opened to the public—in time to learn to live off the land and the water; to know long, splendid periods of isolation; to find solitude and, sometimes, an aching loneliness.

Caretaker's Job in Shangri-la

I first saw Cumberland from the air, as the migrant terns and plovers see it in the fall. Sam Candler, one of High Point's owners, flew to the island in his small plane. He swung across the north end and put the entire island under the wing. From a clear October sky I saw beaches of fine, firm sand, rumpled dunes bordered by live-oak forests, marshes and estuaries, a few buildings and ruins. We landed on a small strip. Later, piloting a rented plane, I landed on the beach to make that first trip spiritually complete.

Only 14 people lived year round on Cumberland then. The number increased gradually, mostly because of enlargement of the Park Service staff, to about thirty. Visits by owners and their guests sometimes doubled and tripled the number.

Then, in 1975, the Park Service opened the southern end to day visitors. In a few weeks, more people visited Cumberland than had in the previous ten years. After that show of interest, the Park Service acquired a bigger boat and opened parts of the island to backpackers and campers.

For me, the allure of the caretaker job was great. Island life promised few temptations to the pocketbook; I would try to write a novel. I left my newspaper job in Atlanta and paid the price in lost income to get away, for a while, from the contrived environment of the city. I wanted to feel the touch of a clean breeze, the wet kiss of the rain in a natural setting; to hear the ocean's roar instead of the freeway's, the trumpeting call of the pileated woodpecker instead of the jackhammer's

clatter. I wanted to calm some discordant notes and reattune myself to nature's rhythms, to repair in my life what Euell Gibbons called man's "estrangement from nature."

Jesse Bailey, one of my High Point neighbors, helped me learn about island living (pages 656-7). In the first week we went into Christmas Creek to get fish. Jesse demonstrated the use of a cast net. From his hands it swirled out like a windblown blossom over the dark water.

I threw the net, and it came up jumping with three small mullet, a sea trout, and a small flounder. The ease of the catch amazed me. I stood holding the dripping net, watching the fish flop about.

Jesse scowled. "Your arm broke?" he asked. "Throw the net, John. Get the fish while the tide's right. You can admire 'em later."

Jesse Bailey is unchallenged king of Christmas Creek. With his help I learned to harvest other fruits of that rich tidal stream—oysters, clams, crabs, conchs, shrimp. But often it wasn't necessary. Jesse was a generous friend who came bearing gifts, a burlap bag full of fish or shellfish. He made it easy—but not too easy. "I ain't clean 'em," he would say. "I catch 'em, John. You clean 'em."

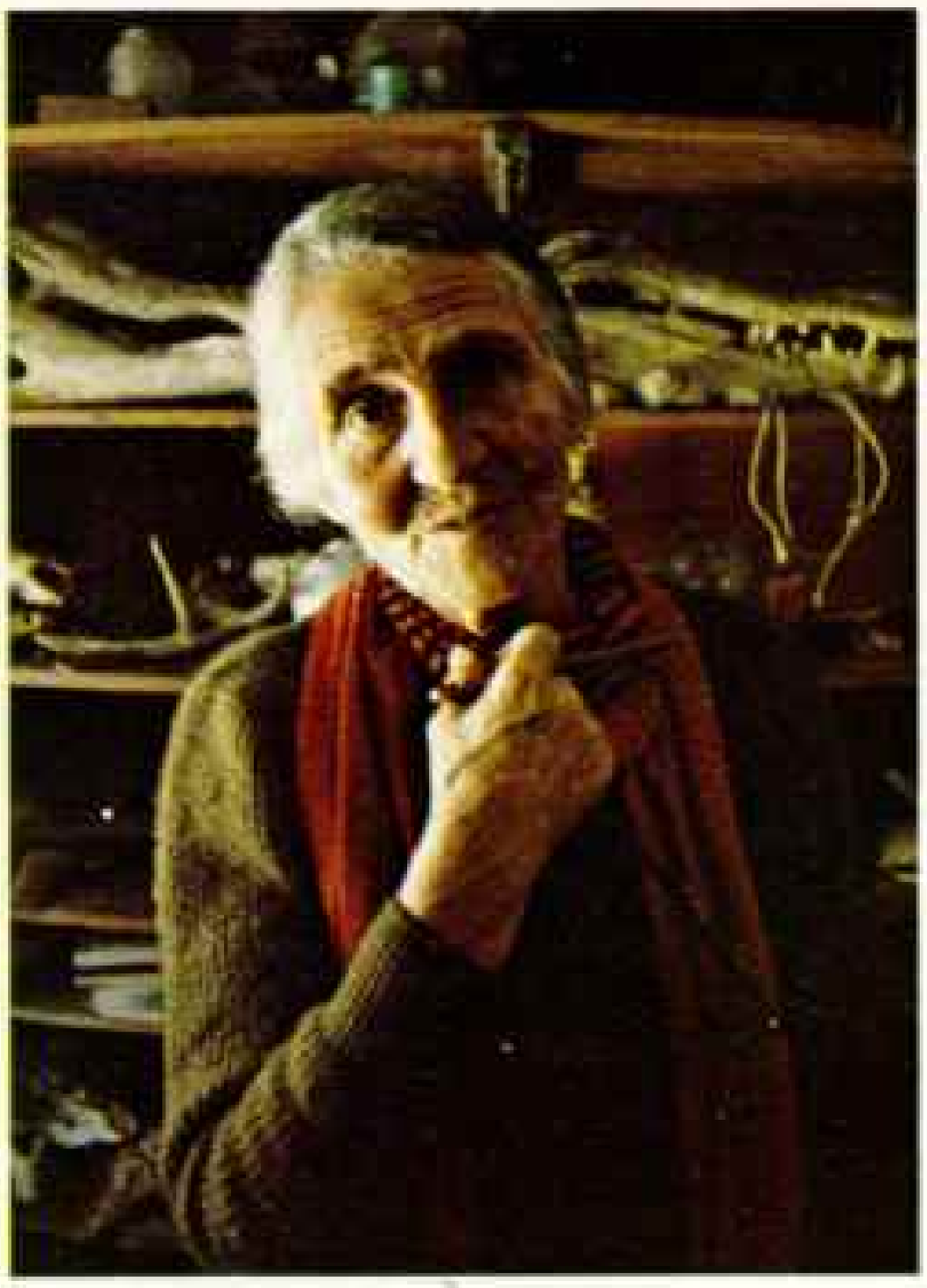
One day I watched him shucking oysters. He built a fire under an old black washpot, then piled in oysters with a pitchfork. He waited awhile, then took them out just as they began to open, tender and succulent.

Eager to learn, I asked, "Jesse, how long do you leave them in the water?"

At first I thought he hadn't heard. He opened one oyster, then another. Finally he spoke: "Not too long."

I put my watch aside, and it stopped at ten of ten. Three years later it still said ten of ten. I concerned myself with measurements of time more significant to island living: how long between tides, between new moon and full, between sunrise and sunset.

Guesthouse on a grand scale, Greyfield Inn was built as a home 75 years ago by a branch of the steel-rich Carnegie family. Today a lodging place and the only touch of commerce on the island, it welcomes outsiders and serves as a community center for Cumberland residents.



One of a long line of women who shaped Cumberland history, Lucy Ferguson (**above**) credits her Carnegie ancestors with preserving the island's wilderness. She remains a vocal opponent of U. S. Government plans to acquire all the land for the national seashore. A granddaughter from Pennsylvania (**facing page**) bears a striking resemblance to "Miss Lucy," whose portrait at 26 hangs in Greyfield Inn. Covered in plastic by the National Park Service, an old station wagon (**below**) harks back to another Lucy.

Excavations reveal that the Indians who once dwelt on Cumberland ate not only shellfish and fish that could be trapped in tidal estuaries but also deer and other animals. Similarly supplied, and with vegetables from a garden, I had little need for a grocery.

It took me a week to get my first deer. Each time I encountered one, the animal would toss its head, snort, and bound away before I could get close enough to shoot.

Gradually I learned the necessary stalking techniques. Scent, sight, and sound were allies of the deer; if I wanted venison, they would have to be mine also.

So I went after a rain had softened the earth, to mute the sound of my approach. I walked into the wind, so the breeze would carry my scent away from the prey. I moved stealthily. I spotted a young buck and waited until eating claimed his attention fully. Putting a clump of palmetto between us, I maneuvered close enough to shoot.

Then I stood with smoking shotgun and wept over the dying animal at my feet. I am not a joyful predator.

Dunes Tell of Sea Wind's Violence

The island was an open classroom, and visiting scientists were teachers. One day on the beach, Dr. Robert Platt of Emory University, a past president of the Ecological Society of America, stopped and pointed excitedly at a sand dune.

One side had been sheared off, exposing the process of creation: layers and layers of sand of different hues, built up by years of winds. Now a northeaster had cut it away, blowing the sand to other hillocks in the dynamic, changing dunescape beside the sea.

Dr. Helen B. Jordan, a protozoologist, studied parasites in small reptiles and amphibians, with a special interest in the transmission and evolution of malaria. In floppy hat, baggy Army fatigues, and tennis shoes, she searched the woods and swamps for snakes and lizards. Islanders called her the "lizard lady."

Other visitors came to Cumberland seeking release from pressures. A guest of Sam Candler's at High Point stopped by my kitchen to talk in the spring of 1974. He said he was going to run for President. Later, in his book, *Why Not the Best?*, Jimmy Carter wrote that Cumberland was "our favorite

JOHN PENNINGTON (ABOVE)

Shades of an opulent past linger at Dungeness, Cumberland's most visited site. Here the widow of Revolutionary War Gen. Nathanael Greene presided over the showcase estate of a plantation aristocracy. After the Civil War hundreds of slaves were freed, and the island was abandoned. Live oaks were reclaiming the land by the 1880's, when another widow, Lucy Coleman Carnegie, completed a new Dungeness on the ruins of the old. Unused since the 1920's, the mansion was burned by vandals in 1959.

Though the island is now open to the public, access will be limited. Because Cumberland's ecology is so fragile, the Park Service proposes that only 1,460 visitors a day be allowed on its ferries (**left**).

place" when he was Georgia's governor. He visited several times with his family.

I remember Jesse Bailey's comment when I told him what Governor Carter had said. "Jimmy run for President? He'll win. He know how to talk to people." Then Jesse laughed. "But I can show him something about throwing that net. And he know it too."

Sunrise found me, many times, plunging over the swells of St. Andrew Sound in High Point's aging surplus Navy landing craft. Operating this 36-foot vessel over a 25-mile Intracoastal Waterway route between Cumberland and St. Simons Island, I ferried vehicles for the owners and brought in gasoline, horse and chicken feed, lumber, and appliances. Crossing the sound on a winter day, with a northeast wind sending sheets of salt spray over me, I felt closer to the moon than to the life I had put behind.

Ghosts Haunt Abandoned Cotton Fields

English Gen. James Edward Oglethorpe, founder of Georgia, built a hunting lodge on Cumberland and named it Dungeness, for a castle on the southern tip of Kent. After the Revolution, Dungeness was acquired by Gen. Nathanael Greene, who had been the youngest general in the early Continental Army. He planned an elaborate home, which his widow built after his death in 1786.

Before the Civil War, Dungeness was one of several large Cumberland plantations that grew long-staple Sea Island cotton. Three or four hundred slaves worked the fields. Cemeteries of landowners can be found, but the graves of the slaves apparently were not marked. Archeologists who surveyed the island in 1975 could find no slave graveyard.

In a symbolic sense stark chimneys at the old Stafford Plantation stand as a memorial to the anonymous toilers. Planter Robert Stafford is said to have chased his slaves away by burning their cabins when they refused to work after the Emancipation Proclamation. The ghostly chimneys stab at the heart of a visitor.

Thomas M. Carnegie and his wife, Lucy, visited Dungeness in 1881, liked it, bought it, and began constructing a new house on the site. Carnegie died in 1886, at the age of 42, leaving his widow with nine children, great wealth, and the mansion. A generous woman who loved having her family around

her, Mrs. Carnegie added to the house and helped her children build three others. One home, Greyfield, is operated as an inn today by Carnegie descendants (page 651).

Of the grand Carnegie mansion at Dungeness, only a skeleton remains, an empty relic of the "big house" that dominated life on Cumberland until it burned in 1959.

The other major estate, High Point, was built as a resort hotel and eventually became a hunting and fishing club. The club folded in 1930, and one of its members, Charles Howard Candler of Atlanta, bought the old hotel complex and a large amount of land.

A dirt-and-shell road runs the length of Cumberland. Some islanders call it "Interstate Zero." The trail passes twisted old live oaks, hosts to lichens, Spanish moss, and ferns; stately longleaf pines; clumps of palmetto; aromatic bayberries; magnolias; yaupon and dahoon hollies; grapevines as big as a man's leg. Deer are plentiful and feral horses, cows, and hogs graze in the forest. Birds are numerous: 323 species have been identified.

Island Shelters Panoply of Life

Biologists studying the ecology of Cumberland for the Park Service concluded that the island has perhaps the greatest faunal and plant-life diversity to be found in the Georgia barrier islands.*

Carol Ruckdeschel, a naturalist, introduced me to species I had not known before. Once we stopped by Oyster Pond to photograph a plant she had discovered.

"Where is it?" I asked.

"You're standing on it," she said.

On my knees, I studied the insectivorous

*James Cerruti described the "Sea Islands: the South's Surprising Coast" in the March 1971 GEOGRAPHIC.

Counting time by the tides that wash Cumberland's fertile marshes, the author (**above**) spent three years under the island's spell. As caretaker of High Point, an estate owned by Coca-Cola heirs, he learned to cast for mullet (**left**) under the tutelage of fellow employee Jesse Bailey. On cold winter mornings Jesse keeps warm with a bucket stove in his boat (**below**).

Drosera, the sundew. Through the closeup lens of my camera I could see why the plant was so named; the viscid fluid on its leaves sparkled like tiny diamonds.

On the beach Carol studied the nesting habits of the loggerhead turtle *(Caretta caretta)* for the Park Service, in cooperation with the University of Georgia. Going with her one night, I watched a turtle emerge from the water under a full moon. The carapace was a rich, mottled brown, encrusted with barnacles, and it glistened in the soft light. The loggerhead stopped at the edge of the surf and raised her head—looking, smelling, listening?—then continued, pulling her weight, perhaps three hundred pounds, in a lurching, cumbersome gait.

The sea turtle sculpts her nest above the high-tide line and lays about a hundred and thirty soft-shelled eggs, the size of table-tennis

Curling south toward the mouth of Christmas Creek, a sandspit near the northern end of the new seashore (map, page 650) exemplifies the pristine quality of Cumberland's Atlantic

oceanfront. Under special arrangements with the Park Service, this area—called Little Cumberland—will remain indefinitely in private hands as long as ecological safeguards are observed.

balls. Water runs from her eyes, and it is a romantic notion that old *Caretta* is weeping during her motherly act. Biologists know that she is excreting salt from her system.

In one summer Carol documented 118 turtle nests in a five-mile stretch of Cumberland beach. Two months after the eggs were laid, she counted 3,300 baby loggerheads, no bigger than half-dollars.

An Isle That Seems a She

My intimacy with Cumberland made me feel possessive. I thought that feeling unique to me, but one evening Nancy Copp, a great-granddaughter of Thomas and Lucy Carnegie, talked about this phenomenon. "It's a female island," Nancy said. "Everybody who comes here wants to possess it. Even after a week people say, 'It's my island; I relate to it; I understand it.' Cumberland really is female."

The island—luscious, lovely female—has been possessed by many. Now she lingers between private and public ownership. The Park Service had hoped to open the entire seashore to visitors in 1978, but the goal is not realistic. Plans and preparations will not be complete by then. The Park Service is still acquiring land on the island. Owners of houses built before 1970 have the option, upon selling, to use their homes for 25 years or for life.

Mrs. Lucy Ferguson, a third-generation Carnegie on the island and the gracious first lady of Cumberland (page 652), has been the most articulate of several Park Service foes. A widow, she lives in a two-story frame house at old Stafford Plantation. On her porch one day, she talked about her feelings.

"I'm not going to sit by and watch them ruin this island," she said. "They can't do anything to me except condemn my property.

"**Somehow my soul seems suddenly free. . . .**" Running across lonely dunes, the author echoes the feeling of native son Sidney Lanier, who extolled Georgia's coastal wilderness

And I told them, 'Go ahead and do it.' They've done nothing. They think that when I pop off, my 18 grandchildren will get in a devil of a fuss, and then it will be easy to acquire."

Mrs. Ferguson paused. "That's the way to handle an old woman," she said quietly. "Wait for me to die."

Since then, Mrs. Ferguson says she has noted a softening of the Park Service's attitude toward her, and their relationship has lost some of its rancor.

To Stand Remote, Yet to Share

I face the island's future with mixed emotions, sympathetic with Mrs. Ferguson's longing to keep things the way they were, yet appreciating the excitement of others who want to share in the island's promise.

On the quiet beach, my feet in the surf and my head in the clouds, I watch the building and reshaping of the dunes by the wind and contemplate the fortuitous timing of my island experience. It has been extraordinary, but not all sunshine. There were insects and snakes, the danger of injury or sudden illness. Sometimes in winter the fog was so dense it would have been difficult or impossible for medical help to arrive. But this is part of what an island is all about: the allure of insularity, the adventure of remoteness.

Where the land meets the sea, one is witness to the process of creation. The dunes are living: shifting, moving always. The vegetation is pruned, sloped, shaped by the salt spray of the northeast wind. Twice each day the beach, washed by high tides, starts anew; yesterday never happened.

I was present at that creation on Cumberland. Perhaps, with careful management, others may experience it too. □

in poetry a century ago. As a national seashore, Cumberland Island seems assured of enduring as an asylum for wildlife, and as a spiritual haven for human generations to come.

Montenegro

Yugoslavia's "Black Mountain"

By BRYAN HODGSON

NATIONAL GEOGRAPHIC STAFF

Photographs by LINDA BARTLETT

HIS FACE seems oddly gentle now, a pale death mask serene upon a pillar in Cetinje, the stronghold of his enemy. Mahmut-Pasha was his name. He led a glittering Turkish army to Montenegro in 1796, bent on conquest for the empire of the Ottomans.

But he met a breed of warriors in love with death, and they deprived him of his army, his ambitions, and his head.

"Perhaps you'd like to see his skull. We keep it in the monastery," says my guide.

I decline. I have had my fill of death and history today, the ceremonial evidence of 500 years of warfare that forged a nation called Crna Gora, Black Mountain.

The Black Mountain: Montenegro. Today it is the smallest of Yugoslavia's six republics, wedged firmly against the northwestern border of Albania on the placid southern Adriatic coast (map, page 668). Behind its fringe of seaside tourist resorts lies a spectacular wilderness of mountains and gorges, where tough and prideful people live with their heads in the future and their hearts in the past.

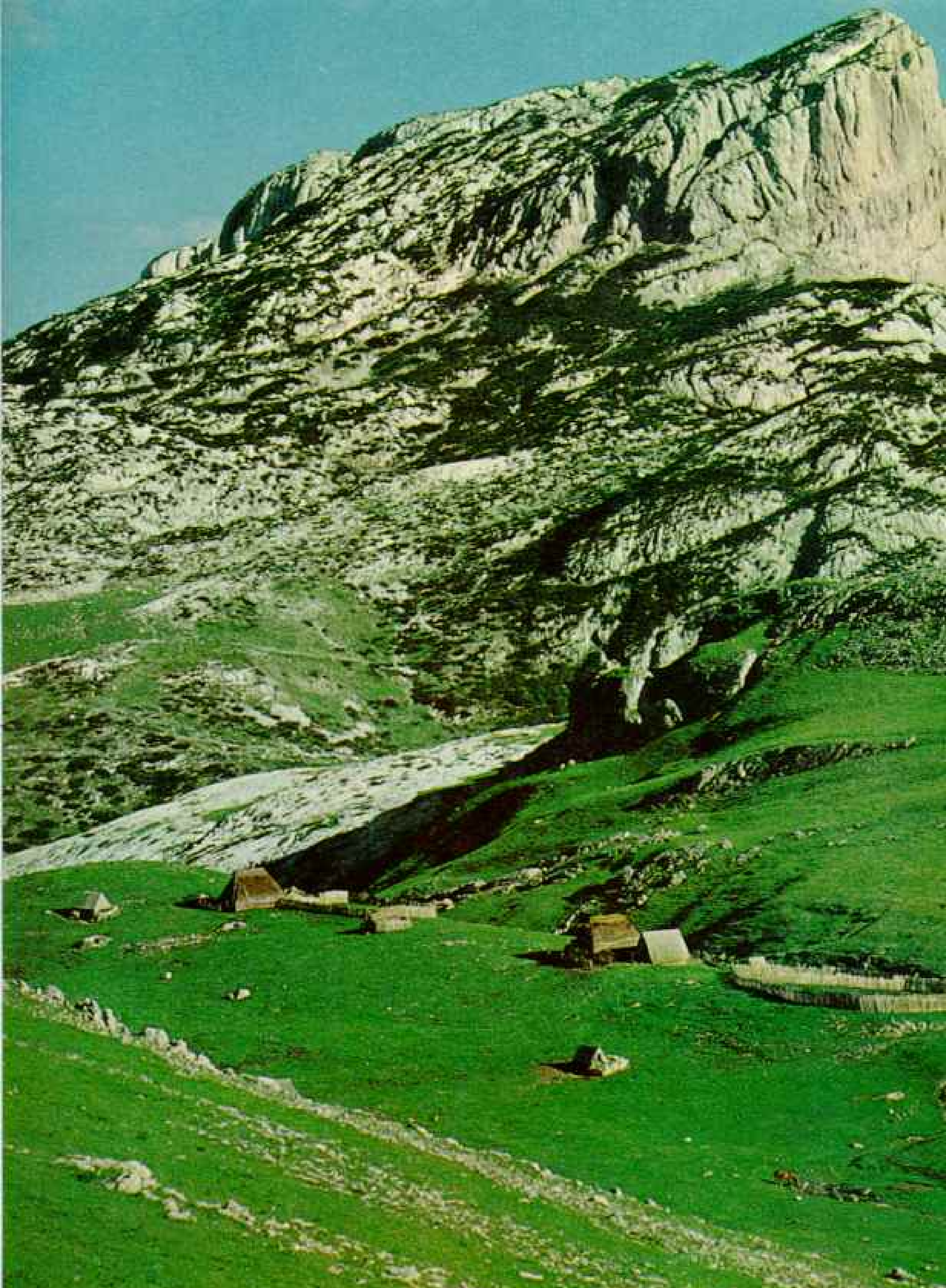
Modern Montenegrins cherish the memory that theirs was the only Balkan land to live—at bloody cost—in freedom from the Turkish invaders who crushed old Serbia at Kosovo in 1389.

Cetinje is the treasure-house of that memory—a strange, graceless town embedded in the mountains that were Montenegro's fortress. Some have scorned it as a comic-opera capital, where barbarous tribesmen struck attitudes of chivalry. More thoughtful visitors note that Christian monks began operating a printing press here in 1494, and that a Montenegrin ruler named Njegoš, who died in 1851, is still honored as one of Yugoslavia's greatest poets.

The Montenegrins' stubborn independence awakened Europe to the existence of a formidable foe against the Ottomans. Russia formed an alliance that still has overtones in modern Yugoslav politics. Britain, France, and Austria established legations in Cetinje after the Serbo-Turkish wars of 1875.

And in 1909 the United States sent a minister plenipotentiary named George Higgins

At home by their hearth in the village of Godinje, two women prepare the evening meal. A giant squash, prized for its nutlike seeds, dries at left. In this hamlet everyone is named Leković, a reminder of the past when clans lived in mountain-girt isolation. Smallest of six autonomous republics that comprise the Socialist Federal Republic of Yugoslavia, Montenegro preserves a long tradition of independence won by a breed of fighting men whose courage is legendary.



Summer's green carpet covers Dobri Do—Good Valley—where shepherds

bring their flocks to graze amid the limestone peaks of the Durmitor range.

Moses, who reported—in the March 1913 NATIONAL GEOGRAPHIC—that "Montenegro, perched in the rocky fastnesses . . . both defies and invites invasion with its magnificent system of highways so delightfully easy of passage in time of peace and so superlatively simple of defense in time of war."

BLACK MOUNTAIN. The name itself is a contradiction. The mountains are bone-gray limestone that does not weather and crumble like other rock, but literally melts beneath the rain, until boulders gape with mournful cavities like skulls and cliffs are furrowed like the face of time.

Rain creates few rushing streams in the high country, but vanishes instead into an underworld of caves, welling up many miles away as rivers full born at the mountains' feet.

Only in small hollows called *polja* does enough sparse soil survive to nourish tiny villages, isolated from one another by the tumbled peaks.

