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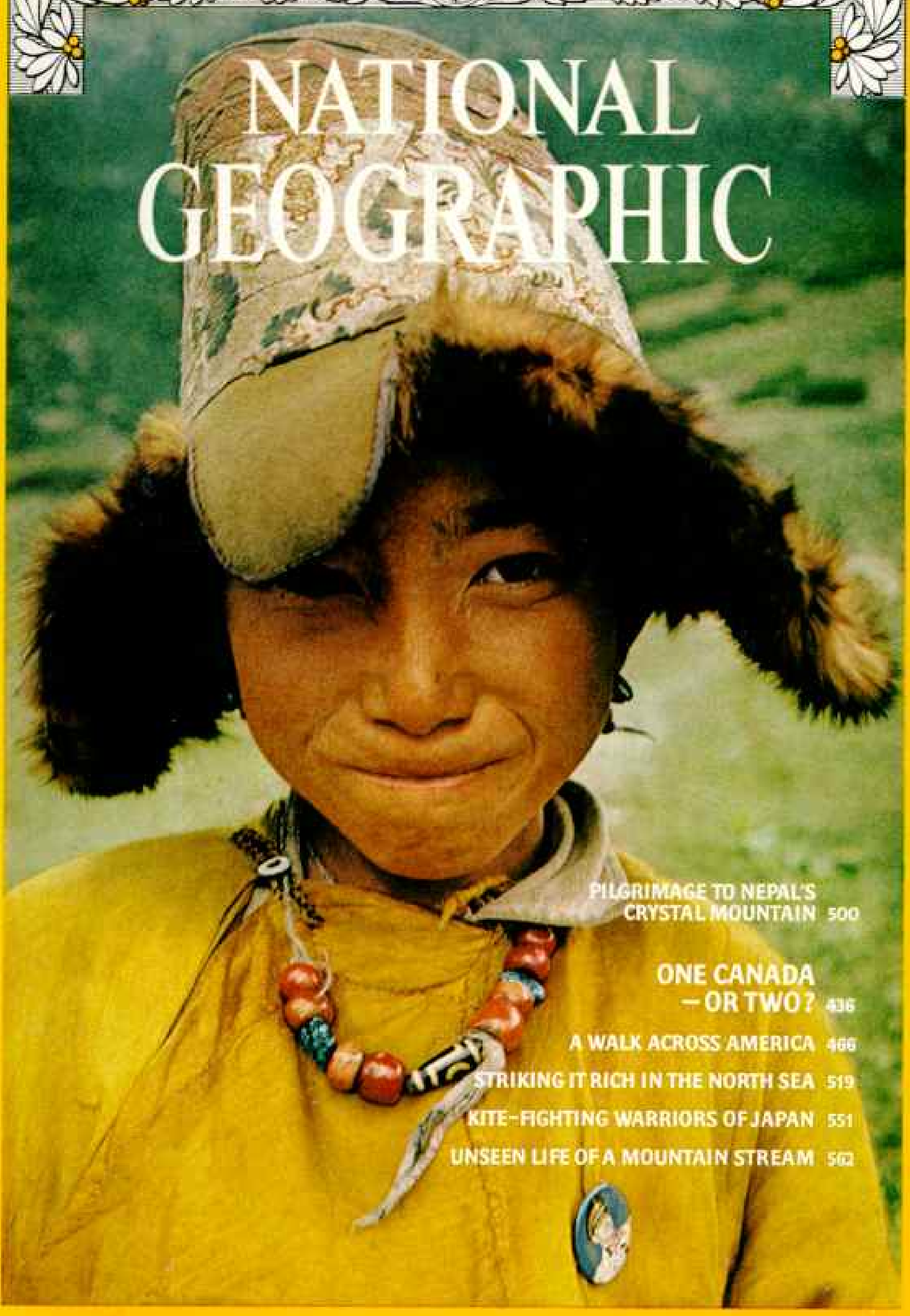
NATIONAL GEOGRAPHIC



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

THE WORDS that came out of Canada were startling. "I'm letting people know," said Prime Minister Pierre Elliott Trudeau, "that they shouldn't count on me to keep Quebec in by force of arms if Quebec overwhelmingly decides that it doesn't want to be a [part of] Canada."

I have always thought of myself as part Canadian. Six generations of my family have had a cherished relationship with the beautiful land of Nova Scotia. So I was deeply shocked by that phrase "force of arms." Is it possible that our good neighbor to the north will come apart, as the United States once did? What is behind the movement in Quebec to separate and form an independent nation?

The Confederation of Canada came into being two years after the close of the terrible Civil War that rent the United States. It marked a practical political marriage of many diverse interests, including those of the pioneering settlers of Canada, the French of Quebec. Though conquered by British troops a century earlier, these French had retained their Roman Catholic faith, their language, and their identity as a people. But over the years, many of them came to feel that they were political and economic underdogs. That resentment undoubtedly played a role in the recent victory in Quebec Province of the Parti Québécois, pledged to pursue independence for the province. Thus a problem of the first political magnitude has been posed.

Perhaps the people of the United States have taken Canada too much for granted for too long a time. But to those who regularly travel that magnificent country, such as our own National Geographic writers and photographers, the signs of change and discontent were evident years ago.

Peter White and Winfield Parks were assigned to report on Quebec and its people. I think you will find the result of their work as fascinating as I did. It explains much, and it introduces you to people of goodwill and reason who are striving to find a solution to a profound social and ethnic dilemma.

All of us wish Canada well. We pray that the day will never come when a Canadian Prime Minister must decide, as Abraham Lincoln had to do, whether to preserve a country by force of arms.

Gilbert M. Grosvenor

NATIONAL GEOGRAPHIC

THE NATIONAL GEOGRAPHIC MAGAZINE, VOL. 151, NO. 4

April 1977

COVER: *Official portrait of Nepal's King decorates the saffron jacket of a young Buddhist of remote Dolpo (pages 500-517). Photograph by Joel F. Ziskin.*

One Canada—or Two?

By PETER T. WHITE Photographs by WINFIELD PARKS

BOTH NATIONAL GEOGRAPHIC STAFF

His expression declares a Gallic heritage. Tobacco farmer Gérard Ricard, pausing during harvest north of Montreal, speaks French—mother tongue of one in every four Canadians. Most of the French speakers, or Francophones, cluster in Quebec, Canada's second most populous province. With the victory of the Parti Québécois late in 1976, French Canadians may be closer than ever to forming their own nation.

TO MOST PEOPLE in that northeastern corner of North America—in Canada's Province of Quebec, where the mother tongue of four out of five is French—Guy Lafleur is a very special hero. He plays right wing for the Montreal Canadiens hockey team, which once again has clinched the Stanley Cup. The nineteenth time! As the traditional victory parade creeps past hundreds of thousands, men swear with admiration. Women want to kiss him.

"Not just because he's the scoring champion of the National Hockey League," a sportswriter tells me. "For many years French Canadians have felt treated as second-class citizens. When Lafleur scores, they feel they have scored too."

Another special hero is Gilles Vigneault (pages 448-9). He writes poems and songs, and he sings—of hardy people he knew in his fishing village, of long snowy winters and the simple ways of the past. Of native riches—iron ore and pulpwood—going cheap to outsiders. And of *mon pays*, "my homeland," "my country." He doesn't mean Canada. He means Quebec.

Thousands listen or sing along in theaters and crowded clubs, before TV sets or under open skies. "We love him," I am told. "He expresses what's in our hearts."

Evidently something powerful is astir in this land that is home to five out of six million French Canadians (map, page 440). Fewer and fewer here call themselves that; more and more say they're Québécois (Kay-bay-KWAH). It's not the provincial assembly anymore, it's l'Assemblée Nationale. By its law, French is now the official language of Quebec.

Robert Bourassa, while Prime Minister of Quebec, coined the phrase "cultural sovereignty." His newly elected successor, René Lévesque (page 441), is pledged to go further. He sees a definite possibility of separation from Canada, and a fully independent Quebec—perhaps before the end of this decade.

Who are these self-assertive Francophones, as they are called in distinction to the English speakers, or Anglophones? What is this culture they are so determined to defend? And why do many of them wish to go all the way to independence, which would tear the Confederation of Canada apart? During numerous trips to Quebec in the past two years I found many eager to explain.

"My ancestors came here from Brittany before the Pilgrims came to Plymouth Rock," said Philippe de Gaspé Beaubien in Montreal. "They came to perpetuate a way of life and spread the gospel to the Indians. They also liked beaver skins, of course, and made money selling them in Europe."

A parchment on his living-room wall attests to a grant of acreage along the majestic St. Lawrence, in the heart of New France. By authority of Louis XIV, the Most Christian King—meaning most Catholic.

Mr. Beaubien said his family has been in business for more than three hundred years, but not just for business' sake. "Grandfather built a brewery and sold it, to enjoy life. My uncles built a bank, a biscuit factory, a brokerage house. They sold them and are still enjoying life. Salmon fishing and whatnot. . . ."

It's a theme you hear often: We are the heirs of the earliest European settlers, we didn't come to lose our identity in some melting pot, and we like to have *fun*. That noun, by the way, has become part of the Quebec culture. My French-Canadian dictionary spells it both *fun* and *fonne*.

Mr. Beaubien studied at Harvard. He owns 14 radio and TV stations, and does not want to cut Quebec off from Canada. "I consider all Canada my country. But I understand those who want to cut us off and isolate us—their desire for independence, for a life in which one's identity isn't threatened every day. They've been underdogs so long. . . ."

That's another recurrent Quebec theme: The Anglophone minority has been the boss, while Francophones, on the whole, are low on the socioeconomic scale. A massive federal

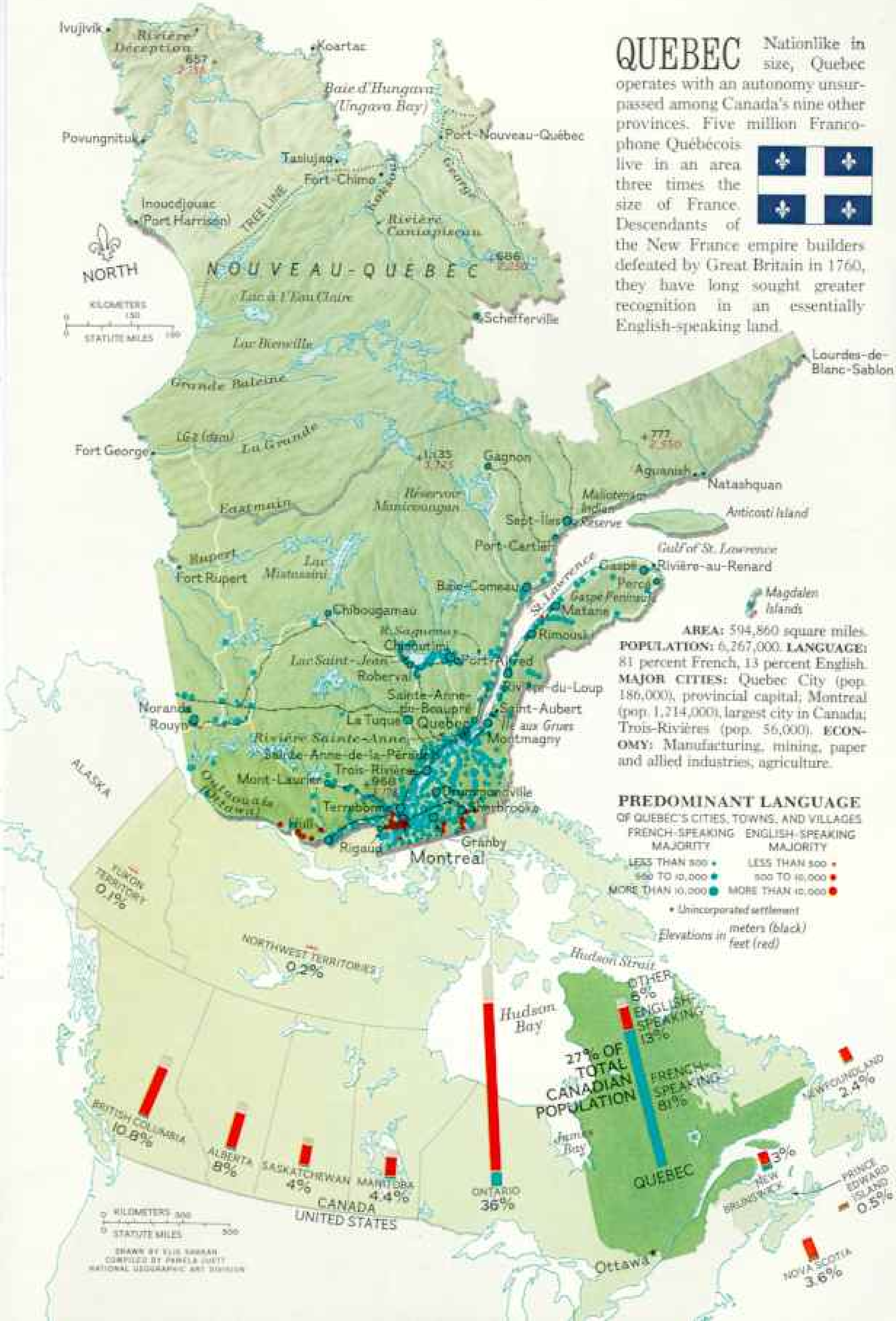
Sign of the times: Paint sprayed by Francophones blots English from a bilingual stop sign in front of a church in Sainte-Anne-de-la-Pérade. Bilingual labels, initiated to ease language tensions, satisfy neither English- nor French-speaking Canadians. Both prefer their own language exclusively. French culture, which once rallied around the Roman Catholic Church and rural life, has survived today's urbanization and weakening of religious influence. Calls for independence continue to mount.


ARRÊT

QUEBEC

Nationlike in size, Quebec operates with an autonomy unsurpassed among Canada's nine other provinces. Five million Francophone Québécois live in an area three times the size of France. Descendants of the New France empire builders defeated by Great Britain in 1760, they have long sought greater recognition in an essentially English-speaking land.

AREA: 594,860 square miles. **POPULATION:** 6,267,000. **LANGUAGE:** 81 percent French, 13 percent English. **MAJOR CITIES:** Quebec City (pop. 186,000), provincial capital; Montreal (pop 1,214,000), largest city in Canada; Trois-Rivières (pop. 56,000). **ECONOMY:** Manufacturing, mining, paper and allied industries, agriculture.



inquiry bore that out: Anglophones dominate the Quebec economy; Francophones who want to get somewhere in business or industry had better adopt Anglophone ways.

It's been like that since Britain conquered New France in 1760, says historian Robert-Lionel Séguin. "To keep those 60,000 Francophone Canadiens quiet, the British pledged to let them retain their religion and French civil law. They expected them to be swamped by Anglophone immigration."

But no. A century later, when Britain created the Confederation of Canada, Francophones were still overwhelmingly in the majority in Quebec Province. "Thanks mainly to a phenomenal birthrate," says Professor Séguin. "By 1867 there were a million."

There had been unrest in Quebec, and a bloody uprising of *les Patriotes* in 1837. To make the Confederation more palatable to Quebec, French was made an official language in the new federal Parliament in Ottawa. Education remained in provincial hands, hence church-run schools have helped the French language to survive.

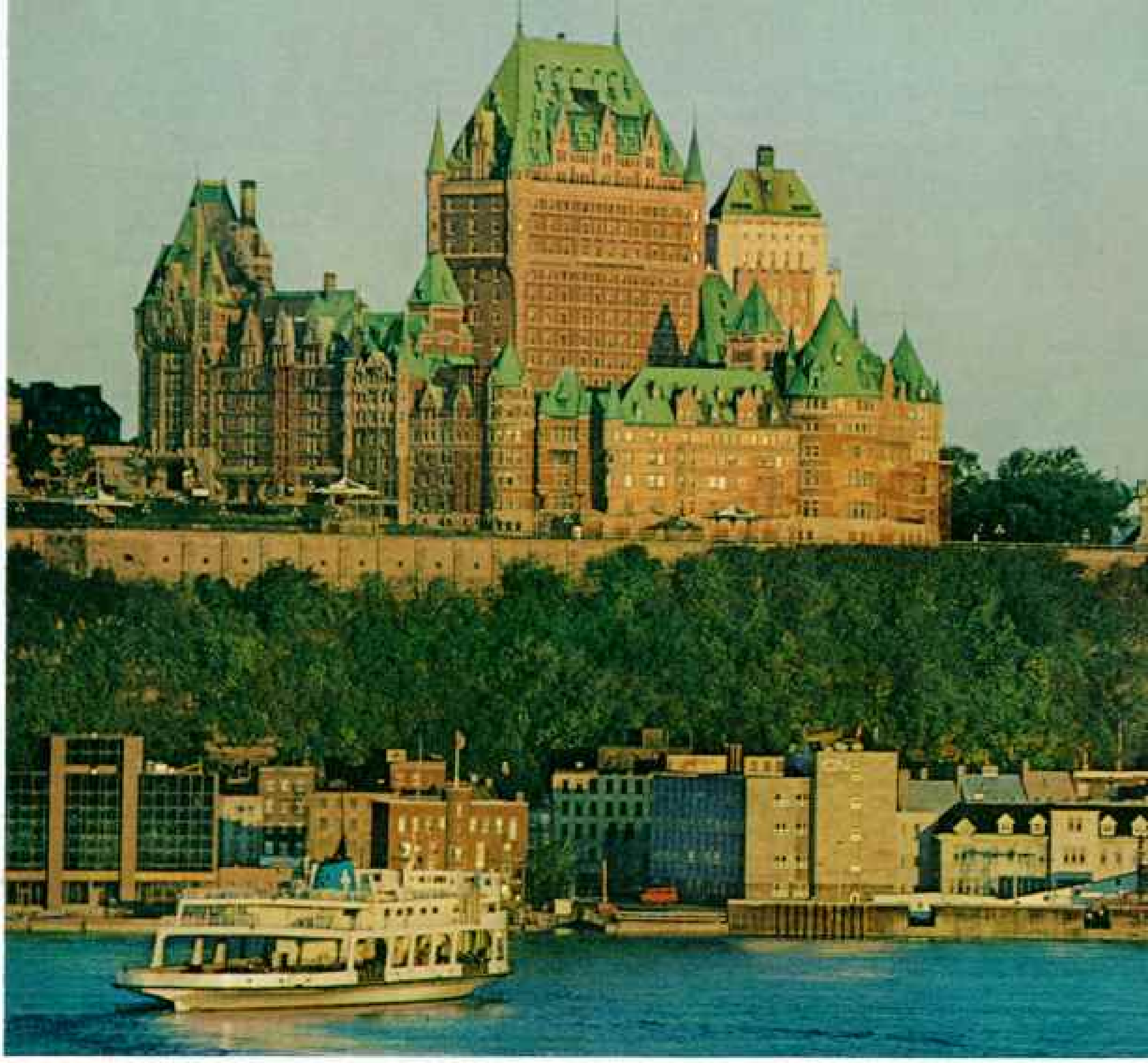
To this day, many in Quebec tend to think of themselves as a *nation*, as a distinct people whose interests may not be identical with Canadian interests. In World War II, so a senior Quebec civil servant told me, nearly everyone had a cousin or two who were hiding in the woods to escape military conscription. "They got food from everyone. Police going after them got shot at." It was a major Canadian crisis in 1942.

PIERRE ELLIOTT TRUDEAU, a Quebec Francophone, became federal Prime Minister nine years ago, aiming to hold the Confederation together; separatist terrorists had been throwing bombs. Seeking to mollify Quebec and to make French Canadians feel more at home in all Canada, Parliament voted for bilingualism—to make federal services available in both languages across the continent.

To make the predominantly Anglophone civil service work in both languages, thousands of federal officials have had to take as much as a year off to study French lest their advancement be blocked. Many say they don't like it—bilingualism goes too far. As I learned soon enough, many Québécois don't like it either. For them it doesn't go far enough.

TOM HOLLYER, LIAISON

Standard-bearer of Quebec sovereignty, René Lévesque is surrounded by supporters and the press after the victory last November of his Parti Québécois. Fiery but level-headed, the former Liberal cabinet minister formed this party of independence in 1968. Separation, he now says, will come only if approved by referendum.



Split-level capital of Quebec presents a layer cake of history. Latecomer to Quebec City's skyline, the copper-roofed 85-year-old hotel Château Frontenac (**above**) commands the high ground above the St. Lawrence. In Lower Town at water's edge, 17th- and 18th-century stone houses are being restored, and will remain a living community.

The years roll back further beneath Place Royale (**right**), where archeologists have unearthed a fortification built by explorer Samuel de Champlain, who settled here in 1608. A nearby privy yielded swords and wine bottles (**left**).

PROFESSOR SÉGUIN studies Quebec folk civilization and keeps hundreds of antique artifacts close to his house in Rigaud. I wander among his sugar molds, plows, sleds, windmills, and relocated barns. They reflect the influence of northwestern France, of Picardy, Normandy, Poitou. By late 18th century, there's British influence; by mid-19th, American. Fascinating!

"It's folklore, the past, good for students and museums," he says. "Our living culture is our kitchen, how we eat and drink. Our Latin temperament and the chic of our women. Our popular singers, our films and theater. . . ."

Above all, he says, it's the language.

"That's not a jewel, to put on occasionally, but a tool for daily life, in school, in the factory and the office, in the street, everywhere. Without my language I cannot feel at home. If I go to Bordeaux or Geneva, I feel at home; in every part of Quebec I'm at home—but only a few miles from here . . . I'll show you."

We drive past spring-green meadows along the Rivière Rigaud. In a few minutes we stop in the village of Saint-Eugène in the neighboring Province of Ontario. "Practically all are Francophones here," says Professor Séguin, "but you notice all the English signs?"

I do. Rolland Diotte, "General Merchant." Leo Binette, "TV Dealer."

"If the police here stop a Francophone and speak to him in English, he must reply in English. They *might* speak to him in French —and he'll be grateful, that's bilingualism. To him it's a victory. But in Quebec I *must* be addressed in French. So to me bilingualism is a defeat. You understand?"

I don't. He sighs. "We Québécois don't think and act like other French-speaking people in North America. They are minorities. They must get along in English; eventually they will be absorbed. We think and act as a majority. That makes all the difference. A minority thinks you can share a country. But to me, my country is like my wife, I don't want to share her! The trouble is we are still colonized, politically and economically."

He adds what amounts to the separatist credo: "Only independence can give us mastery of our economy, which today is necessary for cultural survival."

Quebec represents a sixth of Canada in area, a fourth in population. If Quebec separates, what happens to the rest? A student

tells me: "Look, if my sister breaks a leg, I'll run to take care of her. If some lady in Toronto has trouble, I'll be sorry to hear it, but it's not my affair."

Such Francophone feelings in Quebec find a counterpoint in the other nine provinces. Resentment against federal regulations to implement bilingualism has been rising in the east, in New Brunswick, where English speakers outnumber French 2 to 1. And even more in the west, in Alberta where it's 27 to 1, and in British Columbia where it's 48 to 1.

Says a Vancouver shopkeeper, "Why should we have to see French on every beer can and cereal box, when those Quebec fanatics are turning to unilingualism?" As a widely reprinted editorial put it, "Go suck a lemon, Quebec, or better still, give me a divorce. . . ."

Prime Minister Trudeau calls it tragic. He warns of real danger that Canada will break up over French-English antagonism.

ENOUGH OF FRICTION for a while; I'll look into the Quebec penchant for having fun. There are carnivals and festivals dedicated to song, the arts, and sports. To cod and herring. To strawberries and apple cider.

"We have 230 festivals, in fact, the year round," says the secretary-general of the government-supported Quebec festivals association. "There are commercial overtones, of course, but there is a cultural basis. We give new value to traditional things."

I've missed the Rouyn-Noranda miners' festival and the shrimp festival at Matane. But happily it's fun week in Roberval on beautiful Lac Saint-Jean, whence the Rivière Saguenay flows to the St. Lawrence.

Swimmers will race twenty-five miles across the lake, but first it's handicraft exhibits and a jazz ballet, bonfires and *pétanque*, a French sort of bowling with fist-size metal balls. Dining tables are set in the street, and there's square dancing in the Quebec *western* style. The *câleur* orders *swignez!* The fiddling is fierce. An old man tells me that's really an old Burgundian song, which says good wine puts you to sleep but love wakes you up again.

In pursuit of good times much thought is given to the stomach. Here's a middle-class recipe for a fun evening in Montreal:

"We start at six with pâté, soup at six-thirty, at eight the meat course. Then a salad, it helps the stomach. By nine, cheese; an hour after that, chocolate cake and a coffee. All along a little wine, good for the digestion."

The speaker is no grizzled gourmet; he's 19. "By eleven o'clock, cognac. And music of course. We now have our own Quebec rock. We talk all night—politics, music, poetry. The girls are highly politicized too. All the kids I know are *indépendantistes*."

As for daily fare in the Quebec tradition, it's pea soup, made with lard; baked *binnes*, meaning "beans," cooked with lard; pork or beef pies; maple-sugar pies, molasses-and-raisin pies. At an old-fashioned New Year's Day feast in the countryside, grandfather's blessing may be followed by an aromatic pie of chicken, hare, partridge, and lard.

After I talked to an antique dealer about the rising prices of old Quebec furniture, he asked me into a back room of his shop, spread newspapers on a table, and put something miraculous into an electric skillet. It was snow goose, shot by himself on the Île aux Grues (pages 452-3). The tenderness of that pinkish tawny flesh, the gravy, the aroma! It was poetry, for the stomach and for the soul. My host rolled me a cigarette of black tobacco. "Let's just say we're civilized."

I STAND in the Place Royale, in the Lower Town area of Quebec City—"the cradle of French civilization in North America," says a government archeologist. He's been excavating where Samuel de Champlain built his first dwelling in 1608 (page 443). Many old houses are already restored, and families are living in them at low rents. "We plan to modernize," he says. "Cobblestones instead of asphalt. We want to show how it was."

In Upper Town looms the old seminary founded by Bishop de Laval, whose diocese

Box seats for the Quebec show: Apartment dwellers indulge in a popular French-Canadian diversion—people-watching from their porches. In the theater of provincial economics, the Québécois also hold a viewers' role. Despite the Francophones' overwhelming numbers, private wealth remains largely in the hands of Anglophones, whose English has traditionally been the language of big business.

spanned half a continent. Men of New France set out to build forts in what is now Indiana, Illinois, and Missouri, all the way south to New Orleans. Across the tourist-thronged square from the gigantic hostelry called Château Frontenac, a diorama with sound and light dramatizes the approach of doom: the British burning their way along the St. Lawrence, taking Quebec City in 1759.

A long day's drive away to the east, along the Baie des Chaleurs at the base of the Gaspé Peninsula, I see a battered hulk: a remnant of one of the ships sent to reinforce the French Army that still hoped to recapture Quebec City in 1760. The convoy met a superior British squadron. It was 56 cannon against 265, and the end of New France.

TODAY the Gaspé coast is an ethnic mosaic, the legacy of French-speaking Acadians evicted from New Brunswick; of Loyalists who fled the newly separated United States;* of Irishmen fleeing famine and religious oppression. Some villages are preponderantly Anglophone. Around Percé, I note in the telephone book, live several families named Vibert. Anglophone or Francophone?

Their common ancestor Peter Vibert came from the island of Jersey four generations ago. Today Clarence Vibert speaks no French. His cousin Andrew Vibert speaks no English; he pronounces his name Veebear.

Andrew's bilingual brother, Normand, explains: "Father, who spoke English, learned French to please mother, who didn't. He named the kids Ruth, Arthur, Edith, Mabel. . . ."

He'd be out fishing for days at a time, or away for weeks in winter, cutting wood. So the mother's language took over at home. It's a classic way of assimilation.

The town of Gaspé itself has changed in the past fifty years from 80 percent Anglophone to 80 percent Francophone. The local bishop tells me a predecessor started it. He established a hospital, a teachers' training school, a seminary—employing hundreds of newcomers, all French speakers.

Young Anglophones find few good jobs in Gaspé nowadays, I am told. "If a girl speaks only passing French, she can sell *patates frites*, but how could she work for a lawyer? She couldn't type a letter without mistakes."

*See "The Loyalists: Americans With a Difference," by Kent Britt, NATIONAL GEOGRAPHIC, April 1975.

Montreal at their feet, window washers scale the 49-story Royal Bank Building. High-rise office buildings attest to the city's prominence as a commercial nerve center. This ethnic mosaic of 1.2 million people includes only 185,000 whose mother tongue is English.