It is pleasant to roam the heights. Voices of men and women, toiling in the changeless ways of antiquity, float up to you from a village. There is the fabled Gulf of Kotor, ringed with the crumbling palazzi of the Venetian empire. The Adriatic coast sparkles at night with the pleasure palaces of a new empire built for tourism. Inland is Lake Scutari, largest in the Balkans, which Montenegro shares jealously with Albania. Behind it the factories of Titograd cast a modern haze over the shimmering plain of Zeta.

To the north the 8,274-foot tusk of Durmitor dominates the Dinaric Alps. And slashed across the whole are spectacular river gorges —the Tara, whose purity Montenegrins have sworn to protect against pollution; the beautiful Piva, part of which forms a lake behind the new 342,000-kilowatt Mratinje Dam, and the Morača, with its incredible new railway line that stitches through the mountains like a needle through folded canvas.

From the heights, you may feel you understand Montenegro.

But not for long.

Photographer Linda Bartlett and I drive cautiously on the highway that plunges into the great Moraća gorge. Toward us, a nose-to-tail convoy of huge diesel trucks labors upward. The drivers seem cheerful and relaxed, and a few miles farther we discover why. On a hairpin turn, a small roadside restaurant clings to the mountainside. More trucks crowd the small parking lot.

Inside, a man is singing. It is a strange and mournful voice, echoed by the single-string fiddle between his knees. With the last wavering note his listeners cheer and raise their beer bottles in tribute.

Later, when the truck drivers are gone, the singer shows us his *gusle*—the traditional fiddle of the Serbs. He has made it himself and carved on its neck a defiant dragon. He plays another song. The eerie counterpoint of voice and instrument makes hairs stand on my neck.

Afterward we sip tiny cups of syrupy Turkish coffee, and I ask if the gusle is for sale. He hesitates, then names a price that seems too low. I offer more. Awkwardly he accepts. Suddenly an old woman interrupts, thrusting upon us an armful of pure white wool freshly carded for spinning.

Her hands are twisted and thumbless. Linda exclaims in dismay.

"Nemački!" the old woman says, with a shrug. She hisses the word.

ONLY IN TITOGRAD, hours later, do we fully understand what we have seen and heard. Zoran Leković, a young university student who is to become our translator, guide, and much-loved friend, listens to the tape recording I have made.

"You have made a good start in learning about Montenegro," he says. "The song is part of an ancient cycle that begins with the prayer of the Serbian Prince Lazar before the battle of Kosovo:

"Let us spill our blood, let us redeem death by death . . . better death as heroes than alive in shame.

"The *guslar* was only selling you his instrument to be polite—he made it for his family. You paid more than he asked, so the old woman gave you the wool, which was worth much more.

"And as for her hands—well, 'Nemački' were the German soldiers of World War II. She was young and pretty then. They questioned her about the Partisans. She would not speak. They hung her by her thumbs until she dropped."

Titograd bears the name of the most famous of the Partisans, Josip Broz Tito, President of the Republic since 1953. It is a dusty,

raucous frontier town where high-rise apartments look down on haphazard neighborhoods built on the wartime ruins of Podgorica, as the town was called until 1946. Two years later it became Montenegro's new capital. Today it is home to a large bureaucracy, and a university where 6,000 students work toward degrees in business administration, law, and engineering. Here, too, a new factory smelts 50 percent of Yugoslavia's aluminum from bauxite mined in nearby Nikšić.

Linda and I arrive in the midst of a rush hour that attests to all the problems of progress. But within an hour we witness what seems a miracle on Freedom Street—Ulica Sloboda—which at 5 p.m. becomes suddenly devoid of cars. Instead, a slow tide of humanity swirls in grand procession, and the air hums with animated conversation.

"This is a tradition called *korzo*," says Zoran. "Cars are banned from 5 to 11 p.m. each day. People come out to meet old friends, to gossip, to show off new babies. It is an old village custom—but the people of Titograd are still villagers at heart."

We join the slow parade, window-shopping at two modern department stores and dozens of specialty shops. Their wares range from scythe blades to chain saws, washboards to washing machines, and a wide variety of clothing, electronic goods, automobile accessories, and brightly packaged foods. Under Yugoslavia's brand of Communism the workers in the state stores are responsible for successful management—and profit is the measure of success.

For the young people on korzo, life seems comfortable and promising. They wear the international uniform of youth—skintight jeans and sweaters. The only somber note is provided by scores of gray-clad draftees, who watch listlessly as the crowd moves by. Titograd is a major military base, for it is close to the sensitive Albanian border.

Modern lines of a university dormitory in Titograd, Montenegro's capital, spell progress to septuagenarian Blažo Bojević, a farmer who remembers when he barely coaxed a living from the soil. With industry sparked by new hydroelectric power, Montenegro now processes bauxite into aluminum and manufactures heavy construction equipment as well.

Scrub-covered mountains, here girded by the river Crnojevića (**above**), proved an impenetrable fortress against invaders. Though they tried for five hundred years, the Turks never completely conquered Montenegro. Not much larger than Connecticut and sheltering some half a million people, Montenegro became part of the Kingdom of the Serbs, Croats, and Slovenes—later known as Yugoslavia—in 1918.

Republics of Yugoslavia

Ruler, warrior, and epic poet, Petar II Njegoš (**below, right**) persuaded feuding chiefs to give up power to a central senate 20 years before his death in 1851. The author's interpreter, Zoran Leković (**below, left**), bears a remarkable resemblance.

The swish of the scythe is heard more often than the roar of the tractor in this agricultural land. While his grapes ripen, a farmer at Dobrsko Selo (**facing page**) harvests hay, important as cattle feed during the long mountain winters. A farmer and his wife (**below**) bring in a load of hay from their farm at Golubovci.

"Was never conscription here before," growls a huge young man, one of several English-speaking students Zoran has gathered to meet us.

"Montenegrin man, he laugh, he sing, he go to die. Was tradition. And now? I will get my degree, then I will be in army—probably in Slovenia or Serbia, because usually you don't serve in your own state. But if we have to fight. . . !" His voice leaves no doubt that the idea of combat still has its attractions to a Montenegrin.

Defining enemies—or even friends—is more difficult.

I ask the students their thoughts about the recent arrests of 40 Yugoslavs—including 12 Montenegrins—on charges of conspiring with the Communist Party of the Soviet Union to undermine the Tito government's independent policies.

There is a silence. "Yugoslavia is too strong now to be divided by old quarrels," says one student with a Trotsky beard.

"We will not be a colony of Russia. We will not be a satellite of the West. Let the old men remember their hatreds. We would rather learn and teach from our own experience."

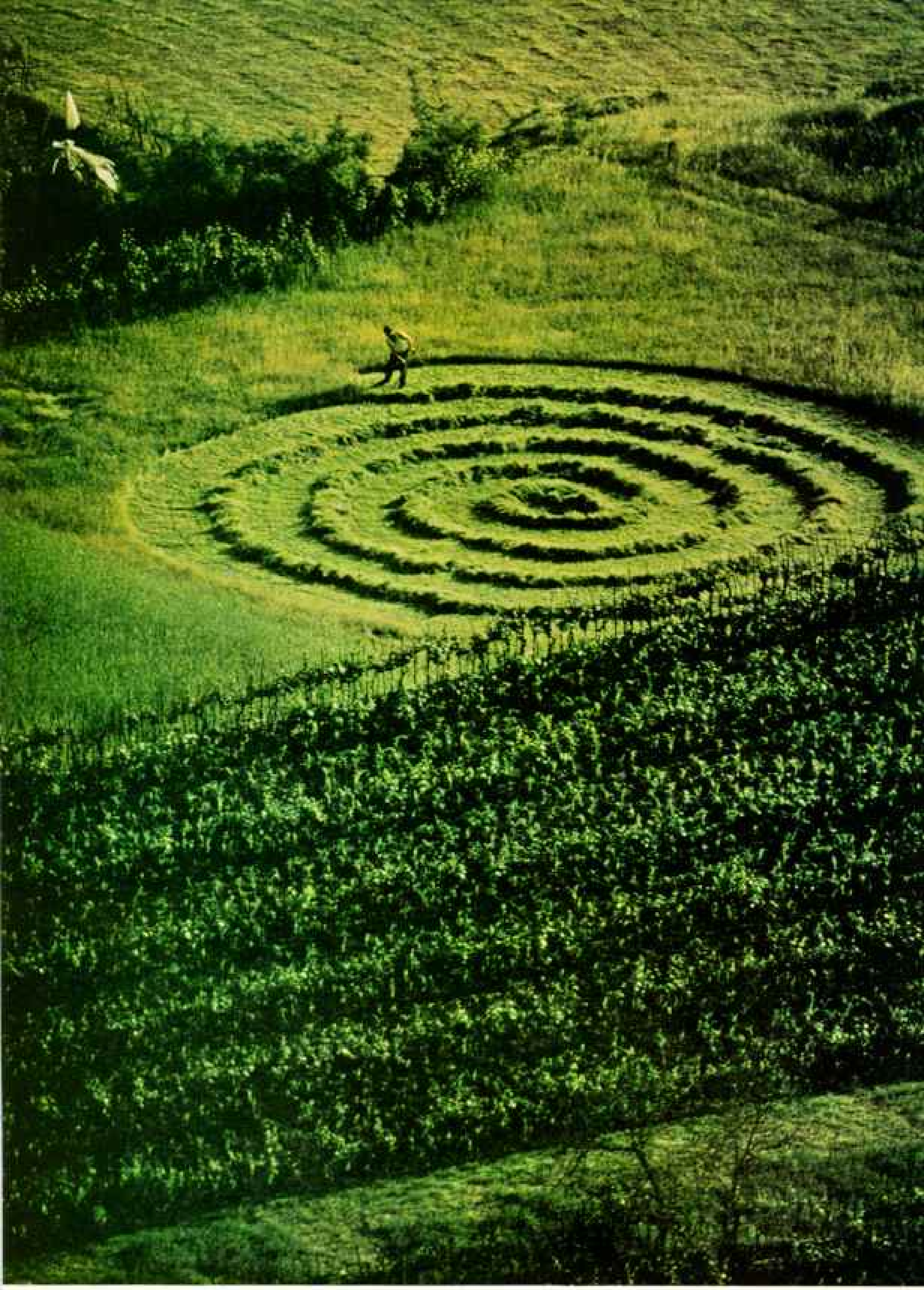
"THESE YOUNG ONES, they know nothing of life!" Petar Mujović takes a mighty swig of beer, smoothes his great white mustache, and glowers at the holiday crowd in the valley of Veruša, some 20 miles north of Titograd. It is July 13, anniversary of the Montenegrin guerrilla uprisings against Italian occupying troops in 1941. Petar is irate because the young people have paid so little attention to ceremonies honoring the old Partisans.

Impatiently he points out a young girl in mourning dress, who has removed her black wool stockings and pinned her skirt to reveal a fashionable amount of thigh.

"Once the boys and girls wore the national costume on days like this," Petar growls. "Now they won't even wear proper mourning for their own dead!"

At 78 Petar still wears the *kapa*—the traditional Montenegrin cap, with its black border commemorating the Serbian defeat by Turkish armies at Kosovo nearly 600 years ago.

Petar fought with the Partisans, but his military memories begin with the Balkan Wars, when he was wounded in combat as a



Montenegro: Yugoslavia's "Black Mountain" 671

"**Tears come in my eyes;** there is sadness in my heart," says Dusan Lubarda (**above**) as he tells his granddaughter Milka on her wedding day that she will now have a new family and home. The speech brings an emotional response from everyone at a pre-wedding luncheon in the Cetinje home of the bride, here escorted by a relative of the groom. Later, in the street, amid singing and dancing and firing of pistols, the groom made a symbolic capture of the bride and took her to his family home for the ceremony.

boy of 16. "In the old days a man was considered poor if he didn't have a pistol. Now he's poor if he doesn't have a car. The young are going to the cities. They are forgetting that nature makes man humane. When he loses touch with the soil, he loses his soul."

I look at the cheerful mob playing soccer, dancing, crowding around refreshment stands that offer roast chicken and corn and the spicy barbecued sausage called *ćevapčići*. Others clamor for fruit juice, Coca-Cola, and Nikšićko Pivo—the potent beer of Nikšić. The bottles are nested in tubs of snow brought from the wintery flanks of Kučki kom and Vasojevićki kom, highest mountains in this region called Komovi.

Wearing his country's history on his head, Petar Mujović enhances a festival near Lijeva Rijeka (**below**). The black border of his *kapa* stands for the terrible defeat of his Serbian ancestors by the Turks in 1389; the red, Montenegrin blood spilled in combat; the braid on top, the centuries of warfare with the Turks. When a 19th-century Turkish commander asked how far it was to Cetinje, then the capital in the mountains, a Montenegrin replied, "It depends. A friend can get there in six hours; a foe, maybe never."

A giant billboard portrait of Marshal Tito gazes benignly on the crowd; except for that face, and the rumble of Serbo-Croatian speech, I could be at a Fourth of July picnic. Suddenly I feel oppressed by history, while the revelers are for this day free of it.

Not far away, in the shadow of the mountain named for them, a monument stands to the fallen men of the Vasojević clan. In 1912 they died against the Turks, and in 1913 against Albanians and Bulgarians. Others died against the Austrians in World War I, and then the Vasojevićs resisted until 1921 the newly created Kingdom of the Serbs, Croats, and Slovenes—today's Yugoslavia.

The second World War at first brought Yugoslav unity against invading Italian and German troops. But Montenegrin nationalists, joining with the royalist *Četnik* forces of Gen. Dragoljub-Draža Mihajlović, were soon locked in tragic civil war with Tito's Communist Partisans.

There are no monuments to Četnik dead. Mihajlović, accused of collaborating with the Nazis, was executed for treason in 1946.

In late afternoon we join the caravan of departing cars, choking in an enormous plume of dust. And then comes one of those small miracles that Montenegro offers travelers. Water glitters in a grotto near the road. We stop and scramble through a fragrant bed of wild mint to enter a wonderland carved

Conquering the mountains, the Belgrade-Bar Railroad threads the Morača River gorge (**right**), linking the Danube with the Adriatic. Under construction for ten years, the 73 miles of track through Montenegro includes 29 miles of tunnels and 92 bridges. Twisting roads can lead to a tragic end. A sign accompanied by remnants of a crashed auto (**below**) memorializes brothers who died near Nikšić.

inside a cliff by a hundred-foot waterfall. Tiny yellow-dashed birds flicker in the wind of the plunging water.

We refresh ourselves in the icy spray, and my thoughts are cleansed of bloody history.

Somehow this seems a holy place, where the soul of such a land might shelter.

MIJO MIJUŠKOVIĆ believes the soul of Montenegro is made of wood. His huge hands can carve and shape with enormous delicacy. His face is huge as well, like a model for something to be chiseled on a mountain.

Mijo is 46, a meteorologist by profession, and a sculptor by something more than choice.

"I travel all Montenegro, to measure the snowpack, the water reserve. Once I am on Durmitor. A snowstorm comes, and I am lost. If I stop to rest, I will die. And then I see one tree, and something in its shape tells me how painful life is, and how patient. So I go on, and soon I find the road.

"And I learn that all wood has something to tell us, if we look carefully. So I am a sculptor, but only to find out the truth of wood, not to make it say my idea."

He works in Nikšić, center of Montenegro's mountainous bauxite-mining district northwest of Titograd. His laboratory-studio is

filled with carvings made from strange pieces of wood he has gathered on his travels. Some are graceful and abstract. Some have features half formed in fury; others are like cheerful figures from a fairy tale of creation.

"It is hard to know where nature stopped work and Mijo began," I say, admiring an exquisite sculpture of olive wood glowing with beeswax finish.

"It will not be finished until you see your own truth in it," he says, and makes a gift of it.

We have come to Nikšić on our way to visit the Mratinje Dam construction site on the Piva River near Montenegro's northern border. Mijo volunteers to guide us, and we set forth on the country's most wretched road—some 30 miles of rock and dust twisting through the hills, swarming with heavy trucks carrying cement for the dam.

Short of our destination, he suddenly commands us to turn off the road, and we find ourselves staring at a rock pile. It is the 16th-century Piva Monastery, which has been dismantled stone by stone to be rebuilt above the water level of the new dam.

Mijo's special joy is a new building nearby, where hundreds of the monastery's precious frescoes hang in air-conditioned darkness. These frescoes, painted centuries ago by

Woven of willow branches and capped by thatch, corncribs in Gusinje (**facing page**) mark the farm of Amir Hot, whose headdress bespeaks the Moslem faith bequeathed by the Turkish occupation of this area.

Many villagers had worked in the United States for a time. Still they returned to the ways of their forefathers, as demonstrated by a miller grinding corn with a stone wheel powered by a mountain stream (**below**).

Smitten by photographer Bartlett, a youth (**above**) followed her admiringly from a distance, then presented her with a rose.

Montenegrin artists trained in Venice, were removed with patient skill. First they were coated with linen glued with honey and bull's bile, then sliced from the walls in fifth-of-an-inch sheets. When the restoration is complete in 1980, the masterpieces will be fitted again and the linen covering removed.

"We could not sacrifice this heritage just for electricity," says Nonin Dusan, one of the conservators. He shows us a 400-year-old fresco he is repairing. It glitters with gold and color as if painted yesterday.

The dam itself crouches like some gravid creature in the Piva gorge, her swollen concrete belly 720 feet high. Some two thousand men worked 24 hours a day for eight years to build it.

"We have always been the poorest state of Yugoslavia," says an engineer at the huge construction camp. "But now our mountains work for us. We have not lost a beautiful river—we have gained a beautiful lake, and electricity for industry as well!"

DURMITOR, the republic's loftiest peak, lies only 14 miles from Mratinje, but no bridge yet spans the Piva gorge. We must drive 90 miles around it to reach Žabljak, the small resort town at the foot of the mountain.

We are without a translator, for Zoran has examinations. Armed with a dictionary, we lurch along a back road that seems to lead only from rocks to more rocks and come upon a black-clad old woman stumping purposefully along. She is delighted to accept a ride, and I ask her destination.

"Dobri Do," she says—and I am baffled, for the dictionary tells me only that she travels to a "good valley."

A few miles farther, she grasps my arm and points. "Dobri Do! Dobri Do!" she says again. Far below, a cluster of thatched huts and sheep pens nestles like a tiny kingdom on green meadows amid towering peaks (pages 664-5). It is one of the sheep camps where villagers bring their flocks in summer to graze on lush new grass.

She alights, and we ask if we can follow. She leads us down the springy turf. Linda stops to make a photograph, and suddenly our guide disappears. We walk alone to the huts. There is no sound or movement, but the air seems alive with eyes.

Montenegro: Yugoslavia's "Black Mountain" 677

Life is a glass prison seems to be the message (**above**) of painter Vojislav Stanić in Hercegnovi. Nada Stanić captures feline grace in stone (**below**). Mijo Mijuškovič (**right**) of Nikšić refines the natural forms in odd pieces of wood. Such varied vision continues an artistic tradition that began with frescoes in 13th-century monasteries.

At last a door creaks open on leather hinges, and a young woman looks out cautiously. "*Dobar dan,*" I say. "Good day." The young woman invites us in. The dirt-floored hut is immaculate. A child sleeps on a huge bed in one corner; bread bakes in an iron pot on the hearth; shelves on the back wall support cloth-covered basins filled with sheep milk.

"*Kajmak!*" she says proudly, and shows us how this traditional cheeselike spread is made by skimming curdled milk from the bowls each day. She serves us spoonfuls of it, incredibly rich, with chunks of hot bread.

The dictionary gives us words for "delicious" and "thank you." She signs my notebook in Cyrillic script. I present my business card. As we leave, flocks of sheep flow down toward the milking pens, their bells clanking softly. We feel little need for words. It seems there are more rewarding things sometimes than conversation.

CONVERSATION is impossible as the open-topped rail diesel car clatters into the 3¼-mile Trebešica tunnel. In seconds the temperature drops from a sunlit 80°F to the perpetual 45°F inside the mountain, and we burrow into sheepskin coats as the tunnel fog envelops us. In the headlight's glow I see exultation on the face of engineer Budimir Kalezić.

Budimir has reason to rejoice. At 31, he has spent a third of his life supervising construction of 29 miles of tunnels and 92 bridges on the 73 miles of track that form the spectacular Montenegro section of the Belgrade-Bar Railroad.

For Budimir the Trebešica tunnel is a masterwork, three years in building. Inside, a bridge spans an underground cataract. We speed toward a mysterious yellow eye that is the fog-filled tunnel mouth, and then we seem to rocket into space; to the right of us we look almost 2,000 feet straight down at the sparkling thread of the Tara River.

The new railway and its modern harbor-terminus at Bar may well change transportation patterns in central Europe. Partially financed by 50 million dollars in World Bank loans, the railway can now save a thousand miles for traffic that once could only travel down the Danube to the Black Sea for ocean transshipment.

Meanwhile, another development program, officially known as the Southern Adriatic Plan, has already revolutionized the once placid Montenegrin seacoast.

Using United Nations planning resources, the government has erected a string of resort hotels along a major new highway from Tivat to Ulcinj. In 1975 about a million tourists—Germans being the most numerous foreigners—left huge sums of money in this new Riviera. The plan calls for accommodations for 220,000 persons daily by 1990.

FOR LINDA AND ME, the coast is a cultural shock. Driving south from Titograd, we have found the raw dirt road that is carved along the lonely hills of Lake Scutari's southern shore. We have watched smoke-blue waters turn purple with the reflected violence of storms in the North Albanian Alps. We have lunched on country cheese and olives in an ancient chestnut grove near Ostros, and seen the costumes of village women change from the dark workaday stuff of Montenegro to the colorfully embroidered blouses and pantaloons of the Moslem fashion.

And then, turning south along the Albanian border, we have come to the Adriatic port of Ulcinj, where platoons of tourists bargain for garish souvenirs in the crooked streets.

At Stari Bar (Old Bar) we climb the rubble of a Turkish citadel destroyed in 1878 by Montenegrin troops who won this coastline in a Serbo-Turkish war. And then we plunge into the modern battleground of traffic along the broad new highway toward Budva and our first taste of mass-tourist living.

Here people arrive in busloads, and the lone traveler is apt to be treated more as a problem than a guest. In contrast, there are true luxury resorts such as Miločer, once the summer palace of Yugoslavia's King Alexander, and Sveti Stefan, an island village whose 200 houses have been remodeled into comfortable apartments. Here the facilities, the service, and the cuisine compare with Europe's finest—as do the prices.

The Gulf of Kotor has more to offer. The ancient towns of Kotor, Perast, and Risan bear the mark of the merchant princes of the Venetian empire, who ruled here between the 15th and 18th centuries.

But not until we reach Hercegnovi do we find what we are seeking on the coast—and once again an artist is our guide.

Caught in the revolving door of history, Kotor was settled by Illyrians, conquered by Romans, ravaged by Saracens, and governed by a succession of rulers until it became part of today's Yugoslavia in 1918. The Venetians remained the longest, from 1420 to

1797, leaving their imprint on the old walled city at lower left. Rimmed by mountains, the city at the head of the Gulf of Kotor never succumbed to Turkish swords; yet it now surrenders its vistas to hordes of new invaders—tourists.

His face is like a ball of modeling clay on which he shaped a thousand expressions before resigning himself to wrinkled, rueful merriment. His name is Vojislav Stanić, and we had resolved to meet him after seeing some of his paintings on exhibit in the palace at Cetinje. They were full of zestful observations of Montenegrin life, made with a primitive's eye for detail and a cynic's eye for truth (page 678).

He welcomes us to his small atelier overlooking the harbor of Hercegnovi. He frowns to hear that we have been less than enchanted with the coast.

"But you haven't *seen* the real coast," he says. "It must be done in the proper way, with the proper friends."

And so, with his sculptor-wife, Nada, we board his tiny boat and sail across the sunset to a small village called Rose on the Lustica peninsula. The small, immaculate houses are golden with last light as we tie up at a small outdoor restaurant. We dine on locally made ham and cheese and wine.

And then we dine again—this time at the jovial insistence of a group of men who come to prepare a ceremonial dinner of a fish caught only in autumn. With it they serve tiny clams called *prstaci* in a broth of cognac, wine, garlic, parsley, and mint.

"*Živeli*—long life!" they say. When we leave, I hear their voices for a long time, singing old songs across the water.

IT WAS FROM KOTOR, in 1851, that the dying poet-ruler, Petar II Njegoš, was carried up the tortuous road to Cetinje, his stronghold of the Black Mountain.

He had asked for burial in a simple chapel on the summit of Mount Lovćen, where he had spent so many hours alone gazing over the stark distances of his land.

"God help the man who loves you," he had written once of his land and people—and might feel the same today if he could see the gigantic official shrine that now encrusts his once lonely mountaintop.

Njegoš's most famous poem, "The Mountain Wreath," commemorates the tragic Christmastime of 1702, when his forebear, Bishop-Prince Danilo I, commanded the execution of all Montenegrins who had been converted to Islam by the Turks.

"Baptized be they in water—or in blood," he ordered. The limits of that bloody tide can be seen today on the edges of Montenegro, in Moslem villages like Gusinje and Ostros, where mosques survive.

Just inside that borderline, on a hill overlooking Lake Scutari, lies Godinje, the ancestral village of the Leković clan. Television antennas sprout from ancient roofs. Some homes are as they were two centuries ago, and others modernized by villagers who work in Titograd but return for weekends.

"You must come for the grape harvest and the wine making," Zoran Leković had told us. We arrive on a warm September day to share the fragrant task of picking dark, sweet grapes. Each family has its own plot of land along the lakeshore, and we stop for welcomes and introductions.

"I tell you only first names," says Zoran. "In Godinje, everyone is Leković."

Zoran's father, Vladimir (right), tramples the grapes in an ancient wooden vat. As he works, he tells us that he hurled the grenade that signaled the start of the Communist Partisan rising at Virpazar on July 13, 1941.

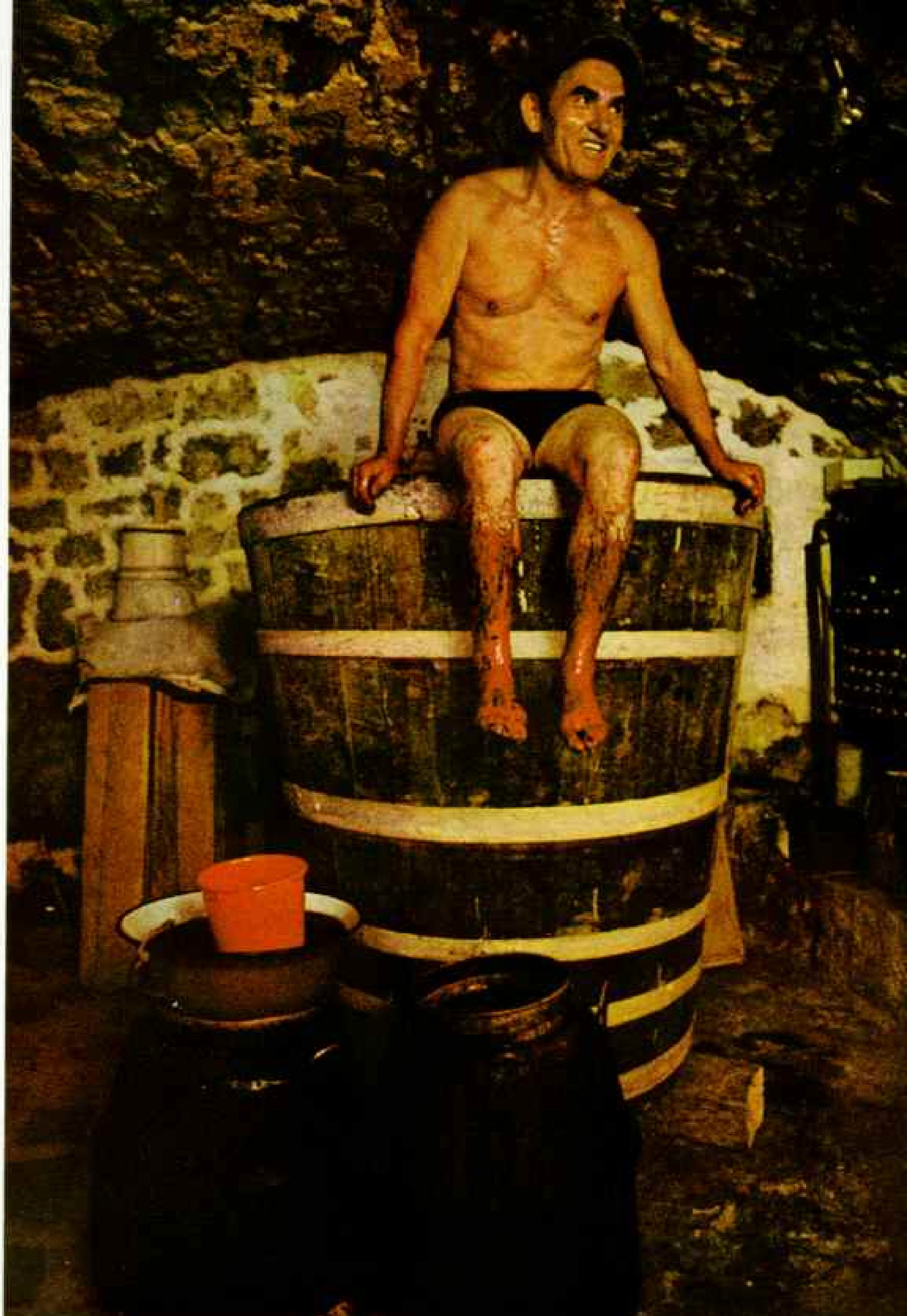
He was wounded then, and wounded again on the last day of the war as he drove an American-made tank into Trieste. He became a major but retired abruptly from the army in 1958.

Why? He smiles. There was a disagreement, a change of national policy. In Yugoslavia it can still be unrewarding to believe in things too long, too strongly—or too soon.

It is a week before the wine is made. At first tasting, it is still sprightly with fermentation, but dark and strong and deep.

"*Crno vino*—black wine," says Zoran. "Like the Black Mountain, may it live long and age well." □

"**Eat the grapes of summer,** taste the wine in winter—only then will you know my home," says Vladimir Leković of Godinje, who pauses from treading grapes for winter's wine. Descendant of soldiers, he helped launch the uprising against Italian troops during World War II. Now his son's generation grapples with the demands of peace, a commodity seldom known in a land where the greatest honor was "not to die in one's bed."



TREASURE CHEST
OR
PANDORA'S BOX?

Brazil's Wild Frontier

ARTICLE AND PHOTOGRAPHS BY
LOREN McINTYRE

"MY FIRST WEEK'S take weighed seven kilos. Nuggets and gold dust," Araujo said. "That was 13 years ago, when I struck it rich."

About $8,000 even then, I figured, wondering what the aging prospector had done with it, since he was still in muck up to his knees. Araujo waved his hand in a circle to suggest hundreds of square miles of tropical forest here in the heart of Brazil. "There's more. All this Tapajós jungle has gold.

"Here, pan some for yourself." Araujo handed me a big iron dish shaped like a coolie hat. I scooped away a foot of humus, then dug a panful of yellow clay and fine white crystalline gravel. I added water and swirled it for a long time, imitating him.

Sure enough, pay dirt! Golden grains sparkling in the rain, worth a few dollars.

Under the forest's high, leaky roof of leaves, we had slogged in a downpour for hours until we reached this mudhole, appropriately called Araujo Gulch. I could never have found it unaided. It was only one of countless claims concealed in the *(Continued on page 688)*

Deep in the Amazon Basin, a dream

of limitless wealth lights the eyes of gold seeker Araujo and a young friend.

Bright reward for hardships—isolation, insects, often dysentery and malaria—a fan of gold shines from a pan (**below**). Here on a feeder stream of the Tapajós, a major Amazon tributary, impounded water turns milky as prospectors, called *garimpeiros*, work in it waist-deep, soaked from above by rain and humidity. Adventurers have long penetrated Brazil's interior in quest of gold and diamonds. Now, under the policy of "national integration," permanent settlers—farmers, ranchers, lumbermen, miners—are helping tame this vast American frontier.

Far from the gaudy masquerades of Rio, a bare-bones Carnival is celebrated at a gold camp called Cantagalo, or Cockcrow, with

dollar-a-bottle warm beer and dancing to a battery-operated phonograph. Some garimpeiros get rich. Some get dead. Some get a stake for a new life, and some vanish downriver, leaving their hopes stranded ashore.

hills east of Jacareacanga—Lair of the Crocodile—a town on the Tapajós, an Amazon tributary. "Nowadays, the Tapajós region yields half a ton of gold a month," Araujo said.

Of course, I wasn't truly prospecting for gold. I was following the tracks of early 20th-century author-explorers, learning what changes Brazil's headlong growth had brought to its wild frontiers since their time—and since 1972, when I last traveled the Amazon.*

In the fading light, Araujo poured his day's take into a glass vial, zipped it into a money belt, then led me up and down hill through sopping jungle. He paused at a *garimpo*—a claim—to call *"Alô!"* In a lean-to hung a blanketed lump in a hammock: a *garimpeiro*, a prospector, too weakened by malarial chills and fever to light a candle or fetch water.

"More than 300 live in the woods nearby," Araujo said, as he heated a bowl of soup for the garimpeiro and lent him a measure of gold dust. "Some have no partners—or their women abandoned them when they took sick. I help them, they help me. About 3,000 garimpeiros are buried in jungle graveyards hereabouts. Some took sick with fever but most died of bullets. Lead and gold, the heavy metals attract each other."

We climbed over fallen and charred tree trunks and came to a hillside airstrip with unlit shacks alongside: Cantagalo, or Cockcrow, Camp. The power generator had failed, and gusts kept blowing out candles. We ate beans and rice by lightning flashes, shouting into one another's ears while rain sledgehammered on aluminum roofing.

Araujo told me how he spent his take. He bought cars and small planes, which he didn't use but would sell when he needed cash.

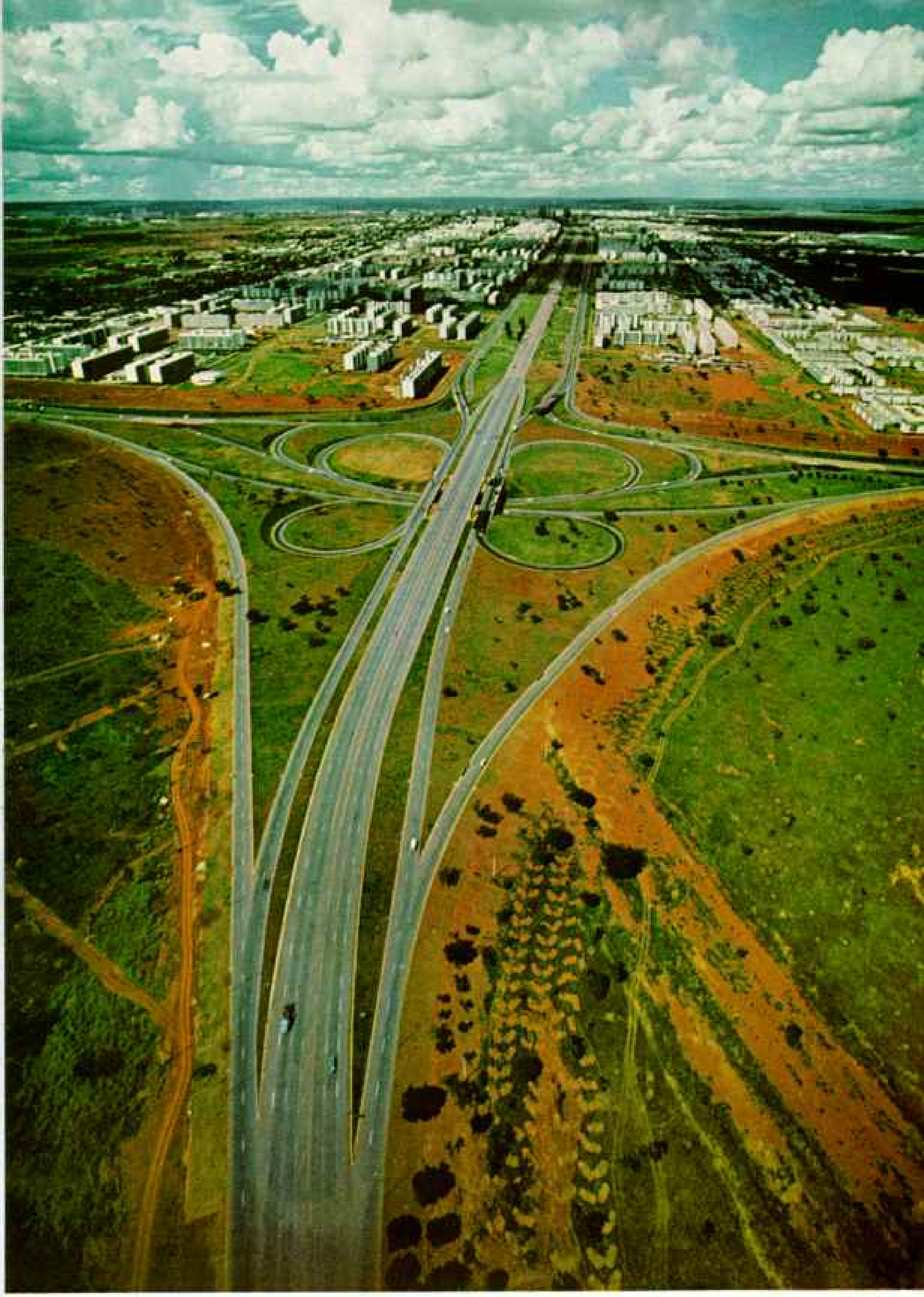
I spent Carnival at Cockcrow. No Rio de Janeiro street pageantry there, no fun-loving Brazilian extroverts, no gaiety. Just a frantic

*See "Amazon—The River Sea," NATIONAL GEOGRAPHIC, October 1972.

Bulldozer-eating rocks take their toll before being muscled off a roadway aimed from Mato Grosso State into the Amazon Basin. Plunging north and south, east and west, new roads open Brazil for settlement and tie its hinterlands together. Despite dangers, road crews enjoy high morale and a sense of national mission.

Brazil's riches unveiled

HALF of South America—much of it dense, wild country cut by rivers—Brazil until recently held remote land seldom traversed, much less mapped. Enter RADAM (from RADar AMazon)—aircraft-mounted, side-scanning radar that can operate day and night in any weather to map soil and vegetation as well as topography. At the risk of injury or death, helicopter-dropped ground teams supplemented airborne findings. By 1972, the Amazon, and by 1975, all Brazil had been mapped and assessed for development.



dawn-to-dark ballet of digging, panning, sluicing, and sweating by all men not confined to hammock by disease.

About 30 garimpeiros showed up on Saturday night to share dollar-a-bottle Coke and warm beer by candlelight with forlorn-faced women who lived in the camp. The bouncer wore a Smith & Wesson .38.

On Sunday, the garimpeiros and the women brought little bottles of pay dirt to the camp accountant. He stirred mercury into a pan of dust to soak the gold from the dross. Then he boiled off the mercury with a blowtorch, heedless of the deadly vapor. He peeled bills from a huge bale of bank notes and paid the women about $4 a gram ($124 an ounce). For the miners he made entries in a notebook; most owed the camp for supplies.

Despite the heat, some women pulled on wool sleeves and stockings to fend off clouds of stinging gnats. It seemed a miserable life.

"Not so," the accountant said. "The girls are our friends, our table companions, our equals in this small, imperfect democracy."

Noon was hellishly hot. Several women ran down to a brook and jumped in, clothes and all, to cool off. One blonde deliberately slashed her hands with broken bottle glass and despondently watched as crimson droplets splashed into crystal water. I thought she needed sympathy, but when I offered mine, she said, "Buzz off."

Another woman, black, tried to sell me her record player. "I need money to go home."

I gave her the knotted bandanna that held my souvenir pinch of gold dust—that dumb yellow metal that Araujo calls "bait on the hook of hell," which for centuries has lured men westward into Brazil.

Next day the black woman left the way she'd come, a long walk through the jungle, then three days' paddling down the Rio Pacu and up the Tapajós to Jacareacanga.

Search for Hidden Riches Never Ends

I forsook Cockcrow Camp aboard a Cessna 206 flown by an elderly Brazilian aviator. He had swooped down on that isolated hillside with an overload of beef, beer, and bank notes. His leather jacket, helmet with earflaps, and parachute-nylon scarf gave him the air of one fond of flying upside down.

He swung the prop by hand, buckled in, and burst into operatic song. We sped downhill, zoomed over the forest, and climbed into cool air above the hidden goldfields.

Tales of Inca gold inveigled Aleixo Garcia, a shipwrecked European, far into Brazil in the 1520's. By the 1920's, visionaries like British Army Col. Percy H. Fawcett were still searching for lost civilizations in Brazil. Fawcett set out in 1925 to discover the secret city of "Z," crumbling capital of some Atlantis race he'd read about in a yellowed document. The jungle swallowed him up.

I remarked to the pilot, "Fawcett expected

No one will come, scoffed critics of Brasilia, the city begun in 1956 and dedicated in 1960 as the national capital. Built in modern international style and planned around broad roadways (**left**), the city on the plains of the interior, center of a Federal District that already holds 800,000, now faces the opposite problem—keeping its population within planned limits.

In the presidential palace, chief of state Gen. Ernesto Geisel (**far right**) receives the Mexican Ambassador.

to discover something comparable to Peru's lost Inca citadel of Machu Picchu."

The pilot replied, "But now we know that no secret city of stone such as 'Z' exists in Brazil—unless it's underground."

I looked at the unbroken carpet of jungle below. "How can you be sure?"

"Because RADAM, a government agency, has examined every inch of Brazil with side-scanning radar planes. A stone city would show up on RADAM's newly published charts."

In 1971 I'd chanced upon guarded airstrips from which planes made secret flights over the jungle, sometimes by night. Now that the secrets were being revealed, I resolved to find out about them in Brasília, Brazil's new capital in the central highlands—a region Fawcett not so long ago expected to find "infested with savages." The explorer's eyes would have popped to behold the glistening city that has since arisen on the plain (page 690).

Mapping Half a Continent

Many government officials in Brasília are drawing up plans "to occupy and control the fantastic empty spaces of the Amazon universe." I consulted one of them, Dr. Manoel da Redenção e Silva, of RADAM.

"By 1975 we completed radar mapping of all Brazil," said Dr. Silva. "Our precise topographic maps then guided ground studies by geologists, soils engineers, foresters, and botanists. In thousands of helicopter drops in remote areas, many men died in crashes, fell victim to disease and Indian arrows, or just disappeared into the wilds. We found an unmapped river 400 miles long, and rich mineral deposits. Now we computerize the data for everyone's use."

How exact was RADAM's Survey of Natural Resources? Did RADAM know, for instance, about Cockcrow Camp, a pinprick in the middle of a country bigger than the 48 contiguous United States?

I opened Volume 7 of Projeto RADAM, 400 pages on the Tapajós area, with a jacket of large maps: Geology, Soils, Agricultural Capacity, Potential Use of the Land. Each map showed an airdrome symbol at the Cantagalo coordinates. RADAM knew.

Under "Vegetation" I found some 500 kinds of trees listed as to suitability for plywood, furniture, paper pulp, and export. Pulpwood trees alone were estimated to be worth 85 billion dollars—if they could get to market. As for "Potential Use of the Land," the study proposed leaving much of the region untouched to preserve the ecosystem.

This recommendation highlights a central controversy. Is Brazil's hinterland a treasure chest or a Pandora's box? In Greek myth each of the gods concealed in a box some power to bring about the ruin of man. When in curiosity Pandora lifted the lid, out flew plagues and sorrows to afflict the world.

Critics allege that Brazil's headlong drive to the west is mindlessly destroying the greatest forest primeval on earth, with worldwide repercussions. Some doomsday predictions: Erosion will clog and flood the rivers; the earth's oxygen will be depleted and its climate altered as lush greenery gives way to red desert; whole tribes of Indians and countless species of plants and animals will die out.

Perhaps Brasília itself—the symbol of a national urge to conquer the unknown backlands—lends credence to critics who protest the slam-bam style of Brazilian expansion. In 1955 no one lived there but a rancher named Gama—although in 1822 a legislator had proposed that "In the center of Brazil, between the headwaters of the confluent rivers Paraguai and Amazonas, the capital of this kingdom will be founded, to be called Brasília. . . ." Yet 133 years later Gama had to travel 800 miles of muddy ruts to reach coastal cities.

Then, in 1956, bulldozers began to rip open the green fields, exposing raw, red earth. In four years some 30,000 workmen erected an architectural fantasy, resembling a gigantic bird or plane, with a ten-mile wingspread, alighting at the edge of an artificial lake. When inaugurated in 1960, Brasília suggested an elegant world's fair situated so far inland that no one would ever attend. Now some 800,000 people live in the Federal District.

"Restraining rampant growth is our hardest task," states the head of the architecture and urban planning board. "We're trying to hold Brasília itself to a quarter of a million inhabitants by limiting construction and requiring high standards."

Such rulings, in effect, preclude families earning less than $10,000 a year and keep Brasília immaculate for government and tourists. Most wage earners must live in seven satellite areas out in the district. They bus home at dusk.

Luiz Dutra, 23, a well-traveled employee of the Federal District who grew up in Brasilia, answers critics who bemoan the transfer of Brazil's capital from warm and gregarious Rio de Janeiro to a cool and pristine plain. "My town is super for clear thinking and productive work. I care more about where we're going than where we've been. Like all Brazilians, my sights are set on the year 2000. That's when we'll become a major power—without recourse to arms. By then our conquest of the west will be complete."

Wilderness Yields—Slowly

Since building Brasília, the nation has dedicated enormous energy to occupying the west—a process that got off to a slow start. Tidings of frontier discoveries began with two Spanish probes in 1541-42. Francisco de Orellana descended the Amazon from the Andes to the Atlantic. Álvar Núñez Cabeza de Vaca descended a tributary of the Paraná River and discovered the great cataract of Iguaçu.

Colonists and cattle eventually settled the southern half of Mato Grosso, a state twice the size of Texas. Today Paraná River dams provide power for much of Brazil's industry. A new six-billion-dollar hydroelectric project, twice the size of any other on earth, will eventually drown Sete Quedas Falls at the southern tip of Mato Grosso.

Yet the northern half of Mato Grosso, with only one human to every three square miles, still belongs to a primeval ecosystem. No species of plant or animal is dominant there, and even the elusive forest Indian sleeps fitfully for fear of his tribal neighbor. Thus, Mato Grosso is a showcase of living examples of almost every stage of Brazil's interior growth—or decay, as some say.

My Mato Grosso travel, from south to north, paralleled Theodore Roosevelt's "zoogeographic" expedition of 1913-14, though I flew much of the way. T. R. steamed up the Paraná-Paraguay River, rode muleback across the Mato Grosso plateau, and canoed down the unexplored River of Doubt, losing his health en route.

From the air, the most spectacular sight in southwestern Mato Grosso is the Pantanal, a swamp half the size of Minnesota (following pages). Swirling skyward, great flocks of five-foot-tall jabiru storks, which Brazilians call *tuyúyú*, endanger low-flying aircraft. Teddy Roosevelt, the first famous man to plead for conservation of Brazil's fauna, was bemused not only by the tuyúyú but also by the "Jesus Christ birds," the long-toed jacanas that appear to walk on water as they skitter across subsurface lily pads.

In the rainy season six million cattle share high ground and newly built auto causeways with jaguars, monkeys, deer, and caimans. Large *pacu*—a splendid food fish—invade inundated pastures. "Eat only fillet of pacu if you plan to move on," I was advised. Tradition dictates that "a stranger who eats a pacu head must marry a Mato Grosso girl."

A thunderstorm roughed up my plane and forced a pasture landing near Corumbá. A cold wave brought respite from Corumbá's withering heat—reputedly Brazil's worst.

When I visited Corumbá in 1964, it was a thriving river port. Now dilapidated shipping houses are padlocked. Paraguay River traffic has dwindled since new highways have opened up. Riverboating is cheaper, but trucking is quicker. For ranchers, planes are quicker still. Corumbá's airport teems with air taxis. A chart in the control tower lists 174 private airstrips within a 200-mile radius.