Linguists by law, immigrants unskilled in either English or French attend a class *en français* (**right**). Law 22, passed in 1974, calls for more businesses and classes to be conducted in the language spoken by the majority of Quebec's people.

Pied Piper of nationalism, poet-singer Gilles Vigneault frolics with youngsters in a snowy field near his birthplace, the fishing village of Natashquan. "My country is not a country, it's the winter," he sings in one of his pensive ballads, expressing the French Canadian's sense of cultural apartness.

Anglophones are selling their houses and moving to Ontario. Well-off ones who stay are buddying up to the French.

The name of that Frenchifying bishop, by the way, was François-Xavier Ross.

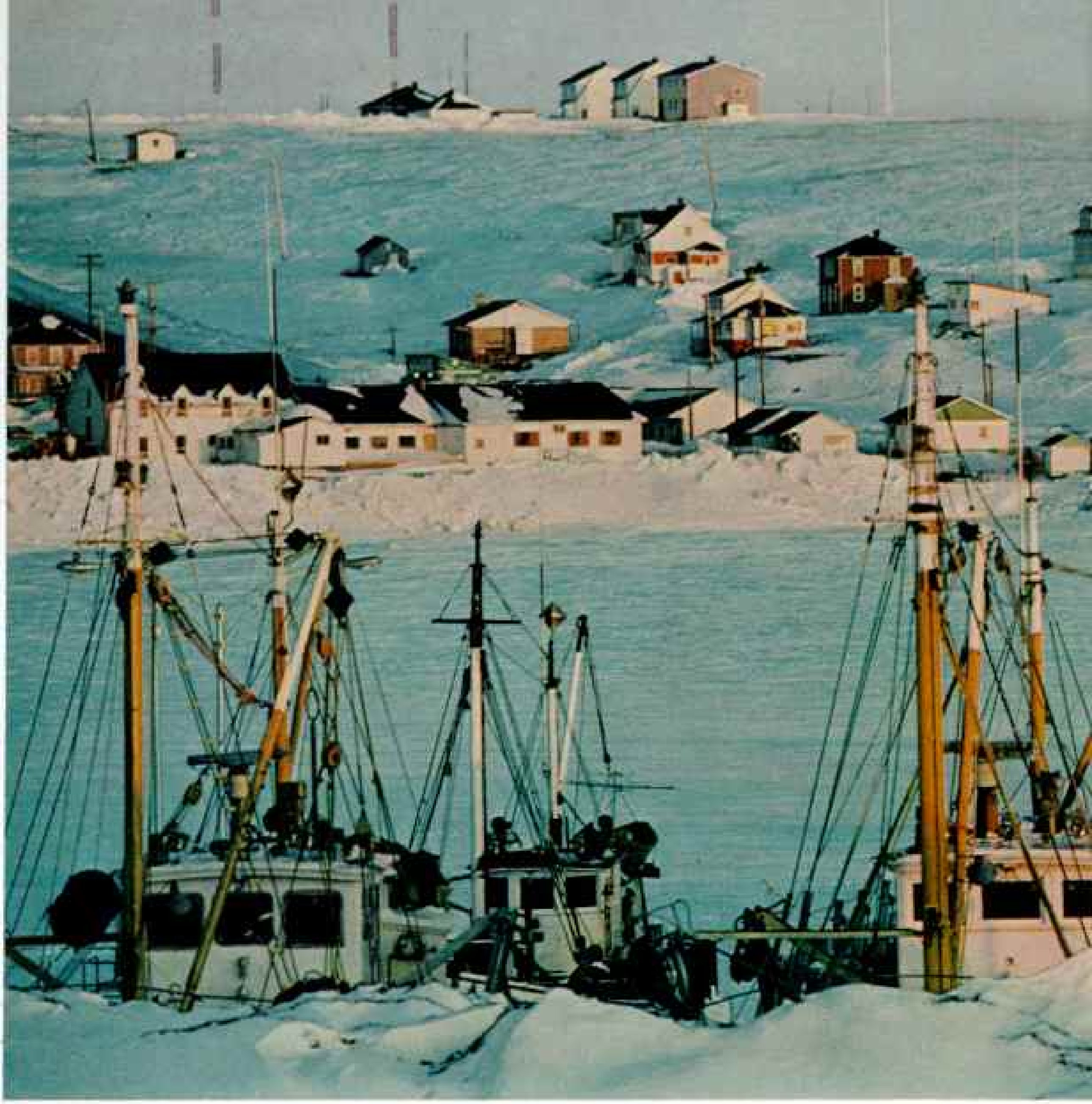
Quebec was long thought of as rural, backward, and poor. Outsiders coming to hunt, or catch trout or salmon, might still get that idea as they pass quiet little villages with big stone churches. In the five or six long

months of snow and ice, a crisp blue day in the open may prompt visions of horse and sleigh. But no, any moment now there'll be the roar of that ubiquitous Quebec product, the snowmobile.

This land, in fact, is highly industrialized. Only one Québécois in five now lives in the countryside. All in all, the standard of living is pretty much up to that of the rest of North America.

Something drastic happened in 1960. The death of an old provincial prime minister had led to the demise of the old order in the province. New leaders now promised rapid transformation of Quebec into a modern state. The so-called Quiet Revolution was on:

Health insurance for everyone. Secularization and vast expansion of education. Reorganization of most of the hydroelectric industry into state-controlled Hydro-Quebec



—and the building of gigantic dams, fostering Francophone pride. An explosion of installment buying, songwriting, painting, and publishing; a proliferation of TV. It amounted to profound social change.

In the pulp-mill town of La Tuque I see a huge convent—for rent. In regional centers such as Chicoutimi and Rimouski, seminaries used to groom the privileged for universities, and the poor but bright for the priesthood. Now these are junior colleges, state administered and open to all, free.

The divorce rate has soared, the birthrate has dropped. The church has lost many practicing members and much of its secular power. Some parish churches depend for revenue on weekly bingo.

"Our fathers came to town from poor farms, looked around in wonderment, and were grateful for factory jobs and weekly pay. Their kids, educated in the cities, are critical of everything. They want to take over." Thus a Quebec City bureaucrat on the newly prevalent attitude of *contestation*, of challenge—the insistent nonacceptance of something one doesn't think is right.

I am mindful of this on the day of the patron saint of Quebec, June 24, the day of St.

Winter-locked in idleness, the village of Rivière-au-Renard on the Gaspé Peninsula (**left**) awaits spring thaw to pursue cod, redfish, and herring. With stocks diminishing, fishing has been overtaken by tourism as a source of income in the Gaspé, a rocky fist thrust into the Gulf of St. Lawrence. Capitalizing on Quebec's deep drifts, snowshoe maker Mrs. Abel Pelletier (**below**) weaves cowhide webbing within a frame of ash at Saint-Aubert on the St. Lawrence.

Jean-Baptiste. At Terrebonne near Montreal I watch a band and floats, the last of them carrying a little boy in sheepskin, the traditional St. John the Baptist, with a big live sheep. Such parades have become rare. Editorials and cartoons deride the sheep as an outdated symbol of Francophone meekness.

The new way to celebrate what the Québécois call their national holiday is to climb the big mountain in Montreal, and along with hundreds of thousands listen to Gilles Vigneault and other beloved singers declaim about *le pays*, "the country." "We don't have one yet of our own," shouts Vigneault, "but we shall. . . ." The thunderous applause is one big happy contestation.

IT IS IN THE EASTERNMOST PART of Quebec, along the windswept northern coast of the Gulf of St. Lawrence, that expectations appear most drastically changed. One used to be very poor and work very hard. An old man tells me he and another villager from Natashquan once caught 12,500 pounds of cod and, with their wives' help, cleaned and salted them—all in 12 days!

Natashquan got electricity in 1958, telephones in '68, *(Continued on page 455)*

AUTUMN'S ARMY: *Hunters on the Île aux Grues head for camp with a day's bag of greater snow geese. Food-rich marshes of the St. Lawrence provide a staging area for many migratory waterfowl on their southward flights. Quebec's abundance of game annually draws more than 12,000 non-Canadian hunters, mostly from the United States.*

A worthy adversary, winter inspires rugged sports among French Canadians. Highlight of Quebec City's Winter Carnival, the ice-canoe race across the St. Lawrence (**right**) began with river-island farmers who relied on the sleek craft to obtain supplies.

Youngsters in a farmyard rink aim at a makeshift hockey goal of scrap wood and grain sacks (**below**); the bilingual label has been required nationwide since March 1976. Quebec ice-hockey teams have won 35 of the 84 Stanley Cup play-offs.

TV in '75. In 22 villages strung along 300 miles and still supplied mainly by ship, 83 percent of the people receive unemployment compensation, a federal official tells me. Fishing is way down, she adds. Big trawlers have spoiled it.

I visit the village of Aguanish. The men put in a few weeks on government-sponsored jobs, chiefly in forestry. Most of the year they draw unemployment checks. Some trap lynx, or marten, or beaver when the pelt price is right. Many have color TV and snowmobiles.

I take the coastal ship all the way to the easternmost end of Quebec. At Lourdes-de-Blanc-Sablon, the airport has been lengthened, and there's a new hospital, a new school, a new fire department. And much dissatisfaction: The local road is poor, and why don't we have a hockey arena? It's those politicians, they just make promises. . . .

SEVEN HUNDRED MILES away, in Quebec City, Prime Minister Bourassa welcomes me to his office near the National Assembly. Within the relatively loose-structured Confederation of Canada he is much more powerful than a state governor in the U.S. He heads his own provincial political party, the Liberals, and can call an election whenever he pleases. I ask him about independence. He shrugs.

"That's glamorous, it's flashy, but much too risky, and it's useless, an obsolete concept. What would we get out of a United Nations seat between Botswana and Idi Amin? The disadvantages would be serious economically. Capital would pull out. . . ."

He was elected, he says, on a promise of more jobs through foreign investment, and so some people call him a puppet of Wall Street. "But Quebec needs capital from outside, and I think the United States is Quebec's best friend. Remember, we are a land of French-speaking people within the North American framework. We want to stay French and keep our culture, but we also want to belong in North America, spiritually and economically."

I sample this North American amalgam at Sept-Îles, at the mouth of the St. Lawrence—not long ago a fishing village, of late a booming town of 35,000, with Canada's top per capita income, $12,592. I see a new trailer park here, another new shopping center there. Railroad cars bring ore from the north to a

plant of the American-controlled Iron Ore Company of Canada for concentrating into pellets. Some go to Europe and Japan—but most to steel mills in the U. S., notably in Buffalo, Cleveland, and Detroit.

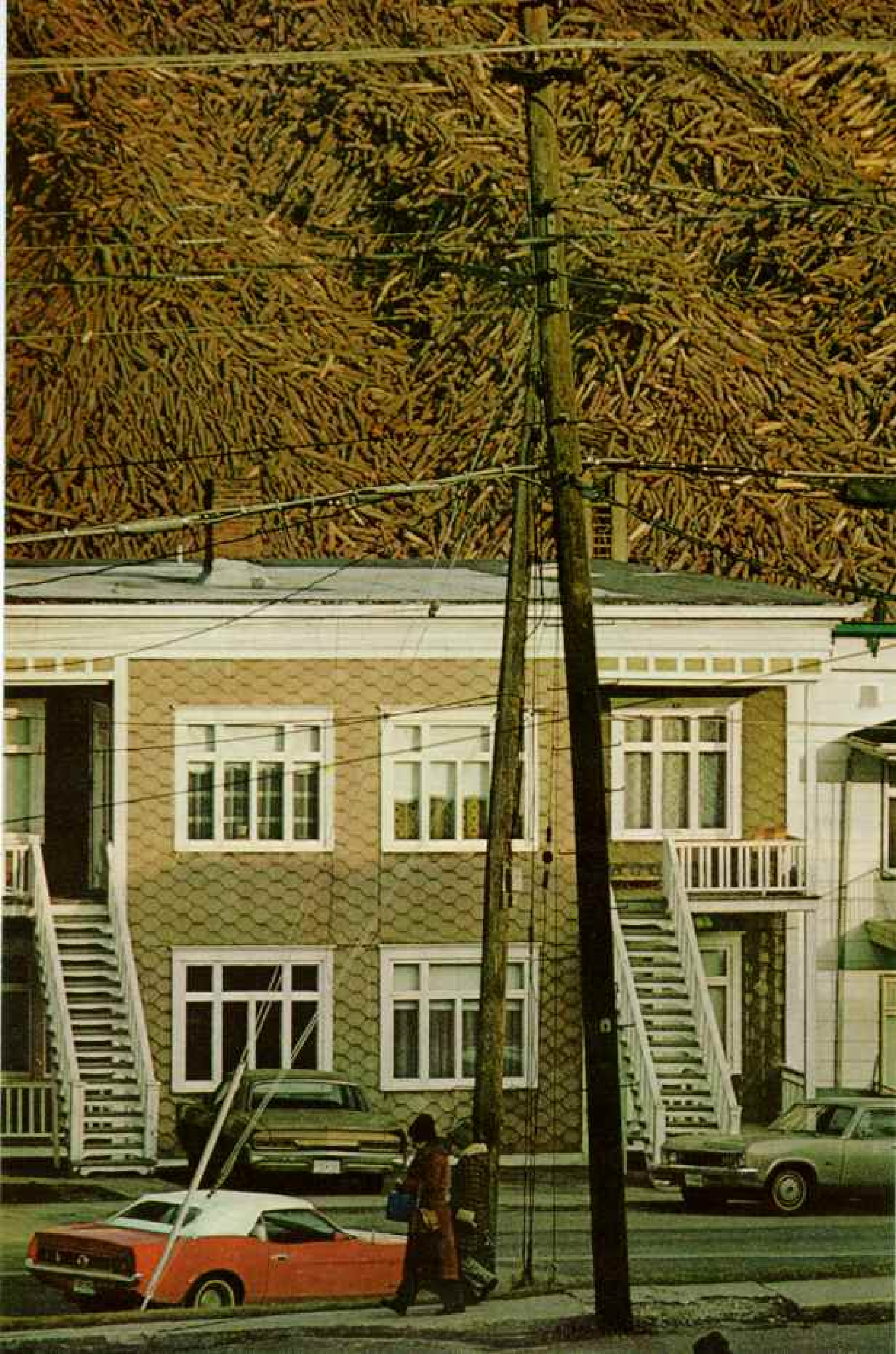
At Baie-Comeau, three hours' drive away, the half-mile-long Reynolds aluminum smelter, also American-controlled, thrives on Quebec hydroelectric power. Along the way, at Port-Cartier, I've seen trucks drop spruce logs at the ever-steaming mill of Rayonier Quebec, an ITT subsidiary. Out comes refined pulp, to be turned into rayon for clothing and into photographic paper and disposable diapers all over the world—half in the U. S. ITT is entitled to cut timber in a strip of Quebec as big as Ireland.

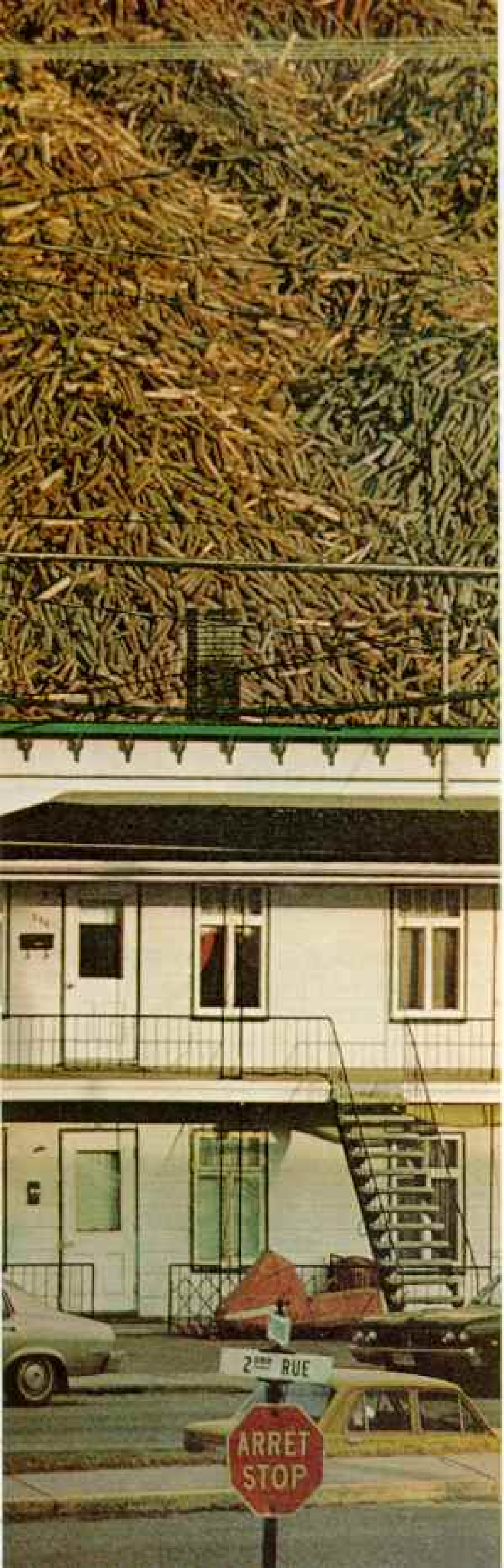
Back near Sept-Îles I run into an all-girl softball game, Maliotenam Indian Reserve versus Gallienne Body Shop! *Balle*, the announcer booms through the amplifier. *Coup sûr!* That's a base hit—big Nicole of Body Shop is *sauf au troisième!* Often, of course, it's *prise*, a strike, and that's a little whiff of cultural sovereignty. It used to be *une strike*.

THE OFFICIAL OPPOSITION of Bourassa's Liberals is the Parti Québécois, or PQ. Its leader, René Lévesque, tours the Baie-Comeau region—where he has long enjoyed strong support among the factory workers—and I follow him.

In the office of a British-owned paper company the manager asks him, "Why improve our plant if you're going to kick us out of Quebec?" Lévesque replies he wouldn't do it all

City on ice blooms each winter on the Rivière Sainte-Anne, a tributary of the St. Lawrence, as fishermen set up their mobile huts for a two-month harvest of tomcod. Shaped like a miniature codfish and rarely more than 14 inches long, the tasty salt-water *poisson* enters fresh water from December to mid-February to spawn. At the little village of Sainte-Anne-de-la-Pérade it must run a gantlet of hooks dangled by thousands of anglers through holes cut in the huts' floors. Prizes are awarded for the biggest fish, checked at a weigh station (**left**). The seasonal take totals three million, an average of 45 fish a day for each hut.





at once, just little by little. "That was a joke," he says to me afterward. "We don't intend to take over any plants; it would cost us millions. But we intend to get more for our basic resources. We say let foreign capital in, but economic development must be based on equality, not colonial-style exploitation."

That night, at a meeting in a school auditorium, he lambastes his Liberal opponent: "Bourassa was asked on TV how he feels about independence, and he hemmed and hawed and said, 'Well, we've got to think that over very carefully; we have no oil, no uranium.' This makes me boil. Why not say we have no coconuts, no elephants! What sort of national leadership is this, making people think themselves smaller, weaker, more dependent than they are?"

I ask Lévesque, if the PQ should come to power—what then? "We'll call a referendum: Do you want independence—yes or no? If it's yes, we'll negotiate with the federal government, as equals. We'll seek a new kind of association, in a common market perhaps. At last we'll control our own affairs!"

René Lévesque was minister of natural resources in the Quebec government that made the Quiet Revolution. Under his guidance Quebec began sending administrators to a colony of its own: Nouveau-Québec, larger than France plus Great Britain. This region of dozens of great rivers and thousands of lakes stretches north from the Rivière Eastmain nearly to the Arctic, to Hudson Strait.

Some 7,000 Cree Indians and 4,000 Eskimos, or Inuit, live in New Quebec, on land believed to hold vast mineral wealth.* In 1975 they agreed to surrender their claims to that wealth for a quarter of a billion dollars and assorted benefits—clinics, schools, and economic development. So far, 36 million dollars has been paid.

"We bought a country for the future," says the director general of New Quebec. "Iron,

*See "The Changing World of Canada's Crees," by Fred Ward, NATIONAL GEOGRAPHIC, April 1975.

Mountain of pulpwood rises behind houses at Port-Alfred on the Rivière Saguenay. Quebec's forestlands, nearly as large as France, account for about 5 percent of the world's pulp and paper. Her rivers provide 40 percent of Canada's hydroelectric power.

copper, nickel! We're looking for oil. And think of all that clear fresh water. It may become our most valuable resource."

We fly to visit his domain. First stop, the LG2 damsite on La Grande Rivière, part of Hydro-Quebec's 16-billion-dollar James Bay project. It is expected to pay off handsomely in electric power.

The Cree Indian settlement of Fort George is expected to suffer increased erosion because of the big dams, and there are discussions on whether it should be moved. I ask a Cree chief how he likes learning French. He says he doesn't. "I don't like to be told you must. That's how I talk to my young children, but when they're older, I don't tell them what to do."

North of the 55th parallel is Inuit country. Until a generation ago they roamed with dogsleds, in family groups, hunting seal and caribou. Now most have snowmobiles, and live in 14 settlements along the coast, largely on welfare, buying food from the Hudson's Bay Company store or the Inuit cooperative. But on clear days in summer they'll still jump into canoes and go after white whales, with rifles. They call their language Inuktitut.

We visit Inoucdjouac and Ivujivik, and Port-Nouveau-Québec on Baie d'Hungava—Ungava Bay. Invariably two cultural symbols stand out. The old Anglican church, with a pastor who speaks English. And the brand-new Quebec government school, teaching Inuktitut and French from kindergarten on. "We want everyone here to speak French," a school official tells me in Povungnituk. So far three out of four still prefer the old English-teaching school. It'll be phased out soon.

At the mouth of the Rivière Déception I see a building 750 feet long and 125 feet high. To store asbestos, mined farther inland. Ships

Gadfly of social issues, singer Pauline Julien unwinds in a theater dressing room in Montreal. A native Québécoise, she returned in 1960 from Paris to join the ground swell of strident *indépendantisme*. As with other Quebec activists, her politics has occasionally led to her arrest.

take it to West Germany. It will turn up in building materials all over Europe. Soon there'll be iron mining near Tasiujaq.

Delegates from all settlements meet at Koartac and reelect their leader. He tells me the Inuit will have to do what the Québécois are doing—gain political power through social and economic development. One of his advisers says the Inuit also have a dream, of a country of their own someday.

A THOUSAND MILES to the south, on a 30-mile-long island in the St. Lawrence, sprawls metropolitan Montreal, the world's second largest French-speaking city. European fads and fashions are said to catch on faster here than anywhere else in North America. I always find it a nice place to visit.

Office girls bounce through the busy Place Ville Marie shopping complex, epitomizing up-to-the-minute chic. "They look a bit like hippies," says a Virginia lady, "but such nice hippies." Mayor Jean Drapeau extols his 35 subway stations, designed by various architects, decorated by different artists! The city has a restaurant for every 230 inhabitants, and scores of outdoor murals (page 465).

What's this? The taxi man is Portuguese, the saleslady Egyptian. Greeks and Italians abound. They're all welcome here, but they have a problem. It goes to the heart of a long-pressing issue in Quebec. Most immigrants don't want their kids in French schools. They want them educated in English, believing that'll give them a better chance to get ahead.

Quebec's 1974 Official Language Act, or Law 22, directs otherwise: Children not already fluent in English shall not be admitted to publicly supported English schools, only to French ones. The lawmakers didn't want to lose any more immigrants to the Anglophone side, especially on Montreal Island. A third of the Quebec population lives there—and Francophones are down to 61 percent.

Educated Francophones have been pouring into the Quebec civil service and teaching, but those sectors are filled now. What if they want good jobs in private corporations? "Under the rules of the game they'll have to learn English," said a sociologist. "They'll be in the process of assimilation."

Law 22 seeks to change the rules. To do business with the Quebec government, firms must qualify for certificates of *francisation*. Applicants for licenses to practice a profession will have to pass French fluency tests. . . .

What do Quebec Anglophones say to all this? "It's destroying a partnership that has existed between the English and the French since 1760," a retired executive tells me. He talks of unfairness and injustice "inconceivable five years ago." His wife says you hear more and more French in the best shoe salons.

A manufacturer finds his suppliers want to deal with him only in French. "I resent their

The past comes alive for townspeople of Chicoutimi, who don 19th-century dress during their annual carnival (**above**), one of the many festivals that fill the calendars of culture-conscious Quebec. Here bids are taken on a pig during a fund-raising auction at the cathedral. Parish churches, impoverished by low attendance, now turn

attitude, that we're interlopers. We are Quebecers too." He says some big companies are quietly moving people out of the province.

But the head of Montreal's Anglophone school system notes more and more students from English-speaking homes in French-immersion classes: "If our children want to work here, they must be functionally French."

MEANWHILE, language issues remain the stuff of daily controversy. A recent flap: Shall air-traffic controllers in Quebec be allowed to speak to pilots in French as well as English? Francophones say yes; it works in other countries! Anglophones say no; it isn't safe! They all say it with passion.

On one of my last Quebec excursions I drive east from Montreal to the so-called Eastern Townships. Here some of the world's biggest asbestos mines produce mountains of gray waste, but mostly it's a place of green hills and pretty lakes. In winter, skiers love it. This land was settled by immigrants from New England and from the British Isles, hence the names of the towns—Sherbrooke, Drummondville, Granby. They're all more than 90 percent Francophone now.

Next morning I move on into the heartland of old New France around Quebec City. I pass a crossroads dominated by a 12-foot crucifix, then a few houses beneath a silvery-spired church. The flat green landscape with black-and-white cows lies in a romantic mist; it is dominated, in turn, by the towers and transmission lines of Hydro-Quebec.

"You don't need English here," a farmer tells me. His ancestors came from France 250 years ago, he says, and he believes one

to bingo to augment the collection plate. "*B-cinq,*" sings out the caller as players tend their cards in a Roman Catholic social hall (**above**). Bingo, once forbidden as a gambling vice, also swells public income—a bingo tax yields about 1.5 million dollars a year to Montreal, where half the games in the province are held.

should move with the times but not bite off more than one can chew. A truck comes by to take his milk to a cooperative.

He's against the Parti Québécois. "They're socialists. Why let them take my good land and my sugar maples and make me a salaried worker?" (The PQ proposes no such thing.)

He also opposes separatism. "Some young people think it'll bring paradise on earth. They're not practical. Look, I've got a hundred pigs, they need oats and barley from Manitoba and Alberta. The federal government helps pay for the transportation. . . ."

WHAT'LL HAPPEN to the Québécois? I think back on many conversations with these traditionally expansive talkers. Often what I heard, alas, came out of traditional pessimism and unhappy experience.

For example, a country priest: "The English have always treated us as inferior, and so we feel inferior. It's deep in our subconscious. The young are different, they know more about countries that made themselves independent and turned out well."

A housewife: "To feel threatened is part of our heritage. Our schoolbooks were full of how the British beat us 200 years ago, that they're strong and we're weak. It's an underdog feeling. You fear you can't make it. . . ."

A lawyer: "My mother wouldn't buy a stove made in Quebec. She said how could it be any good? We don't trust ourselves; we're almost glad when we don't succeed. . . ."

A businessman: "I'm not separatist, few businessmen are. But I think we must take our affairs into our own hands, and I'm sure we could succeed, but those with capital have

no confidence in our management abilities. I fear that to achieve our aim we may be obliged to pass through socialism. . . ."

Said a union leader: "We reject capitalism. If independence comes, it will start a process for changing the society. But will Canada and the U.S. accept that? Then all may not be so peaceful."

Pierre Vallières was a theoretician of the FLQ, the Front de Libération du Québec, which threw bombs in the 1960's and kidnapped two men in 1970, one of whom died. The Canadian Army briefly occupied Montreal. The FLQ evaporated. Vallières is out of jail now, living alone on an island in a lake, writing. He now thinks armed revolutionary action would be futile: "The Québécois want to hold on to their present way of life, which is a lot of waste—in other words, behave like Americans." He's supporting the PQ.

NOVEMBER 15, 1976, astounds all Canada. Province-wide elections in Quebec give the PQ 71 seats out of 110. No one had expected that many so soon.