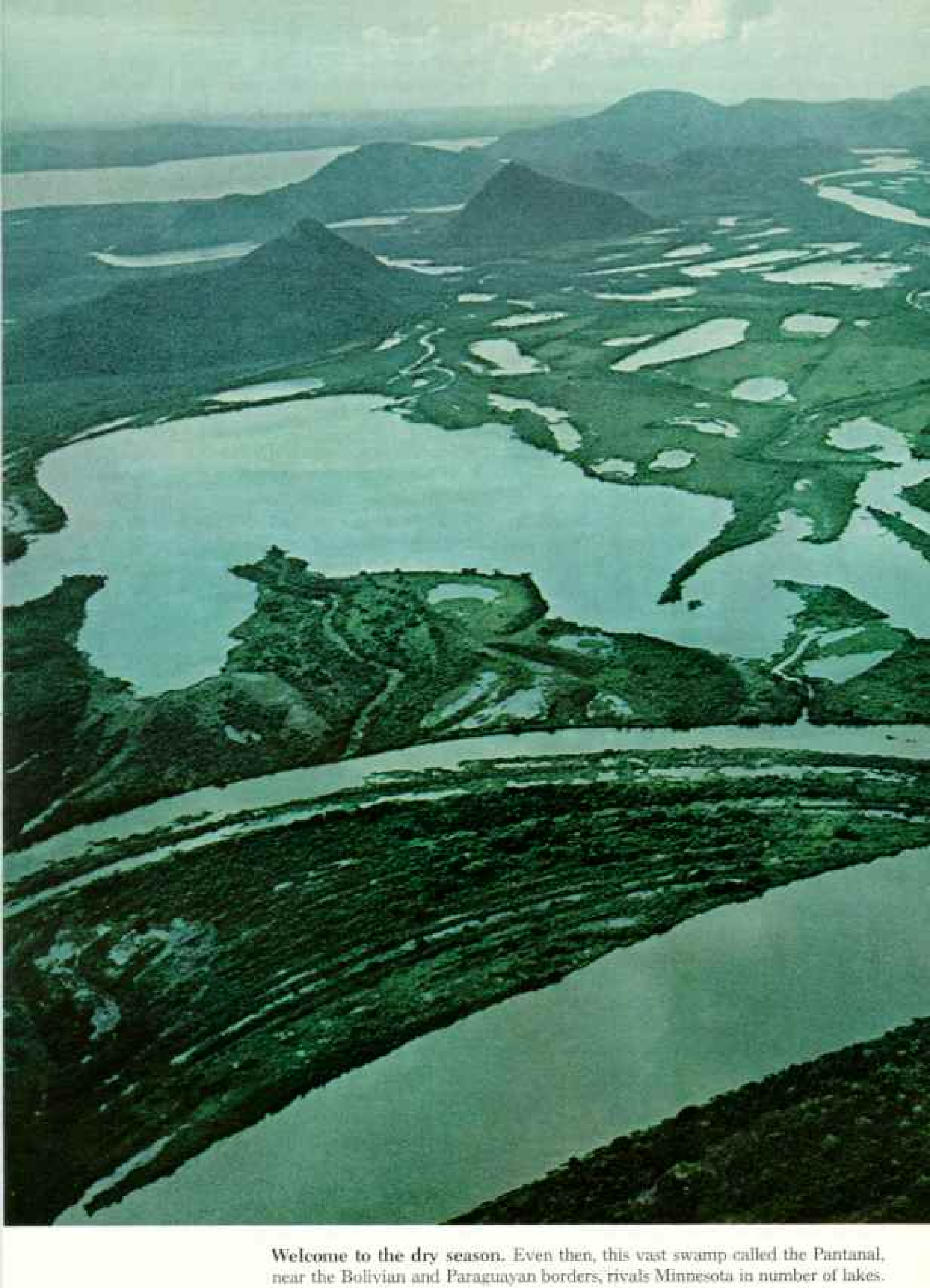
Hero Linked West With Wires

I flew to a paved strip at São João, a 128,000-acre cattle ranch where T. R. was received in 1913 by a band playing the U. S. national anthem. He and his hosts, Senhor João da Costa Marques and his son, went jaguar hunting with spears.

I was met there by a graying grandson of Dom João. When he learned I wanted to take pictures, he explained, uneasily, that São João—like many of the old family estates—had been sold to wealthy real estate developers in São Paulo, Brazil's industrial center.

"The company prohibits picture taking because the press criticizes absentee ownership of Mato Grosso farms by Paulistas."

He escorted me to a once elegant wooden mansion, where T. R. had replenished his girth at elaborate meals with his expedition companion, Col. Cândido Mariano da Silva Rondon. Mato Grosso-born Rondon had been stringing the telegraph—"Mariano's tongue," the Indians called it—to bind the west to the nation. Rondon later became Marshal of the Army, and the territory northwest of Mato Grosso was *(Continued on page 700)*



Welcome to the dry season. Even then, this vast swamp called the Pantanal, near the Bolivian and Paraguayan borders, rivals Minnesota in number of lakes. Despite its forbidding climate, among the hottest and wettest in South America,

the Pantanal supports some six million zebu cattle, native to India, as well as rice and such fodder crops as corn. Already the world's third largest beef cattle producer, Brazil sees gain in turning more virgin country into grazing land.

Warfare has been the way of many Brazilian Indians for millennia. But with the advance of civilization they face more devastating threats—disease, disruption of culture, and removal from ancestral territory.

Along the Juruena River, a chief of the Erigpactsá people, resplendent in nose plumes and wooden earlobe disks (**left**), pauses from hunting fish with bow and arrow. His tribe has been in amicable contact with outsiders longer than the fierce Cintas Largas, or "Wide Belts." One of their chiefs (**below**) holds the helmet of a diver reportedly killed while searching a riverbed for diamonds.

Even with all the goodwill possible, Brazil's dual policy of developing the interior while protecting the Indians may prove incapable of accomplishment.

A mustering of storks seems to wade in formation, part of the "wealth of

strange bird life" that Theodore Roosevelt observed on his travels near Corumbá.

(Continued from page 693) named Rondônia.

My host served me broiled pacu fillet and jugs of icy orange juice, then filled the plane's tanks with two-dollar-a-gallon gasoline before sending me back into the sky.

Up in the center of Mato Grosso, three Boeing 737's poured jet exhaust onto the already sizzling airport at Cuiabá, the region's fastest growing city. Though founded 258 years ago by prospectors—nuggets are sometimes dug up during street excavations—Cuiabá is still a gateway to the unknown.

Struggle to Save Still-wild Peoples

It was from Cuiabá that Percy Fawcett set out toward the north 52 years ago to seek his secret city of "Z." An acquaintance of mine, Britisher George M. Dyott, found evidence in 1927 that Fawcett had been slain by Xingu tribesmen. But the rumors of a "White God of the Xingu" persisted. In 1950 Orlando Villas Boas found a skeleton thought to be Fawcett's, but later proved not to be.

Orlando and his two brothers, white champions of the Indians, set up Xingu National Park to save isolated tribes and their pre-Columbian culture from disastrous exposure to outsiders, and from butchering each other —a leading cause of tribal extinction often overlooked by idealists.*

The Villas Boas brothers, wearied by malaria and the encroachment of roads and ranches upon the park, eventually retired (one died in 1961). The park and more than 100 other reservations are now run by FUNAI, Brazil's National Indian Foundation.

In Cuiabá I encountered both Orlando and FUNAI's president, Gen. Ismarth de Araujo Oliveira, while they were trying to stop a war between squatters and Indians in the northwest Mato Grosso and Rondônia.

"My friend General Ismarth has a mission impossible," said Orlando. "He is supposed to defend constitutional rights of forest-dwelling aborigines: the permanent possession of their land and its resources. But FUNAI is an agency of the Ministry of the Interior, and the minister is pledged to spur development —or 'national integration,' to use the government's term. Now, hasty integration of the Indian into national life brings degradation, even annihilation.

"I see General Ismarth, figuratively, at the head of some 100,000 bewildered bowmen, blocking the march to the west of 100,000,000 Brazilians. Odds of a thousand to one."

The odds are worsening, Orlando argues. By the end of this century Brazilians will number 200,000,000, while most Indian populations are dwindling. But perhaps the odds, while formidable, aren't that bad.

A minister of the interior once pointed out to me that "Brazilian law favors Indians to a degree enjoyed by no ethnic group elsewhere in the Americas. About 100,000 Indians—illiterate, unable to vote—have been allocated 100,000 square miles of land. To grant every Brazilian a like share would require twice the land surface of the earth."

Of course the main reason large tracts are still left to the Indians, nearly five centuries after Columbus, is that nobody coveted those feverish, bug-ridden lands—until recently. And enforcement of the law is feeble, as I found on a journey into the wild reaches of northwestern Mato Grosso.

Automobiles Help Open a Frontier

I prepared for my trip by studying plans for colonization of the Aripuanã-Roosevelt and Juiná River areas. The Roosevelt is the former River of Doubt. T. R. and Rondon mapped it on a 58-day descent to the Aripuanã by dugout canoe.

Automobiles—way out here in 1914!—helped transport T. R.'s equipment and naturalists part of the distance to the headwaters. Today a highway, built in the 1970's, connects Cuiabá to Cruzeiro do Sul, 1,700 miles westward near the Peruvian border. Paved from Rio to Cuiabá, this southern route—part of the Pan American Highway system—thus totals some 3,000 miles, but falls short of being truly transcontinental because Peru has not yet forged an 80-mile link to its Trans-Andean Highway.

This alternate Pan American route is tied by a network of roads to the famous Trans-Amazon Highway much farther north. The Trans-Amazon starts at the Atlantic bulge of Brazil and zigzags across the nation south of the Amazon. A third, even more ambitious trans-Brazil highway has begun to circuit the northern perimeter of Brazil along the unpopulated frontiers of French Guiana,

*Orlando and Claudio Villas Boas told of their efforts in "Saving Brazil's Stone Age Tribes From Extinction," NATIONAL GEOGRAPHIC, September 1968.

Surinam, Guyana, Venezuela, Colombia, and Peru. The route will traverse some of the emptiest and wettest land on earth, touching only four towns in 2,500 miles (map, page 689).

I traveled the southern road from Cuiabá to Vilhena—turning north there, as Roosevelt did—and followed a new road into lands of Indians called Cintas Largas, "Wide Belts." Men wear foot-wide bark belts, their only clothing, wrapped around their waists.

Some of the first Indians of this area to clasp hands with *civilizados* were photographed in 1969 by my good friend, Brazilian explorer W. Jesco von Puttkamer.* About a thousand Wide Belts still roam the forest, unaware of boundaries drawn on maps to indicate where they are supposed to live.

Equally ignorant of the boundaries, squatters plunged ahead of road crews and hacked out homesteads in the promised land without waiting for titles from the colonization agency.

"The Wide Belts fixed that," remarked my driver, a highway engineer. "As in a *filme faroeste*, a Western movie, they lobbed six-foot arrows into clearings. Then they began to make haunting sounds in the night around the clearings. 'Woo-ahh. Woo-ahh. Woo-ahh.' The settlers packed up and left."

Later we came upon an old man burning off jungle. Corn sprouted in ashes. His house was a plastic tablecloth atop four poles.

"You said all the colonists were frightened away," I reminded my informant.

"Oh, that's Claudionor, from Bahia State. Out of hundreds, the only one who stayed."

Impressed by such courage, I asked Claudionor, "How come you stayed on?"

"Eh?" He pitched a branch into the fire.

"I say, you're not afraid of Wide Belts? Of the bad 'woo-ahh woo-ahh' in the night?"

Claudionor cupped a hand to an ear. "Eh?"

Trolley Lines Powered by Waterfalls?

From the road "front," where bulldozers were still felling trees, I flew north to Aripuanã. Small supply boats reach the site by boating 20 days upstream from the Amazon, portaging 27 rapids. The route parallels Roosevelt's 650-mile trip downstream.

Brazil's wealth of waterpower led T. R. to predict that someday industrial centers in these far places would be linked by trolleys. That day may be nearing, as the cost of oil slows road building in favor of new railroads powered by hydroelectric plants.

Above Aripuanã's highest waterfall, 430 feet, stands Humboldt Scientific City, a research station dedicated to "Man and the Biosphere." Young scientists work there on an astonishing range of colonization concerns: from allergies and race relations to urban architecture and "avoiding predatory exploitation of subsoil, fauna, and flora." I like their ban against cutting virgin forest within 650 feet of riverbanks to check erosion and soil runoff; future voyagers might still enjoy primeval scenery.

"Unfortunately, we can't enforce such regulations," said Carlos Bueno, 23, director of Humboldt. "We have no police power out here. The frontier's an anarchy. Squatters often threaten to shoot us."

Diseases Ravage Jungle Tribes

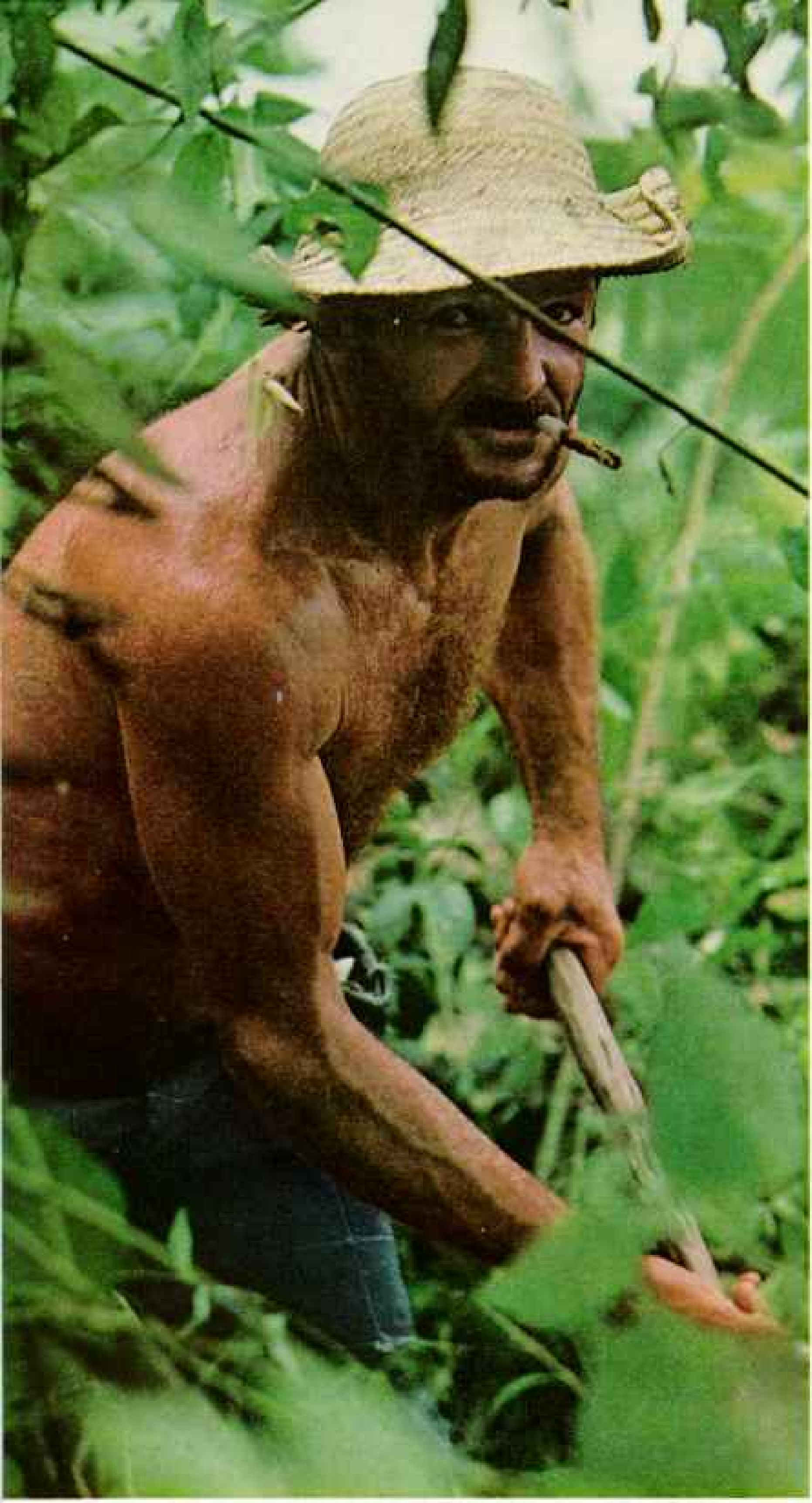
Humboldt's most dangerous enemies include microbes borne by mice, monkeys, and mosquitoes. Mice transmit leishmania parasites that eat away the nose and palate. Monkeys carry yellow fever. Anopheles mosquitoes spread malaria. Sand flies make fieldwork an ordeal by itch. Although Indians, too, are tormented by bugs, maybe more so in their nakedness, their most deadly illnesses are caught from civilizados: measles, the common cold, and tuberculosis.

I flew upriver to the isolated FUNAI post of Serra Morena to see how well one group of Wide Belts, who call themselves Kabano Pomons, was responding to pacification.

Not so well. Elders were coughing and spitting. "Many have suffered colds for two years," said Francisco de Assis, the FUNAI man in charge. Two women stayed in hammocks all the torrid day and cool night. They were dying of pneumonia, Assis said.

Children wreathed with butterflies splashed in the Aripuanã with a strange plaything: a deep-sea diving helmet (page 697). Assis explained: "The Wide Belts tell that years ago a white man floated downriver on a raft, pumping his arms up and down. They shot him. The raft stopped, held to the bottom by a black vine. Days later they pulled up the vine. It was a hose attached to this helmet. Inside was the fish-eaten head of another white man. It was a diamond prospector who had been

*Mr. Von Puttkamer's article and photographs appeared in the September 1971 NATIONAL GEOGRAPHIC.



Slashing through second growth, sprung up in the eight years since he first began to clear his land, Adão Morais da Rosa (**left**) labors with sweat and pride on his 250 acres along the Trans-Amazon Highway. Belts on both sides of the road are

reserved for homesteaders. Here, in rolling country between two watersheds, crops thrive. Farther into the jungle, in advance of roads or sanction, a small foothold (**right**) may prosper. Or it may fall to attack by its aboriginal occupants, the Indians.

Home sweet lean-to, a harvester roofed with fronds is center stage for children at Ariquemes (**above**). Their families came 1,500 miles overland from Paraná State after severe frosts had twice ruined the coffee crop. In rapid order, they carved space in the jungle for a town, constructed houses (**below**), and cleared ground in the nearby forest for planting corn, rice, and tropical fruits.

walking on the river bottom. He drowned when his companion stopped pumping air."

One evening a strange cry from the far bank brought everyone running to the river, Chief Nepotui and Assis flying in the lead. From long shadows at the edge of the forest emerged a band of Indians in wide red belts and feather headdresses. They laid down bows and arrows and beckoned for a canoe.

Assis was jubilant. He exclaimed, "At last! Thank God! At last!" He had been sending presents into the jungle for months, hoping to "attract" Kabano Iára tribesmen who lived six trail days away. The Villas Boas brothers often labored years to achieve such a contact.

Assis ferried 15 Kabano Iára warriors across the river, three at a time, then two women with babies on their backs, a sign of peace. Each man was naked except for his wide belt. The warriors strode up the bank with heads erect, eyes darting from side to side but never locking with ours for fear of a hex.

The Kabano Pohons pressed close; my tape recorder picked up their incessant coughing. I saw this was not the first Kabano Iára contact with civilization either. Several warriors bore nasty scars on their backsides from bullets, and some still carried lead slugs under the skin. They had been shot at from childhood by rubber gatherers, gold and diamond prospectors, and colonists.

Can the Indians Truly Be Protected?

Assis waved them toward the camp infirmary. "For injections against measles and colds, lest they die," he explained.

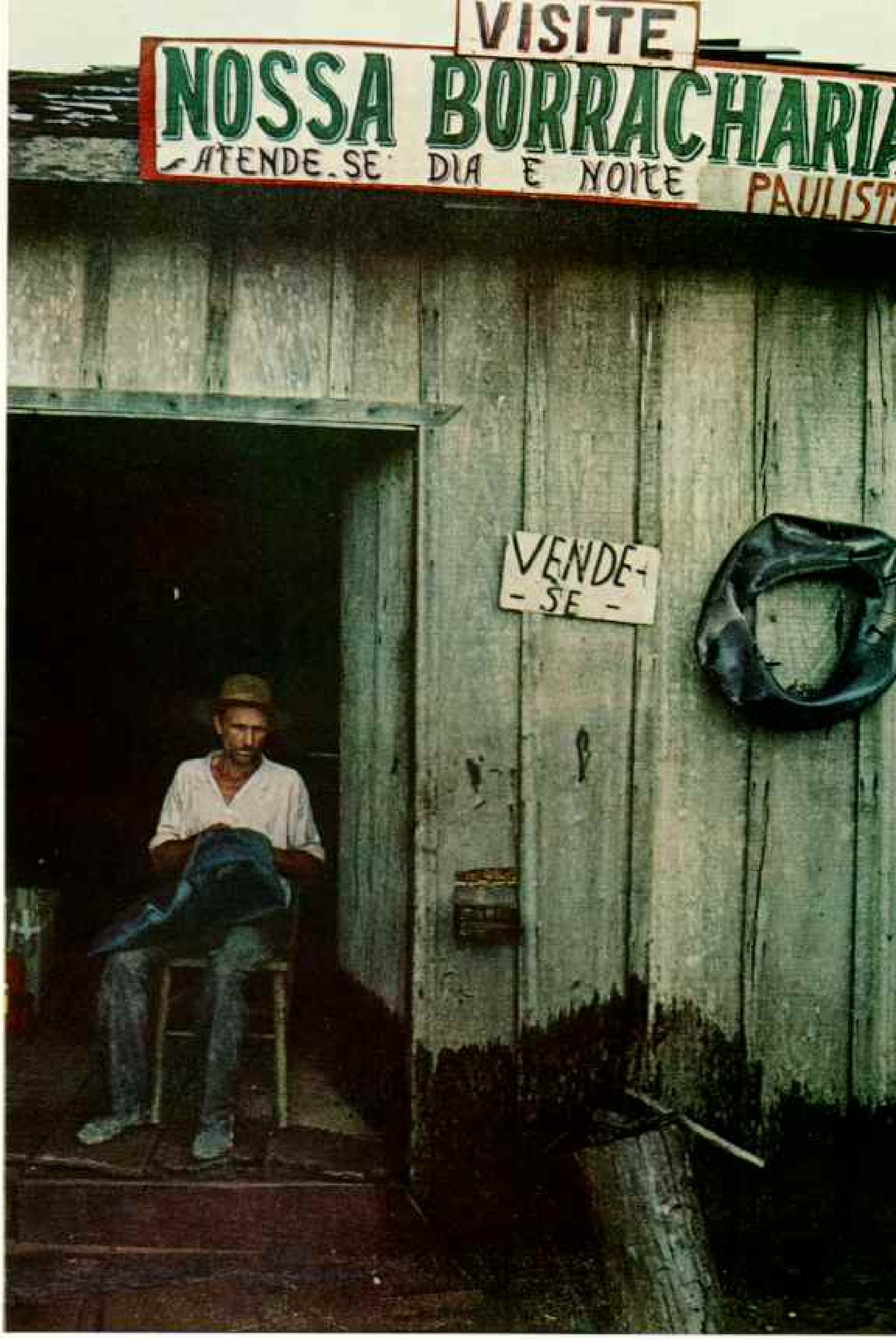
I wanted to call out to the warriors, "Go back! Go back to your side of the river! There is no medicine to stop colds!"

But, I thought, who am I to puncture Assis's jubilation . . . to hinder Kabano Iáras from swapping headdresses for baseball caps . . . to say don't risk a cold? They have to catch one sometime. Better here than in a roadside bar under a FUNAI placard that reads: "Forbidden to sell liquor to Indians."

So I took a dip in the cool, dark Aripuanã River and watched butterflies cluster on the

The reel world of film is rewound by members of a Gypsy family and a helper (**above**) in the four-year-old town of Cacoal. Their theater is a tent on three sides, a wooden facade on the fourth.

Where settlers go, services follow, but the owner of a tire repair shop along the Pan American Highway in Cacoal (**right**) has his place for sale. Not everyone can take the frontier life or make it pay.


VISITE
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PAULIST
VENDE-SE

diving helmet in the last light of day. They reminded me of the plagues and sorrows that flew out of Pandora's box, and I recalled the bottom line of the Greek myth: "One gift remained in Pandora's box. Hope."

After dinner I lazed in my hammock, listening to Kabano Pomons and Kabano Iáras talking things over musically. They chanted by their campfires all night, mournfully.

Next morning a Wide Belt lad translated my recording of their singing. "They say only 'It is good, it is good,' over and over."

The Kabano Iára chief wore no pants as yet, but he had swapped his wide belt for a T-shirt lettered with a popular Brazilian slogan: *Êste é um país que vai pra frente*—"This is a country that's moving ahead."

Familiar War: Settlers and Indians

No settlers threatened this camp as yet, but other FUNAI *postos indígenas* to the west and south were under siege. Seventh of September Camp had been attacked by settlers for abetting the Indians—and raided by Indians for not throwing out settlers.

At the Pan American, only 12 miles away, a settler cursed the Indian agency. "FUNAI's backing a bunch of losers. Indians won't do a lick of work. Look, newspapers said the government wants to build a new Brazil in the west. I came in 1970. Land was free. I cleared it myself. OK? In 1972 I turned down a $500 offer. Now, with 6,000 coffee trees, 100 zebu cattle, a brick house, barns, I can sell my 250 acres for $50,000. Now can you imagine an Indian doing all that? Fat chance!"

He hailed from Texas-size Minas Gerais, an upland state north of Rio, denuded of forests by mining and cattle raising. Gold and precious stones once lured frontiersmen to Minas. Today, despite iron mines and new industry, many long-time residents continue to abandon Minas to seek fortunes elsewhere.

Hundreds of migrants from all Brazil follow the highway westward to Rondônia every day. Keeping pace, tall microwave antennas replace Mariano's tongue, the telegraph laid by Rondon. From Cacoal, a town of 15,000 that didn't exist five years ago, I was able to place a phone call—via satellite—to my Virginia home.

I found blond colonists of Polish and German descent settling at Ariquemes, a wide spot in the highway southeast of Pôrto Velho, capital of Rondônia. They had abandoned coffee farms in the southern State of Paraná. The crop had been ruined by two bad winters that drove temperatures below freezing even at tropical Iguaçu Falls.

Ten or 12 families a day came in their own stake-body trucks piled with household goods. They had driven 1,500 miles. Newcomers crowded a half-mile square of burned-down jungle littered with charred logs and smoldering stumps. They slept under lean-tos of palm fronds and plastic sheets laid against their trucks. Earlier arrivals were building fine wooden houses in the ashes and varnishing them (pages 704-705).

A pregnant mother, blue-eyed, barefoot on sun-seared clay, hung diapers in lifeless air. She invited me into a spotless kitchen for juice of the *maracujá*, a jungle passion fruit. The drink was tepid. The house was an oven, in contrast to the deep forest shade.

Most migrants gravitate to urban centers like Pôrto Velho, where population and prices are skyrocketing. Some drive on to the far-western State of Acre. Acre had already been opened up, and the Indians decimated, by rubber tappers during the turn-of-the-century boom. Gathering wild rubber and Brazil nuts is still the main way to make a living all the way from Acre to the Amazon.

Twin Jetports Flank the Border

I flew over this jungle to Tabatinga on the Amazon at the Brazil-Peru-Colombia intersect. Five years ago the only airstrip in that region devoid of rock was a brick runway at Leticia, Colombia. The Brazilian Air Force tired of using it and built a big jet airport at their neighboring town of Tabatinga. Not to be outdone, Colombia built its own jet airport right alongside.

The Amazon is an international waterway,

Fearsomely clawed anteater, this tamandua could step straight into a science-fiction film. Instead, it spends most of its time in the trees. Strong for its size, the two-foot-tall creature can turn claws into slashing defensive weapons, but normally uses them to rip apart termite nests that would be tough work for a man with a machete.

People, people everywhere, yet barely enough water to drink has been a chronic problem along the northeast coast, where well water must be rolled home in barrels (**above**).

and oceangoing ships call at Tabatinga on their way to Iquitos, Peru, 2,300 miles from the sea. Yet modernity scarcely touches the lives of the part-Indian riverine families living six or eight people to a grass shack. They suffer from worms, anemia, leprosy, and bad teeth—and seem to me less healthy than highway pioneers.

A Peruvian Navy hospital ship cruises the waterways, treating patients of all nationalities. Projeto Rondon volunteers, Brazilian university students who promote community development while learning about their far frontiers, operate a medical-dental boat from Benjamin Constant, across the Amazon from Tabatinga.

The boat's supervisor, Professor Adroaldo Piccinini, 26, said his students weren't welcomed at first by the *caboclos*, people of mixed European and Indian blood. "They suspected we were foreigners, perhaps spies. We are tall, with names like Stein and Candiotto. Our volunteers—all from Pôrto Alegre, a big modern city—asked questions in a southern Brazil accent. These caboclos speak a mixed jargon of Portuguese and Tupi Indian."

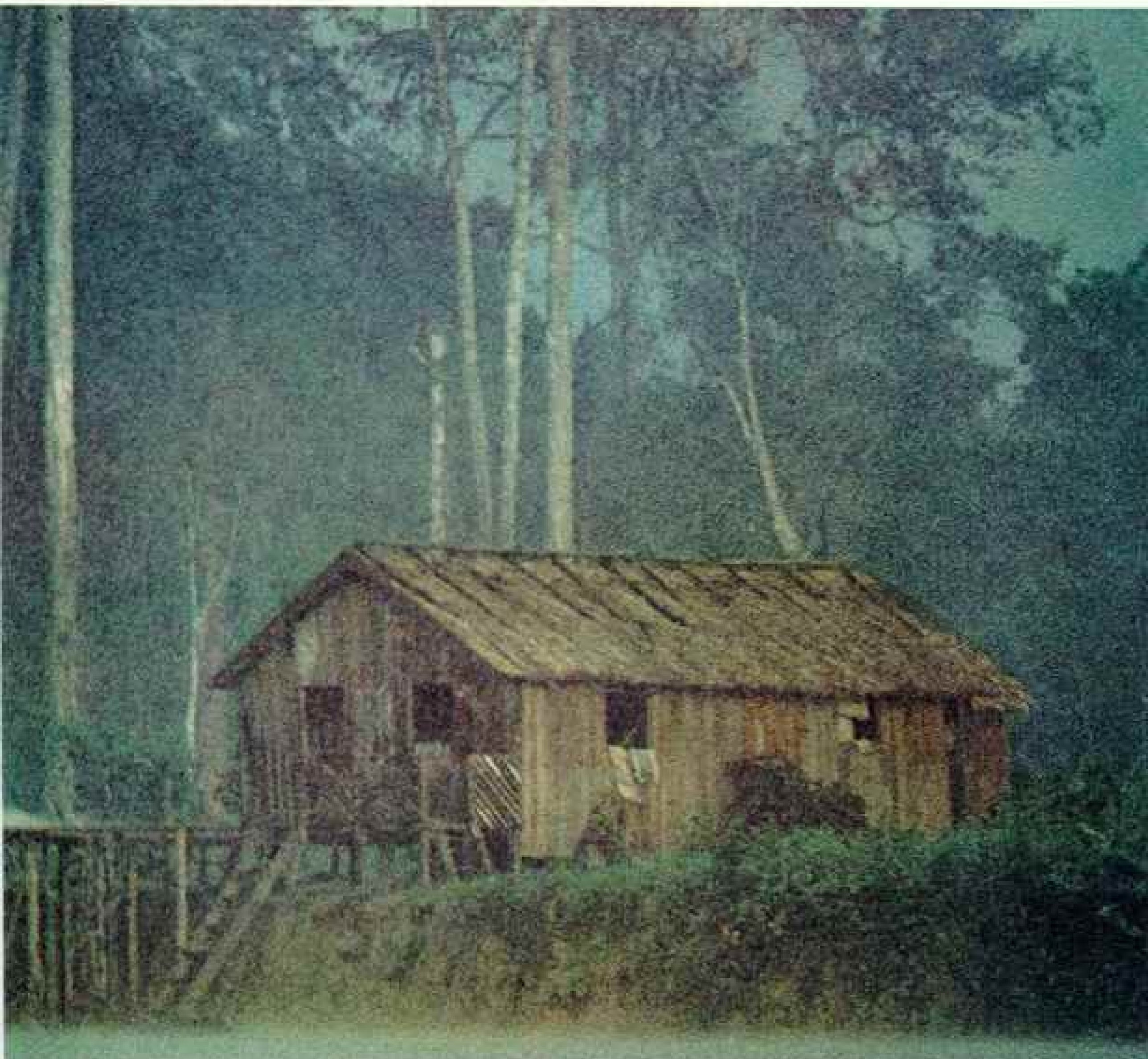
Rivers Still Rule the Backcountry

The rivers regulate life, providing food, water, transportation, and carrying away sewage—and entire farms in times of flood. Then families paddle away in dugouts to settle elsewhere. Young men go east, not west, drifting down the Amazon to seek urban jobs. Someday migrants to and from the upper Amazon will bus along the Northern Perimeter Highway to Roraima Territory.

One moonless night in Boa Vista, capital of Roraima, I knocked on the door of the outlying residence of Capt. Marcos Cardoso

Many Nordestinos resettled in São Paulo or Rio. Now, with the building of the Trans-Amazon Highway, others are being siphoned off into the Amazon interior, where water is abundant but energetic people all too few.

Along the Jari River (**below**) rain turns day into twilight; it falls with such force that it bounces off a pier and even the river itself.



Taking the bull by the tail, a Nordestino horseman at full gallop

Ramos of the 6th Army Construction Battalion. Although he was sick in bed and I was a total stranger, such is the hospitality of Brazilians that his pregnant wife, Maria Jussana, invited me in without hesitation. Her husband was recovering from a brush with death by malaria, a consequence of two years' work on a highway linking Manaus with once isolated Boa Vista and thrusting on north to Venezuela.

"We lost 64 men to disease, accidents, and Indians," said Captain Ramos. "But we made it possible to drive from the Caribbean through the heart of the Amazon jungle to Rio, or even the Strait of Magellan if you like. Since March 1977, buses commute between here and Manaus, though all traffic must be escorted in convoy through Waimiri-Atroari Indian lands for protection from attack.

"When Panama and Colombia complete the Darién-Chocó gap in the Pan American Highway, we expect American tourists to come swarming through Boa Vista."

More Backpackers Than Motor Homes

Tourists aren't swarming yet. On a 260-mile drive up to Santa Elena, Venezuela, and back, through open savanna studded with termite hills and cattle, I met only eight cars. And two backpackers, Blake Allison of Wellesley, Massachusetts, and François Bellemare of Drummondville, Quebec. Near the road I saw

yanks it to the ground during a **vaquejada,** *or Brazilian rodeo.*

a *bandeira* tamandua, or flag-tailed anteater, ripping open termite mounds with giant claws and licking out the tunnels with its 16-inch tongue.

I had told the backpackers that when they reached Manaus, after traveling down the dank 488-mile corridor of trees from Boa Vista, they were in for a big surprise if they expected to see a quaint riverside relic of the rubber boom. Reminders of bygone charm still abound, but this central Amazon metropolis of 315,000 inhabitants now counts more than 200 new industries—including a steel mill—in its burgeoning industrial area. A swank tourist hotel set in landscaped jungle overlooks the four-mile-wide Rio Negro. Seven skyscrapers flank the old opera house. And the highway to Pôrto Velho is paved.

Both the other big Amazon River cities, Santarém, at the mouth of the Tapajós, and Belém, near the sea, are now linked to the rest of Brazil by highway as well as by water.

In 1967 Daniel K. Ludwig of New York City bought a Connecticut-size tract on the Jari River across the Amazon Delta from Belém to grow rice and trees for pulp and lumber. So far he has replaced 225,000 acres of virgin forest with pine and *Gmelina*, an Asian tree (following pages). In October 1972, I reported in the GEOGRAPHIC that Jari "may cost a hundred million dollars before it turns a nickel." Jari so far has cost five

Huge experiment, closely watched, involves three million acres along the Jari River bought by New York shipowner Daniel K. Ludwig. The land is being cleared of virgin timber and planted with

fast-growing pine and *Gmelina* trees (**above, left**), native to Asia. This stand has been thinned to allow only the best trees to develop.

Pine seedlings (**above**), when grown to maturity, should help feed a mill producing 750 tons of wood pulp daily. Some fear such practices, if spread across Amazonia, could deplete soil fertility and destroy an ancient ecosystem.

hundred million dollars, and the first nickel is only beginning to be turned.

But Mr. Ludwig, now 80, is by no means discouraged in his experiment to solve coming world shortages of paper, lumber, and food. In May 1978, a 269-million-dollar item of his investment will be installed. That month two enormous barges will be towed from Japan up the Amazon and Jari Rivers to be permanently placed on pilings. One will carry a wood-burning power plant, the other a paper-pulp mill to produce 750 tons of pulp every day.

I asked Dr. Warwick Estevam Kerr, a geneticist who directs Brazil's National Institute of Amazon Research, how he views replacing lush native forest with commercial stands of one or two species. He replied: "I am against turning the Amazon into one big cattle ranch, the current rage. Jari's scientists are first rate. Jari alone is too small to upset the Amazon ecosystem. It is well worth watching."

One of Jari's managers told me that the rice experiments, while requiring vast capital, demonstrate that reclaimed floodplains of the Amazon Basin could annually produce four tons of rice per acre for a world faced with the specter of massive famine.

Slow Tide Flows Westward

Most of Jari's 8,000 workers came from Brazil's Nordeste, the northeastern bulge. Their ancestors—bushwhackers, cattlemen, Indians, African slaves—were among Brazil's first overland migrants. Though much of the Nordeste is sere farming country, the mixed races multiplied, reaching 25 million by mid-century. The Trans-Amazon Highway was built to lead some of them out of the parched, overpopulated Nordeste and into the underpopulated west.*

I know a black man named Cicero Aurelio de Melo, born in São Tomé in the dry Nordeste State of Rio Grande do Norte. In 1969 he decided to go west and packed his family into a passing truck. For a week they bumped along the new Trans-Amazon and got off 28 miles beyond Altamira on the big bend of the Xingu River. There Aurelio staked his claim to a 250-acre plot of tall jungle given to him by the Brazilian colonization agency.

Thirty days later another family walked

* "Drought Bedevils Brazil's Sertão," by John Wilson, appeared in the November 1972 GEOGRAPHIC.

A phalanx of combines shuttles across a rice field, part of the Ludwig operation at

Jari, an experiment monitored by scientists. The floodplains of the Amazon Basin promise a vastly expanded agriculture that could greatly bolster the world's food supply.

in: Adão Morais da Rosa, 43 (page 702); his wife, Altemira, 39; and two children. They had backpacked 2,500 road miles from Pôrto Alegre in Rio Grande do Sul. Then came Derly Schütz, a big blond-bearded man, with children as plentiful as yellow chicks, also from the south.

In February 1972, I met these three pioneer families. Exactly five years later I returned to look them up.

Frontier Breakers Make a Go of It

"We're prosperous now—but don't repeat that," said Aurelio, the Nordestino. The weathered wood of his unpainted house was masked by flowers planted by relatives from São Tomé, some of the extended family who had joined him.

Adão, the backpacker, said, "I've cleared 216 acres of the best land in all Amazonia single-handedly, and keep Altemira busy washing six shirts and six pairs of pants I sweat up every day." He has planted all sorts of crops. I helped him gather melons and bananas for lunch. Altemira plucked and fried a chicken in my honor.

I wondered how they would fare when Adão could no longer farm all that acreage alone. Their handsome son, Tito, now 16, avoided work on the farm and dreamed of owning a motorcycle and someday becoming a mechanical engineer.

Maria Schütz, Derly's wife, had just mixed 14 sacks of cement and laid a new bedroom floor. She hoed the flower garden while we talked. "I've given birth to 18 children; 14 are still alive to help around the house. Even so, I hardly have time to sleep."

They are the new breed of frontiersmen.

I know one of the old breed, Baron Wolf von Puttkamer, born in 1887, two years before the Empire of Brazil peacefully became a republic. Brazil's population was 14 million then, 100 million less than today.

The baron, father of my friend Jesco, left Prussia for German South-West Africa, where he became a farmer before World War I. When the conflict came, he shipped for Rio. In 1923 he set out for the interior by oxcart with his wife and babies. He bought land, farmed, prospected for gold and diamonds, and settled in the capital of Goiás State—Goiânia, a planned city like Brasília.

I attended the baron's 90th birthday party last January (right). The old boy is full of life. He builds houses. He plays the harmonica. He filled his home with his own wood carvings until, he says, "I quit five years ago because there were no worthwhile subjects left in the world."

In a rusty unlocked file cabinet he keeps several pounds of emeralds he cut himself, some weighing more than 30 carats.

"Aren't you afraid of robbery?"

"Hah . . . let them come! They'll be sorry!" He showed me a shotgun loaded with a single shell. It stands at the head of his bed.

The baron works on his autobiography every day. It is handwritten in rhyme and illustrated like an illuminated manuscript from the Middle Ages.

Confidence as Endless as Brazil's Future

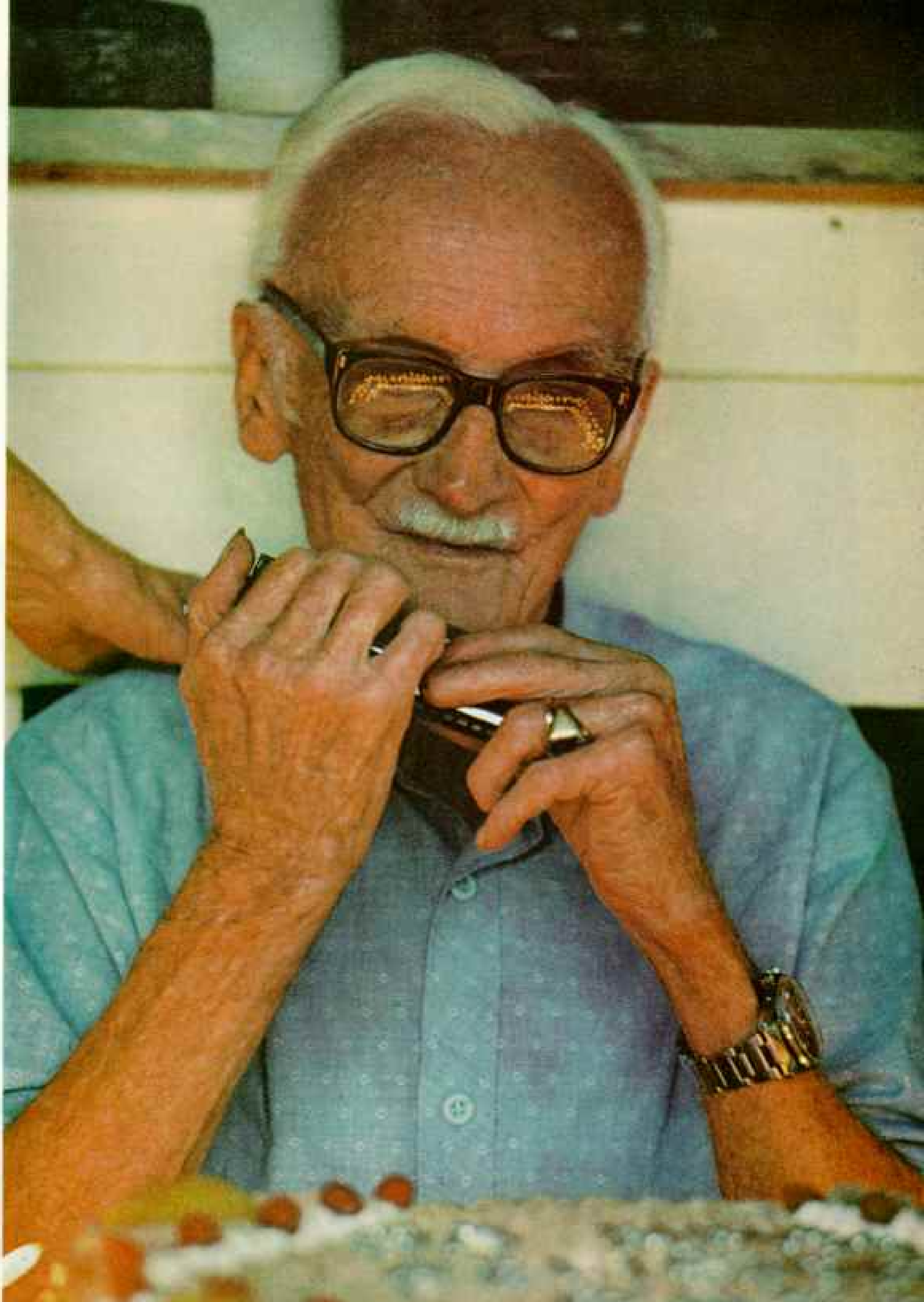
The baron shares with every literate Brazilian I met a boundless confidence in the future of his country. He radiates pride in its infinite distances and supposedly infinite wealth. He is one of millions who believe the Amazon overlies a great pool of oil; never mind the delay in finding it, for meanwhile it increases in value.

The oil is speculation. But one of the world's richest iron-ore fields, in the Serra dos Carajás, bauxite on the Trombetas River, tin in Rondônia—these are realities.

The new breed of pioneer will eventually open the treasure chest of the west, and if painstaking governmental planning works out, most of the people may benefit thereby.

"What man can imagine, man can do," the baron says, and the Brazilian attitude in the 1970's is very much "can do." The nation will climb swiftly to its seat among the great powers—if imagination can make it so. □

The flames of many years—reflections of 90 birthday candles—sparkle from the glasses of Baron Wolf von Puttkamer. A Prussian, he came to Brazil when it was still a nation of immigrants and amassed adventures to match his age. Now, as in the United States of generations past, he and his adopted Brazil sense a manifest destiny on the western frontiers.



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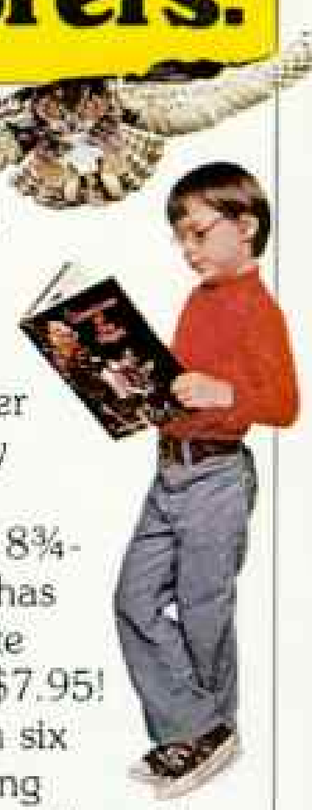

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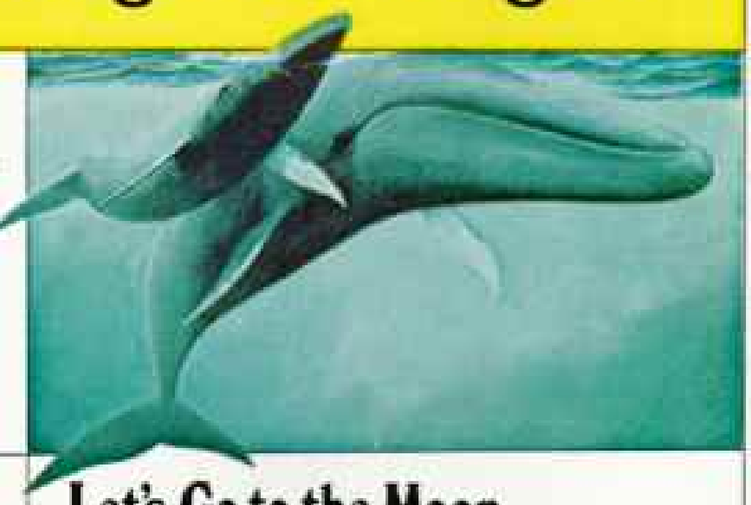

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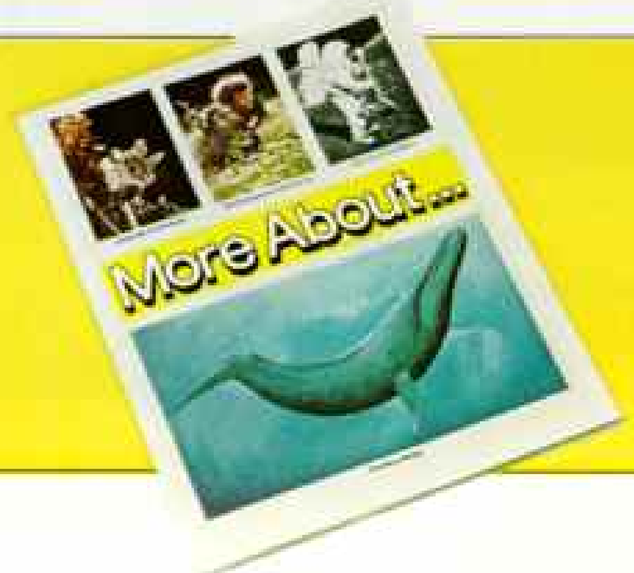