A Montreal sports arena explodes with joy as René Lévesque arrives. He thanks all voters who overcame their fears of change. He vows "to give ourselves the Quebec we desire, a homeland for all who live in it and love it." Women scream, men wipe their eyes. Again the arena explodes. "Excuse me," says a middle-aged man crushed against me. "We've awaited this day for 216 years. Now the hard work begins."

The morning after, an Anglophone sociologist calls it the blackest day for Canada he's ever seen. A young Francophone says now he'll study better. "Now I know I'll really have a chance for a job as an engineer. . . ."

Nine days later René Lévesque takes over as Prime Minister. The first task is to give Quebec good government, he says. The referendum on independence will come within two or three years. "The trend toward independence appears to be irreversible."

Federal Prime Minister Trudeau reaffirms his dedication to an indivisible Canada. But Canada cannot, must not, survive by force, he says. He still bets on bilingualism.

It appears certain that for years to come Canada will be in crisis.

CAN A POET perhaps see furthest ahead? I talked often with Gilles Vigneault. One night in a national park near Hull, across the river from Ottawa, a downpour cut short one of his outdoor concerts. In a nearby log cabin, by a fire, he reflected about his song "When We Go to Louisiana."

For many Québécois, that word conjures up the fate of the descendants of those unfortunate Francophone Acadians who were dispersed among strangers—perforce losing their customs and language, disappearing. Vigneault's song is an allegory, of Quebec in effect going to Louisiana. It implies a question: Even if independence comes, what of the inroads of English, the barrage of American foods, films, and TV—words, ideas, values, everything American? Toward the end, the song slips into a French that's Anglicized. To some it's just a catchy blues number. To some it's heartbreaking.

Vigneault said: "Maybe we're bound to disappear. Deep down we feel it. In twenty years, in fifty? Quebec is a little island of five million Francophones. How can we survive with 13 million Anglophones around us in Canada and 216 million Americans next door?

"My song is a little bell. It is very important to ring a bell when the fire is in the barn, then people can come and put it out before it gets to the house."

While writing, I received a tape of Gilles Vigneault's latest appearance, with a monologue that's more cheerful:

"The country that interests me is not a piece of earth, a bit of land. Land isn't a country. Take the people away from it, and you have a dam or a parking lot. When I say country, I mean people—the country that is inside of people, inside each of us. When we put all those countries inside us together—we will have a real country for us all."

The applause, as usual, was thunderous. □

Building alive with Gallic fantasy nearly obscures a strolling woman and child in Montreal. Some 80 murals depicting French-Canadian joie de vivre decorate exteriors in this second largest of the world's French-speaking metropolises, after Paris. Will Montreal, commercial hub of Quebec Province, become the showcase of a new nation?

To a long-distance walker like me, a country store on a lonely road is like a port of call to a sea-weary sailor. Such rural landfalls offer food and drink, friendly conversation, and directions I can count on for the unfamiliar way ahead. I almost

A Walk Across America

Confused by our turbulent times, a young Connecticut Yankee sets out to span the continent in search of his country and himself

TEXT AND PHOTOGRAPHS BY PETER GORTON JENKINS

flipped when I saw the name of this store in Alabama; the owner was no relation. I guess wherever you go, you find some kind of reflection of yourself. Alabama trooper Oscar Kyles stops by to chat—one of the really great people I've met along the way.

IT WAS ANOTHER two-gallon day. We had been heading down Alabama country road 117 at our customary speed: three miles an hour. *We* means my dog, Cooper Half Malamute, and myself. Some eight hours back a farm lady had said we'd come on a country store in ten miles or so. But we'd gone twenty. It was so hot, I felt I was going to melt into the pavement.

Then I saw the store, a quivering shape in the heat haze. It looked like a piece of driftwood tossed up at the side of the road. Dumping my backpack against a tree, I rushed up on the porch, past a blue-overalled farmer drinking a Dr Pepper, and burst through the door.

While the lady behind the counter looked on astounded, I grabbed everything cold and wet in sight and started drinking—a half gallon of orange juice, a quart of Coke, a half gallon of grapefruit juice, a quart of milk, and, topping it off, a half gallon of water. Right at two gallons.

Dropping some bills on the counter, I plunged back into

that Alabama heat. Leaning against a 1930's-vintage Coca-Cola cooler, the farmer was eyeballin' Cooper and Cooper was eyein' him back, lookin' hard at that Dr Pepper.

Grabbing a hose, I soaked Cooper with icy water. While he shook off a cloud of spray, I hunted up a big aluminum pan, filled it, and let him lap to his heart's content.

As I started back into the store to buy some solid food, the farmer finally spoke.

"Where y'all started to?" he asked, measuring me with narrowed eyes.

"Well, sir"—it wasn't the first time I'd answered such a question—"my dog, Cooper, here and I, we happen to be walking across America—from New York State down to the Gulf Coast, then on over to the Pacific somewhere."

"Well, son," he said, "this is a mighty big country to be walkin' across. Now *where* did you start from, and *when* did you start, and *where* were you born and raised up at?"

And so I answered all those down-home questions that a hundred newfound friends had asked me in the previous nine months. How I'd started in upper New York State from the college town of Alfred, where I'd gotten my BFA in sculpture-ceramics the June before. How Cooper and I had set off on this walk across America on October 15, 1973. How I was born and raised in Greenwich, Connecticut, 40 miles from New York City.

"Oh, you're one of them Connecticut Yankees," he grinned. When a country man pokes fun at you, you've made yourself a friend.

But—and now he came to the big question, the one they always ask:

"Now, son, don't get me wrong, I don't aim to be nosy, but . . . well . . . now, *why* would a young college feller like y'self go out and walk across the country, anyhow?"

And, as many times as I had tried to answer that question, a straight answer always eluded me. I knew in my own mind what had started my journey. I had grown up in the late 1960's and early '70's, when my country seemed to be pulling loose from its moorings: the student protests, peace marches, Kent State, racial violence, conservation battles, Watergate. Like many of my friends, I was confused. I felt isolated from whatever truth lay behind the headlines. I had to find the certainty I once knew. And so I decided on this walk of mine. It amounted, in my mind, to giving the country another chance.

THAT IS WHAT I was thinking, but I found myself saying: "Well, I decided that after I got my degree, and before I started to work, I'd just go out and take a look at America first-hand, go walk right through it to see if what I'd read and heard about it all was true."

"And," he asked, eyebrows raised, "what have you found?"

"Well, sir, for nine months now I've been walking, and I've come to realize what a bad press America's been giving itself. There's a lot of good in it that also needs telling. The land, the geography—they're unbelievable. And the people! I haven't gone a day that someone I met hasn't been kind, or thoughtful, or helpful. Plain, simple, ordinary folks they may be, but they're heroes to me."

He nodded and smiled. "Welcome to Alabama, boy! You just throw your pack and that there wolf in my green pickup over there, and you can put down at my place for the night."

"Sorry," I said, "but I promised myself when I began that I would walk, really *walk*, every step of the way while I'm traveling. But I sure thank you for the offer."

"Well, y'all got to camp somewheres," he said, as he climbed into the pickup. "Down the road a spell you'll see a pecan orchard. Plop down there if you like. By the way, what's your name, son?"

"Peter Jenkins," I said.

"Well, Peter, may God bless you and your dog in your walk. My wife and I will put you both in our prayers."

He drove off. I realized I hadn't even asked him his name. And I realized, too, that I had just met another American hero.

Cooper and I finished our ration to the tune of that most wonderful music, country quiet. We had several digestive miles to go to get to that pecan orchard, so I threw on my pack and we hit that early evening, meditative country road. It was dark by now, and the staccato notes of a peeper and cricket orchestra gave a lively rhythm to our steps.

Cooper came alive when the sun went down and the animals came out to be chased. Watching him rocket into the darkness after a mysterious rustle, I remembered how he and I had trained for this

SCOTT VAN PELT JENKINS

"Arise, walk through the land...
for I will give it unto thee." GENESIS 13:17

It all began on October 15, 1973, back in New York State, where I'd graduated from Alfred University. I'd been so discouraged by all I'd been hearing about this country that I decided I'd go and find out for myself. I figured it would take maybe nine months for me and my dog, Cooper, to walk down to the Gulf, then over to the Pacific. Well, it's going on four years now—and I'm still walking. I found it wasn't enough just to walk through America; I had to stop and work and live with the people. And that's where I found it—the real America I'd been looking for—at home among the people.

walk for 4½ months, running hundreds of hours uphill and down and turning our suburbanized muscles into the catgut and piano wire you need, man or dog, if you're going to walk 20, 30, 40 miles a day for months on end.

Of course, Cooper was not your typical suburban mutt. His mother was a full-blooded Alaskan malamute. His father, according to the only human witness, was a "dark black shadow" that tore the door off his mother's kennel one night.

FROM the start I decided I would not become mileage crazy. I wanted to *be there*. I wanted to share every environment I passed through with the people who were rooted in it. At times I would have no choice, because I would have to stop walking and take a job to get money enough to go on. I had $600 in traveler's checks when I set out—enough, at about $5 a day, to last me four months.

The day we left, a crowd of friends went with Cooper and me as we stepped out into that blue, red, yellow, and orange Allegheny autumn morning. By the time we'd hiked 30 miles and made our first night's camp in the northern Pennsylvania mountains, only my brother Scott and Charlie Keane, a friend, remained. We had a ceremonial fire and herb tea and slept better than kings under wise old pines.

Next morning Cooper and I headed south on Pennsylvania road 449. We were alone. The walk had begun.

My original plan was to take about nine months or so to make a rough V across the United States—from Alfred to the Gulf Coast, then over to the Pacific—maybe 5,000 miles in all.

Instead of following a detailed route on a map, I would plot our way by asking directions from farmers, hunters, police, anyone we met. When practical, we would go by the wilds and back roads. I had promised myself to obey two rules. One is an Indian law that says, "With all beings and all things we shall be as relatives." The other is my own: "Disturb the land no more than a deer would do in passing through."

But I had forgotten that Cooper was no deer. One day as we strode through the Pennsylvania mountains on an old logging road, we were startled by a terrific animal screech not five feet away. A long dark blur tore out of the grass. Somehow—it happened too fast to see—Cooper lunged and stopped it cold. He gave one tremendous shake of his lionlike head, and there he stood with a long brown mink hanging limp as a lady's fur stole in his mouth. He looked almost embarrassed. Leaving the beautiful limp body there in the grass, we walked on. I felt depressed. Cooper, too, hung his head. We had met the predator, and he was us.

Fast as we walked, we were no match for the great flocks of geese migrating south over our heads, though somehow they transmitted their spirit to us.

We spent eight windblown hours in 1,479-foot Waggoners Gap just north of Carlisle, Pennsylvania. Thousands of hawks and falcons bulleted by only a dozen feet above our

(Continued on page 476)

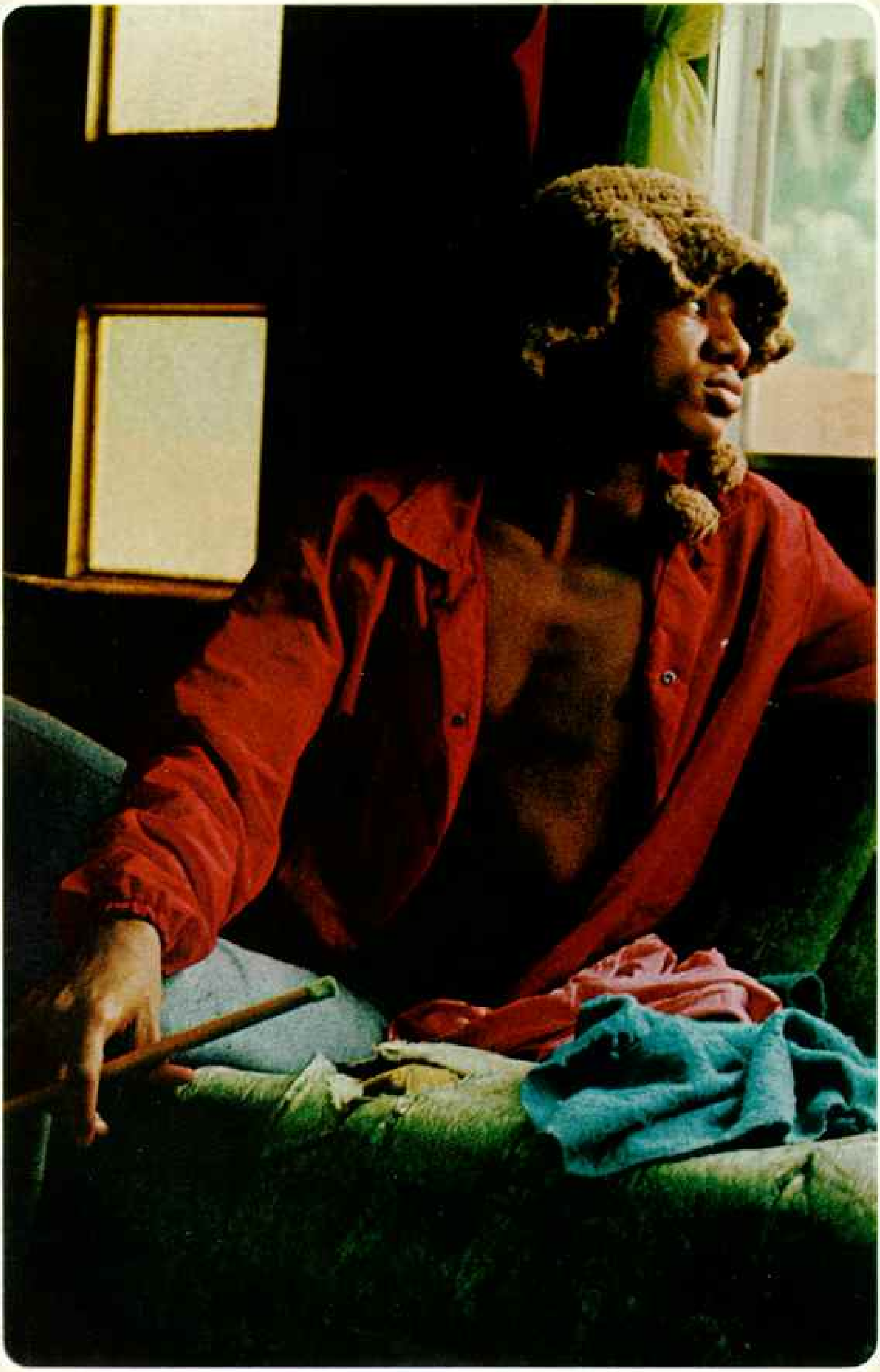
On a wild mountaintop near Saltville, Virginia, I met Homer Davenport, who lives up there with his dogs and chickens and sheep. He doesn't usually care for human company. But he took a shine to me, asking me to live there. I explained I had a few thousand miles to go before settling down.

Exhausted after a 40-mile day, I collapse against a tree. Cooper's as tired as I am. "Time to pitch camp," he yawns.

MARTIN ROGERS

I greeted New Year's Day atop the highest spot east of the Mississippi—6,684-foot Mount Mitchell in North Carolina. With my brother, Scott, who joined me for a time, I slogged up, got completely lost, and finally reached the top just before dark. When we woke up on New Year's morning, this is the way the world looked. It was so pure and clean up there—it felt like our heads were pressed right against Heaven itself. I felt sorry for all those people hung over in their beds down below all those clouds.

The colder it got, the more Cooper liked it. He's half Alaskan malamute. His thick fur has a lot to recommend it over thin human skin when the temperature plunges far below freezing. Here he leaps into the air as I rifle a softly packed snowball his way—part of a game we played on cold mornings to get thawed out before striking camp.



*Texana, a black community in Murphy, North Carolina, is where I lived for five months with the Lloyd family. A resident (**above**) hauls wood past two of Texana's finest homes. Our place, an old trailer, was nowhere near so grand. But what it lacked in grandeur it made up for in love. I was one of the family. They called me Al—for Albino. Let me introduce you to Zack (**facing page**), one of my new brothers. That's him again (**left**), getting a hug from his mother—and my second mother—Mary Elizabeth, at his graduation from Murphy High. He was the first of his family to get through high school. My blood kin came down from Connecticut for my 23d birthday (**below**). Both my white and black mothers are named Mary Elizabeth—a coincidence that I see a special meaning in.*

The Winklers live about a mile from my black family. This is Annie Winkler holding some of her mouth-watering pickled beets and applesauce. Oscar "Preacher" Winkler, a lay minister, loads hay onto a hand-built wagon with his brother Bart on the farm they carved out of nothing. Oscar also works at a local veneer mill, where we met. I got a job there at $1.80 an hour (below). Moving those hundred-pound hardwood logs all day made walking with a full pack seem like lying down and taking a nap.

(Continued from page 470)

heads. My pack and Cooper seemed like the only things anchoring me to that rocky height in the high wind.

Everything flowed seasonally for fifteen 16-hour days until we hit Washington, D. C., and commuter traffic. I gagged on exhaust fumes getting past the beltway that loops the city, then wandered among the great marble buildings—outward symbols of the inward America I was seeking.

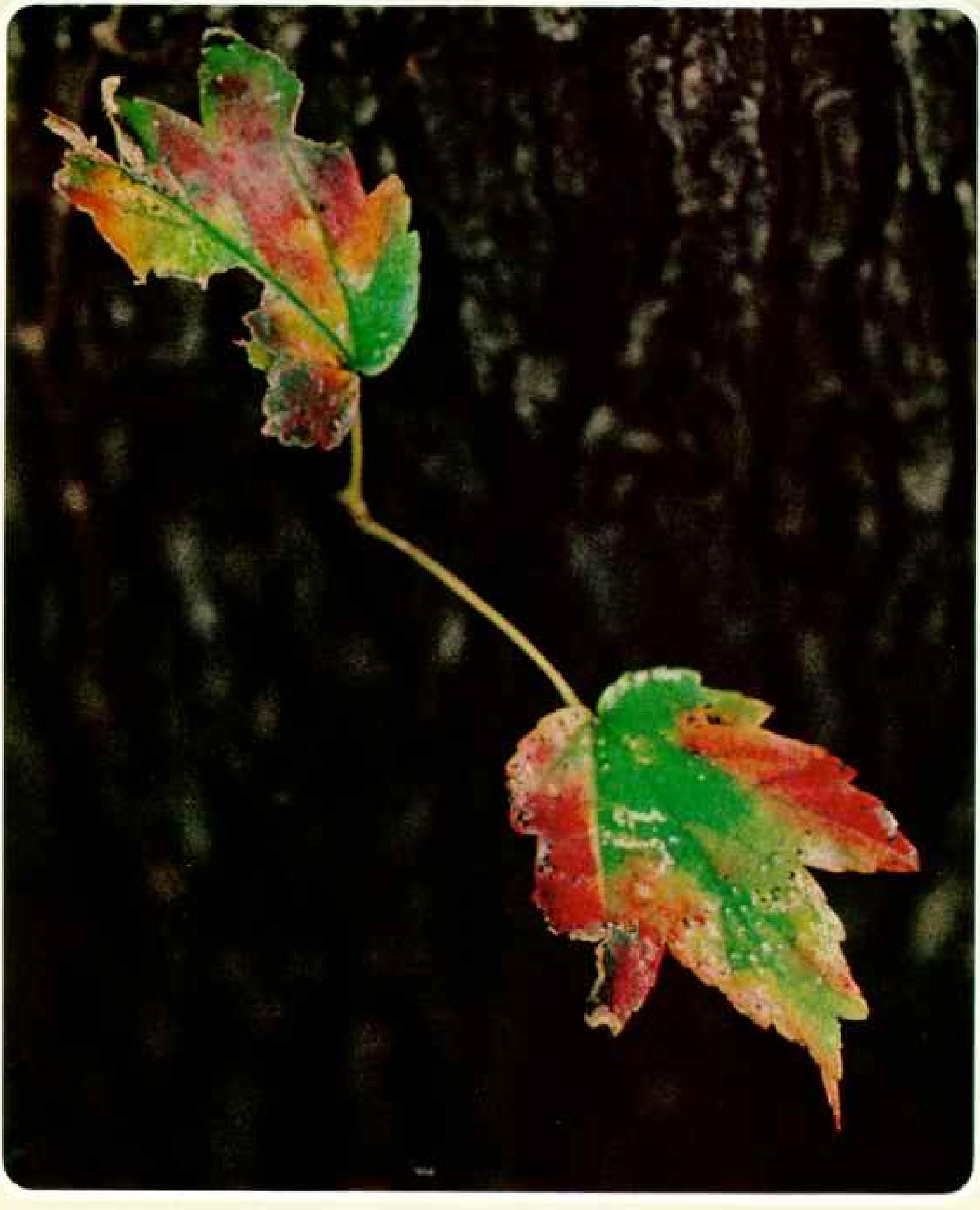
But already there was a cold breath of winter in the air, and I felt that same southward pull that impels the geese and hawks. We angled by the first country road we could find toward the wilds of the Appalachians.

Our first snow flurry hit us five miles west of Sperryville, Virginia, making the footing slick as we hiked through the late-autumn forest up toward Skyline Drive and the

tree-canopied Appalachian Trail. We followed both for a while, drinking in the tremendous pastel panoramas of Virginia's Shenandoah Valley.

Then, near Bluefield, West Virginia, came the first real blizzard. We would be spending our first night out in deep snow. I was scared. But for Cooper, the snow-drifted countryside became a white paradise. He plunged in and out of the drifts, romping and jumping and hurtling his body straight up into the air in sheer joyousness.

We pitched camp that first night between two thickets beside a hypnotic stream. When I opened my eyes next morning, my tent was sagging under 12 inches of pure white snow. Cooper initiated a wild winter wake-up and warm-up routine. As I tried to take down the tent, he bounded up and down around me, knocking me to the ground. I guess



Beauty is where you find it. These two maple leaves with their coats of many colors were among the last to fall in deep woods I passed through one November day near The Plains, Virginia. I found the little leaf at right in Charlottesville, Virginia, on a city curb.

These good people are among the 1,100 residents of the Farm, a spiritually oriented agricultural commune near Summertown, Tennessee. I stayed here for six weeks, sharing the routine of hard work and meditation. Turning all-night drudgery into a joyous occasion, a rock band (below) beats out rhythms for members slicing vegetables. A woman and a man (right) take turns riding and plowing as they cultivate a field of turnips. Most residents of the Farm are urban dropouts who've never done any farming.

there's no better way to get your blood circulating than a rousing battle in the snow. Only a few old-timers and winter campers are able to appreciate what it's like to wake up in a bedroom where God sets the thermostat.

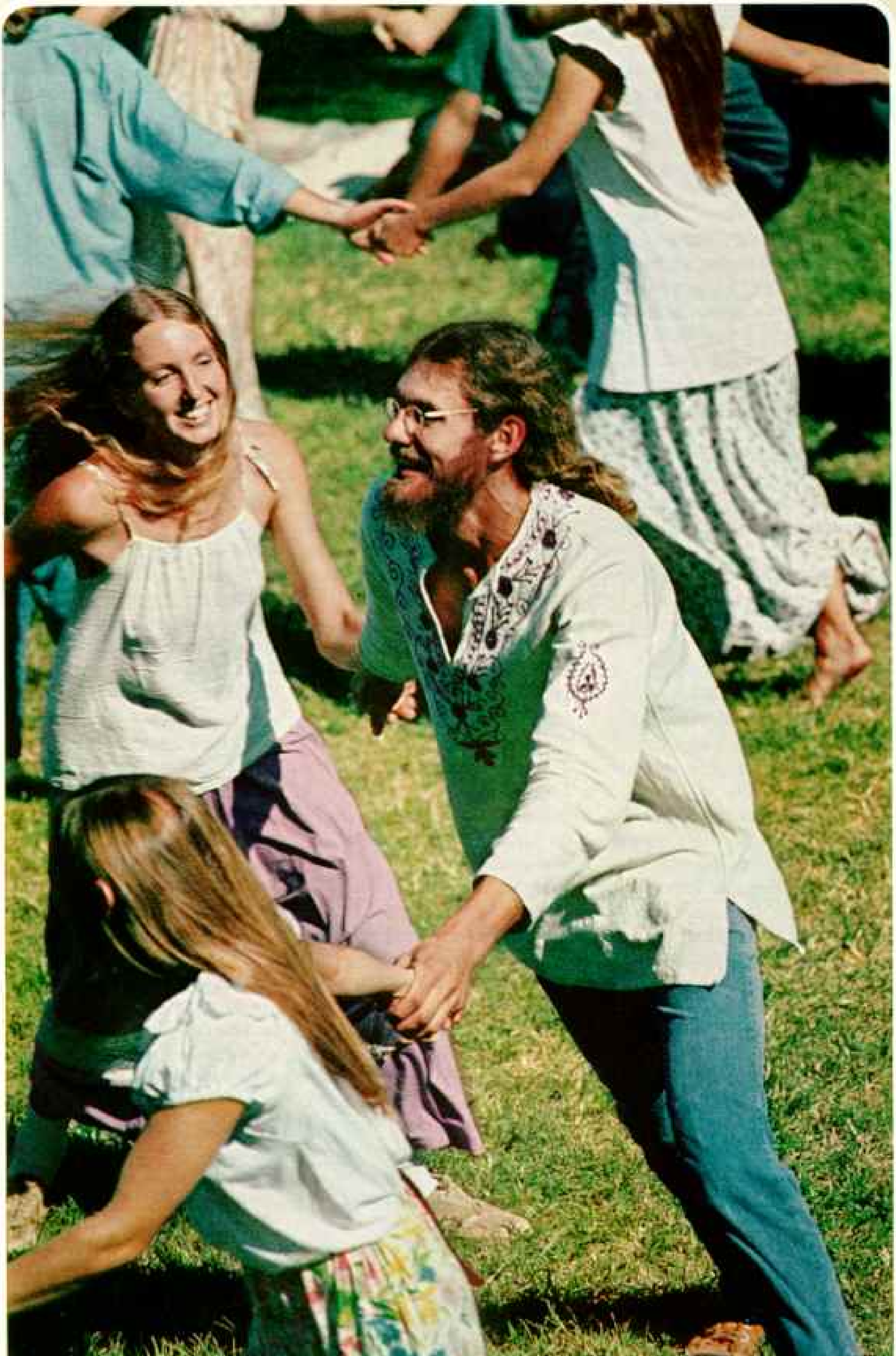
Somehow, moving along an old country road, we left West Virginia and found ourselves back in Virginia. It didn't make sense that Virginia was this far south and west, but here it was. All mountains; winding, curving roads; very few people; and a lot of white wind and cold. We were out of breath and out of food. Finally, I could see one mountain peak higher than all the rest. My map told me that if I could struggle to the top, I would be able to coast down from there to Chatham Hill, Virginia—population 58. About fifty feet from the top I all but collapsed against a tree, too drained even to shrug off my pack.

Unexpectedly, I heard a car struggling up the other side of this killer mountain. It was a silver and white VW bus. The driver pulled to a stop. I asked how far it was to a store and food.

"Oh, three or four miles," he said. It was nice to hear a human voice. He reached back into his VW and, one by one, brought out five giant red apples. They seemed to glow with an inner ruby light. Sitting on a rock after the good Samaritan drove off, I shared the fruit of Eden with Cooper. This priceless gift from that unknown man totally renewed my body, mind, and spirit. I sang all the way to that country store.

NOW MEET Homer Davenport. He lives all alone on a mountaintop 12 miles north of Saltville, Virginia. Anyone in these parts will tell you Homer is the greatest living American mountain man.

*When the Farm was founded in 1971, members planned to till the land pioneer style. But soon it became clear that survival required some mechanization—hence the harvester (**above**). A former student at an eastern prep school (**right**) works hard to understand the innards of a tractor engine. Two young men from the Farm deal watermelons to a supermarket (**below**). Harvesttime prompts celebrators (**facing page**) into a dance of thanks for the gifts of the earth.*



People took one look at me and said I had to meet him.

"Careful, though," I was told. "He don't like most folks. He might even take a shot in your direction if you go wanderin' up there."

But I went. Rural Route 2 goes half those 12 miles, then ends. The last six miles were torture. Homer's front sidewalk is a rocky mountain stream with a trail fading in and out and mud, mud, mud!

After several miles of head-down trudging, we came to a sharp bend in the stream. In those pure woods I felt another presence. Cooper barked once—a rarity—and then stood still as stone—also a rarity.

I looked up. And there he was—looking for all the world like a prophet on his way down from the holy mountain. Fifty feet away stood an ageless old man with white shoulder-length hair. Something electric passed from his eyes to mine and back again.

He had an empty sack over his shoulder. He nodded back down the mountain.

"Goin' down to fetch some meal, flour, and salt," he said. "Join me if you like."

I would have followed him anywhere. So it was back down the mountain again, then back up—me with my 45-pound pack and Homer with his 30 pounds of supplies. It was all I could do to keep up with him.

Just below the peak of this 4,400-foot mountain is Homer's "mansion"—a cabin of logs and scrap, about 30 by 15 feet, with its back end built right into the mountainside. His fireplace is a pit dug into the living earth. While we warmed our hands by the fire, he began "boilin' up some coon."

Being a vegetarian, I swallowed hard at the thought of that boiling raccoon in the fireplace pot. I didn't realize Homer intended it only for his dogs.

Homer whipped up some hot corn bread, canned applesauce, and homegrown yellow beets the size of cantaloupes. He laughed hoarse and loud when he realized I thought the coon was for me. With a swift slice of his bowie knife he cut a chop from a quarter of lamb hanging from a beam, then handed me a straightened coat hanger and pointed to the fire.

"Cook up a chop, son," he said. "Freshest meat you'll ever have."

My vegetarian days were over. I never ate a more satisfying meal. We talked until 3 a.m., exchanging details of our lives like two collectors trading rare old coins. Then I slept on ash-wood shavings from the ax handles Homer carves as a sideline.

Homer had paid for his mountaintop—about a thousand mostly vertical acres—by selling black walnuts and trading sheep and goats, buying in the days before land prices shot up. Like the grizzly and mountain lion, Homer Davenport had taken refuge from the world of men in the mountaintops no one else wanted.

"Maybe when you finish walkin'," he said, "maybe then you'll come back. This mountaintop'll always be here, even if I ain't."

I'll never forget his blue mountain eyes looking clear through me as he spoke, or the warm sandpapery feel of his hand as he gripped mine for a good-bye shake.

FROM Homer's mountaintop, it took us seven days—mostly in heavy snow—to reach Penland, North Carolina. There I enjoyed some indoor warmth, conversation, hot tea, and bell-shaped Christmas cookies with my old college friend Jack Neff and his family. Jack was teaching pottery at the Penland School of Handicrafts.

I decided to spend New Year's Day atop the highest peak east of the Mississippi: 6,684-foot Mount Mitchell, in North Carolina's Black Mountains. I was joined for a couple of weeks by my vacationing brother Scott, and we bushwhacked 15 miles uphill through dense, dripping fog, got lost for a time, then finally reached the top of Mount Mitchell in near darkness. We were crooned to sleep by a high, moaning wind that seemed to orchestrate all the human voices I had ever known—my mother's, father's, brothers' and sisters'. I awoke with a warm, wet feeling on my face. It was Cooper, licking me to wake me up. Dawn had broken bright and pink and dazzling. Below us a billowing gray blanket of cloud sealed off the world. We stood above it. It was New Year's morning.

From Mount Mitchell we descended back into the clouds and the world below, rolling with all the freedom of a clear mountain stream across the brown and white countryside. We passed briefly

I thought the era of Scarlett O'Hara was gone with the wind until I met Madrue "Lanier" Walker and her family in Montgomery, Alabama. Lanier is equally at ease riding her quarter horse among moss-clad oaks or darting around town in her Datsun 240-Z.

You get a lot of different looks from people when you're out walking. Sometimes you get a suspicious look like this man (above) gave me along a North Carolina road. Other times folks warm right up to you, like this wonderful Alabamian (left) who gave me a quarter and a chocolate bar and told me about life.

While passing through northern Georgia, I met a man (right) who offered me something to drink. It looked like water, and I took a swig. Turned out to be moonshine. Boy, did he laugh.

through Asheville, North Carolina. It was the first sizable city we'd hit since Washington, D. C. We went right through the middle of town, for a time walking side by side with scurrying, dark-suited businessmen. If I looked strange to them in my stained and sweaty walking garb and pack, they looked no less strange to me in their three-piece business suits with those strange ribbons of colored cloth around their necks, separating their heads from the rest of their bodies. I was glad this rush hour was theirs, not mine. Cooper and I headed out of that extra-terrestrial scene and back to the wilds of mother earth.

I decided we'd get back onto the Appalachian Trail. After I bought provisions in Fontana Village, North Carolina, my pack weight shot up to 70 pounds and my money supply sank to $45.

In the blue-cold sunlight we crossed Fontana Dam and launched ourselves up a moderately steep trail. Several miles on we were wrapped in a cold, smoky fog, and after a while I began feeling chills and throbbing aches in my muscles. I knew there was a trail shelter two or three miles ahead and decided not to turn back.

It began to hail and got progressively colder. A storm was coming. I lurched along, sicker and sicker, every muscle feeling like it had been hit with a hammer. I was becoming delirious.

Somehow I found the shelter—a tin-roofed rock lean-to with a chain link fence to keep bears away—and managed to gather enough wood to build a fire. For four nights and three days I lay there in my sleeping bag, occasionally stumbling out to get water from a spring or to relieve myself. Cooper whined deeply when I started talking aloud as if the shelter were filled with people. The rain and snow and hail beat down unendingly on the tin roof during those days and nights of intense black stormy sleep and dreary light.

At dawn of the fourth day the sun reappeared, and so did my presence of mind. With no food left, I generated enough energy to leave that rock-and-metal cage and let the mountain carry me down to Fontana Village. A doctor told me I'd had influenza.

STILL WEAK and shaky-kneed, I began backtracking up and down country roads, finally reaching Robbinsville, North Carolina (pop. 587), the next morning. Since there were no jobs in Robbinsville, I headed toward the bigger town of Murphy (pop. 2,035), where I'd heard there were some construction jobs to be had.

I had $15 left when, after a 36-mile hike in cold, damp weather, Cooper and I walked into Murphy on a Friday evening. I passed some lighted basketball courts where a bunch of black teenagers were playing. They came over when they saw me and Cooper, asked the usual questions, then invited me to play. I couldn't resist.

Later, exhausted, we camped out for the night in their neighborhood across the railroad tracks. Two of the teenagers, Eric and Bruce, invited me to their home for a southern meal next day. And that's how I met my second mother, Mary Elizabeth Lloyd.

She was standing there in the door of the house trailer where the Lloyd family makes its home in the leafy depths of Smokey Hollow. She told me later that when she first saw my scraggly red beard, she thought, "Uh-oh, what have the boys brought home to dinner this time?" But when she saw how Cooper liked me, she figured I must be worth her trust. Dogs don't lie. Soon we were immersed in a dinner of cake-rich corn bread, forever-simmered turnip greens, ham chunks, freshly caught perch, bream, and catfish, and rivers of Kool-Aid.

In the middle of the meal, Mary Elizabeth rose and announced that she believed God had sent me to test their faith and henceforth I was one of the family. Bruce, 15, immediately volunteered his bedroom, saying he would sleep on the spring-protruding couch in the living room.

In that loving family everybody had a nickname. Mary Elizabeth's was Red, though I called her Wild Mama, which she loved. Mary Elizabeth's husband, Frank Lloyd, Jr., was Grumpy, Bruce's nickname was Onion (I called him Nappy), Eric's was Bubba, and so on. My nickname was Al—shortened from Albino.

For the next several months I lived with my family in Smokey Hollow and worked sawing logs at a veneer mill. When Frank Lloyd, Jr., lost his job, my weekly wages of about $75 helped buoy a family economy sustained otherwise only by the $2.80 an hour Mary Elizabeth

received at a local yarn mill.

Weekends I would usually go wandering with Cooper through the mountain wilds, coming back Sunday morning to attend Mount Zion Baptist Church, where Mary Elizabeth's 73-year-old father Pau Pau was a deacon. He would put me in the front pew, and there I would sit, the only grain of salt in a shaker of black pepper.

I would get carried along by all that gospel singing and rhythmic shouting and finger-snapping counterpoint between preacher and congregation. No rock concert I'd ever been to—even Woodstock—could surpass little Mount Zion Baptist Church for sheer electric excitement.

FOR A TIME my stay in Smokey Hollow became problematical. A whiskey still had been busted by Government agents, and a rumor got out that I was an undercover agent sent to that dry county to look for more "leaks"—that is, stills. When Frank Jr. heard that some bootleggers were talking about doing me and Cooper harm, Mary Elizabeth and the family rose to my defense. A small arsenal was kept at the ready. Sharp eyes were peeled. The boys let it be known that any raiding party in these parts would be met head-on. People saw that I worked hard at the veneer mill and that I did no snoopin' around, and soon the rumors were forgotten—drowned, you might say—as local stills started to flow again and life returned to normal.

But not quite normal. One evening while I was hiking back through the woods toward the trailer, I heard Eric calling frantically for me to come on home. As I came near the trailer, I could hear Mary Elizabeth crying and praying out loud. My first thought was that the bootleggers had come to take revenge. But Mary Elizabeth just pointed up at the sky through the trailer door. It was the first time I'd noticed that the sky had turned a deep greenish black.

Even as Frank Jr. blurted out "Tornado!" the side of the trailer suddenly sounded like it was being bombarded machine-gun fashion with rocks. Golfball-size hailstones were flying on the horizontal. Outside it sounded like a locomotive was bearing right down on the trailer. "Pray!" shouted Mary Elizabeth, and for ten unending minutes we all huddled together there on our knees with the full expectation that eternity had finally arrived.

As it happened, the tornado veered and skipped right over the river like a flat stone over a trough in the water. It hit down on the other side, where the devastation was unbelievable—splintered homes, fallen trees, mangled automobiles and power lines. The nearby Mount Liberty Baptist Church, a white church just five miles away from Mount Zion, was wrecked.

That Sunday the stunned white members of the Mount Liberty congregation came, at Mount Zion's invitation, to share in money-raising services. Many a dollar bill with a hundred folds in it was pulled out of black folks' pockets to help white folks that day. The chocolate-skinned preacher from Mount Zion handed $232.27 to the well-tanned reverend from Mount Liberty, as they hugged each other unselfconsciously.

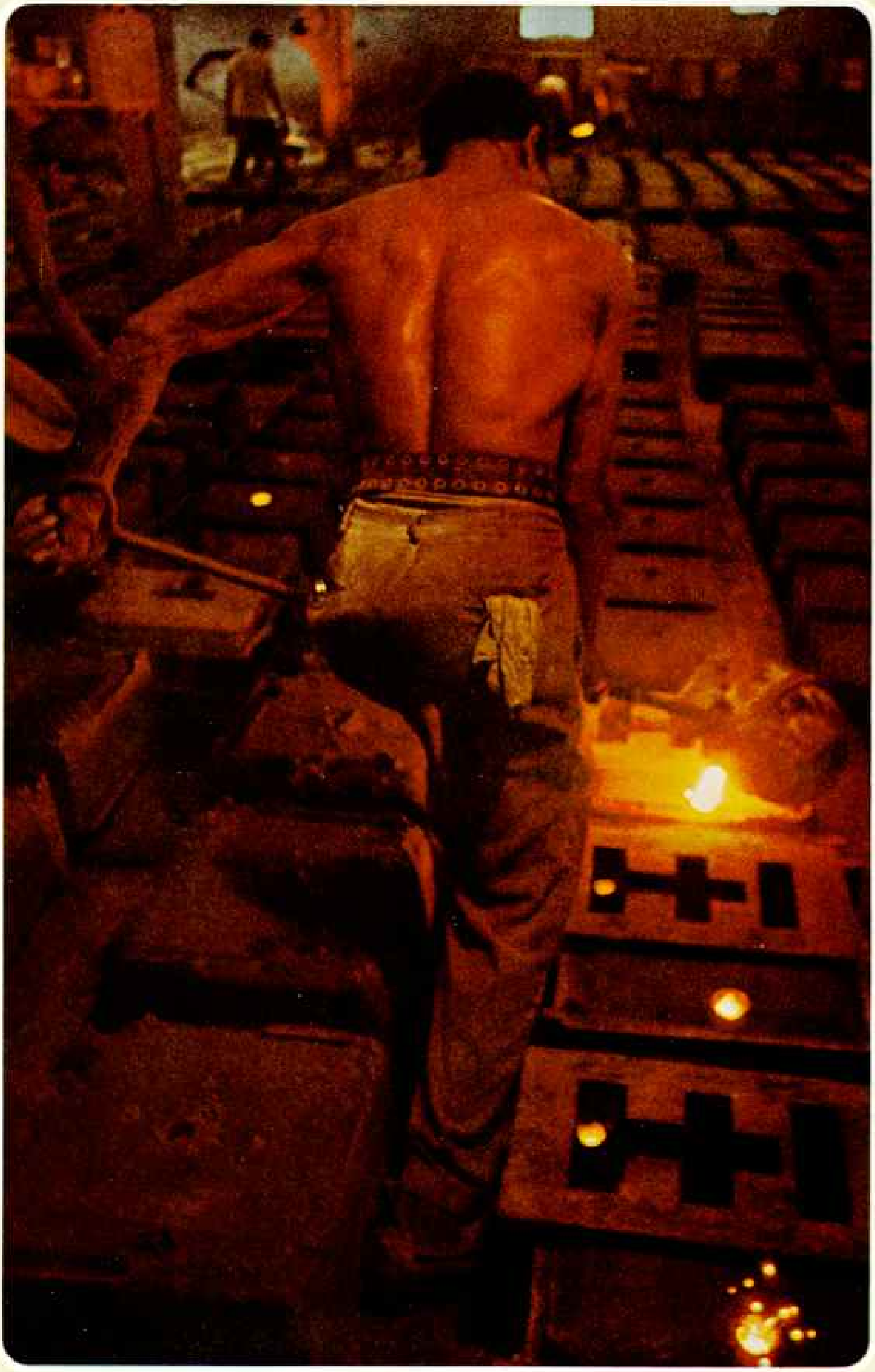
The time came to leave. My good-byes with Mary Elizabeth and the family were more gut wrenching than any of the trip so far. I had enough money to get down to the Gulf Coast—I hoped—and so I headed into Georgia.

Somehow I had envisioned Georgia as all flatness and dust and red clay, but here were the sweet green mountains of Chattahoochee National Forest. I was rock-climbing at a survival school called Wolf Creek Wilderness when a couple of fellow climbers told me about something that would turn my plans upside down. It was the Farm—a spiritually oriented agricultural commune in Tennessee.

Right off I felt a kind of call, and even though it was some 300 miles out of the way, Cooper and I headed north and west. I'd always wanted to see Tennessee anyway.

We passed out of Georgia

I found real beauty while watching foundry workers in Sheffield, Alabama, pour molten metal into molds for traditional-style wood stoves. There's a balletlike quality to their movements as they swing 60-pound ladles through the air—man and his work in total harmony.




BANKS
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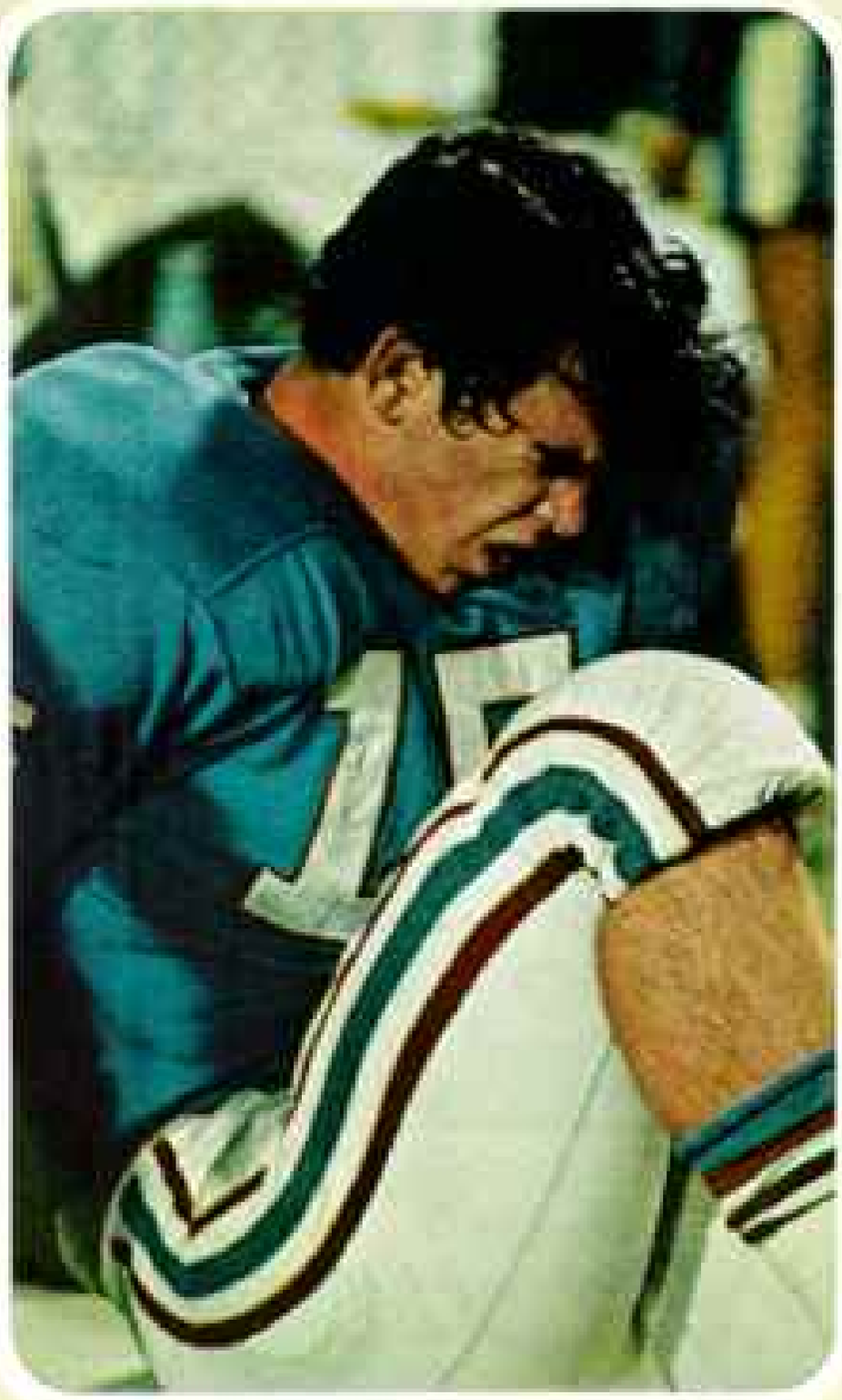
Seniors

There's nothing more American than football—or prayer. As I walked through Birmingham, Alabama, I found myself caught up in plenty of both as the Banks High School team—ranked among the best in the nation—geared up for the city championship game against West End High. Native Alabamian Bart Starr, great Green Bay quarterback and coach, greets team members (facing page) before the game. A majorette (left) helps draw cheers from a hopeful crowd. During the calm before the storm, a pregame prayer meeting (lower left) welds the spirit of which championship teams are made. But this day Banks High endured the pangs of defeat as quarterback



Jeff Rutledge (above)—now a University of Alabama star —suffered an ankle injury in mid-game. For all the outward violence of the game, I was really impressed with the humility and inward gentleness of the players.

The death of Cooper beneath a truck left me stunned, despondent, overwhelmed. His tremendous love and energy had seemed to me to epitomize life. To bury him seemed almost unthinkable. Yet, if I left a part of myself back there with him, I know I also take a part of him along with me wherever I walk.

into the northeast corner of Alabama—where I met the blue-overalled farmer with the Dr Pepper—then crossed into Tennessee. After two weeks we came to Summertown, Tennessee (pop. 1,300), where local folks took one glance at my red beard and pointed out the way to the Farm without even being asked. The place obviously had a reputation. In fact, as I later found out, more than 15,000 visitors like myself arrive each year.

What is the Farm?

I learned that it's a place where some 1,100 people have come together to lead a simple, devoted, intensely spiritual way of life.

Back in 1967, in San Francisco, a college teacher named Stephen Gaskin had begun teaching free classes dedicated to the expansion of the human potential—mental, physical, and spiritual. By 1970 his Monday-night classes were magnetizing some 2,000 students. Stephen then recessed the classes in order to make an extended trip around the U.S.A. in a bus. Some 250 of his students decided to go along, and for four months their spiritual caravan roamed from coast to coast, visiting colleges, churches, small towns—always looking for a piece of the American landscape that might become their own promised land. They found it in south-central Tennessee. Pooling resources, they made a down payment on 1,000 acres of Tennessee red dirt, and soon some 400 young people—artists, students, college graduates, high-school dropouts, businessmen and women, rock musicians—landed en masse on Lewis County, Tennessee. A Martian landing party could not have been much more astonishing to local folk.

But these "Martians" soon proved that they were not here to dawdle but to work, and work hard. They became farmers, real farmers—even if their life-style, by Tennessee country standards, was a bit offbeat. Tomatoes, cabbages, sweet potatoes, hot peppers, beans, watermelons poured from the soil of the Farm and helped buoy the local economy.

After initial suspicions and misunderstandings, the folk of the Farm soon became recognized as good neighbors by most of the people of Lewis County.

Upon my arrival I was allowed to partake of the Farm's life—working and eating and meditating with Stephen and his disciples.

I almost walked no farther.

Some big-city reporters have stayed at the Farm for a few days and told their readers that a lot of people there were confusing religion with getting high on marijuana. But in all the time I was there, I saw and felt a lot of simple goodness far more real and lasting than any smoke cloud.

I seemed to have found what I wanted in that communal settlement of hard work and living faith and overflowing love. But still, I felt a certain gnawing inside. Was this really my life? Sometimes Cooper would gaze at me with a wondering look, as if to say, "Well, it's nice here, old pal, but . . . shouldn't we be moving on?"

Six weeks passed. I started staring down country roads. October came—marking a full year since the walk from Alfred, New York, had begun. Once again I heard the soul-moving honks of migrating geese high above. I decided the time had come to leave.

Once the decision was made, my spirits soared. Soon I would be back out on the road again with Cooper. We would be walking through the green mountains again, running and dodging and chasing each other between the trees, downhill at full speed, tumbling into mattress-thick piles of autumn leaves.

I SET Wednesday, the 16th of October 1974, as my departure date. Until then I would continue with my chores on the Farm. On Tuesday morning I rode the Farm's water truck to the fields for my last day's work. Though I never rode any machines during my actual walk, I occasionally did when stopping somewhere for a long spell. Cooper, as usual, trotted along behind, chasing twigs that I would throw to him off the truck.

And then, coming to a pothole in the road, the truck slowed down. Cooper, trotting close behind, just didn't notice. He kept on running even as the truck slowed.

We lurched over the bump—one of ten thousand potholes we'd traveled over in the past year. Only when I looked back a few seconds later did I realize that Cooper wasn't running behind us anymore. He was lying on the ground back by the pothole.

I let out a shriek. Leaping off the truck, I ran back. Even as I ran toward him, I saw Cooper make a tremendous writhing motion with his entire body, his huge paws flailing the air. It was the last movement he would ever make. When I reached him, he was totally still. The rear wheel of the truck had gone right over his chest. There wasn't an outward mark on him. He looked so unharmed. I cradled his great, perfectly shaped head in my lap, rocking back and forth, moaning, and pleading with him to wake up.

Later, in the soft earth of a clearing, among some red-leafed dogwood trees, I buried him. I laid his beautiful body into the freshly dug soil, expecting him somehow to burst out of the confining earth; he never did.

Thankfully, it had happened on the Farm, among friends who knew and loved Cooper as I had. Their love and support rekindled the dimming spark of my spirit. Though they wanted me to stay on, I stuck by my original decision. Several mornings later I was off down that country road, heading southward toward Alabama.

I had never been so alone.

Cooper's absence was palpable with every step. When we'd walked together in the past, it had been as if he were on an invisible and endlessly expandable leash. No matter how far away he would go, I had only to make a special little whistle and he would snap back to my side. Now that whistle brought only silence.

I kept moving. Though speed meant very little to me, I found myself traveling faster than before. It took awhile to get used to, this being really *alone*.

Moving south out of Tennessee, I saw a big billboard on a hill with a smiling picture of Governor George Wallace saying "Take a fun break in friendly Alabama!"

I did.

After nurturing vague fears of what those Alabama "red-necks" I'd heard about might do to this bearded Connecticut Yankee, I decided to vacuum away all such preconceived notions and allow the people of Alabama the same open-mindedness I hoped they'd allow me. And so I began my months-long immersion in the extraordinary 51,609 square miles called Alabama, the "Heart of Dixie." I walked long days through tiny, tenacious towns like Wren and Arley and Sipsey and Graysville. I walked through William Bankhead National Forest, which encloses the fading southern extremities of my old friends, the sheltering Appalachians.

I even cruised into Birmingham, "Pittsburgh of the South," walking into its wealthy suburbs and its brawny, fast-building inner city, and even some of its black "slums." But the latter —with their worn but usually well-kept homes, their flowering front yards and vegetable-garden backyards— looked more like restorable townhouse neighborhoods than the flowerless brick-and-asphalt hells we call slums back up north.

Then I headed on to Montgomery and walked right into the Alabama Capitol. I said I wanted to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PROFANITY.

I was deeply moved at a revival held by evangelist James Robison in Mobile, Alabama. With folks all around being "born again," that bright light shining down seemed like the presence of God. Even a cash register (left) carries a religious message.

talk to the Governor. Even though a farmer had told me you could do that, I expected a big hassle. To my amazement, there was none.

After being looked over carefully by some guards, I was told, "Two minutes and hurry," and was led down long, cool hallways to the Governor's office. I drew a deep double breath and walked in. The big billboard picture I'd seen on entering Alabama came to three-dimensional life before me. Sitting in his wheelchair, a smiling George Wallace held out a firm hand—a hand they say has shaken the hand of nearly every citizen of Alabama.

I explained what I was about on this walk of mine, how all my stereotypes about southern red-necks had been broken and discarded over the past months. He grinned.

"Well, Peter," he said, "anyone who ever really takes the time to open his eyes and ears and live in the South, especially Alabama, that person's bound to come to a similar conclusion. Besides, with that red beard and sunburned skin of yours, you qualify as something of a red-neck yourself."

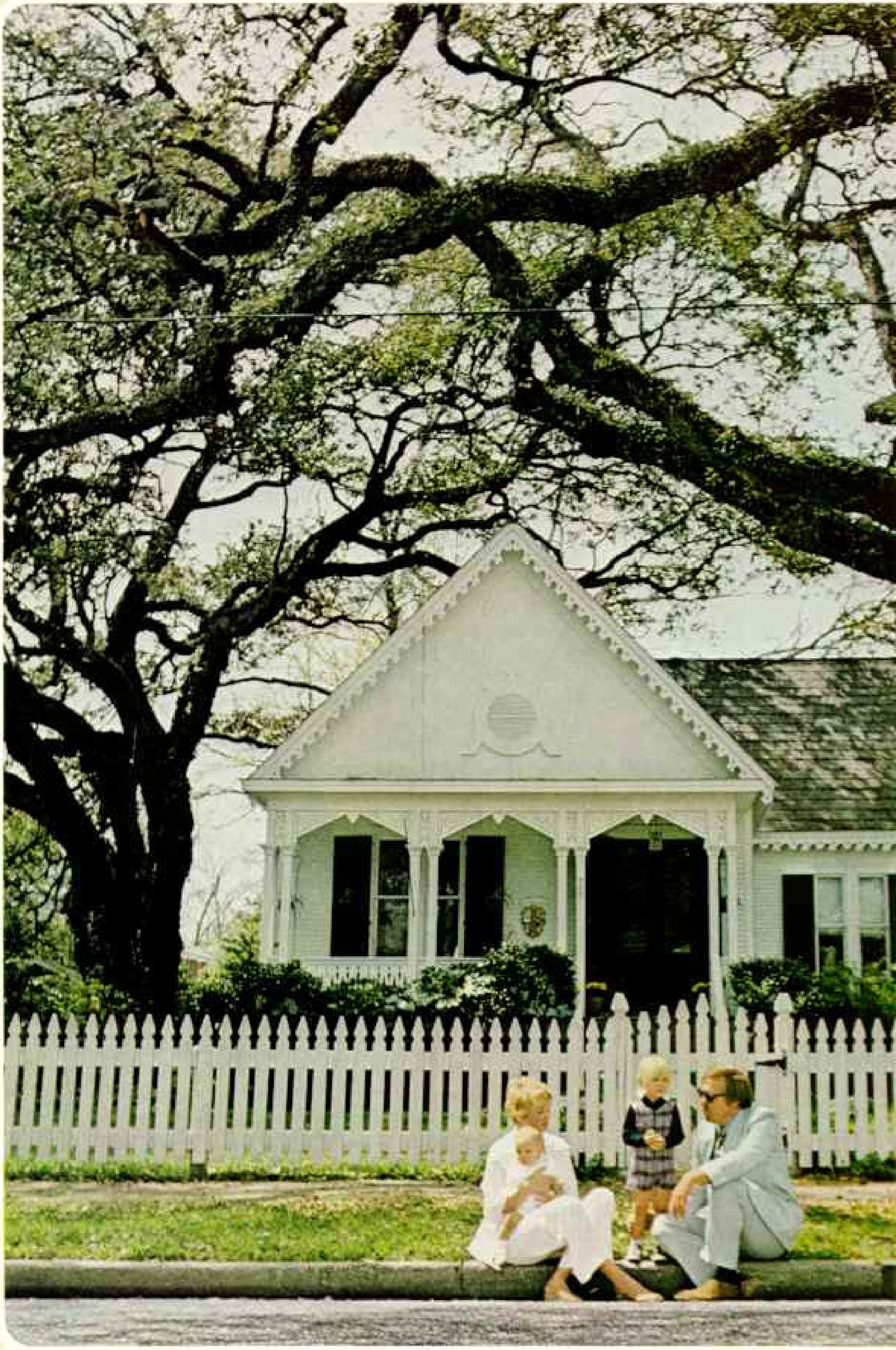
As I left, he said he'd have his state troopers "keep an eye out" for me during my travels on Alabama's lonely country roads. That promise was kept many times.