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1/4 tsp. salt
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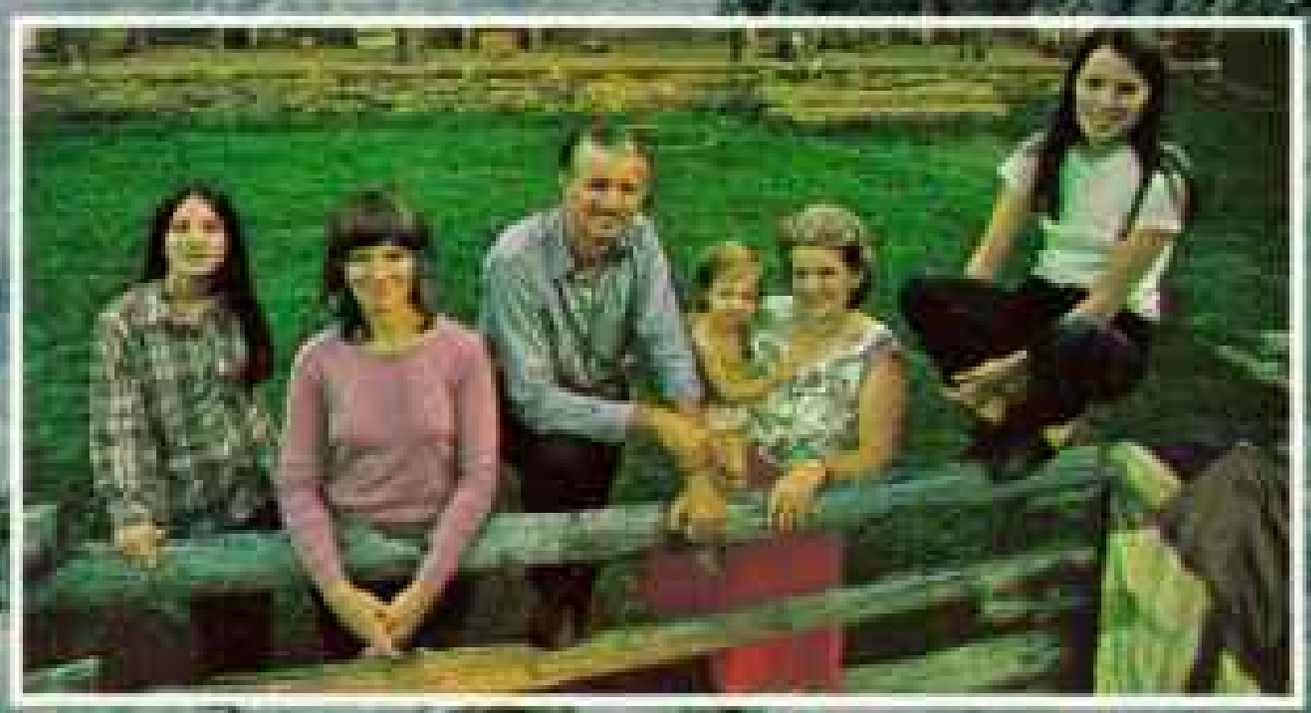

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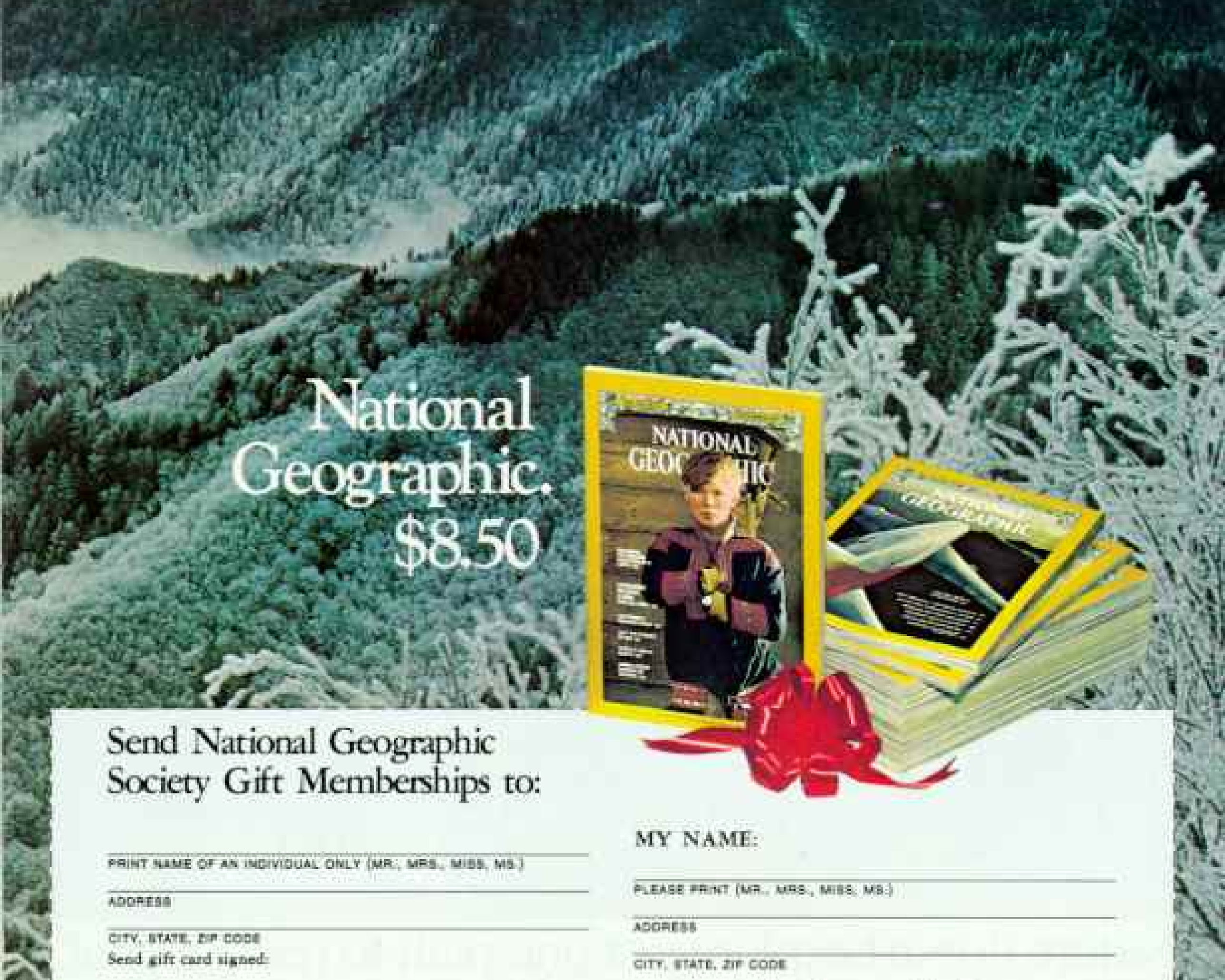

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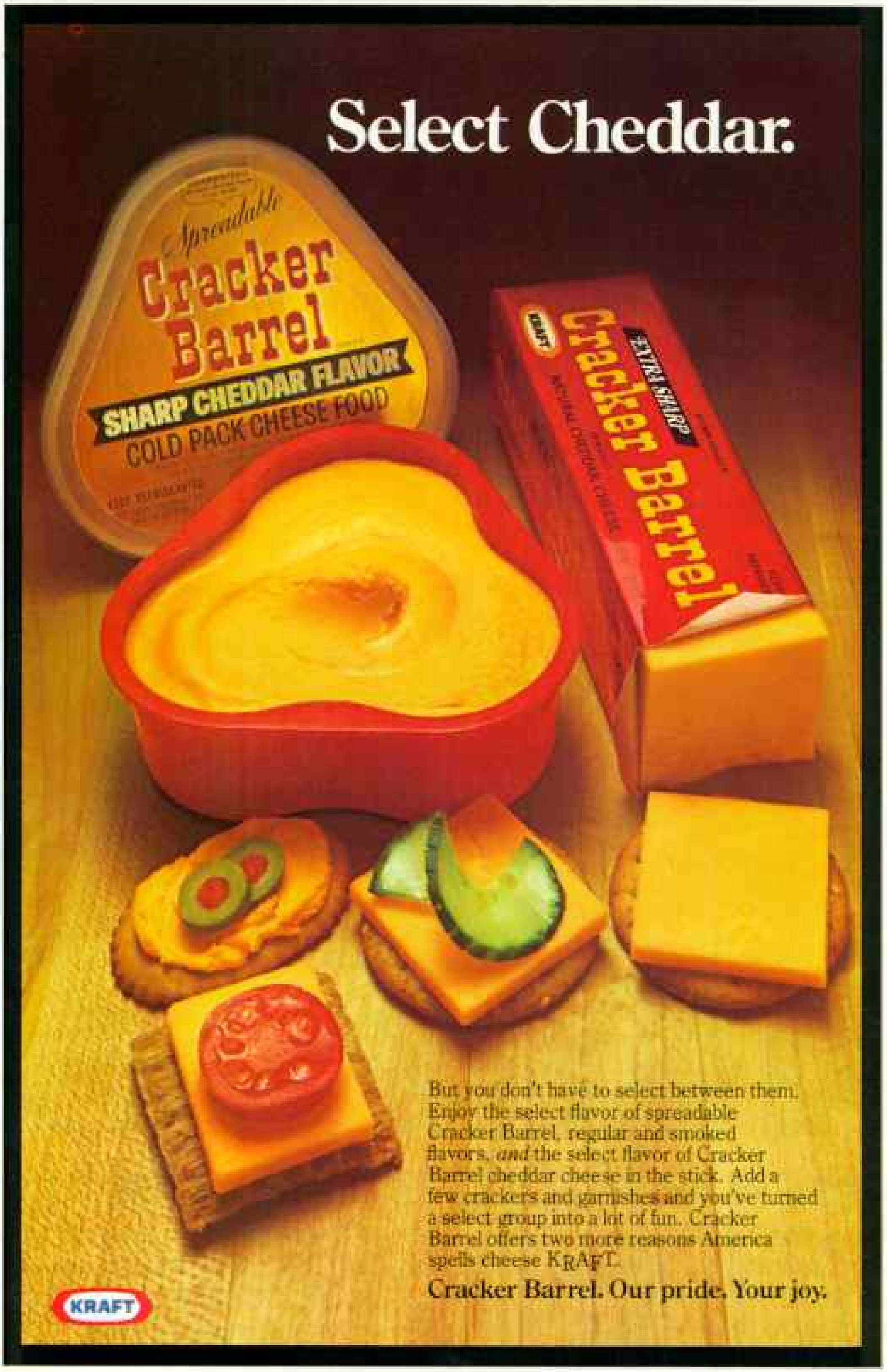
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This exclusive edition of The Great Books of the Western World will be privately printed and bound for subscribers only. This unique limited edition will be published only once, and it is available only until the subscription rolls are closed. Thus, the subscribers will be the only people in the entire world who will enjoy the privilege of acquiring these beautiful, leather-bound volumes.

Moreover, unlike the previous edition of The Great Books (which has been available in the past only as a complete set), this special 25th Anniversary Edition will be available *only as a series*, to be issued at the rate of one book per month until the collection is complete.

As a subscriber, you will be billed for each book individually, on a monthly basis—at only $39 per volume. This favorable price is made possible because this magnificent edition is offered to collectors *by direct subscription only*.

Moreover, the original issue price will be *guaranteed* to each subscriber for each book in this edition—regardless of any future increases in the costs of fine leather, gold, printing or binding. In these inflationary times, when costs are subject to persistent upward pressure, such a long-term price guarantee becomes a most important and valuable consideration. Moreover, subscribers will have the right to cancel their subscription at any time upon thirty days' notice.

You may enter your subscription by mailing the application below no later than November 30, 1977. The subscription rolls for this limited 25th Anniversary Edition will then be closed forever.

SUBSCRIPTION APPLICATION

THE GREAT BOOKS
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Please enter my subscription to the special 25th Anniversary Edition of *The Great Books of the Western World*. I understand that this private library will consist of 96 volumes to be specially designed, illustrated, printed and bound in leather expressly for me. The books will be issued to me at the rate of one volume per month. And I understand that I have the right to cancel my subscription at any time on 30 days' written notice.

No payment is required at this time. I will be billed $39.* for each volume, individually, in advance of shipment.

**Plus my state sales tax and $1.75 per book for shipping and handling*

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ALL APPLICATIONS ARE SUBJECT TO ACCEPTANCE

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PLEASE PRINT CLEARLY

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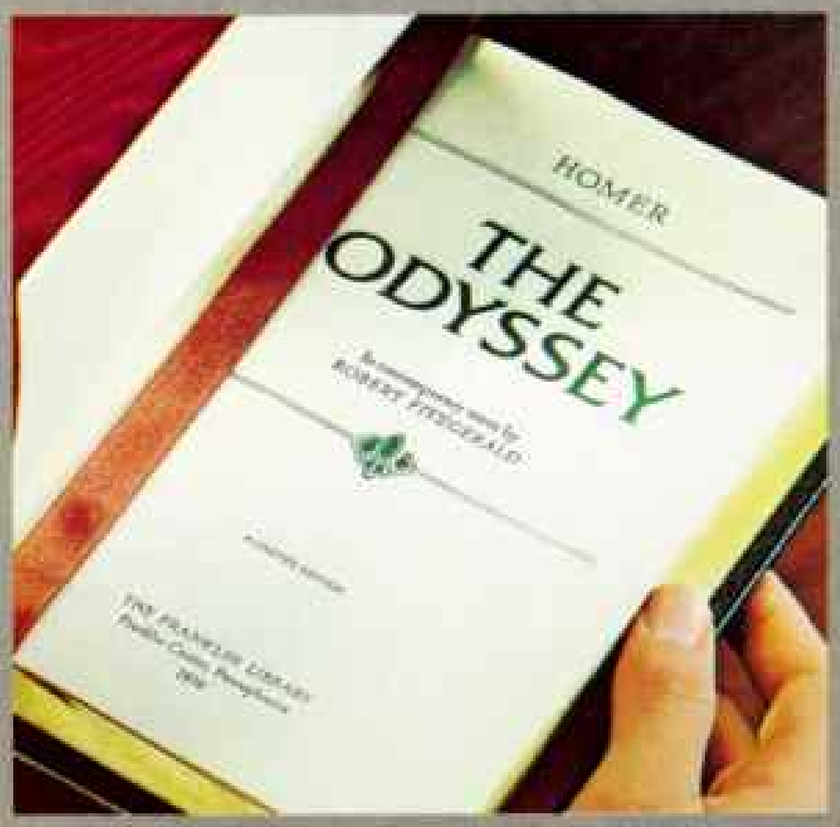
Must be postmarked by November 30, 1977.
Limit: One collection per subscriber. 201

Also available in Canada. Mail application to The Franklin Library, 70 Galaxy Blvd., Rexdale, Ont. M9W 4Y7.



Look. A lot more Chevette for a lot less money.*

Amazing. More for less. For 1978, we added eighteen new standard features to Chevette and still kept the price below last year's Chevette with the same equipment.

Some of the new standard features on the 1978 Chevy Chevette: 1. AM radio. 2. Whitewall tires. 3. 1.6 Litre engine. 4. Bumper rub strips. 5. Sport steering wheel. 6. Body side moldings. 7. Console. 8. Swing-out rear windows. 9. Wheel trim rings. 10. Cigarette lighter. 11. Color-keyed instrument panel. 12. Glove compartment lock. 13. Deluxe grille. 14. Reclining bucket seats.** And more . . . 18 in all!

And you still get all this standard, too: 15. Four-foot-wide hatch. 16. Front disc brakes. 17. Delco Freedom battery. 18. Rack-and-pinion steering. 19. Carpeting. 20. Fold-down rear seat. 21. Short 30.2-foot turning circle. 22. Fully synchronized 4-Speed transmission. 23. Retractable seat belts. 24. Diagnostic connector. 25. Strong unitized body. 26. "Smart Switch". 27. Plus an extensive dealer organization from coast to coast. And more . . . .

All things considered, the new '78 Chevette is considerably more car. At a very considerable value.

*Comparison of manufacturer's suggested retail price for a 1977 Chevette Coupe with options now standard on 1978 Chevette Coupe.

**Some early production Chevettes in dealer inventory will not have reclining seats. The suggested base price will be reduced accordingly.

SEE WHAT'S NEW TODAY IN A CHEVROLET.

Polaroid's SX-70 Alpha 1

Its electronics and optics make it the world's finest instant camera.

The SX-70® Alpha 1 Land camera has the most advanced optical and electronic system integrated into one camera. The SX-70 is the world's only folding single-lens reflex camera. Its four-element glass lens offers razor-sharp focusing from infinity to 10.4 inches. You see details clearly, even in dim light, because the SX-70 has one of the brightest SLR viewfinders in photography. Its electronics automatically calculate all exposures, using a unique variable shutter and aperture combination which even makes split-second flash corrections. The SX-70 Alpha 1. So advanced, it frees you to do the creative thinking.

Own your own utility.

You can turn the sun's free energy into hot water for your family, the day you install a Grumman Sunstream™ Solar Domestic Water Heating System.

You'll save money because the hot water the average family uses to keep itself, its clothes, and dishes clean amounts to more than 27,000 gallons every year.

The cost of heating this hot water may amount to 15% to 40% of your annual heating bill.

The Grumman Sunstream system immediately lowers this heating bill by using the sun's free and non-polluting energy. The system pays increasing dividends as other energy costs continue to soar. And it's an investment that can add to the resale value of your house.

Grumman Sunstream Solar Domestic Water Heating Systems are being used today in homes all across the country. The system is easy to install. Suggested retail prices start at $995 plus transportation, local taxes, and dealer installation.

For more information on how to put the sun's free energy to work for you, write Dept. 330, Grumman Sunstream, 4175 Veterans Memorial Hwy., Ronkonkoma, NY 11779.

Prices and specifications subject to change without notice.

GRUMMAN **Sunstream** ™

The reliable source

A product of Grumman Energy Systems— a division of Grumman Corporation

Some kids get more from the measles than funny little red spots.

Some lose their hearing. Some suffer brain damage. Some even die.

All needlessly.

Because an immunization is available that can prevent measles. There are also immunizations for mumps, diphtheria, German measles (rubella), whooping cough and tetanus.

Yet 40% of America's children, over 20 million, are inadequately immunized. And the number is growing.

Not surprisingly, so is the incidence of childhood diseases. (Cases of measles jumped more than 62% last year.)

That's why Metropolitan Life urges you to talk to your family doctor, to make certain your children are getting the right immunizations at the right times.

To be doubly sure, use the attached card to keep an up-to-date immunization record of your own. (For additional cards, see a Metropolitan representative.)

Otherwise, a childhood disease may strike. And the effects could last a lifetime.

Metropolitan
Where the future is now

FAMILY IMMUNIZATION RECORD

- Ask your doctor when shots are due.
- When shots are given, have your doctor enter dates under child's name.

Detach and save card for reference.

SHOTS FOR ▼				
• DIPHTHERIA • TETANUS • WHOOPING COUGH — One immunization (one shot each date) can immunize for all three if doctor recommends.				
CHILD'S NAME ▸				
At age 2 mos.*				
2 mos. later				
2 mos. later				
12 mos. later				
Booster 4-6 yrs. old				
• POLIO — One oral immunization each date.				
CHILD'S NAME ▸				
At age 2 mos.*				
2 mos. later				
2 mos. later				
12 mos. later				
Booster 4-6 yrs. old				
• MEASLES • MUMPS • RUBELLA (German measles) — Triple immunization (one shot for all three). Measles booster at 15 mos. if first immunized before 1 year				
CHILD'S NAME ▸				
After 1 year old				
After 1 year old				
After 1 year old				

*For children already beyond infancy, don't delay. See your physician and start series now.

Metropolitan
Where the future is now

To stop childhood diseases, start here.

Family Immunization Record
See the other side.

Use this card to make sure each child gets all immunizations necessary to protect against the dangerous diseases named on the reverse side.

Keep it where you'll see it often, perhaps taped inside a medicine chest or kitchen cabinet door until each child has received every shot. Then keep this card with other medical records.

Additional cards and an informative booklet on immunization are available free at Metropolitan Life offices.

Metropolitan
Where the future is now

Our nature trails lead to sky-high adventure.

Nature blessed Georgia with exciting variety. We've got the mountains, the coast, and a lot of beautiful scenery in between. So when you come here, take the time to enjoy it all.

Make your own trail along a secluded beach. Follow a winding road through a national forest. Let your imagination soar—there's no limit to the fun you can have. Our colorful vacation guide will show you where. Send for your free copy today. And when you reach Georgia, stop at a Visitor Center for the latest directions and information. We want your Georgia vacation to be the best yet.

Georgia Department of Industry & Trade
Tourist Division
P.O. Box 1776, Dept. NG-81
Atlanta, Georgia 30301

Please send me your free vacation guide to adventurous Georgia.

Name

Address

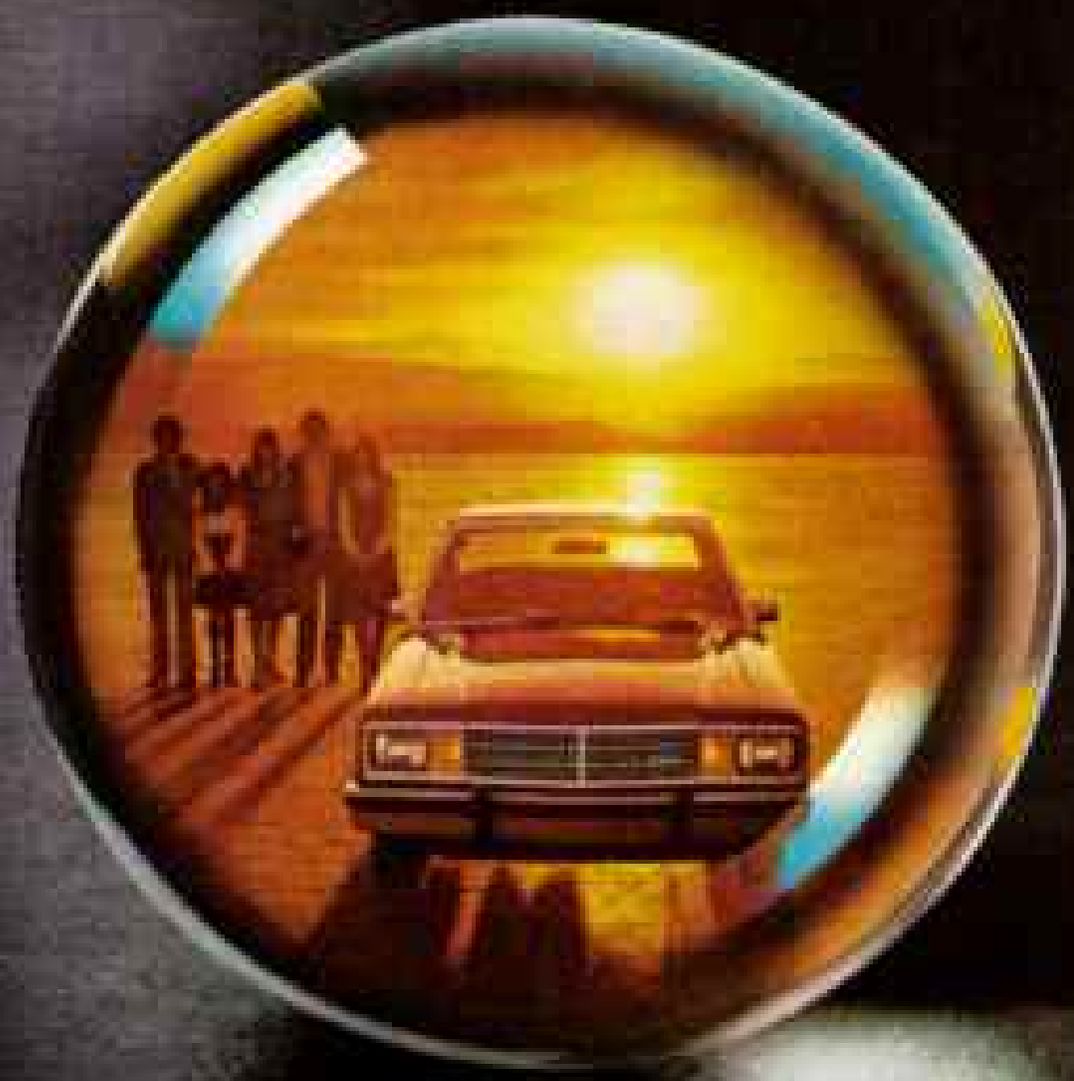
City, State, Zip

Georgia

Introducing the new

Fairmont.

The Ford in your future.



Fairmont Squire Wagon.

Fairmont Wagon: designed for an excellent combination of fuel efficiency, space efficiency, cost efficiency.

Fairmont Wagon. Built for today, but designed for the years to come. It's the newest better idea from The Wagonmaster.

Fuel efficient. For today's driving, good gas mileage is more important than ever and the new Fairmont's EPA ratings are very good: 29 MPG highway, 19 MPG city. With available 3.3 litre engine and manual transmission. Your actual mileage will vary according to how and where you drive, your car's condition and optional equipment. California ratings are lower.

Space efficient. Even with its good fuel economy, Fairmont is not a little wagon. It has almost 90% of the passenger space of GM's biggest wagons and is rated at 84% of their cargo space. (Based on EPA interior volume formula.)

Cost efficient. Yet, with all this, Fairmont base sticker prices are surprisingly low . . . lower than some little subcompact wagons like Toyota Corona.

Visit your Ford Dealer. Compare Fairmont's excellent combination of high mileage ratings, roominess and low price with any other wagon sold in America.