Southwest of Montgomery I passed the site of "Tent City," where just ten years earlier Martin Luther King, Jr., and hundreds of resolute followers, including some whites, had camped during their celebrated Selma-to-Montgomery march. The point of the march was to win and guarantee the black right to vote, a right freely exercised today. I pitched my tent nearby for the night, then continued on toward Selma, once a synonym for racial ugliness. The town looked pleasant enough. It seemed shockingly and unselfconsciously integrated. A policeman asked me a few questions, became very friendly, and gave me an American-flag patch he thought would look "mighty good" on my pack. I had been looking for a patch like that for months. I wear it still—one proud American.

THEN it was on down to Mobile and the Gulf Coast. Walking into Mobile was like walking into a giant park. What really struck my eye and absorbed my mind were the trees and the azaleas. The whole city seemed like a pink, white, and red fantasy. Equally exciting were the live oaks standing like moss-bearded prophets above the petty affairs of men. I was so enamored of these wood giants—and so out of money—that I got a job with the city trimming trees. Cutting dead branches off a regal live oak made me feel like a privileged barber trimming the hair of a king.

I fell in love with Mobile, the most beautiful city I had ever seen, and the one that seemed to me to have struck the best balance between nature and urban man.

One night in Mobile, while going to what a friend had promised would be a "real wild party," I saw a sign for a Christian revival meeting



sponsored by the James Robison Crusade.

I had always laughed off the notion of going to any such "Jesus joinin'," but once again—as with Homer and the Farm—I felt a kind of call. My soul started spinning like a weather vane, and where it finally pointed, I would walk. It pointed not to the real wild party but to the James Robison Crusade. So that's where I went.

Ten thousand people packed the auditorium. I sat down front so I could take some pictures, feeling just a bit silly at being there.

Then up to the podium strode the evangelist James Robison, a tall, tough Texan who looked more like a linebacker for the Dallas Cowboys than a preacher. But a preacher he was.

I found myself listening—not so much to the words as to the fire that was in them, lighting me up inside. Robison called for repenting sinners to "come up and accept Jesus as your Savior."

A rush of people, maybe three hundred in all, pressed toward the podium where Robison stood. Was this me standing there among them?

"Do you accept Jesus as your personal savior?" Robison asked us.

My lips opened. I said I did. I meant it.

Man has struck a fine balance with nature in Mobile, whose majestic live oaks give the bustling city a relaxed air. I got a job trimming branches for the city. This family—orthopedic surgeon Joe Ray, his wife, Delaine, and sons—live beneath some of my centuries-old patients.

Again he asked, again each of us replied, affirming our acceptance.

Later, relaxed and clear-eyed and more inwardly at peace than I had ever been, I floated out of there and back into the street. I never did get to that real wild party. I had gone to a realer and more far-out party than any I might have missed.

Like a wavering compass needle that points at last to north, that weather-vane soul of mine had found the direction it would point to from now on. Now I knew what folks meant when they talked of "amazin' grace."

AND SO I reached the Gulf Coast. Now I had come as far south as I could go. I particularly loved the sea air, all salt and vaguely fishy and filled with magical, soul-stirring vapors that no mountain wind can surpass for perfection. I swung westward along unending beaches that lead across the misty, marvelous coastlands of Alabama and Mississippi.

After all the landlocked miles I had walked, it was pure poetry to go barefoot at the water's foamy edge. Every so often I would see a dog romping in the surf, and the memory of Cooper would almost overwhelm me. . . .

Ahead was New Orleans, where I hoped to get a job for a while on one of the oil rigs out in the blue gulf. After that, it would be two, maybe three years more of walking and working to reach the Pacific and the other end of the rough V that I'd begun back in Alfred, New York.

Part one of my walk, my own personal pilgrimage into America, was over. I'd started out with a sense of bitterness, turned off by the whole idea of what my country seemed to me to have become. But with every step of my walk I'd learned otherwise. I'd been turned on by America in a thousand fantastic ways. And as much as I was changing, it seemed to me that America itself was changing right along with me, as if all of us—more than 200 million strong—were somehow taking this walk together.

Since making that first fateful step out of Alfred, I had lived a life of extremes. I had starved my way through the Smokies and stuffed myself southern-style. I had frozen my feet in West Virginia and broiled my brains in Alabama. I had shared outer and inner spaces with a mountain man and been baptized "Albino" by an amazing black family. I had loved and lost a magnificent friend named Cooper Half Malamute. I had been elevated by a nameless man who gave me five red apples on a Virginia mountaintop, and by a gutsy, generous governor named George Wallace. And as many American heroes as I'd met, I knew there were countless others still to meet.

I glanced behind myself down the long Mississippi shoreline. I could see my two footprints trailing behind me into the misty milk-blue infinity. Those footprints in the sand, in a way, were my own signature. I liked the fact that the waves would soon wash them away.

Facing back toward New Orleans, I quickened my steps. □

I was really impressed by the big strides toward integration being made in the South. I found most Southerners much more realistic about racial matters than I expected. A teacher in Mobile (above) encourages youngsters in a foot race. I take meditative pause (right) on the bridge where whites confronted blacks during the Selma-to-Montgomery march for black voting rights in 1965. It seemed a fitting place to ponder the tremendous changes that have been taking place in the South, in America . . . and in myself.

KAY CHAPLIN

A young American scholar threads dizzying Himalayan passes to reach lofty Dolpo and its shrine, where life still moves to timeless Tibetan cadences

Trek to Nepal's Sacred Crystal Mountain

ARTICLE AND PHOTOGRAPHS BY JOEL F. ZISKIN

RAIN LASHED the straining yak-hair tent, and the wind howled, as if the spirits of the peaks raged in the black Himalayan night. Within, huddled in flickering shadow, a circle of rugged men pulled their sheepskin coats tighter, but did not dare edge closer together.

In the feeble light of a butter lamp, a nomad shaman squatted over a bare-chested, youthful herder glistening with sweat despite the cold. Young Kunga, so the shaman hissed, had angered a *klumo*, a blue mermaidlike guardian of springs and streams.

To staccato bursts from his double-headed drum, the shaman flung a fistful of barley into the air. Here in the highest yak pastures of Dolpo, remote border district of Nepal, I witnessed a rite older than history. Whispering hoarsely, the shaman called on his ally, a mountain god, to help expel the evil.

My guide, Oga, himself born in a nomad's tent, muttered to me, "He says a holy mountain called Fierce Red Spirit sends him the life-force of seven black wolves."

A blast of rain flung open the tent's smoke flap. Something possessed the shaman. He howled and bent, sinking his teeth into the spellbound Kunga.

Next morning the frenzied exorcism of the night before still echoed dimly. In a sun-drenched meadow above the tents of the high-pasture camp at Tangmoche, Oga and I listed the spirits that the shaman had invoked, among them "Warrior King of the Black Crag" and "Great Lord the Soil God." Propitiating local deities was a practice that had survived since before the introduction of Buddhism and sedentary agriculture into Dolpo more than a thousand years ago.

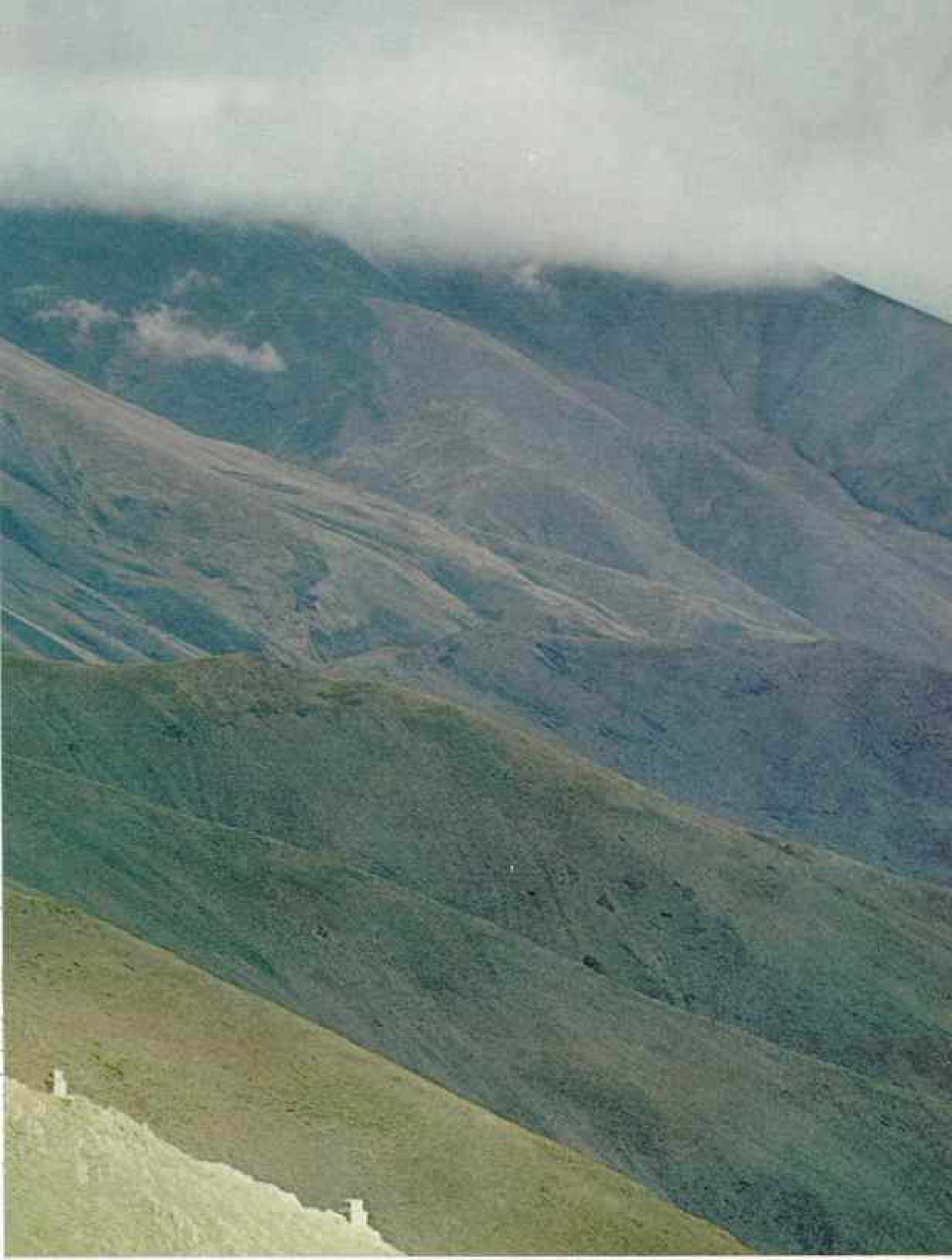
In the clarity of its rarefied atmosphere, Dolpo lay before us—an endless expanse of rumpled brown mountains buttressing the main Himalayan range that we had crossed coming from Kathmandu, a month's trek to the southeast. Less than a day's walk to the north lay an invisible line—the border with the Tibetan Autonomous Region of the People's Republic of China.

Just below us, nomad women sat weaving on back-strap looms. Curd cheese dried on blankets spread in the sun (page 506). A pair of eagles patrolled a turquoise sky.

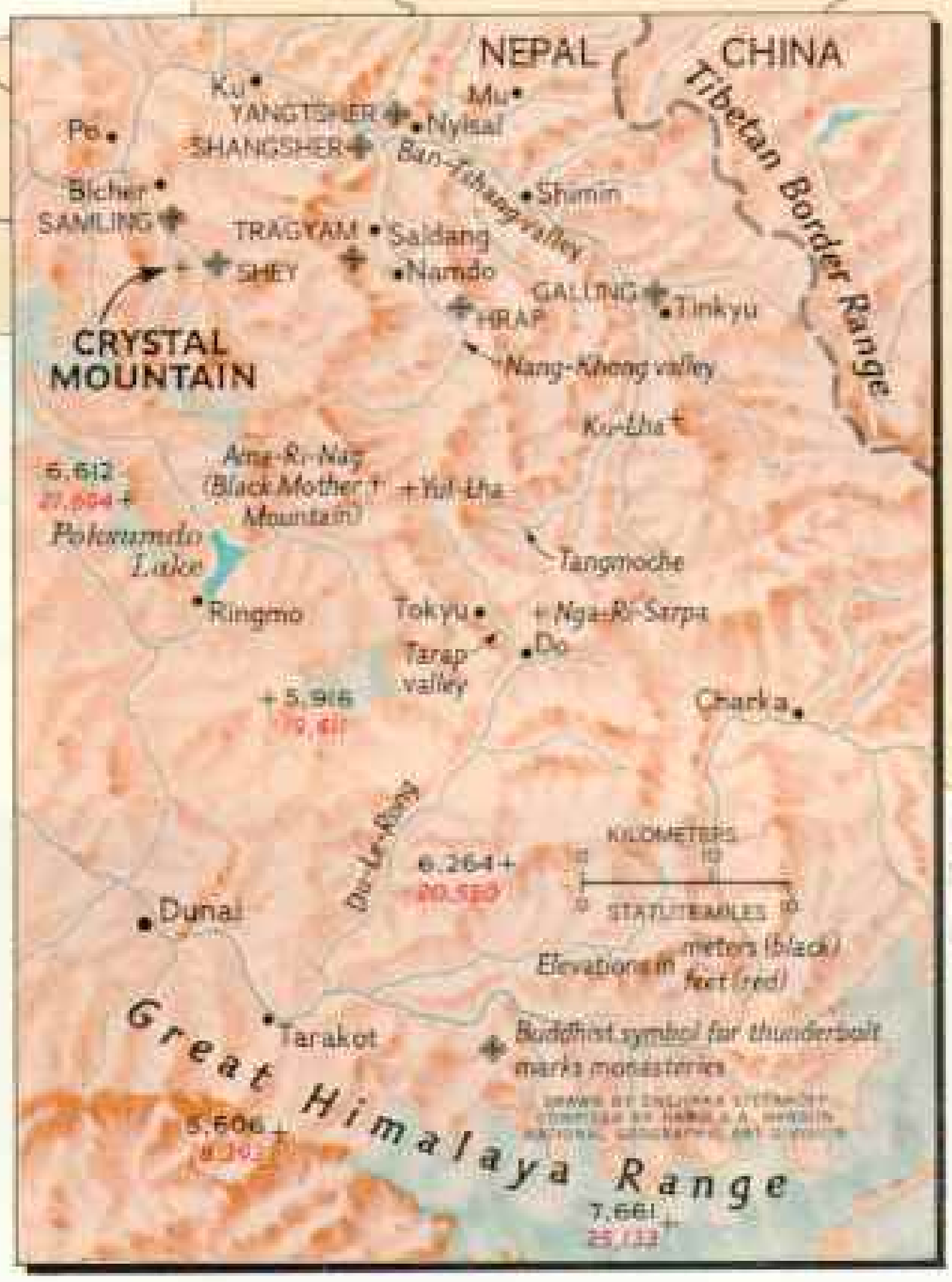
Time seems to have passed Dolpo by. Hidden away in a cultural cul-de-sac, an ember of traditional Central Asia survives here on Nepal's frontier. *(Continued on page 506)*

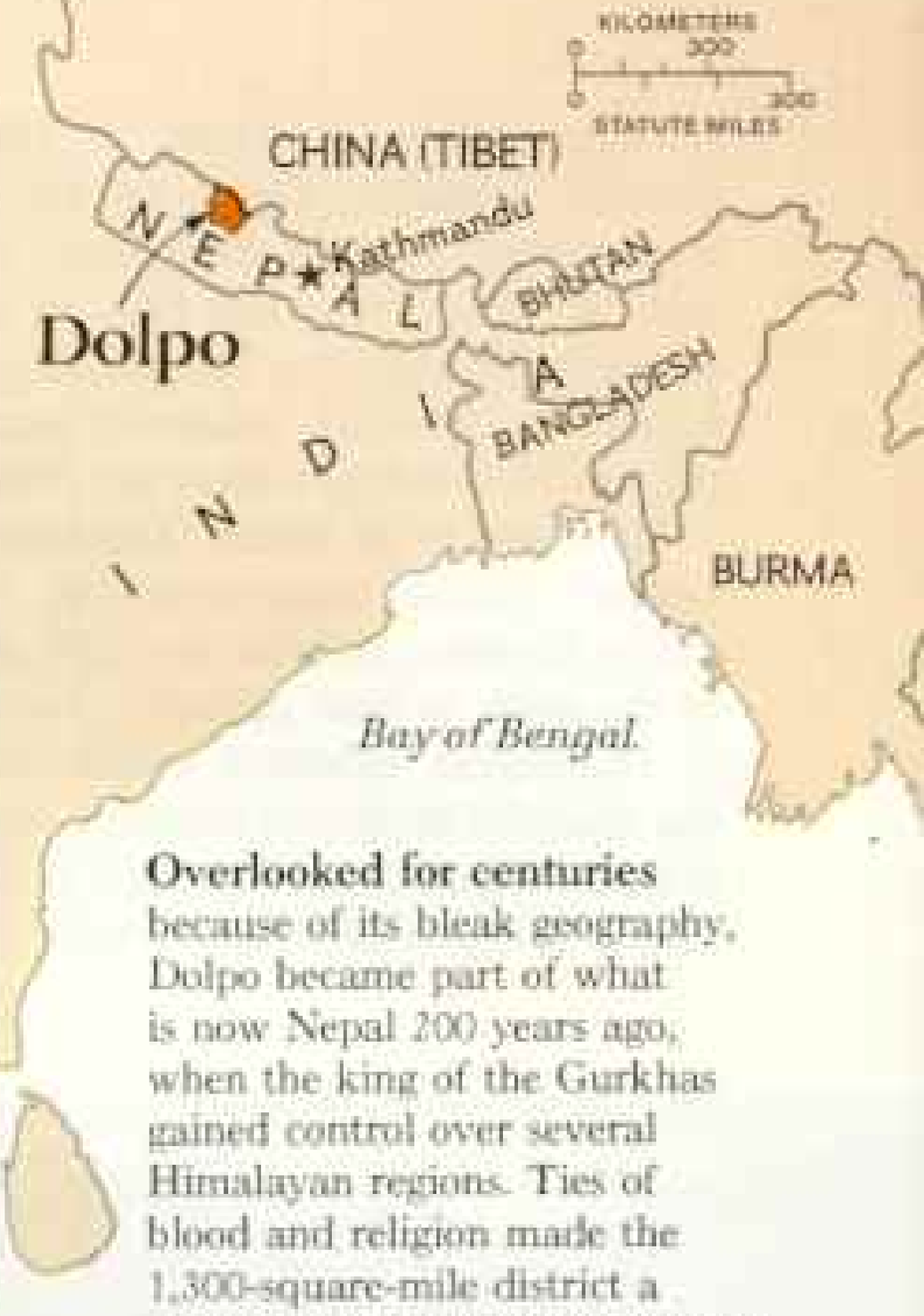
Culture in twilight: A Tibetan nomad shaman of Nepal's remote Dolpo district invokes a mountain god called "Fierce Red Spirit" to help him heal a patient. Traveling with such nomads on a journey to the Crystal Mountain, the author studied an ancient Tibetan way of life that combines animism with the teachings of Buddha.

Astride a barren ridge in the Himalayan fastness, wayside shrines lead upward to a Buddhist *gompa*, or monastery. For more than a thousand years meditators have



lived lonely lives of self-denial in such retreats. Three weeks' walk from Nepal's nearest road, mountain-locked Dolpo has been visited by only a handful of Westerners.





Overlooked for centuries because of its bleak geography, Dolpo became part of what is now Nepal 200 years ago, when the king of the Gurkhas gained control over several Himalayan regions. Ties of blood and religion made the 1,300-square-mile district a natural refuge for many Tibetan nomads who fled the Communist Chinese takeover of their homeland between 1959 and the mid-sixties. Nepal now has begun a program of resettlement and assimilation of nomads.

Not for the fainthearted: High above the Du-Le-Rong gorge (**left**), the author's bearers enter Dolpo along a perilous path. Horses laden with supplies were led in by a longer but less precipitous route. To visit this district—virtually inaccessible during the long winter months—Joel Ziskin walked for some five hundred miles. Within Dolpo's ring of massive mountains, he found a people economically and culturally disrupted by their estrangement from Tibet. A young man (**right**) playing a Himalayan lute greeted the author on the slopes of the Crystal Mountain—capstone of an extraordinary trek.

(Continued from page 500) Dolpo's subsistence economy, based on livestock and barley crops wrested from fields situated as high as 14,000 feet, has little to arouse the avarice of conquerors. Her people continue to follow the old ways, relatively untouched by the culture-leveling rush of the 20th century.*

Two groups of ethnic Tibetans make up Dolpo's sparse population: the *rungba*, or valley farmers, and the nomadic yak herders of the *drok*, or high pastures. The privations of Himalayan existence ensure that life, at the material level, can never be anything but frugal. Dolpo's people, though, have long felt amply compensated by a richly variegated spirituality, a melding of two religious inheritances.

The first, and more archaic, involves the belief that anything, alive or not, organic or inorganic, may possess a spirit—a force to be reckoned with. The second, as taught by Buddha, is a rigorously intellectual path ascending past material concerns to a mystical transcendental state. The age-old animist beliefs held sway over Central Asia until Buddhism, in step with evolutionary social change, eventually gained the upper hand.

*Life in the neighboring region of Karnali was described by Lila M. and Barry C. Bishop in the November 1971 NATIONAL GEOGRAPHIC.

Camped in a high pasture, nomad women prepare for Dolpo's long winter by drying curds of yak, goat, and sheep milk in front of a yak-hair tent (**above**). Cut off from their traditional winter pastures in Tibet, nomads and villagers alike face hard times. Trachong, an old nomad (**right**), spins wool while telling of his lost wealth.

I had come to Dolpo to learn what evidence might remain of the early contact between these two spiritual traditions. To explore the landmarks of Dolpo's sacred geography, we traveled as pilgrims. Oga—who could create a blaze on the wettest of days with just flint and steel and dried yak dung—was my companion and bodyguard. The iron trident atop one of our tents signified the presence of a Buddhist ascetic, my clear-minded Thai friend, Chan Asomsatana.

Our wiry packhorses, laden with yak-hair bags stuffed with tents, blankets, and precious food, and topped with pots, pans, and a clanking tea churn, lent a festive air to our little caravan, which was tended by two pigtailed, turquoise-earringed Bawa tribesmen.

Traveling on foot, we followed a route that looped about 500 miles through north-central Nepal (map, page 505). We would visit nearly all of Dolpo's villages and temples, but as often as possible we pitched our tents in the high-pasture camps.

Nomad Woe: Barley Is Up, Butter Is Down

Late one spring afternoon, in the tent-dotted meadows of Tangmoche, we helped herd hundreds of yaks, sheep, and goats coming down from the day's grazing. Kunga, the youth who had undergone the shaman's

exorcism, was helping sort the bleating animals. Obviously he had recovered. Milking women joked and sang as they moved along lines of goats, slapping at swollen udders in imitation of a hungry kid.

At nightfall barking camp dogs announced the return of Lawang, the headman, from a nearby village. His saddle over one arm, our friend urged us inside his roomy tent. Chan and I sat on skins of blue sheep, in the guests' place beside a small folding table carved with Buddhist designs—a nomad's portable altar.

Lawang's rosy-cheeked wife flung drops of yogurt to the four sacred directions, then ladled our portions into wooden bowls. A crackling fire of green juniper sent up sweet-smelling smoke and sparks through a vent into a starry sky.

Lawang was disturbed. He had ridden to Tinkyu in search of barley. Roasted and ground into *tsampa*, this grain constitutes the Tibetan staple. But nothing was the same anymore, he said. For a thousand years Dolpo herders had wintered their animals in nomad lands across the northern border. Recently, in a countermovement, many Tibetan tribesmen had fled to Nepal, escaping the Chinese takeover of their country. Refugees from the 20th century, they could not evade its pressures. Dolpo pastures once restricted to summer grazing were crowded year-round.

For a thousand years, Lawang said, rates of trade—nomad butter for village barley—had also remained relatively constant. In the past five, the price of barley had tripled.

Worshipful Eyes Gaze on the Heights

But much had not changed. On Lawang's altar table, between worn bronze Buddhas and a yellowed photograph of high lamas, Chan noticed a large finger of faceted quartz. Lawang reverently touched the crystal to the crown of his head.

"In the year when I first came to Dolpo, I found this while going round the Great Tent Post of the Sky."

He passed it to Chan.

"A holy mountain?" I asked.

"*Nyeda ko*—by the sun and moon!" he swore. "On the cliffs of Shey itself!" Lawang referred to the Crystal Mountain, most sacred of Dolpo's holy peaks. Living at the edge of vegetation, at the very margin of life, the nomads worshiped the gods of the Himalayan peaks that seemed to secure their world.

To the Peaks of the Black Goat King

Later on, standing on a flat mud roof in Saldang, I could see the white-watered Nang-Khong rushing past the stone farmhouses. In a walled courtyard below, festive villagers dressed their horses in saddle carpets and silver-studded bridles.

Oga called, and I climbed down a notched log to pass through a smoke-black room hung with brass plates and a poster of Nepal's Harvard-educated King Birendra, in sunglasses and combat gear.

The villagers had invited us to ceremonial horse races held at the Nang-Khong's source, a site associated with an ancestor the people called Black Goat King. Red-tasseled pigtails swinging, the Saldang men mounted and drained stirrup cups of barley beer.

Our cavalcade made jerky progress upstream past scattered fields and fortresslike farmhouses. Groups of newcomers joined us, each formally welcomed with drafts of beer. Then everyone galloped to the next hamlet, hoofbeats and ringing harness bells set against the foaming water's sibilance.

From an old monastery, Hrap Gompa, perched high in a ravine, descended a red-robed *nagpa*, the sorcerer who was to preside at the ceremony. He was greeted respectfully by parishioners, who regarded him as a lama.

It took all day to reach our destination, where twin peaks commanded high pastures. These were the holy mountains of Black Goat King. Tents mushroomed around a stone and stucco chorten, or wayside shrine.