Test drive Fairmont.
Find out for yourself.

FORD

When America needs a better idea, Ford puts it on wheels.

Fairmont 4-door sedan.

Fairmont 2-door sedan.

FORD
FAIRMONT
FORD DIVISION

75th ANNIVERSARY

"There's something very special about tennis here. I suppose it's the island that makes it so. The beauty."

Steve and Felicia Lewis comment on their first visit to Bermuda.

"St. George's was fun. We bought some of those beautiful Bermuda onions to take home with us."

One evening at dusk, we took off our shoes and walked through the sand and watched the ocean from high above the beach. It was magnificent."

Bermuda

Unspoiled. Unhurried. Uncommon.

See your travel agent or write Bermuda, Dept. 4-1-5
630 Fifth Avenue, N.Y., N.Y. 10020 or Suite 1010, 44 School St., Boston, Mass. 02108
Suite 1422, 401 N. Michigan Ave., Chicago, Ill. 60611

Bermuda has 85 superbly maintained courts. You can always find a court or a game. Come play a few sets with us.

Deciding which smoke alarm to buy could be one of your most important decisions.

Here's why you should decide on the Home Sentry® from GE.

Our red button. The first point in our 3-point checking system.

Our low-battery warning tells you when to replace the battery.

Our flag reminds you to put a new battery in after you take the old one out.

GE is the only smoke alarm with a 3-point checking system. It will keep working even when your electricity doesn't. It comes equipped with a special 12.6-volt Duracell® battery made just for smoke alarms by P. R. Mallory & Co. Inc.

There's no way to guarantee against injury or loss of life in a fire. However, the Home Sentry SmokeAlarm from GE is intended to help reduce the risk of tragedy.

We hope you buy a Home Sentry (or as many as your home may need). But for your family's sake, don't take too long deciding when.

The Home Sentry from GE. It can help save your family's lives.

GENERAL ELECTRIC

Andersen®. The window to build a room around.

Every room needs an idea to build on. And Andersen gives it to you. With a charm, elegance, style and comfort that's bound to please.

Andersen® windows and gliding doors are the beautiful beginning of any room.

And unlike the leaky, drafty kind, they help save on energy.

That's because of Andersen's use of wood, a natural insulator, in every window and gliding door. Along with optional double-pane insulating glass in a snug-fitting design to help lower rising heating and cooling bills.

So whether you're adding on or replacing worn out, drafty windows, first think of Andersen. In primed wood, or low-maintenance Perma-Shield® vinyl-clad windows and gliding doors.

To get your new room started, call your Andersen distributor or dealer. He's in the Yellow Pages under "Windows."

To: Andersen Corporation
Box 12, Bayport, MN 55003

Please send me more information about Andersen® windows and gliding doors.

I plan to ☐ build ☐ remodel.

Name

Address

City

State Zip

The beautiful way to save fuel™

Andersen Windowalls®

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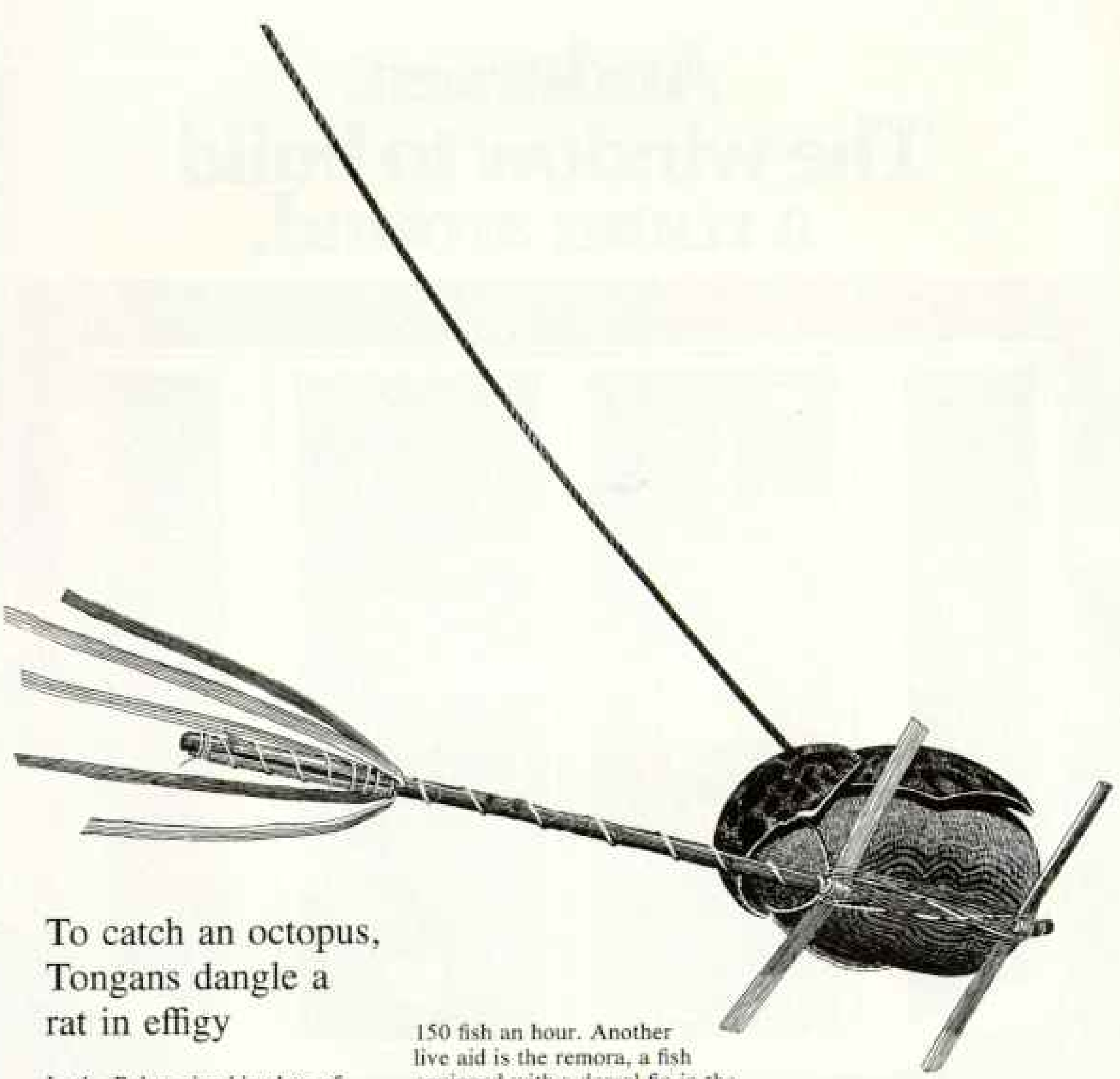


To catch an octopus, Tongans dangle a rat in effigy

In the Polynesian kingdom of Tonga, legend says that an octopus gave a rat, floundering in the sea, a ride to shore. Once on land, the ungrateful rat called out: "O octopus, feel of your head; see what I have left there."

Its head soiled, the octopus from that day has hated rats. Taking advantage of its enmity, Tongan fishermen fashion lures like the one shown here. Made from limestone, spotted cowrie shell, and coconut fronds and roots, this *maka-feke* represents a rat but resembles a crab, the octopus's favorite food. Whatever the appeal, the lure works. Hanging on tenaciously, the octopus is lifted from the sea.

Fishermen's methods are as varied as their victims. Some Japanese fish with birds. A tethered cormorant, its neck tied to prevent swallowing any but the smallest catch, may nab 150 fish an hour. Another live aid is the remora, a fish equipped with a dorsal fin in the form of a suction disk. On the east coast of Africa these sucker fish, lines strung through their tails, latch onto turtles.

In Oceania, islanders catch garfish with spider web. How? They fasten a ball of the gossamer threads to a line and wait for the fish to snag their teeth on it. In Europe, eels are captured the same way, on a bob of twine. If an eel shakes loose when pulled up, it's caught in an open umbrella held upside down.

Many fish seem made to catch themselves. In Latvia, baskets suspended over waterfalls catch jumping salmon. In Yugoslavia, mullet leap into boats blocking migration streams.

Flailing the surface of the water with long poles, Brazil's Waurá Indians frighten fish into waiting nets. Another Brazilian tribe, the Erigbaagtsa, stalk fish from the tops of bankside trees. His bow and arrow at the ready, a tribesman chews on fruits and lets the scraps fall into the water. When a fish rises for a nibble, an arrow flies. Then the fisherman leaps in and seizes his prize.

It is not known what Julio Buel ate that day in 1834 when he lunched on the shore of a Vermont lake. But the story goes that he was using a spoon, and it dropped into the water. A large fish saw it reflecting the light and struck. Buel also saw the light: He soldered a hook to the bowl of another spoon. Lo! a famous trolling lure was born.

Whether spoon or maka-feke, fishermen's tricks have given birth to many good stories. Readers find them a flavorsome addition to the pages of NATIONAL GEOGRAPHIC.

Silent and Sound reasons to give a Kodak Moviedeck projector.

Kodak movie projectors make showing movies easy. Count the Kodak benefits:

1 Watching movies without setting up a screen or turning down room lights. Our unique pull-out viewing screen is ideal for small audiences. There's also the option of projecting movies onto a traditional screen.

2 Bright images.

3 Automatic threading and automatic rewind.

4 Showing super 8 and 8 mm movies at the flip of a single switch on all models.

5 Replaying previous scenes in just seconds, and a choice of fast or slow motion on some models.

6 Low-profile design and smoke-tinted dust covers that make these projectors easy to look at.

Visit your photo dealer's soon. Ask to see a silent or sound model. And see all the silent and sound reasons to give your family a Kodak Moviedeck projector.

Kodak

Kodak Moviedeck® projectors

Kodak gifts say: "Open me first"

...to save Christmas in pictures.

To give you an idea of diamond values, the piece shown is available for about $1600. Your jeweler can show you other diamond jewelry starting at about $200. De Beers Consolidated Mines, Ltd.

She usually laughs at my anniversary gifts,
but this year, I think she's going to cry.

A diamond is forever.

ALL FOOD PROCESSORS ARE NOT CREATED EQUAL.

Of all the food processors around today, none gives you all the features of the GE Food Processor.

The GE Food Processor chops, grinds, shreds, slices, grates, blends, mixes, purees. In less than 60 seconds.

The motor is in the back, not underneath, so it fits under standard kitchen cabinets.

It has a dual-switch panel with on/off and pulse control. A five-inch food chute rather than a four-inch one. And a dual-purpose disc which slices on one side and shreds on the other. There are no extra blades to store outside the bowl.

It usually costs under $90.*

It's serviced by a network of 235 service centers.

If you need any more reasons to buy the GE Food Processor, drop in to your local GE dealer. Seeing is believing.

*Actual price may vary by dealer.

GENERAL ELECTRIC

Number Eight in the Involved American Series from Atlantic Richfield Company.

I came back to life.

A year ago I was ready to die. Seventy-two years of life was enough. My work was over. My family gone. I sat alone watching the calendar go by, lost in memories and self-pity. Then something happened.

A large noisy family with too many children moved in next door. I was polite when the kids came by to introduce themselves and patiently let them race around the house exploring my mementos. But I didn't like it.

In the weeks that followed, those monsters took on human characteristics. I learned their names. Their heroes. Their hiding places. Their favorite desserts. One day I found myself liking them. The next, loving them. I became the person I'd forgotten I was.

When an opening came up at the children's school to cook hot lunches, the kids encouraged me to apply for it. The school board felt the job might be too much for a woman my age. But my husband and I had owned a restaurant for twenty-six years so they decided to give me a try. Well, I'm doing just fine.

Older people can give so much if we're given the chance. Without that chance, our lives can be so bleak. So dark. With it, we can become the people we've forgotten we were. We can come back to life.

Atlantic Richfield Company believes that one of our national goals must be to encourage older Americans to continue to contribute to society as long as they are able. You can help make it happen. Consider the facts. Take a stand. Get involved.

For a free booklet on this issue, please write: Atlantic Richfield Company, Aging, P.O. Box 30169, Los Angeles, CA 90030.

ARCO

Petroleum products of Atlantic Richfield Company

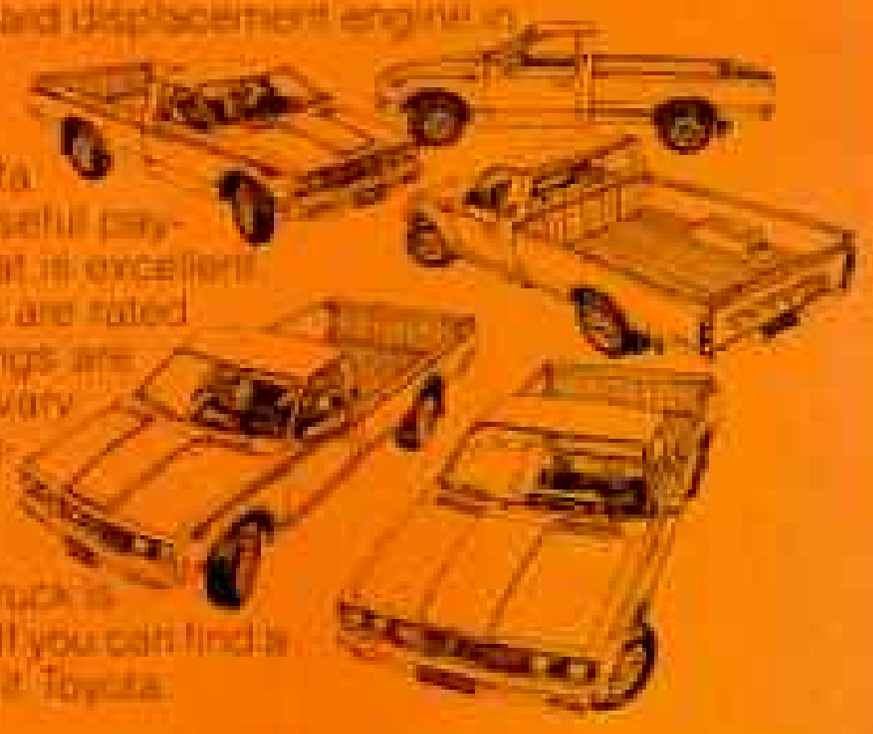
YOU HAULERS.

Tough Toyota Trucks! Five different models built for the long haul. Standards. Long Beds. Sport Trucks. Each offers the driving fun you thought you could only get in a sports car. Each offers a long list of standard equipment, and a durable base for the loads of personal options and accessories available for Toyota Trucks. There're lots of ways for you to go with a Toyota.

The SR-5 Sport Truck recaptures sports car fun. The interior features hi-back bucket seats, tinted glass, wall-to-wall carpeting, and a smooth shifting, 5-speed overdrive transmission. The suspension geometry has been redesigned for a more "car-like" ride without sacrificing truck utility. Performance is crowned by a 2.2 liter, single overhead cam power plant — the largest standard displacement engine in its class. In a Toyota Truck you can really "haul."

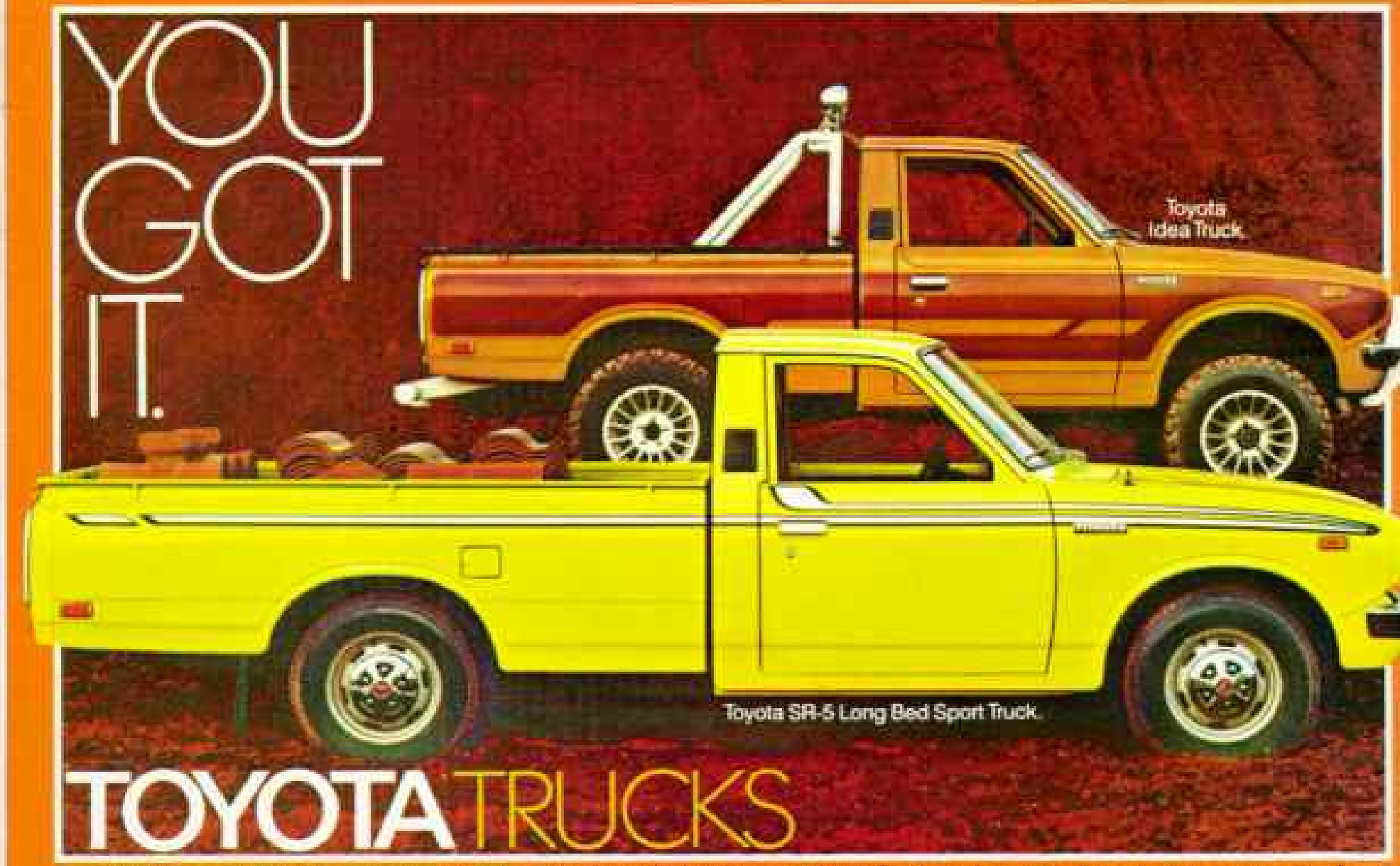
EPA 34 HWY 24 CITY

More practical than a sports car. The Toyota Long Bed Truck has a bed over 7' long, a useful payload of 1100 pounds, and gas economy that is excellent. All Toyota trucks with manual transmissions are rated at 34 mpg highway, 24 city. These EPA ratings are estimates. The actual mileage you get will vary depending on your driving habits and your truck's condition and equipment. California and EPA designated high altitude ratings will be lower.



Find "yourself" in a Toyota Truck. Everything you've been looking for in a truck is in a Toyota. Choice. Trick equipment. Economy. Durability. That's why we say, "If you can find a better pick-up truck than a Toyota ... buy it." You asked for it. "You" haul it. You got it. Toyota.

YOU GOT IT.



TOYOTA TRUCKS

Toyota Idea Truck. Shown with some optional equipment not manufactured or warranted by Toyota, but available through other sources. Your Toyota dealer can help you with your own Toyota Idea Truck.

The Krementz Collection in 14-Karat Gold Overlay. Superbly hand-crafted. Subtle, tasteful and exclusive designs. All of the rich beauty and wearing quality of the world's finest gold jewelry. Guaranteed by Krementz to last a lifetime. Krementz ladies' and men's jewelry is available in the nation's finest stores.

LEFT TO RIGHT: Butterfly Nothing Necklace $13.50, Coral Heart Nothing Necklace $20.00, Forget-Me-Not Pendant $27.50, Butterfly Brooch $22.50, Rose Pendant $15.00, Rose Bracelet $60.00, Mosaic Opal Pendant $40.00, Opal Bracelet $115.00, Neckchain $17.00, Mosaic Opal Earrings $50.00 (for pierced ears only). In fine leatherette gift cases.

Write Krementz & Co., 43 Chestnut St., Newark, N.J. 07101 for free copy of "Unique—The Story of Krementz Gold Overlay Jewelry."

The unique on-camera microphone.

Just one of the many sound reasons to give a Kodak Ektasound movie camera.

If you want to save family memories, give your family a Kodak Ektasound movie camera. It's so easy to use. Just drop in a cartridge of film, aim, and shoot.

The microphone's right on the handle, so you're free to move around without thinking about cords or microphone placement.

And the Kodak Ektasound movie camera takes colorful super 8 sound movies in any light, without movie lights.

There's also automatic exposure control, a sound monitor to hear what the camera is hearing—both before and during use, and most models come with a zoom lens.

Visit your photo dealer's soon. And wrap up a Kodak Ektasound movie camera.

For a free pamphlet "Sound Movies," write to EASTMAN KODAK COMPANY, Dept. 841, Rochester, N.Y. 14650. Please include a self-addressed #10 envelope, and write AD 1H on the outside. No return postage necessary.

Kodak Ektasound movie cameras

Kodak gifts say: "Open me first"
...to save Christmas in pictures.

In North Clarendon, Vermont, there are 450 people, and one Honda Dealer.

And because there's a Honda Dealer in North Clarendon, Vermont, there are a lot of Hondas in North Clarendon.

In fact, that's why you'll find a good many Hondas in towns like Ellicott City, Maryland with a population of 2,000. In McCook, Nebraska with a population of 8,300. Hurley, Wisconsin where 2,400 people live. There's a Honda Dealer in Dunbar, Pennsylvania with a population of 1,500.

The point is, there are Honda Dealers in small towns, big towns, medium-sized towns. All kinds of towns throughout the country.

And, as we continue to grow, we'll have even more dealers in even more towns.

And all of our dealers are stocked with genuine Honda parts and accessories.

But even the best parts department can't always have every part you might want. So we have a computer that keeps track of every single Honda part that we have in the United States. And it can find a part with the speed of light.

So what it all boils down to is simply this: There are Honda Dealers all across the country. And they're there for one simple reason. To take care of your Honda.

That's why they're Honda Dealers.

HONDA

What the world is coming to.


HONDA
HONDA
CVCC
D26-741

Rowan and Martin explain how the GE Weathertron® Heat Pump can cut your bill for ordinary electric heat 30-60%.*

1. **Dan:** The General Electric Weathertron heats your home in the winter, cools it in the summer.
Dick: Like a furnace and an air conditioner in one.

2. **Dan:** Even on cold days, there's heat in the outside air. The Weathertron extracts this heat and pumps it into the house. Very often, that's all it takes to heat a house.
Dick: And no gas or oil shortage to worry about.

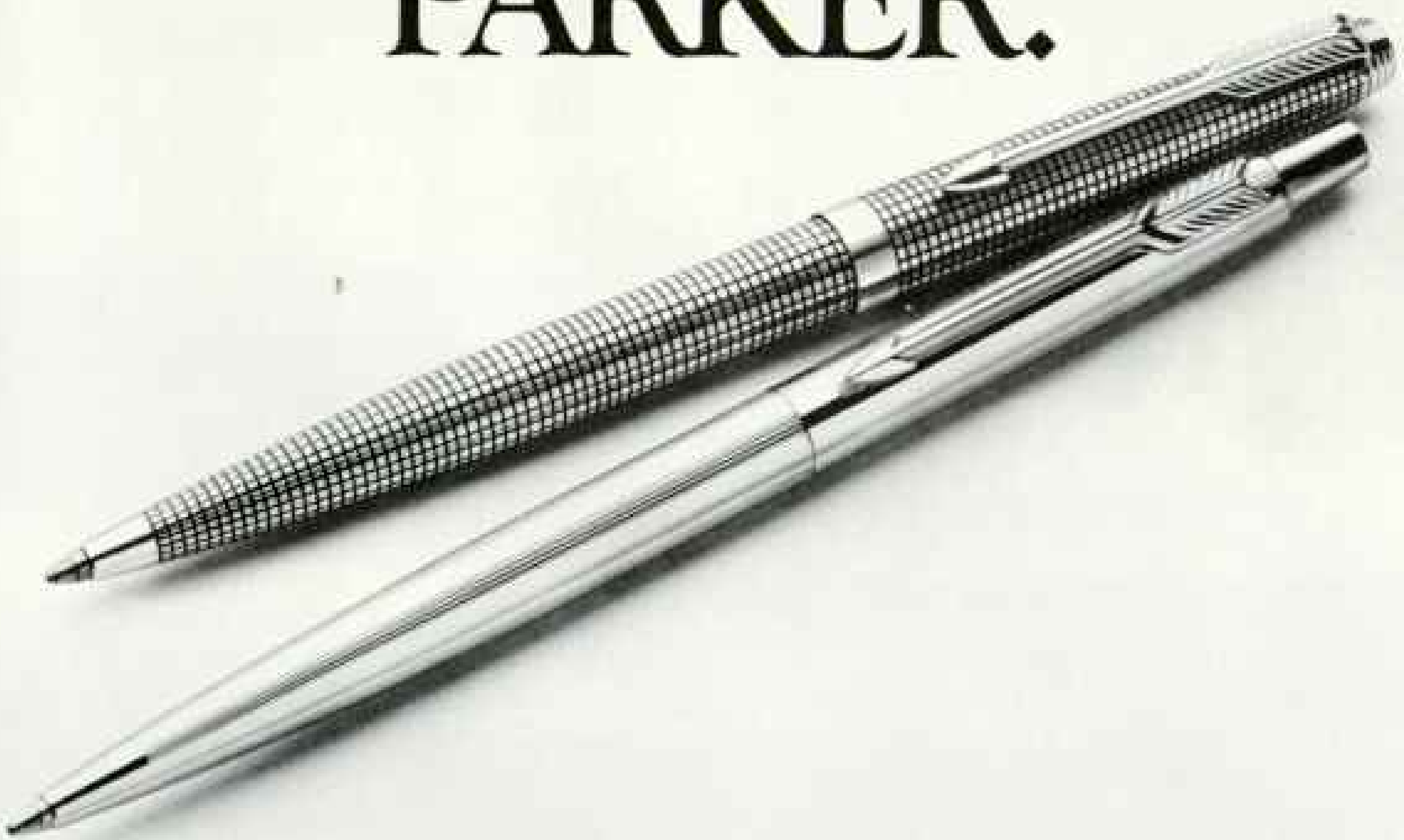
3. **Dan:** Then in the summer, it works in reverse—it's an air conditioner—pumps heat from inside the house to the outside.
Dick: Keeps you comfortable all year round.

4. **Dan:** *Saves you 30-60% on your heating bill—compared to ordinary electric heating, depending on where you live.
Dick: Makes perfect sense to me.

For more information, write to General Electric, Appliance Park, Bldg. 4, Room 206A, Louisville, Ky. 40225.

GENERAL ELECTRIC

THERE ARE PENS.
THEN THERE IS
PARKER.

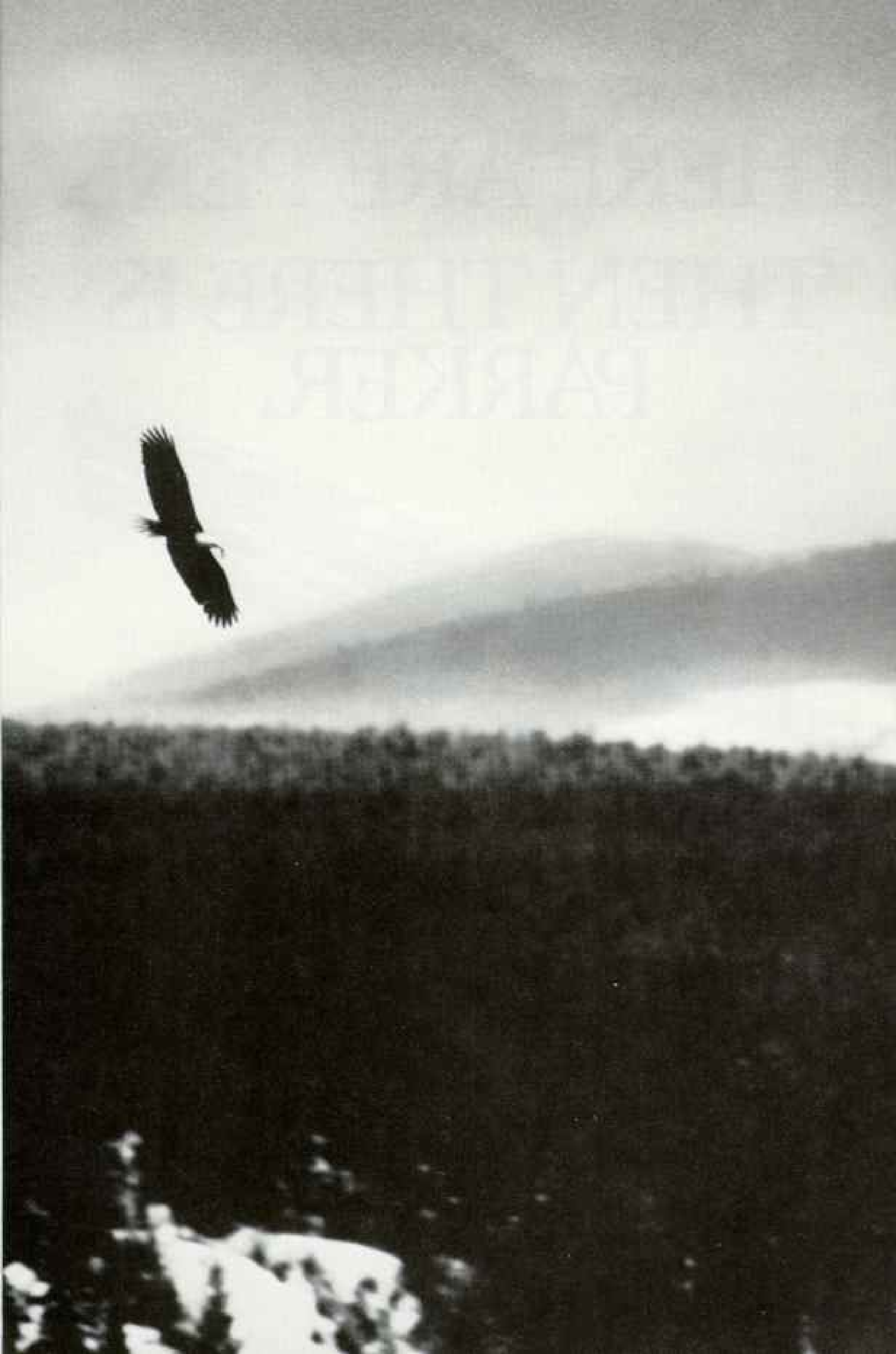


We make a writing instrument that does more than just write. Any pen will put a mark on paper. Only a Parker says so much about you, from the fine precise line it sets down to its distinctive look in hand. But, of course, a Parker ball pen *does* write. Smoothly. Effortlessly. Up to 80,000 words —a full year of writing—on one refill.

The slim Parker Classic in 22K gold electroplate, $13.50.
Substantial Parker 75 in solid sterling silver, $22.50.
Matching gift pencils.

There are pens. Then there is Parker.

PARKER
World's most wanted pens



Did we dream too fast?

Progress too eagerly sought can compromise our most important standards: Pride. Honor. Honesty. Standards so delicately wrought that once tampered with can become, like the eagle, in danger of extinction.

At Whirlpool we believe, like many other companies, that these standards must be maintained. We believe it strongly and we're dedicated to the idea.

We start with pride. Pride in our craftsmanship. It's represented in every appliance we make. Or we simply don't make it.

Of equal importance, we believe that making a sale is only the beginning of a relationship. Not the end of one.

Our warranty, for instance, is worded in very understandable language. We do this because a warranty is a promise. A promise that must be stated so clearly that you're confident in it. Not confused by it.

We have a toll free telephone service called Cool-Line® service. Its only function is to help you with any problem or question you might have. Just try it: (800) 253-1301. In Michigan (800) 632-2243. You'll see.

We have a nationwide franchised service organization known as Tech-Care® service. It's not so much an organization as it is a lot of good people, well-trained and quite willing to come to you when you need them. They're right in the Yellow Pages.

We realize that by doing these things we're not going to change the world. But we'd like to think of it as a beginning. A beginning that might help us to realize our dreams without forgetting our standards.

Whirlpool
CORPORATION

INTRODUCING A FIENDISHLY SEDUCTIVE NEW LUXURY WAGON. THE 1978 DODGE DIPLOMAT.

Most people will buy the Dodge Diplomat wagon for all the luxury it offers. And, later, end up patting themselves on the back because it made a lot of sense, too.

Happens all the time. Because Diplomat is every inch a luxury wagon. With clean, contemporary lines. Teak applique on the side. Gleamy deluxe wheel covers. Inside, there's a thickly padded split-back bench seat that has a fold-down center armrest.

And you can order wire wheel covers. Or genuine leather seating. Or a digital AM/FM stereo radio with electronic station-seeking . . . and a power antenna.

Diplomat also has the wagon features that'll make a buyer look . . . well, smart. Power front disc brakes. Power steering. Radial tires.

Another thing. While this is a manageably sized wagon on the outside, there is surprising people room and cargo room on the inside.

We invite you to compare the 1978 Dodge Diplomat wagon with anything else around. For luxury. For features. For comfort. For operation. We're sure you'll end up buying or leasing one. From your Dodge Dealer.

Dodge

"Most of our roads need immediate work."

One looks at America's freeways and marvels. But another talks secondary roads: many outdated, in disrepair. Which reflects reality?

We have 3.8 million miles of roads. Almost two million miles paved. 37,000 miles are wide, sweeping Interstate Highways joining 42 state capitals, 90% of all towns over 50,000 people, carrying 20% of our traffic. Urban freeways speed traffic into and around cities. Highway fatality rate on our interstates is about half other roads. Many expressways are beautifully landscaped, such a pleasure to travel, you're tempted to conclude: "America's roads are great. The work is finished!"

Driving secondary roads and city streets is another matter. Most were built generations ago. Many are narrow, broken-up, patched, repatched, crossing antiquated bridges, and unguarded tracks. Hosting 13.5 million accidents yearly. Years behind today's needs. 60% in need of modernization or repair. Travel these roads and you say, "Our roads are in bad shape!"

Truth is, we have an excellent road system. But roads wear out with age and use. Some Interstate Highway miles are 20 years old. They need maintenance, repair. Older secondary roads are in worse shape. The total repair and maintenance will take over $200 billion according to the Department of Transportation. Every delay increases the cost in terms of vehicle damage, higher construction cost later on and inefficient transportation. Near 90% of America's intercity passenger travel is by road. We must be willing to fund a national policy that gives priority to maintaining that important national asset.

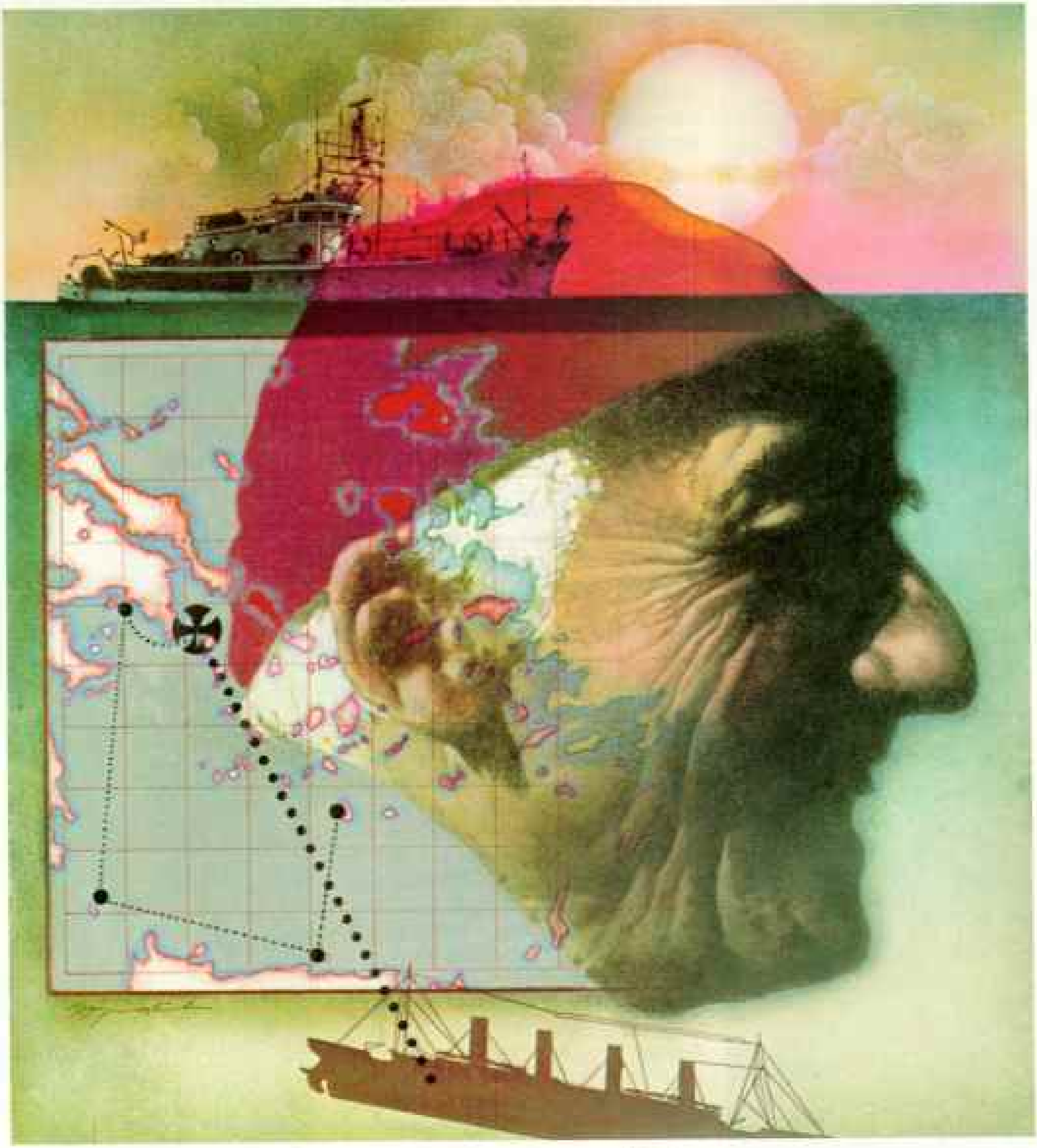
Caterpillar machines and engines are used to build and maintain roads and to power trucks. We believe America needs an efficient, total transportation system.

There are no simple solutions. Only intelligent choices.

CATERPILLAR

Caterpillar, Cat and ⊠ are Trademarks of Caterpillar Tractor Co.

"We have the world's best highway system."



The Cousteau Odyssey

Jacques Cousteau's life is a history of adventure, excitement, and mystery.

But none of his many expeditions has ever been as unique as the new one Cousteau embarks on this year aboard Calypso.

"The Cousteau Odyssey."

Four hour-long specials begin on November 22nd with "Calypso's Search for the Britannic."

Cousteau and Britannic survivor, eighty-six year old Sheila MacBeth Mitchell, return to the sunken luxury liner to find the reason for its disaster.

Early next year, "The Cousteau Odyssey" in two hour specials explores a new theory about a lost civilization that has held the imagination of people everywhere.

"Calypso's Search for Atlantis. Parts I and II."

An extraordinary journey that puts the indelible stamp of Cousteau's genius on a legend that is sure to keep inspiring men for all time.

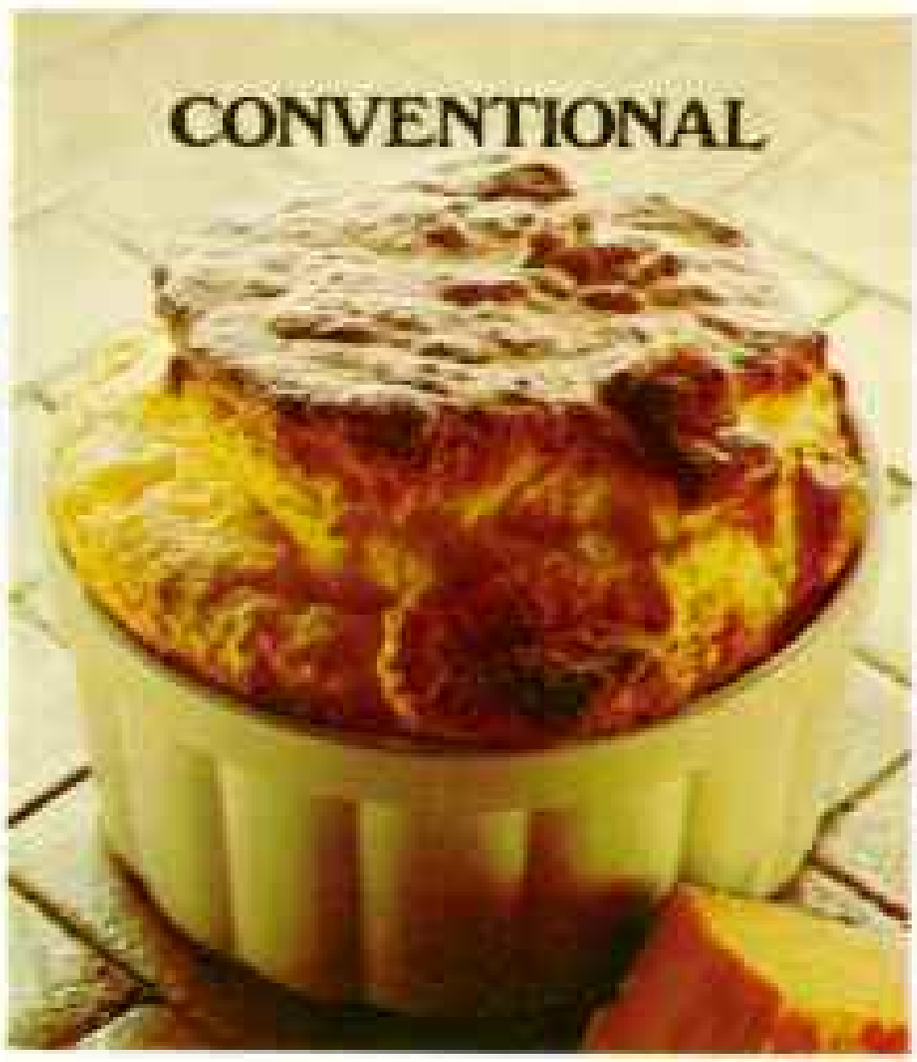
Later, Cousteau's never-ending search to learn from the past takes him to an island buried by a volcanic eruption 200 years before the birth of Christ.

"Diving for Roman Plunder."

A fantastic story of Grecian art treasures stolen by the Romans and recovered from under the sea by Cousteau.

The production of "The Cousteau Odyssey" specials for PBS is made possible by a grant from Atlantic Richfield Company to KCET, Los Angeles, expressly for the funding of the broadcasts. The specials are produced by Captain Cousteau and Philippe Cousteau in association with KCET.

With Litton, you can have your microwave and a range too.



Cook all three ways. In the Litton Combination Microwave Range.

Litton has put microwave cooking inside a range that does everything a conventional range does and more.

It cooks with microwaves. Or conventionally. Or with a combination of both at the same time.

All that in a range that fits into the same 30-inch space your old range does.

It's a microwave oven.

In a hurry? With microwaves you can quickly warm leftovers, vegetables, sauces, snacks and soups. Defrost frozen meats automatically. And save time and energy.

It's a conventional oven.

Bake and broil just like you do in a conventional range.

The Model 651 combination microwave range has a smooth one-piece cooktop, smokeless closed-door broiling and a self-cleaning oven system that removes even the toughest baked-on stains. All designed to make cooking and cleaning up easier.

It's a combination of both.

So you can cook with microwaves and conventionally at the same time.

It's a better way to cook.

Microwaves penetrate the food quickly to seal in flavor and juiciness while baking and broiling brown in crispness.

You get better taste in one-half the time of conventional cooking alone. Crunchier topped creamy casseroles. Juicier roasts and poultry. And lighter breads and desserts. Even a complete meal can be cooked in just 30 minutes.

You'd expect it from Litton.

The Litton combination microwave range is another innovative way Litton is changing the way America cooks. But that's what you've come to expect from the entire line of Litton countertop microwave ovens, combination and double-oven microwave ranges.

Ask your Litton dealer to demonstrate it for you. For his name and address call us, right now, toll free **800-328-7777.** In Minnesota call **612-553-2354.**

LITTON
Microwave Cooking

Litton... changing the way America Cooks.

Delta is an air line run by professionals. Like Walter Doll. He has been with Delta for 15 years, the last 5 as an FAA-licensed Flight Superintendent. Walter supervises up to 40 flights a day over the Delta system.

He also coordinates scheduling of crews and aircraft. If there's a problem, he switches planes and crews around to get that Delta flight off on time. So those passengers can get where they're going on time.

When it comes to people, Walter Doll–like all 29,000 Delta professionals–couldn't care more.

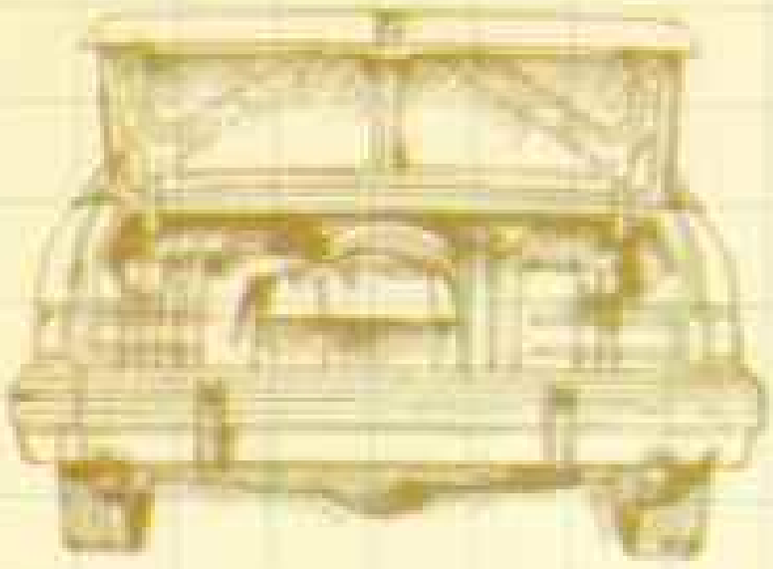
Delta is ready when you are.

This is Delta's Wide-Body® L-1011 TriStar, a $25 million superjet. The "living room" cabins are 8 feet high, almost 19 feet wide.

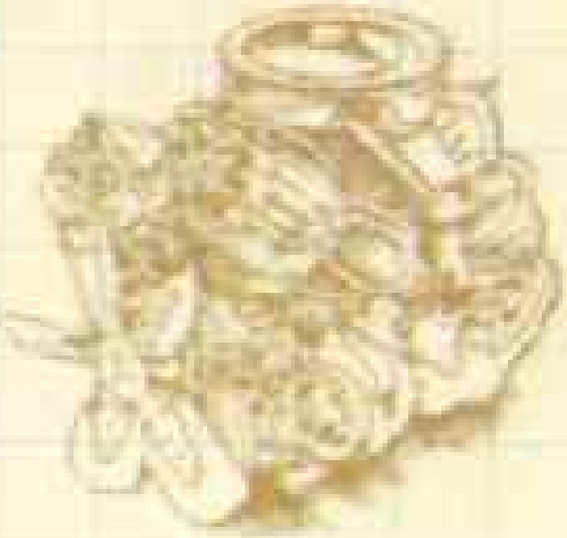
The right way to design a family car is to begin with the family.

Oldsmobile Delta 88. The car that puts first things first.

The 88 trunk is designed to pack in what your family can pack in.



The 88 makes economical as well as mechanical sense with excellent mileage for a family-size car.



Generous headroom and legroom in back mean a comfortable, enjoyable ride. For everyone.

GM

It goes without saying that cars are built for people. But Oldsmobile decided you get a much happier set of results when, instead of building for people, you build around them.

That's the idea of the Olds Delta 88: your family first.

Your family prefers sitting stretched out to sitting scrunched up. So try our head and legroom up front and in back. Olds 88 has always meant "roomy car", and our 88s for '78 keep the faith.

Your family needs a trunk that really packs it in. The new Olds Delta 88 gives you 20 cubic feet of trunk space.

When you and your family hit the road, you don't want to feel it. Computers helped us to select the proper combination of springs and shock-absorption rates, to help cradle all of you on the roads you drive.

And you don't want our car free-wheeling with your money. Delta 88 puts fuel to work and keeps it there. 25 mpg in highway tests, 17 in the city, 20 combined, according to EPA estimates with standard 231 V6 engine and automatic transmission. Your mileage depends on how you drive, your car's condition, and its equipment. (EPA estimates in California are lower.) The Delta 88 is equipped with GM-built engines produced by various divisions. See your dealer for details.

Oldsmobile Delta 88. The family car we build by beginning with the family.

Oldsmobile

Delta 88

Can we build one for you?