Next morning the deep-voiced thud of a prayer drum woke the camp. The Hrap Lama read aloud from well-thumbed scriptures. Attendants carried out offerings of molded barley and butter dyed bloodred and threw them on a sacred fire of juniper scrub. The smoke bent toward the two holy mountains,

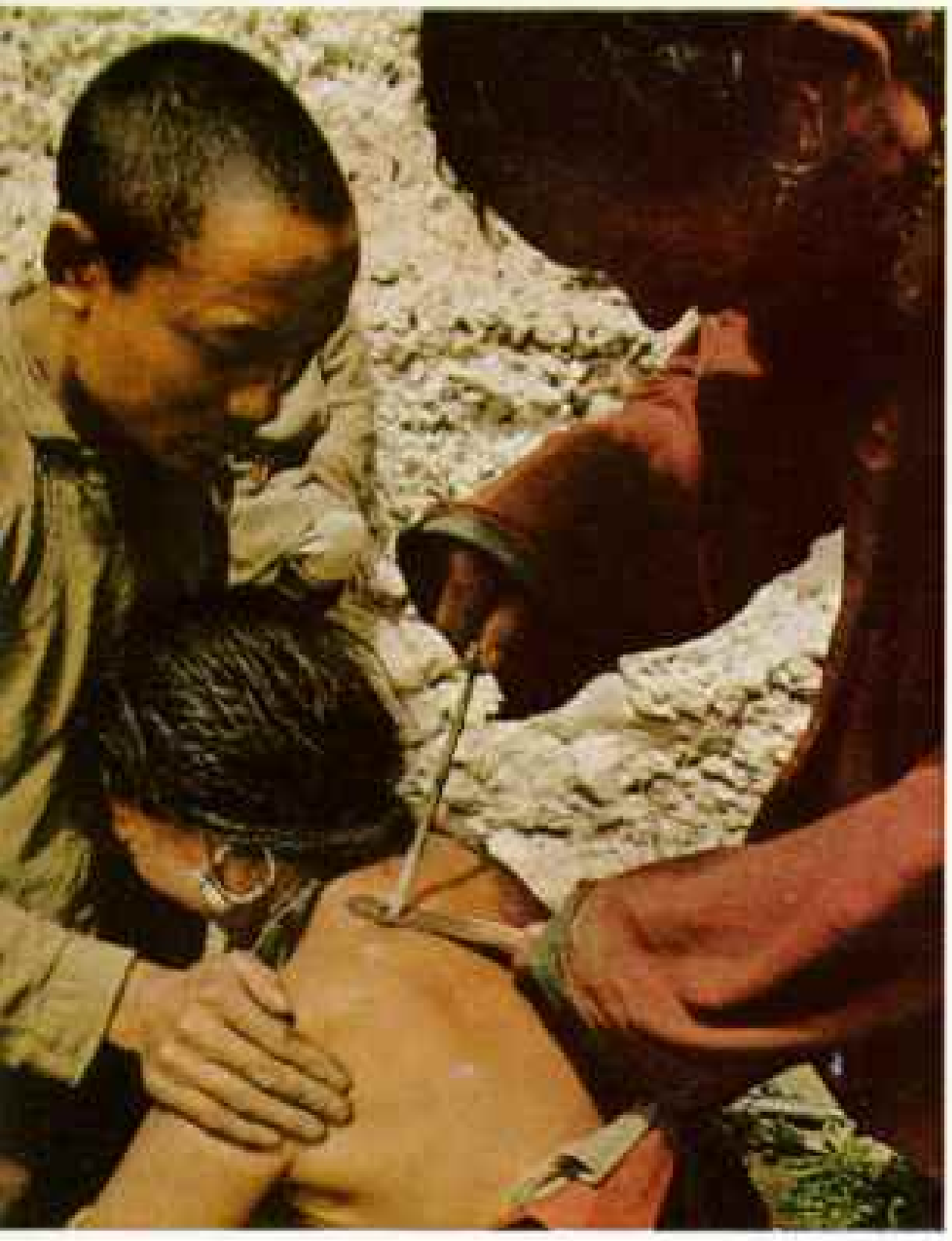
Lofty frontier of Tibet rides the horizon far beyond Shangsher, a village and monastery complex overlooking the plummeting river gorges of inner Dolpo. At 13,300 feet, fields of barley greening a slope are among the highest in the world.

then straightened. An ambiguous omen, I thought. With a loud blast from an old matchlock gun, the horse races began.

While we watched, the Hrap Lama told how this place had gained its sanctity. Nomads, searching for a missing black goat, found it suckling a wild boy who had descended a rainbow from the heavens to Black Mother Mountain, one of the very peaks under which we were camped. Carrying the child down on their shoulders, they enthroned him as chief. Known as Black Goat King, he fathered, tradition says, the villagers of the Nang-Khong valley.

I remarked that this legend and much of today's ceremony seemed clearly to have survived from Dolpo's animist past. Indignant, the Hrap Lama retorted: "The shamans lost their power long ago. The mountain gods are Buddhist."

When I pursued my questioning, the Hrap Lama demurred: "I have mastered many rituals. But in these other matters, I am not so well versed. Go to Shangsher Gompa. Perhaps Tsering the Painter knows more."



Bravely submitting to a folk-medicine treatment, an ailing woman (**above**) allows a lama to cauterize a vein with a hot iron and herbs. If this fails, demons will be blamed and an exorcist called.

Pantheon of Buddhist deities decorates votive tablets molded from clay and funeral ashes (**facing page**). The silver-dollar-size talismans mark the pilgrim route circling the Crystal Mountain.

Buddhism Climbs the Himalayas

It was now July. The days were warm, and we forded streams swollen from melting snow. Dropping down from 17,000 feet, we reached the vegetation line at 15,500, and shortly after heard but could not see a lonely shepherdess singing to her echo. We went on down to Shangsher Gompa, perched on a spur above the junction of the Ban-Tshang and Nang-Khong valleys (preceding page).

Tsering the Painter greeted us barefoot. Though the red robe hanging from his shoulder was threadbare, he possessed an innate urbanity. I was not surprised to learn that he had once studied at Tsurphu, a great Tibetan monastery of the Karma Ka-gyu sect.

We spent pleasant days in Shangsher. Prayer flags snapped and crackled in the endless wind. Under a skylight in a room beside the temple hall, a repoussé brass and copper teapot heated on a brazier. Here Tsering worked amid clutter—homemade cat-hair brushes, mineral colors in skin bags, a mortar and pestle to grind them, stone paint bowls. Tsering's *thangkas*—often called Buddhist icons—hang on many Dolpo altars.

As an initiated lama, Tsering understood much of the symbolism behind the holy images. The painter rummaged through piles of old thangkas. He unrolled a brocade-bordered painting that depicted the Eighty-four Mahasiddhas, storied saintly yogis of medieval India and Tibet, whose esoteric teachings reached widely throughout the Himalayas and Central Asia.

"This sort of lama first brought Buddhism to Dolpo," Tsering said. "Many years ago, the Buddhist ascetic Drutob Senge Yeshe came to Dolpo and found here a wild people whose supreme god was a fierce mountain spirit. The lama went directly to this mountain and meditated. There he attained enlightenment. You yourself can see the shrine of this great teacher at Shey, the Crystal Mountain."

If that were true, I reflected, then behind the stuff of legend likely stood some such charismatic individual who had been a major force in solidifying Buddhism's hold over the animist mountain worshipers of Dolpo.

"*Ajo*," said Tsering, addressing me familiarly as brother, "I am only a student like you. There is one who might tell you more—the old hermit, Tulku Tsewang. But it will take good fortune even to get to see him. He has been in seclusion for almost a year."

Determined to visit the hermit, Oga, Chan, and I set out again. Our path at last led to a cluster of red-washed cliff dwellings—Tragyam Gompa, residence of Tulku Tsewang. His devotees claimed he had reached the threshold of Buddhahood.

We stood before a door that would not open to us. There was no possibility of seeing Tulku Tsewang. A small crowd gathered—the old and weak who sought shelter under the hermit's wing, who shared the alms he himself was given. A pockmarked man leaning on a crutch confirmed that the Tulku had not yet broken his yearlong retreat. He was still locked in his cell, engrossed in meditation. His housekeeper, a young nomad woman, alone might approach him.

Oga, not to be denied, wrote a note in Tibetan. With this we sent in to the Tulku saffron, musk, and incense.

The housekeeper returned with the hermit's reply scribbled in chalk on a board.

"It is good that you have questions. Concentrate, look around you, the answer is there. We shall meet after Shey."

Nameless Seas Adorned Crystal Mountain

In the seventh lunar month, before the barley harvest, villagers and nomads from all over Dolpo assemble to make the great *kora*, the circling on foot, of Shey, the Crystal Mountain. Shey is a very strange mountain indeed, its contorted cliffs laced with quartz and embedded with a rich variety of marine fossils—for Shey, like the rest of the Himalayas, in an earlier geologic era lay under a primeval sea.

The day before full moon, we slid down slopes of scree on the pass from Tragyam. Other groups—the red and blue stripes of their *kamlo* blankets brilliant against the barren expanse—converged on temple buildings at the foot of the huge twisted massif of brown rock. There the gurgling, sucking sound of buttered tea being churned mixed with the babble of conversation. We moved from fire to fire, visiting and chatting.

Oga introduced me to someone he called Mr. Holy Beggar, an old, sun-seared nomad who had completed more than a hundred circumambulations. From his patched skin coat, he produced a crumbling manuscript detailing the legend of Shey. The text confirmed what Tsering had told us; it even contained poems supposedly written by the mystic Drutob Senge Yeshe himself.

Magical episodes enlivened the long tale. A flying snow lion had served the yogi as a mount. When the mountain god resisted with an army of snake-beings, this loyal lion reproduced itself 108 times and overcame them. Drutob Senge Yeshe then transformed the earth spirit into "a thundering mountain of purest crystal." A white conch shell fell from the sky, and the yogi rose on his lion and pierced a hole in Shey's summit. Rainbows arced across the heavens.

Around Holy Shey to a Serene Haven

Before dawn the next day the whole throng of pilgrims set out on the circumambulation, ten miles of climbing and scrambling. We entered a canyon whose twisted walls bore the images and marks of gods and goddesses visible to the true believer. Celebrants scraped rock dust from fallen boulders and swallowed it with water from sacred springs.

Crossing a snowy plateau, we climbed to a barren saddle, at 16,800 feet the highest point of the kora route. From a row of cairns piled high with bleached yak skulls, shredded prayer flags whipped in a cold wind. These were pilgrim stations venerated by an animist cult, yet marking a route that lay at the sacred center of Dolpo's Buddhist faith.

As clouds roiled the sky, pilgrims filed past a glacial lake. A herd of blue sheep ignored our footfalls. High above, in the summit ridge, I could plainly see a gaping hole. Behind it, I was told, lay a perennial ice cap. Where the legendary snow lions had pranced in victory, men and women now joined hands in a circle and danced, stomping and whirling to a plunky tune picked out on horse-necked lutes (page 505).

The sky grew darker, and it began to sleet. The crowd hurried *(Continued on page 516)*

The strongest of men still bow before the unknown in Dolpo. In supplication to a *yul-lha*, or "god of this place," a Ngawa tribesman rides his sturdy Tibetan pony through the consecrated smoke of a juniper fire. After this ritual is concluded, the day is given over to horse racing, also considered sacred.

Exalted in legend as the site of Buddhism's ascendancy over the region's animist gods, Dolpo's hallowed Crystal Mountain was depicted (**above**) by an artist-monk, Tsering the Painter, in a work commissioned by the author. A thousand years ago, according to lore, a Tibetan ascetic named Drutob Senge Yeshe flew in on a magic snow lion, conquering the reigning mountain god, and the rock became crystal. Ever since, Dolpo's faithful have made annual pilgrimages around the shrine's ten-mile girth. Climbing toward a saddle separating the main summit from a spur—as illustrated at far left in the painting—two pilgrims (**left**) begin their *kora*, or circumambulation. The fossil-layered mountain—once beneath a primeval sea, as were most of the Himalayas—has recently drawn pilgrims of a different stripe: rock-hunting geologists.

Seeking perfect knowledge through harsh Buddhist disciplines, Dolpo's living saint, Tulku Tsewang, has spent most of his 65 years in his meditator's crib (**right**). To gain an audience with him, the author and his companion Chan brought offerings, including a votive tablet and a shell suggesting the spinning cosmos (**below**)—only to be told in writing to go first to Crystal Mountain. On their return, the holy man spoke to them of illusion and the impermanence of all worldly things.

to reach a temple built in the mouth of Drutob Senge Yeshe's meditation cave. A dim ambulatory, so narrow we had to turn sideways, led to the central altar room, filled with the smell of wet wool and butter and the sound of murmured prayer. A reliquary enclosed the ashes of Drutob Senge Yeshe.

A sense of contentment and completion filled us, as we finished the circuit of Shey. But then we had to turn at once to laying in what meager food stocks we could find. Daily, the weather was growing colder; and we must begin the journey back to Kathmandu before snow sealed the Himalayan passes.

Studying a copy a local scribe had made for me of the manuscript from the monastery at Shey, it became clear that the ascetic's name, Drutob Senge Yeshe, was an epithet: Master of Mysticism, Powerful as a Snow Lion, Perfected Sage. And one could see him as the personification of the entire parable—the more sophisticated Buddhist creed, mystical enlightenment transcending mere matter, in collision with a folk religion tuned to the harmonies and dissonances of the natural world. In the end, Buddhism did not crush those old beliefs, but absorbed them.

Thoughts on Pillars and Permanence

We returned over the pass and ascended once again to the retreat of the hermit, Tulku Tsewang. This time the door, squeaking on leather hinges, opened to us, and we went in. The scent of incense permeated the gloom. One narrow beam of light fell on a face as lined and furrowed as the weather-ravaged landscape of Dolpo. The hermit sat cross-legged in a *gomtri*, a meditator's wooden crib (above, right). His lips moved silently as his fingers played over well-worn prayer beads.

Hesitantly, Oga spoke. He told of our quest, of our studies of the spiritual traditions of the Tulku's land. The hermit considered us.

"The old men of Dolpo speak of Shey, and the other sacred peaks, as the pillars of their world," I said. "Yet Tsering the Painter called Shey's summit a symbol of transcendence. Which is the true Buddhist concept?"

Tulku Tsewang spoke. "There are many paths along the Way."

"*La, la-so, Rinpoche*—yes, oh yes, Most Precious One," Oga whispered.

Why had Drutob Senge Yeshe renamed the sacred peak the Crystal Mountain, I asked. The Tibetan word pronounced SHEY means "crystal." To me it also evokes the word meaning "to perceive." Could this be significant, or was it just coincidence?

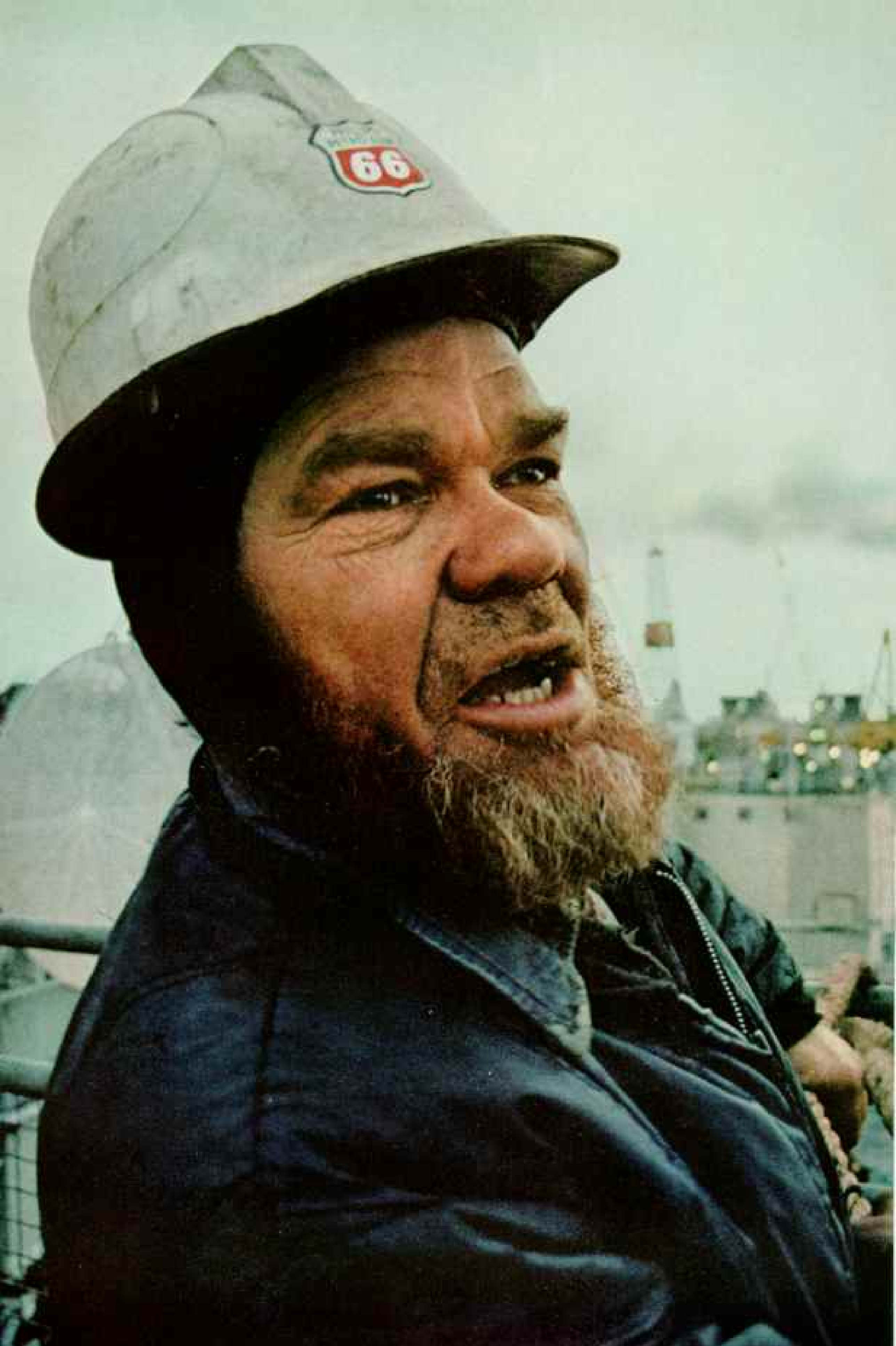
The old hermit stared beyond us into darkness, and he did not answer directly. "His teaching was this: The yogi understood that the true nature of existence is impermanence. To a flea, a man might seem immortal. The people of Dolpo think of their mountain as indestructible. But is it? The stars have seen many such mountains come and go."

Clutching amulets he had given us, we left Tulku Tsewang to his meditations.

Day faded into night. A shepherd whistled, and the jangling of yak bells echoed faintly in the canyon.

On the heights above, nomad campfires flickered into life. I spoke aloud the words of that other, earlier, visitor to this lost land:

I flew through the sky on a snow lion,
And there, among the clouds, I performed miracles.
But not even the greatest of celestial feats
Can equal once rounding on foot this Crystal Mountain. □



Striking It Rich in the North Sea

By RICK GORE
NATIONAL GEOGRAPHIC STAFF

Photographs by
DICK DURRANCE II

A HUNDRED MILES out of Aberdeen and our chopper is shaking in the wintry gale. High waves brawl on the sea below. It is twilight, and we seem lost in a murky blue nowhere, when suddenly the bright orange flare of Charlie platform breaks through the clouds. Forties field, one of the major oil reservoirs of the North Sea, lies dead ahead.

A decade ago the wild North Sea seemed an unlikely place for an oil boom. A prominent geologist, in fact, said he personally could drink all the oil to be found there. That would be at least a 23-billion-barrel mouthful —more than twice as much as may lie beneath Alaska's rich North Slope.

Close to 4 percent of the world's crude is now thought to rest between the coasts of Scotland and Norway, and some oil companies are spending $2,000 a minute or more to get it out. Already this bonanza beneath the

New Viking of the North Sea, Texas welder Red Verrett struggles to secure gear at Phillips Petroleum's Ekofisk complex in the sea's Norwegian sector (map, page 525). Ekofisk pipes crude oil to England and natural gas to West Germany as part of a multinational gusher of wealth.

sea has wrought dramatic changes onshore. Long-term effects promise to be profound.

Windfall revenues from North Sea oil will help bail Britain out of its dismal economic fix. Oil may well make Norway, per capita, the richest industrial nation on earth. Oil is revitalizing—some say it is ruining—the Highlands and northern islands of Scotland. Moreover, anticipated oil riches are firing a serious Scottish independence movement.

Giant Platforms Stud the Sea

But we have left the politics and the economics back on shore. Now there is nothing but the agitated sea and this mammoth steel island coming up fast just ahead.

Charlie is one of four platforms in British Petroleum's Forties field. Its four steel legs, pinned to the seabed 420 feet below, hold three decks and a drilling derrick 75 feet off the water. Some 225 feet higher, a towering flare burns off natural gas coming up with the oil. Standing as tall as a 30-story building, Charlie straddles the waves.

We stop to let off crew at Charlie, the control platform for Forties field, then fly on to Alpha. As I hop onto the helicopter deck, a cold, rainy gust pummels me back a step. The sea bellows, and that great orange flare above me roars like a giant pilot light.

I dash for the stairs to the main deck. They are perforated steel slats and give a dizzying view of the sea far below. They are slick with oil. I have been told that guardrails will keep a man from being blown off the platform, but right now I don't believe it.

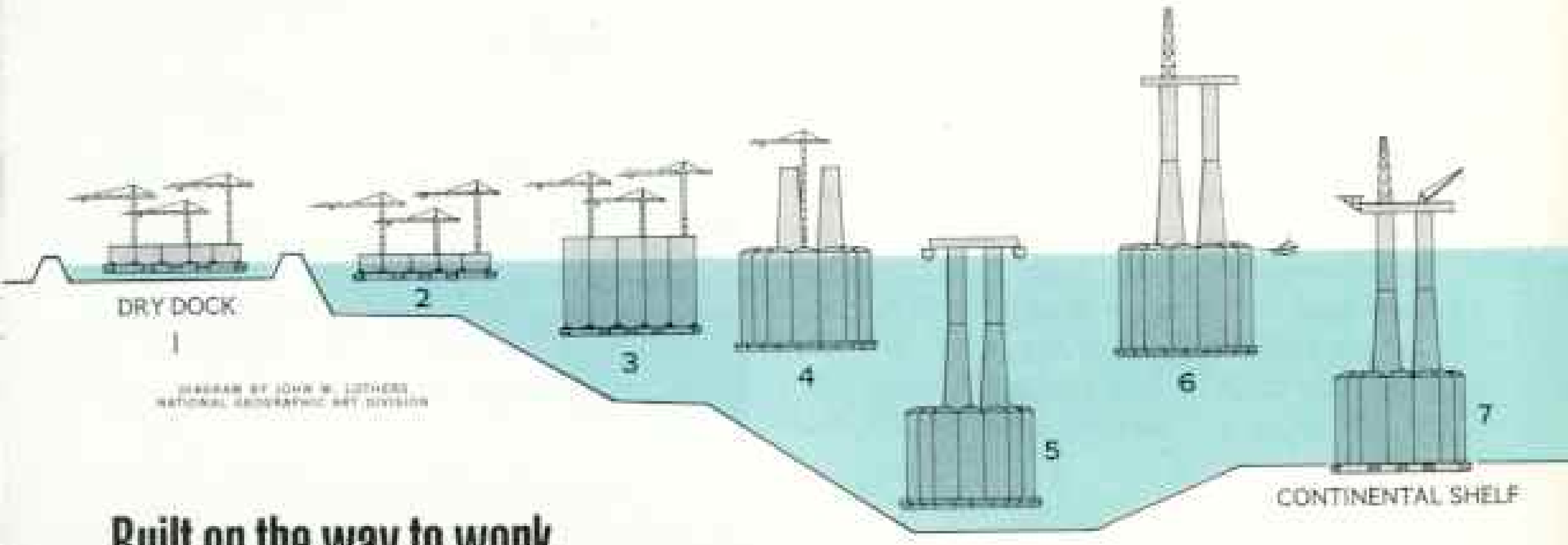
Forty-five-knot winds like these stop some of the work, explained David Erskine, platform superintendent, a few minutes later. But not until the speed exceeds 60 knots—approaching hurricane force—do offshore veterans consider the weather really rough.

"In all of December we were able to unload our supply boats on only 12 days," Erskine said, checking his log. "For the month, we had seven days of 60 to 70 knots, and another nine of plain gale."

The platforms, he told me, are designed for the 90-foot waves and 110-knot winds that the North Sea produces. "But when it gets to blowing 80 knots, you can't help hoping the designers got their numbers right."

The business of this platform is to drill wells—as many as 27, angled off in different directions—and pump the crude oil to Cruden Bay on the Scottish coast through a 106-mile underwater pipeline (map, page 525). As I walked the decks of Alpha, I saw mighty cranes able to lift 145 tons of pipes off a supply boat and stack them in tidy piles. I hurried past generators, some painfully noisy, that produce 10,600 kilowatts of electricity.

Again and again I gazed up at the brilliant flare that warmed and lighted the top deck like a tiny sun. Eventually the natural gas that fuels this flare will be liquefied at the platform. But now, for safety, 20 million cubic feet is burned off each day. Converted into



DRAWN BY JOHN W. LUTHERS
NATIONAL GEOGRAPHIC ART DIVISION

Built on the way to work

HOW TO CONSTRUCT a very large, very strong production facility to rest on the bottom of the North Sea? Solution: "Condeep." This Norwegian design begins in dry dock (**1**). As the 19 concrete tanks are built, the dock is flooded and the structure floated to sheltered waters (**2**). Construction continues (**3**), and platform support towers are added (**4** and **left**). The rig is nearly sunk so barges can cap the towers with the platform (**5**). Raised again, the 700-foot-high Condeep is towed to sea (**6**). Finally it is sunk to the bottom (**7**) to drill for petroleum, and then to siphon and store it.

electricity, that much energy would power an average home for about 250 years.

Drilling goes on 24 hours a day. At the derrick I watched a team of ruddy-faced young Scots run pipe into the seabed below.

Dozens of 93-foot-long pipes dangled from a rack in the derrick. With a grunt, a beefy roughneck swung one of the suspended pipes into place above the wellhole. Two others, faces streaked with grease, helped him drop it into the collar of a pipe already in the well. A powerful hydraulic wrench screwed the pipes together. The new pipe was dropped up to its collar into the well, becoming one more link in the 8,000-foot-long string.

Good Food, Good Wages, and Long Hours

A stint of offshore drilling, sings country balladeer Wayne Nutt, "is a lot like being in jail." Men at Forties field work grueling 12-hour shifts for 14 days straight. But most men have two weeks off between stints.

And the food at Forties as well as at Phillips Petroleum's Ekofisk complex, which I visited off Norway, is far from prison fare. "No trouble sleeping or eating on this job," said drilling engineer Noel King. Menus featured such choices as sole Véronique and beef jardiniere. (One young Oklahoman at Ekofisk did complain, however, that he could not get a good enchilada.)

Nevertheless, platform life takes on a timelessness. Boredom pervades the metal corridors. Quarters are close, often four beds to a room, and sterile. Privacy is impossible.

As Percy Cooke at Forties field put it, "Can you imagine any bloke hibernatin' out here for 14 nights, not havin' any of life's pleasures, if it weren't for the money?"

Offshore salaries average one and a half times those of comparable jobs onshore. Some workers earn far more. But many men have paid dearly. More than 80 have died on the job since exploration began.

In July of 1973 four perished after a helicopter flying to Stavanger from the Ekofisk

Tugging in two directions, five boats pull a Condeep forward, while others stabilize the structure as it leaves Stavanger, Norway. Five days and 250 miles later, the Condeep, built by Aker Group and Norwegian Contractors, was safely in place. LEIF SKOGE

complex went down. (When we made the same trip, we were required to wear survival suits that could keep us alive in 37° F. water.)

Three others died in November 1975, when an explosion set an Ekofisk platform ablaze. Six men boarded a floatable safety capsule designed to be lowered slowly from the deck in an emergency. Apparently in a panic, one pulled the wrong lever, which released the capsule and it plummeted into the sea.

In February of 1976 a 35-million-dollar drilling rig being towed to Bergen ran aground in a storm. Six men drowned when their lifeboat capsized.

By far the most dangerous occupation in the North Sea, though, is diving. At least 30 divers have died since 1971. In 1975 Peter Walsh and Peter Carson were sucked into a 36-inch pipeline off the Orkney Islands. Pier Skipmase and Robert Smyth died from the bends when their diving bell accidentally bobbed to the surface. Inexperience and panic contribute to most fatalities.

"The psychological strain is considerable. At three hundred feet your friends are far above, and they can't reach you," said Peter Harborow, now chief development officer of a new British diving school.

Divers Live in Cramped Quarters

In the cold North Sea, divers wear wet suits with tubes that continually bathe them in hot water. After working at three hundred feet, divers must decompress for as long as four days. Most work shifts of 20 days or longer, living in pressurized chambers between dives.

Outside Aberdeen, Malcolm Williams of Comex Diving Limited showed me one of these pressure chambers, about seven feet in diameter and a mere 15 feet long.

"Four to six men live in there," he said. "They have a toilet and hot-water shower. Music is piped in, and food and magazines are sent in through a special lock. When a diver is needed, he enters a diving bell and is lowered to the bottom."

Probably the most critical diving jobs involve the laying of pipeline in deep water. On a special "lay barge," such as the 95-million-dollar *Viking Piper*, pipes are joined together and continuously lowered into the water from an apparatus called a "stinger" at the stern. The pipeline settles into a trench blasted out of the seabed by a jet sled. Bottom currents then gradually cover the piping.

Divers must be on call continually to make sure the pipeline is coming off the stinger at the proper angle. At times they must cut and join the pipeline on the bottom and do odd jobs such as moving obstacles in the pipeline's path. The work is exhausting, but a top diver in a top month can earn as much as $6,000 plus bonuses.

The price of operating in the North Sea continually astonished me. For instance, laying a pipeline costs some $200 a foot. Mounting a diving system costs about $100,000; operating it runs up to $12,000 a day. Yet when oil prices quadrupled in 1974 to about $12 a barrel, the potential for profits became no less impressive.

Help for Britain's Ailing Economy

North Sea oil currently costs about $3 a barrel to produce. (Inflation will raise the cost for newer fields.) The British Government in particular has given the oil companies relatively lenient tax and offshore leasing terms. So, after taxes, the net profit on North Sea oil averages $3 a barrel, compared to 25 cents a barrel on oil from the Middle East and $1.20 a barrel from the United States.

Forties field cost 1.6 billion dollars to develop. However, it will produce 1.8 billion barrels of crude over the next twenty to thirty years. And, by writing off development costs against taxes, British Petroleum should get its money back in less than three years. As long as oil prices stay above $7, oilmen figure, the North Sea is profitable.

Which puts the British in a surprising position. Says financial radio commentator Aubrey Wilson, "We are now praying that the Arabs *won't* drop the price of oil."

The oil is a godsend to Britain. The country's major economic problem is that it imports much more than it exports. Much of what it imports is Mideast crude.

But within three years Britain will be producing more oil than it consumes. By 1980 it will be reaping billions of petrodollars. Britain has already borrowed heavily against these revenues. Its economy needs a thorough reordering. But oil will provide a breather.

"Having it won't give us all Cadillacs," said British Broadcasting Corporation economic correspondent Dominic Harrod, "but it would be *(Continued on page 530)*

When the pie was sliced in 1958 to establish national rights, the North Sea's vast reserves were only guessed at. The first indication came in 1959 with the discovery of a large natural-gas field in the Netherlands' Groningen Province. Even so, the offshore boom was slow to start. During the next decade gas fields were explored and harnessed, but not until 1969 was there a major oil strike. The North Sea reserves may prove to total 23 billion barrels, ninth largest in the world.

Skoal, y'all: Roughneck ways and cowboy hats (**above**) have come ashore at Stavanger, Norway, a main supply port for North Sea operations. Grocers in this former sardine capital have been quick to cater to the Texas palate (**left**).

On the Scots' side of the sea, in an Aberdeen hotel lobby, all time is oil time (**right**). The usual rip-roaring atmosphere of boomtowns has been moderated somewhat by company policies that import not only oilmen but also their families.

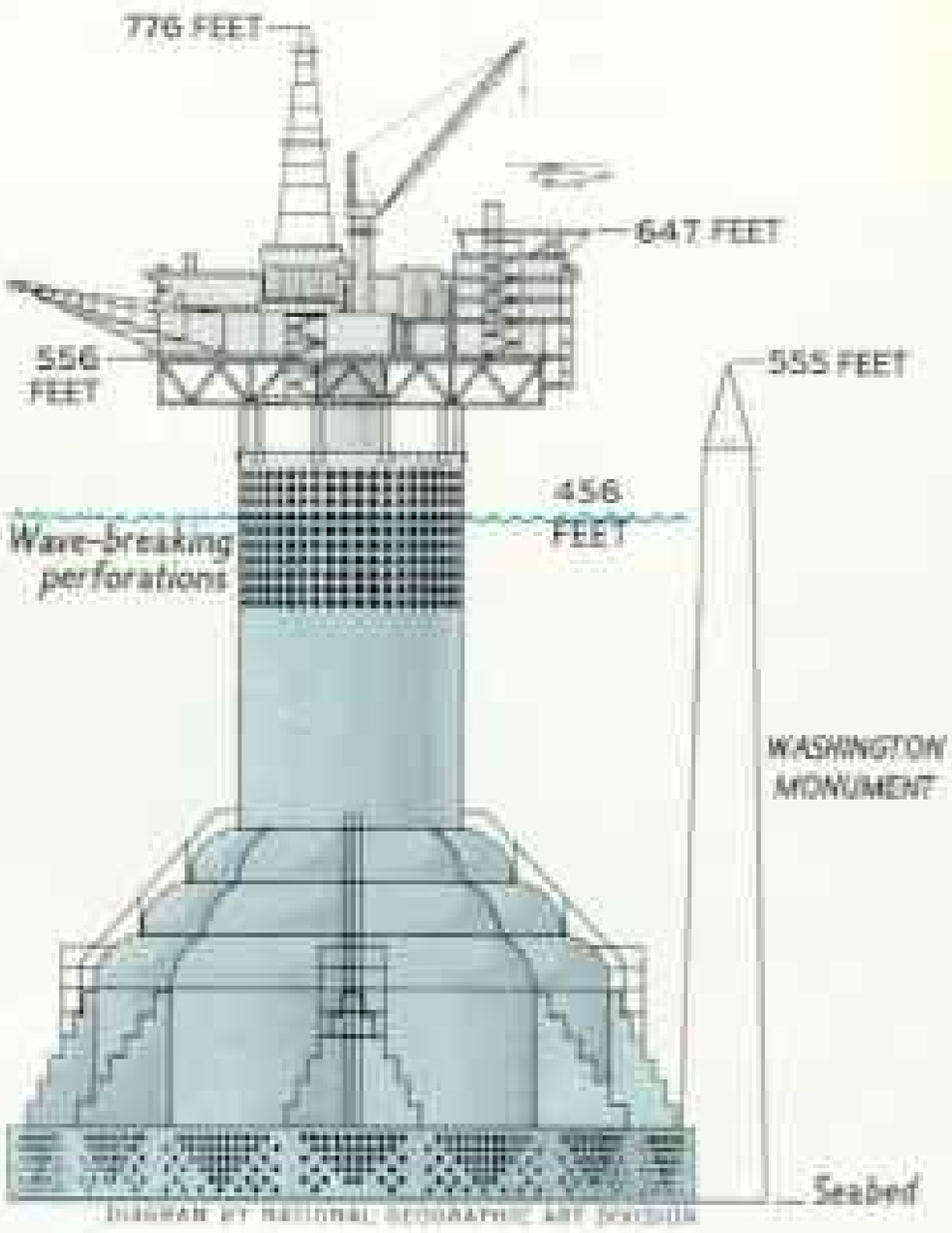


DIAGRAM BY NATIONAL GEOGRAPHIC ART DIVISION

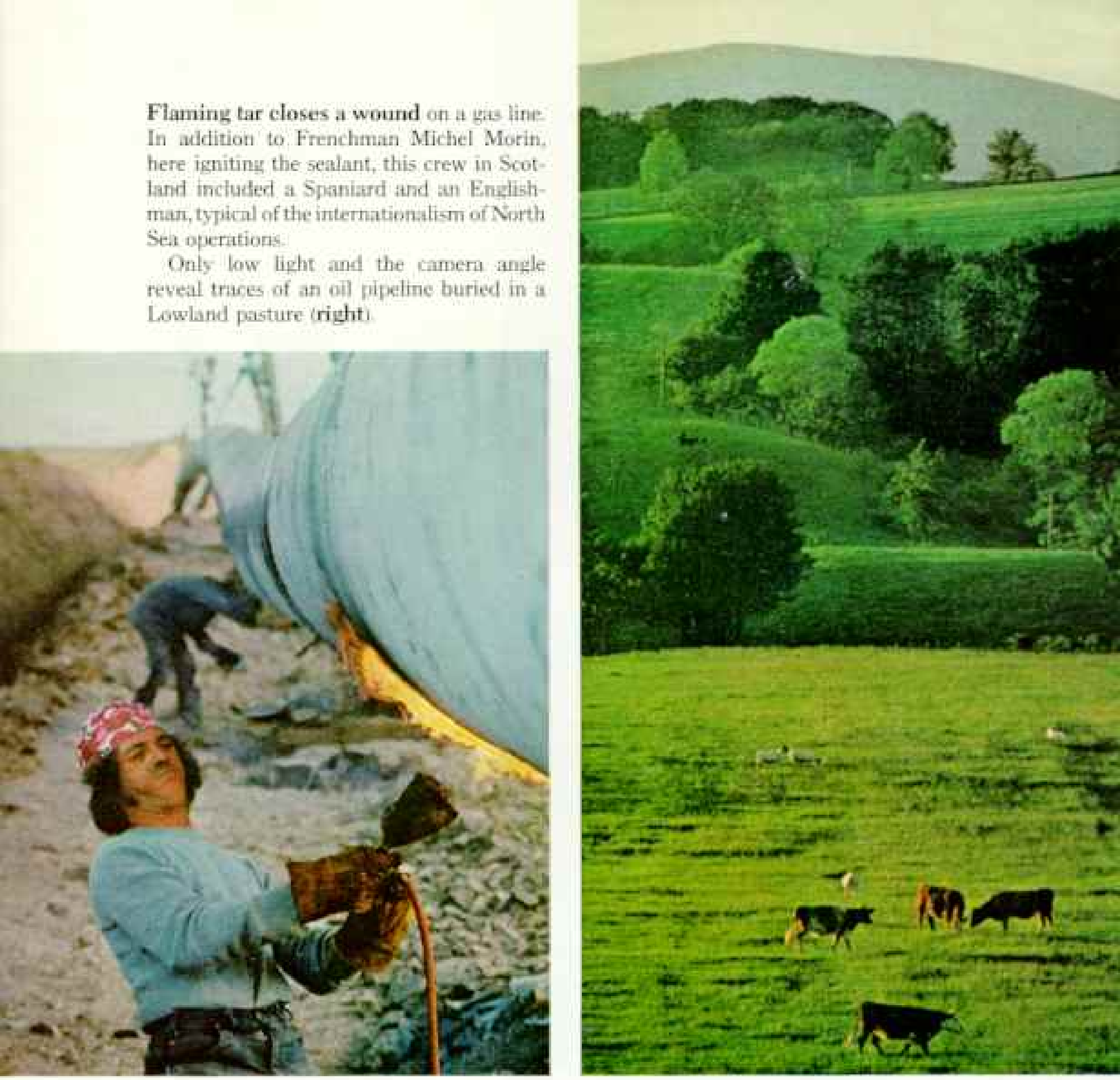
Cathedral for the age of oil rises in dry dock (**left**) at Loch Kishorn, Scotland. Under construction by the Anglo-French firm of Howard Doris Limited, it will serve as the master production platform for the Ninian field off the Shetland Islands.

Perforations in the massive 455-foot-diameter base and at the waterline (**above**) will reduce the effects of currents and waves. When towed to sea in the summer of 1977, it will briefly become, at 550,000 tons, the world's largest man-made floating object. As with Condeeps, it will then be sunk to rest on the bottom of the North Sea.

The application of new technologies on such a scale far exceeds what could have been imagined ten years ago.

Flaming tar closes a wound on a gas line. In addition to Frenchman Michel Morin, here igniting the sealant, this crew in Scotland included a Spaniard and an Englishman, typical of the internationalism of North Sea operations.

Only low light and the camera angle reveal traces of an oil pipeline buried in a Lowland pasture (**right**).



(Continued from page 524) a nightmare if it went away. Oil will give us time to sort ourselves out and get started with a better shake. Without it we'd be up a creek in a big way."

In order to see the full effects of the onshore oil boom, one must head north to Scotland. Most of Britain's oil lies off the Scottish coast. And oil has turned Scotland into a country of contradictions.

The bustling downtown streets, the overworked airport and harbor of Aberdeen—a city of 210,000 that now proudly bills itself as the "Houston of the North"—radiate prosperity. Yet Glasgow and the nearby banks of the River Clyde, the home of a great shipbuilding industry when Britain ruled the waves, are beset by chronic unemployment and despair-ridden slums.

One day at Nigg Bay I heard Ken Humphreys, an executive with Highlands Fabricators Ltd., an oil-platform construction firm, proclaim: "It's great to be alive in Scotland! There's hope that hasn't been here for years. Our lads, who used to leave home because there were no jobs, now are planning to stay."

On another day, in booming Peterhead, a fishing town that has been virtually commandeered by the oil business because of its ideal harbor and proximity to pipeline landfalls, I heard different viewpoints.

At the West End pub a young local Scot bitterly complained that he could not find

work. "Strangers," he said, "have got most of the good jobs."

Down the street at the Light Bite bakery an older woman, whose husband and son have fished the North Sea for years, sighed: "We used to have such a lovely bay. Then they put those piers in for the oil boats and it's . . . it's just . . . different. My family's seen no prosperity from the oil. It's not really for the benefit of the people of Peterhead."

Scots Clamor for Independence—and Oil

Such contrasts breed political discontent, and in Scotland the most serious dissension in centuries is now afoot.

"It's Her Oil," says a poster for the Scottish National Party, showing a distraught young woman. "So why are many Scotswomen in substandard houses?" Another poster, of a sad-faced laborer, reads, "It's His Oil. So why are there so few jobs for Scots?"

Adopting emotional rhetoric in hard times, the Scottish National Party (SNP) now threatens to send political shock waves through all Britain. The party could well win a majority of the 71 Scottish seats in the British Parliament in the next general election, which by law the ruling Labour Party must call by 1979. Parliament is now so evenly split between Labour and Conservatives that the "Scots Nats" could wield the balance of political power in the next Parliament.

The SNP wants Scotland to become an independent member of the Commonwealth, like Canada—and to own the oil.

"Scotland and England came together to form the basis of empire," said Stephen Maxwell, an SNP officer in Edinburgh. "Scots played an important part in ruling that empire. But England's prestige has deteriorated, and Scots are discovering a sense of identity. Being a junior partner in an enterprise that ruled one-fifth of the world's surface was very satisfying. It's not so pleasant being a junior partner of the sick man of Europe."

By no means, however, do a majority of Scots want full independence. Polls put the hard-core separatist vote at 21 percent. Nevertheless, a clear plurality of Scots has been voting SNP in local elections. The SNP commands landslide popularity among young Scots. Presumably, many are voting SNP to tell the English that Scotland wants much more control over its own affairs.

London Offers Home-rule Compromise

Last December Britain's Labour Government introduced a bill, hotly debated in Parliament, that would establish a Scottish National Assembly. This would bring the Scots closer to home rule than they have been since 1707—but it would not give them taxing authority, nor ownership of the oil. While many Scots protest the proposal as too weak, Conservative Members of Parliament—as well as many Labour MP's—fear that a Scottish Assembly would be just a first step toward independence. Furthermore, they argue, 45 million Englishmen cannot afford to let five million Scots walk off with the oil.

Most Scots Nats oppose violence. SNP leaders believe that patience and shrewd politicking will eventually bring them the power to negotiate a peaceful separation.

"What worries me," said Edinburgh journalist Chris Baur, "is that events are moving too fast. It doesn't take much stupidity to misinterpret the importance of what is happening here. Stupid things could be done after the next election by a government unsympathetic to Scotland. You could create a genuine anger here."

Oil has brought more than a change in the political complexion of Scotland; it is also imposing an industrial revolution across some of its loveliest countryside.

Loch Harbors Man-made Monster

Along Loch Kishorn, surrounded by remote, misty Highland grandeur, I saw the "Kishorn Monster," one of a new generation of concrete offshore oil platforms (pages 528-9). To construct it, the builders, Howard Doris Limited, had to excavate a hole larger than London's Trafalgar Square out of the Applecross hills that plunge down into the loch.

This is a magical wilderness, where fog-bound stags graze on brown heather. Even though the monster I saw taking shape in this great muddy pit—550,000 tons of concrete and steel that will ascend nearly 800 feet—has a majesty of its own, the paraphernalia of heavy construction is dismally unpoetic.

"I'm a bit betwixt and between," said Andrew Currie of the Nature Conservancy Council, as we sat across the loch from the platform. "Some days I look at this and think: 'My, it really is but a tiny scar on the vast west coast of Scotland.' Other days I'm incensed at what an appalling intrusion it is."

Originally the platforms were to be built an hour's drive away, near the hamlet of Drumbuie. Local residents and environmental groups fought off the project. The influx of transient workers with the inevitable demands for housing and social services, they argued, would overwhelm the local villages.

About the same time Howard Doris applied to construct the platforms at Loch Kishorn, promising that the workers would be insulated in a camp at the site and that there would be no disturbance to the area.

The people of Lochcarron, the nearest sizable village, eight miles and a mountainside away, welcomed the project eagerly.

"We are an aging community," explained

Petrol power flows out of a service station in Keith, Scotland, where coproprietor Veronica Smith flaunts a bit o' bluster. The British lion may roar again by the 1980's if oil revenues can reverse Britain's disastrous trade deficit. For now, London has secured loans on the collateral of those hopes. Yet Scotland, seeing the crude pouring in from off her shores, debates just whose oil it really is.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the Reverend Allan Macarthur. "Our fishing industry disappeared. The crofting, or small farming, these days is virtually nil. Many men had to leave every Monday for the week to work on construction far away. The people were quite willing to have that platform site on their doorstep if necessary. We have to accept what we can get here."

With the Boom, Some Boomtown Troubles

Today Lochcarron, like Andrew Currie, is betwixt and between. Many local men and almost every available woman work at the site or in the camp. As George Banks, public relations manager for Howard Doris, put it, "There's never been so much money here!"

But prosperity had an unexpected price. Hard-drinking, swearing, fistfighting camp workers began driving many locals from the pubs, which had been the center of Lochcarron's social life. Although strict action by Howard Doris has eased this problem, I still saw several red-eyed workers walking unsteadily along Lochcarron's main road.

Roads were torn up by truck traffic. The village inns were booked solid with oilmen. Schools were overcrowded. Urbane executive families have brought some cultural stimulation, but local parents worry that their children will be led into new ways.

Most villagers are deeply religious and thrifty. Profligate spending, work on Sundays, and the arrival of "tarts" upset many.

For others, jobs and a pride in having the world's biggest man-made floatable object being built nearby override these complaints. People are more concerned about next year after the "Kishorn Monster" goes to sea. Future platform orders are uncertain. What happens when the jobs disappear?

"I fear we'll end up with a ghost town," said regional councillor Torquil Nicolson. "And the human dereliction will be worse than before."

As one drives east from Lochcarron, the Highlands flatten into the soft green hills of Easter Ross. These are Highlands in name only. Cromarty Firth, one of the finest undeveloped deepwater harbors in Europe, dominates the landscape. Its broad mud and sand flats nourish thousands of migrating geese and ducks en route to or from summering spots in the Arctic or Iceland. The land along its shore is among the most fertile in Britain.

For decades, rural Easter Ross was troubled by the same economic stagnation that plagues the rest of the Highlands. Then oil was struck. A huge platform yard and a pipeline factory sprang up, creating 3,000 jobs and drawing welders, riggers, and general free-lance labor from depressed areas like Glasgow.

The brunt of the boom has hit the town of Alness, whose population has more than doubled to 6,500. "Alness was just a street before the oil," recalled Isabel Henry.

Newcomers and natives, like oil and water, do not always mix well. "Many of the wrong kind of people have come in," a local grocer told me. A social worker said his department's referral rate has gone up by 400 percent, to about 350 cases, in the past three years. He cited alcoholism, divorce, mothers abandoning their families for incoming men, and local girls becoming promiscuous. Though common problems in industrial areas, they are new here. "Rather than sending our people off to Glasgow," he said, "we are just creating Glasgow in the Highlands."

Welding Better Than Milking Cows

Many newcomers to Alness do enjoy better lives. Betty Anderson was a poorly paid dairymaid in southern Scotland. Today she earns $200 a week as a welder. "This is interesting work," she said, standing inside a giant pipe. "Better than lookin' at cows all day."

Recently, after bitter debate, approval was granted for the planning of a major refinery, oil storage depot, and supertanker port along the Cromarty Firth. Construction of the complex would bring about 1,500 more temporary jobs. The refinery could mean 450 permanent ones and perhaps the development of a major petrochemical complex.

"It wasn't real comfortable," remembers assistant production superintendent Robert O. Ellis, who photographed 60-foot waves battering the Ekofisk complex in a November 1973 storm, one of the worst on record. Winds of 90 knots raked the structure. One man slept in a bright orange life jacket—but not because it could possibly save him. He wanted his body to be found, he said, so his wife could speedily collect his insurance.

ROBERT O. ELLIS

Tranquil again, the waters surrounding the central Ekofisk complex glisten in the benediction of a sunset (**above**). While storms have taken lives and a multimillion-dollar toll of equipment in the North Sea, the most hazardous tasks must be performed hundreds of feet beneath the waves.

Divers sometimes earn more than $1,500 a week, for good reason—at least thirty of them have been killed. A new generation of submersible craft, such as the Vickers Oceanics L-1 (**below**), offers improved safety and flexibility. From L-1's control station (**left**) a diver, who is operating an underwater grinding machine, can be observed directly or by television monitor.

For the L-1's services, all you need is a deep problem and $20,000 a day.

NATIONAL GEOGRAPHIC PHOTOGRAPHER EMORY KRISTOF (LEFT AND ABOVE)

Oil rampant on a field of history could be an apt coat of arms for Grangemouth, Scotland, where a refinery rears beyond dark ruins (**above**).

The union of Scotland and England strains under how to divide petrowealth, as the Scottish National Party, led by William Wolfe (**below**), gains increasing influence.

The inevitable pollution would ruin Cromarty Firth both biologically and scenically. Nevertheless, the approval brought celebration among the anxious work force in Alness, which has been hit by a slump as the first phase of platform and pipeline construction winds down. As Isabel Henry said, "I'd rather have a penny in my pocket than a pound of scenery."

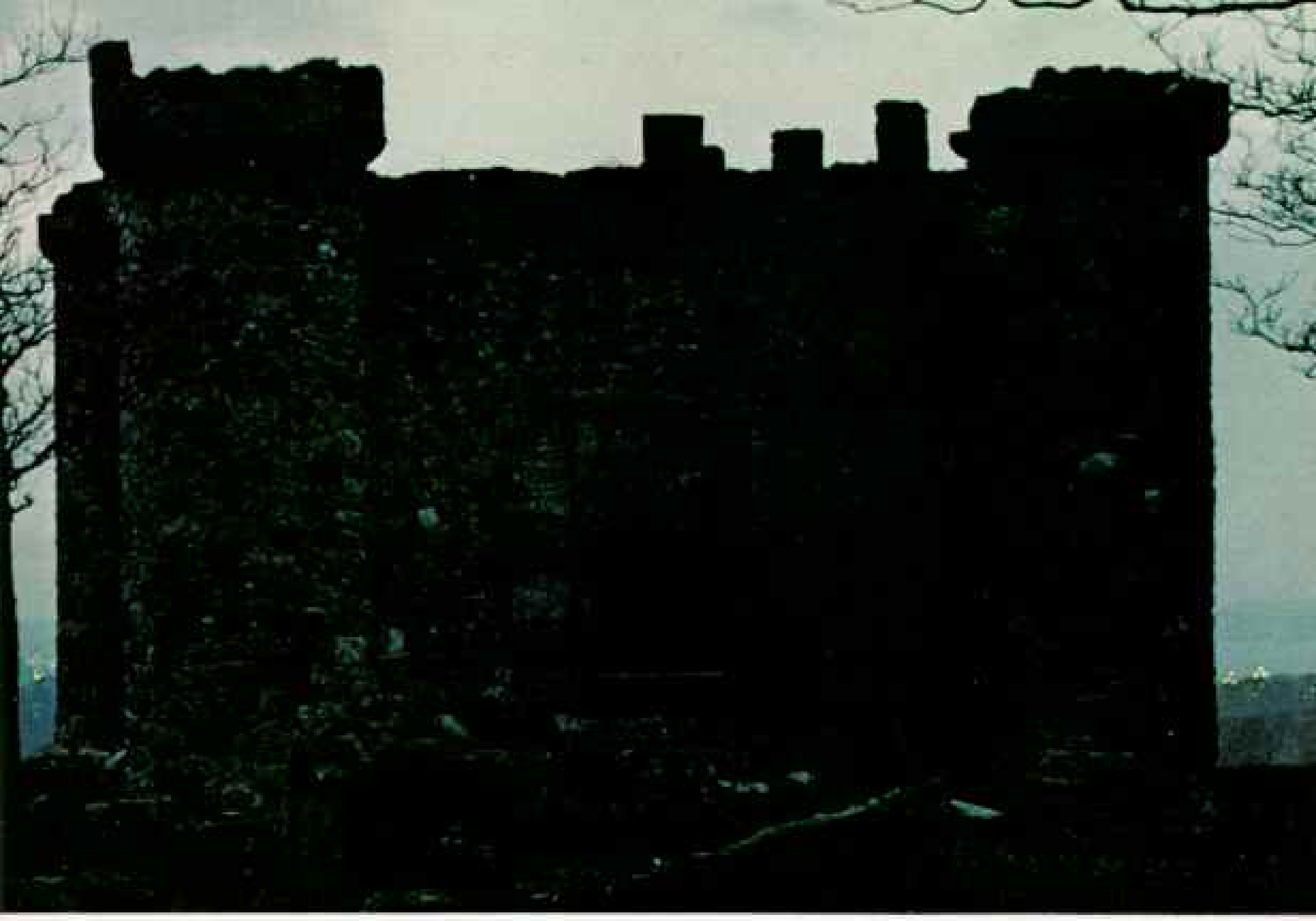
Shetlanders Won't Bow to Big Oil

Most of Scotland, on the whole, seems willing to accept the problems oil wealth brings. By contrast, the Shetland Islands, the northernmost isles of Britain near several of the North Sea's biggest oil fields, balked. Shetland's traditional industries, fishing and knitwear, were holding their own when the boom hit, and the plucky Shetlanders refused to be steamrollered by "Big Oil."

When I think of Shetland, I see foaming breakers beating against cragged bluffs, and the calm clear waters of the narrow bays Shetlanders call voes.

I see the weathered face of a fisherman, Walter Leask, as he tells of open boats in freezing, mountainous seas and curses the

National Geographic, April 1977



Shetland weather. "Oh, sto-arms continuous. Gales and rain all winter. Grim."

There are the crumbling, derelict stone croft houses. Around them Shetland wives struggled to make the land bear oats and potatoes while their husbands fished. At night the women knitted and prayed, remembering the terrible "Delting Disaster," when the sea swallowed 22 men from that district.

I can hear the relentless wind and watch the weather change almost on the half hour: Now fog paints the peat bogs a flat gray. On a snow-covered hill I hear sheep bleat plaintively, while Shetland ponies stand stoically in stinging sleet.

I see the torches of the festival Up-Helly-Aa, celebrating Shetlanders' Norse heritage. The islanders stay up until dawn fiddling, dancing reels, and drinking legendary quantities of whisky.

I see Margaret Laurenson sitting in her great-grandfather's croft house, bottle-feeding a sickly lamb while her husband, Charles, exhausted from the hard hours of lambing season, talks of Shetland seabirds, the great skuas and the great black-backed gulls that prey on weak newborn lambs.

But then I can also see Shetland's bustling Sumburgh Airport, swamped by helicopters and cargo planes, its waiting room packed with oil workers about to be ferried out to their rigs and platforms.

Islands Council Makes Battle Plans

Shetland, which encompasses 55-mile-long Mainland and some 100 smaller islands, is ideally situated to be a supply base, a landfall for pipelines, and a major oil port. In the early 1970's virtually everybody in the North Sea oil business wanted a piece of Shetland for facilities. The prospect of oil complexes scattered all along the coastline horrified many people in Shetland. As Thomas Cooper, a Mossbank man, said: "Anyone who tries to crowd Shetlanders won't be popular. We're an independent people."

The Shetland Islands Council quickly brought in consultants and managed to get special legislation through Parliament that enabled the islanders to do battle with Big Oil.

It was a bruising confrontation, but Shetland came out apparently victorious.

The Shetlanders realized that the oil might not last more than fifty years. To minimize its

impact, they insisted that the oil companies coordinate their plans and confine their activities to one tract of land, an abandoned military base at Sullom Voe. Moreover, the council itself will be a partner in this enterprise. It owns the tract and will lease the facilities to the industry. This gives the Shetlanders a continuing say in what the oil companies do.

Shetland's most remarkable coup was negotiating "disturbance money," or, basically, a tax on the oil passing through Shetland, to compensate for the disruption brought to the islands. The Shetlanders will reap between two million and six million dollars a year through the rest of this century at least. The money will be put in trust to be used for whatever the Shetland Islands Council feels will benefit the people.

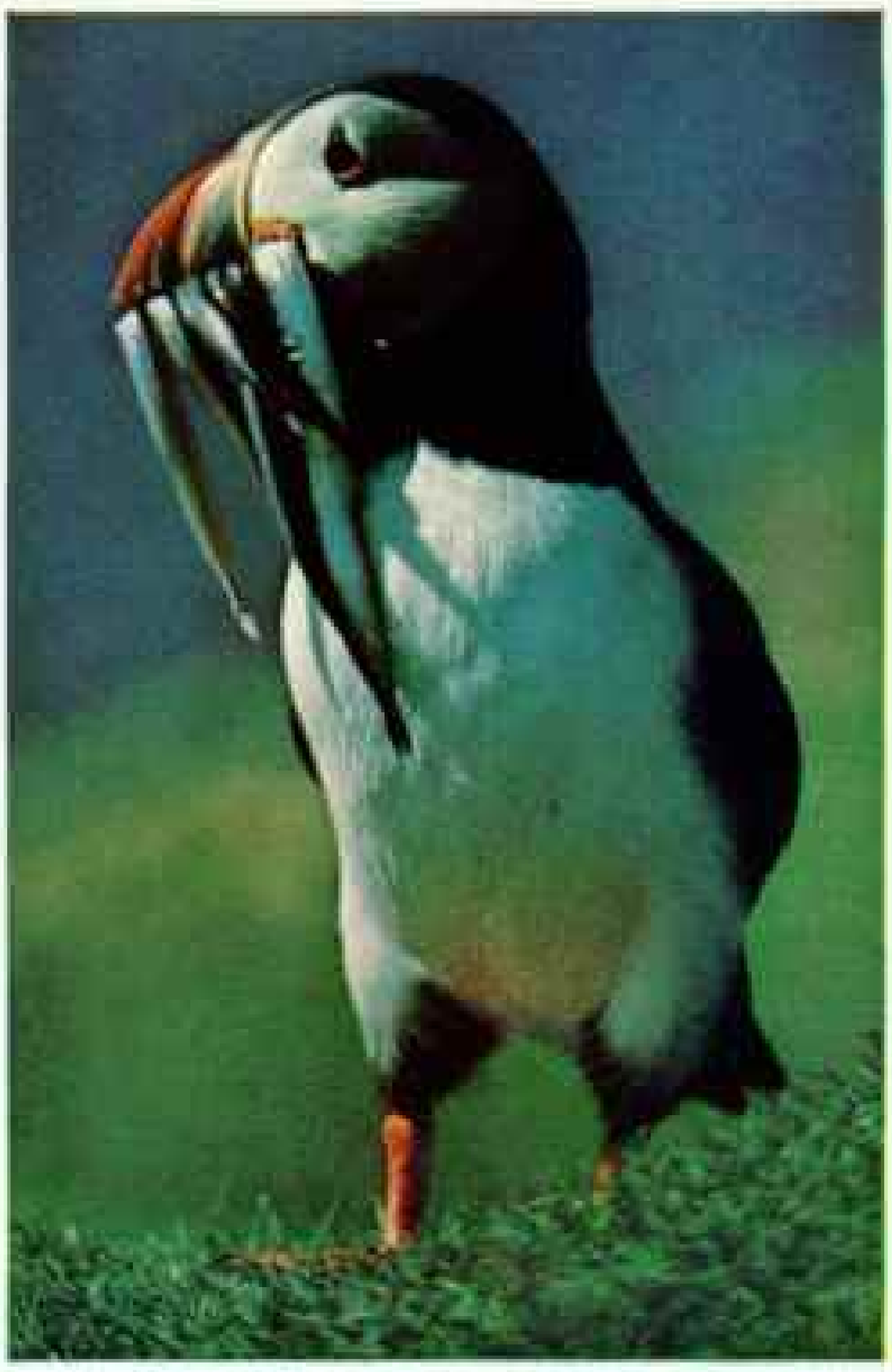
Already two pipelines have landed near Sullom Voe. An enormous supertanker port is taking shape. In the 1980's Shetland may become the biggest oil terminal in Europe. Were it independent, tiny Shetland then would be one of the largest oil producers in the world.

Oil Money Threatens Traditional Values

Even with their lucrative settlement, many Shetlanders are far from happy about oil's intrusion. "I feel we've failed horribly, that the

Slicing peat, a traditional Shetland fuel, Charles Laurenson and his son lay in a year's supply. A gifted teller of ghost tales and yarns of ships sailing into gales of fiction, Laurenson remains unimpressed by the impact of oil upon his island. He will keep to his crofting and to his sheep.

Beakful of fish makes for a happy puffin, but almost certain oil spills off the Shetlands may devastate birds and fish alike.



oil companies basically got what they wanted and that we are losing it all," a young Shetlander told me.

It took a while to understand what he meant. One quickly learns about the painful oil inflation and the stress on local shops and industry, which must compete with the exaggerated pay scales of oil-related work. But there are deeper problems.

"The rapid injection of money has not been healthy," said Ian Clark, chief architect of Shetland's oil policy. "Until 1973 Shetland was a community that valued money and used it wisely, but was not dominated by the desire for money. This helped give rise to the Shetland way of life. Shetland has not lost its values, but it has not yet reassessed its values for the future."

In the cafeteria of the work camp at Sullom Voe I saw a tableful of teenage girls, all uniformed in bright orange smocks. As chambermaids they were being paid about $100 a week, far more than they could have earned two years ago. Young Shetland men are earning much more than that driving trucks, bulldozers, and the many new taxis and buses that now shuttle visitors about the main island.

Sadly, alcohol is one of the few entertainments to spend this money on in Shetland. At

a Friday-night dance at Voe I saw a striking number of Shetland youths too drunk to dance. Older men, workers from the camp, had claimed many young Shetland girls for their partners.

"The women are finding themselves at a premium," said Dave McDonald, proprietor and barkeep at the Sullom Voe Hotel. "Several couples have broken up. You can see the resentments building up in the local lads. At dances I have several times had to break up fights between Shetlanders and the incomers."

The villages of Brae and Mossbank are sprouting large complexes of new homes for incoming workers (following pages). Brae will probably get a supermarket. Some 600 new residents, almost all of them outsiders, will soon move into Mossbank, which now has a population of 72.

Shetlanders view it all with both fear and hope. Three young men from Mossbank who used to spend most of the year at sea on merchant ships now have jobs on boats in the new port near their homes.

"Life is becoming more high-strung," said Dr. Albert Hunter, a general practitioner in Voe. But a moment later he lifted his glass of whisky in a toast: "To the beneficent North Sea oil. May it flow!"

"The new people will come in, find Shetland not to their liking, and after a while they will move back," said his wife, Lena, not looking up from her knitting. "We'll just go on the way we are. That's the way it's always been."

This time, I wonder whether she is right.

Seabird Breeding Ground in Tankers' Path

If Shetland becomes Europe's leading oil port, it will have to accept more than a flood of strangers. Perhaps twenty supertankers a week will be calling on Sullom Voe, and the environmental risks will be substantial. Some of the most treacherous of the wild waters these oil-laden ships will have to navigate lie off Shetland's Herma Ness, one of the major seabird colonies of Europe.

Herma Ness, at the northernmost tip of Britain, is on the island of Unst. To reach it I

Their farm no longer, part of the land Bertie Johnson and his wife sold now supports construction of a giant port facility at Sullom Voe in the Shetland Islands (**left**). In the 1980's as much as half of Britain's petroleum needs will be piped here from North Sea fields for shipment by tankers. The Shetland Islands Council (**above**), having extracted a promise of millions of dollars from the oil industry to compensate for disruption to the Shetland way of life, now debates how best to use oil revenues.

took two ferry rides and a long, strenuous climb up a windswept hill. But the view from its high cliffs in late May is spectacular: countless gannets, kittiwakes, guillemots, or murres, and more than a hundred thousand puffins gathering from distant waters to nest on these dark cliffs and nearby skerries.

"See those guillemots out there," said Bryan Sage, an environmentalist with BP. "Sometimes there can be ten thousand of them sitting on the surface like that. That's our problem. If there were an oil spill among so many birds in nesting season, we could have a mind-boggling disaster. BP and the Shetland Islands Council are doing all they can to prevent such an accident, but statistically it's likely to happen."

Fish and Fishermen Take Brunt of Spills

Despite precautions, bad accidents seem inevitable in the North Sea, so far relatively unpolluted. Tanker spills are the most likely. But a really bad blowout—an uncontrolled eruption of oil and gas from a well—could occur. Or a pipeline could break and pour crude oil into the sea for days.

Not only birdlife, but also the rich North Sea fisheries could be seriously hurt. The eggs and larvae of some commercially valuable fish float near the surface, where they might be harmed by even small concentrations of oil. The North Sea's primary mackerel breeding grounds lie near the Ekofisk complex. Prevailing currents could carry oil spills on the Norwegian side north to herring and cod spawning grounds. Moreover, drifting oil can harm or even kill the plankton many fish feed on.

Not surprisingly, fishermen in Norway feel threatened. The threat involves more than pollution. Trawlers often ruin their nets when they snag heavy construction debris washed off supply boats in storms. Some fishermen have turned to higher-paying, less rigorous work on oil supply vessels.

In 1976 fishermen briefly blockaded Stavanger harbor to dramatize their grievances. They picked an appropriate port. Stavanger, once the sardine capital of the world, is now clearly an oil town, the throbbing land base for Norway's offshore action.

When I was there, giant drilling rigs dwarfed other vessels in its harbor, and two Condeep platforms soared from nearby construction

By yon bonnie Brae a small suburb for permanent oil workers has risen amid the crofts (**above,** foreground). By the fall of 1977, more than a thousand construction workers will have come to the Shetlands; the permanent force will number about 400 and remain for at least a generation.

At a Friday-night dance in Brae, clowning (**right**) increases as "wee drops" become a torrent. The village wonders how many years it will suffer the hangover from oil.

sites. Oil has brought nearly 8,000 jobs to the area and a stream of foreign businessmen. The drawls of Texas, Louisiana, and Oklahoma now waft through its old downtown.

At first Norway embraced the oil industry with only half its heart.

"Many people, instead of shouting 'Bingo! We've found oil!' were crying 'Help! We've found oil!' " said a Norwegian friend of mine. "Others felt that oil would be a bother because we were well enough off already."

Also, Norwegian sentiments are strongly nationalistic. To many, Big Oil looks like imperialistic capitalism.

Many more remain distrustful. "Oil is no good for fishing," scowled an electrician I met at a tram station in Oslo. "Fish is food. You can't eat oil."

However, fishing quotas limit the catches, and shipping and shipbuilding have had bad years recently. Increasingly, Norwegians view their oil as necessity rather than nuisance.

Norway was per capita the eighth richest nation in the world when the North Sea oil boom began. With an extremely stable government, only four million people, and a highly industrialized economy, the country has evolved into a modern welfare state. Literacy is high, poverty invisible, and unemployment averages about one percent.

What worries Norwegian economists is that money flowing too rapidly into the economy may price Norwegian goods out of the export market. Also, too many high-paying oil-related jobs could draw workers away from fishing, farming, and other industries.

"We could become dependent on this one thing," worried Norwegian businessman Håkon Lavik. "Then in fifty years we'd have nothing but a lot of money."

Small Is Good for Small's Sake

Much of Norway's population still lives in towns and villages scattered throughout the countryside and dotting its long coastline.

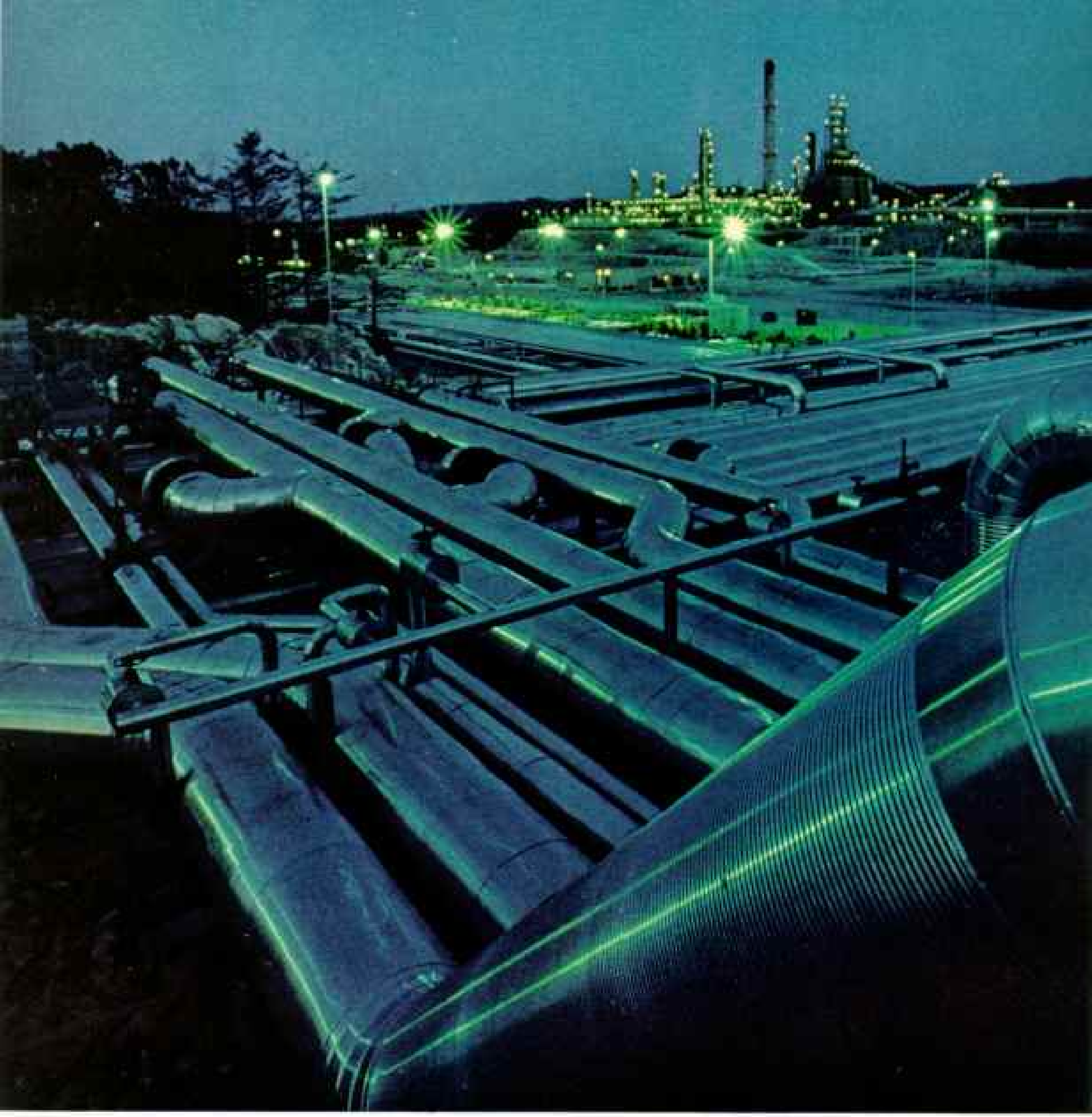
"There is strong political sentiment that we should keep our pattern of settlement," explained Bjørn Skogstad Aamo of the Ministry of Finance. "But to do this we must stabilize small industries in these communities. We must bring them amenities of modern life. This is very expensive. It means subsidizing agriculture, building roads, houses, and bridges, and providing transport. But we think there are values and ways of life we should pay to keep."

"In Norway we feel that the small things are to be preferred, just because they are small," said Magne Fjeld, a newspaper editor on Sotra, an island near Bergen that may be a landfall for a new pipeline. "There is value to the little society. It is the distance between our houses. The way you can talk with people in your village. You live with each other

Poised for lift-off, Norwegian crane operator John Kvilhaugsvik jockeys his levers with a feather touch (**left**). The window of his cab mirrors the towers of an Ekofisk platform.

An expert operator before the oil boom, he also holds to the Norwegian traditions of going to sea and working a farm. At home on the island of Karmøy, he explores the earth with his daughter (**right**).

Already prosperous, and endowed with abundant hydroelectric energy, Norway discourages an inflationary economy based on oil. That and hard bargaining for profits have earned Norwegians the nickname "blue-eyed Arabs" of the North.



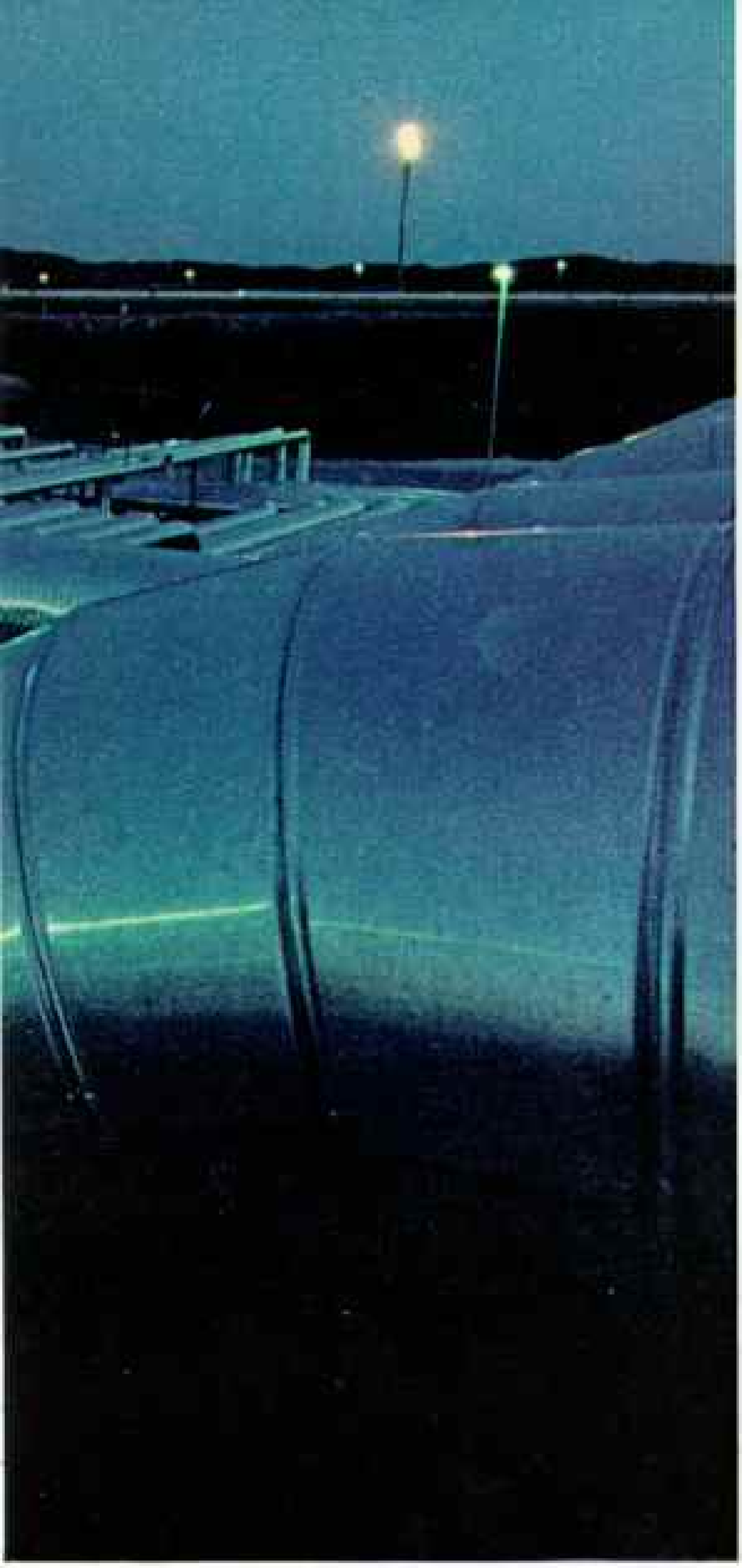
through the good and the bad. When someone dies, you are all sad. There is clean air, clean water, clean nature. We will not be able to hold this little society if oil comes."

Norway hopes to hold on to its idyllic little societies by moving slowly with oil development. The Storting, or parliament, wants to keep oil and gas production below ninety million tons a year and has established a national oil company, called Statoil. Eventually, the government hopes, Statoil will be the major company extracting Norway's oil.

Norway's well-laid oil plans seemed to be working when I visited. New oil projects were proceeding deliberately. No serious negative social impacts had appeared. Oil had even enabled Norway to escape the recent worldwide recession. The country borrowed billions of dollars against its future oil revenues to shore up its economy during the downturn.

Go-slow Approach May Be Impractical

An unfortunate development has taken Norway by surprise. The Petroleum Directorate has had to downgrade significantly the estimate of recoverable oil and gas at the big Ekofisk complex. The downgrading means that taxes and royalties derived from Ekofisk



Gleaming veins of the refinery for North Sea crude at Mongstad, Norway (**left**), channel the lifeblood of a world on wheels.

The coming generation (**below**) may learn to live side by side with a pipeline terminus on the quiet island of Sotra and finally decide which was the wiser to apply—the accelerator or the brakes.

will fall far short of earlier expectations. And with heavy debts to pay, the country may have to develop its oil much faster than it would like. Which leaves the question open: Will Norway control its oil, or will the oil control Norway?

Much of the new exploration will have to occur in the deeper, rougher waters off the Norwegian coast north of Bergen, at depths of 750 feet or more. And, once again, pioneering technology will be needed.

For instance, submersible craft with automatic steel hands are already being developed to operate at these great depths. And engineers are testing underwater domes that will enable men to live and work for extended periods on the seabed itself.

By the time the North Sea's oil is exhausted, surely the big platforms like Charlie, Alpha, the Condeeps, and even the "Kishorn Monster" will be outmoded antiques, technological Stonehenges.

They will be reminders that the North Sea is where man, driven by his need for energy, learned to walk back into the ocean depths, and perhaps where he learned, for better or for worse, to extend the petroleum age into an all too indefinite future. □

Japan's Warriors of the Wind

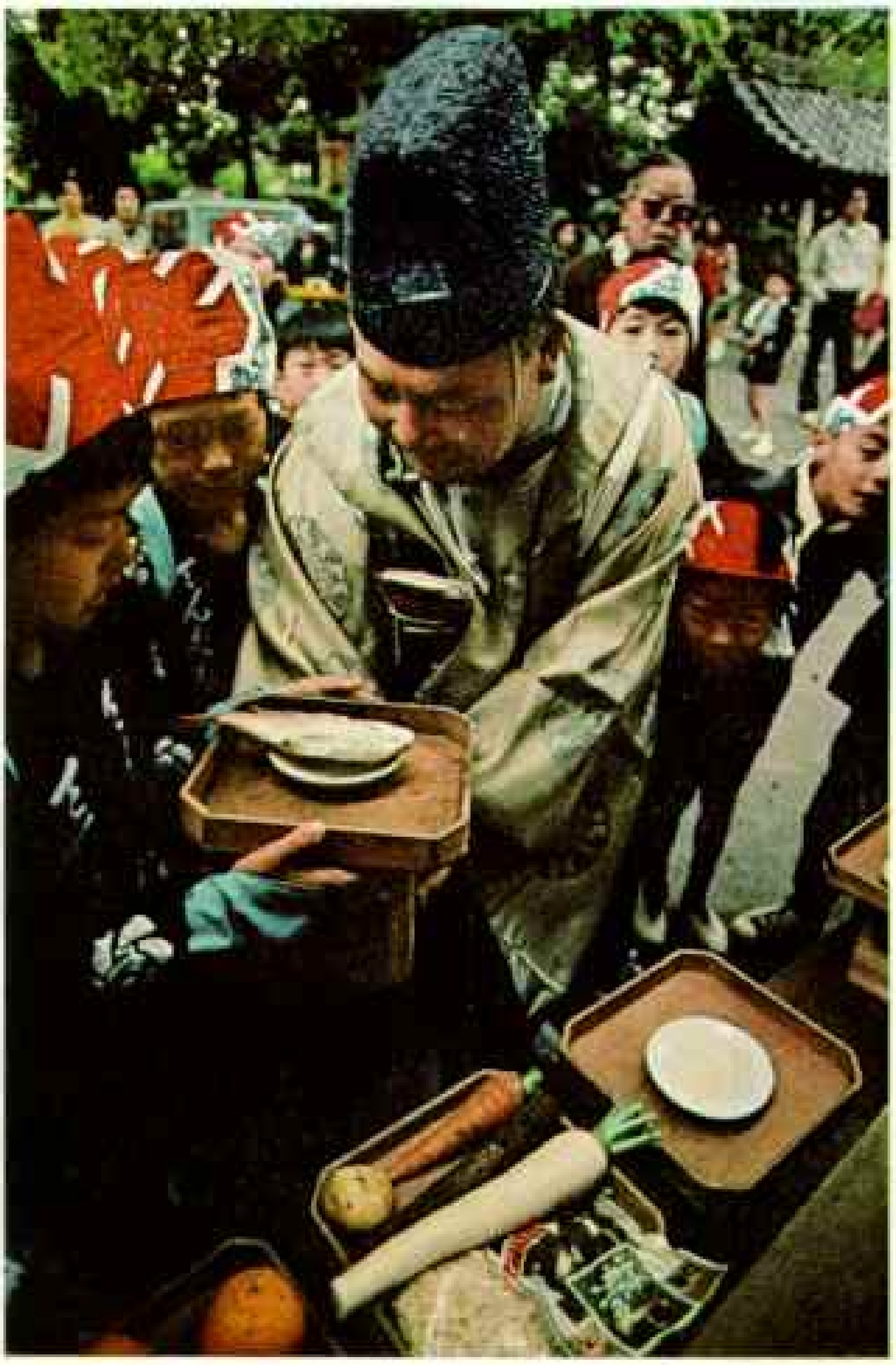
Photographs by
DAVID ALAN HARVEY

FIGHTING BLOOD AFIRE, Japanese team members wait tensely atop a windswept dune in the city of Hamamatsu, about 130 miles southwest of Tokyo. A gallery of spectators surrounds them, eyes fixed on a vividly colored kite straining against its tether. A quarter of a mile away, a teammate at the end of the line flashes a signal—and the kite sails free (**left**). Battle cries of "*Wasshoi! Wasshoi!*—Forward! Forward!" erupt. The symbol of a new generation soars skyward.

This emotion-charged scene takes place hundreds of times in early May during the city's annual three-day tribute to its first-born sons. About sixty neighborhoods sponsor the huge kites, some bearing the boys' names, and turn the sky into an aerial battlefield as teams try to down rival kites.

The people of Hamamatsu believe the festival dates from the 1500's, when a kite was flown to honor the birth of a prince. Another legend suggests that the sport began when a ruler told his people to fight with kites instead of with one another.

Today the spectacle draws nearly two million people, as the city praises its progeny and renews the unity of its neighborhoods.



GLITTERING WAVE of color flows along a city street (**right**) as neighborhood teams pull floats bearing young musicians. The floats—made of intricately carved wood and often lacquered or coated with gold leaf—resemble Shinto shrines.

Parades and parties fill all three festival nights, with revelers singing, drinking beer and sake, and dancing in streets lit by paper lanterns. For once, the people mingle in common camaraderie; normally most of their social life is spent with fellow workers.

In a serious moment a boy offers food to a Shinto priest (**left**), hoping for good luck for his neighborhood's entries in the competition. The fighting, however, is done only by men, such as the three businessmen (**upper left**) demonstrating tactics in the attic of a shoe store.

A neighborhood's contribution: as many as 20 kites, including one for each of that year's firstborn sons. Such dedicated industry reflects Hamamatsu's role as a major manufacturing center that has made names like Yamaha, Suzuki, and Honda known around the world.

名店ビル

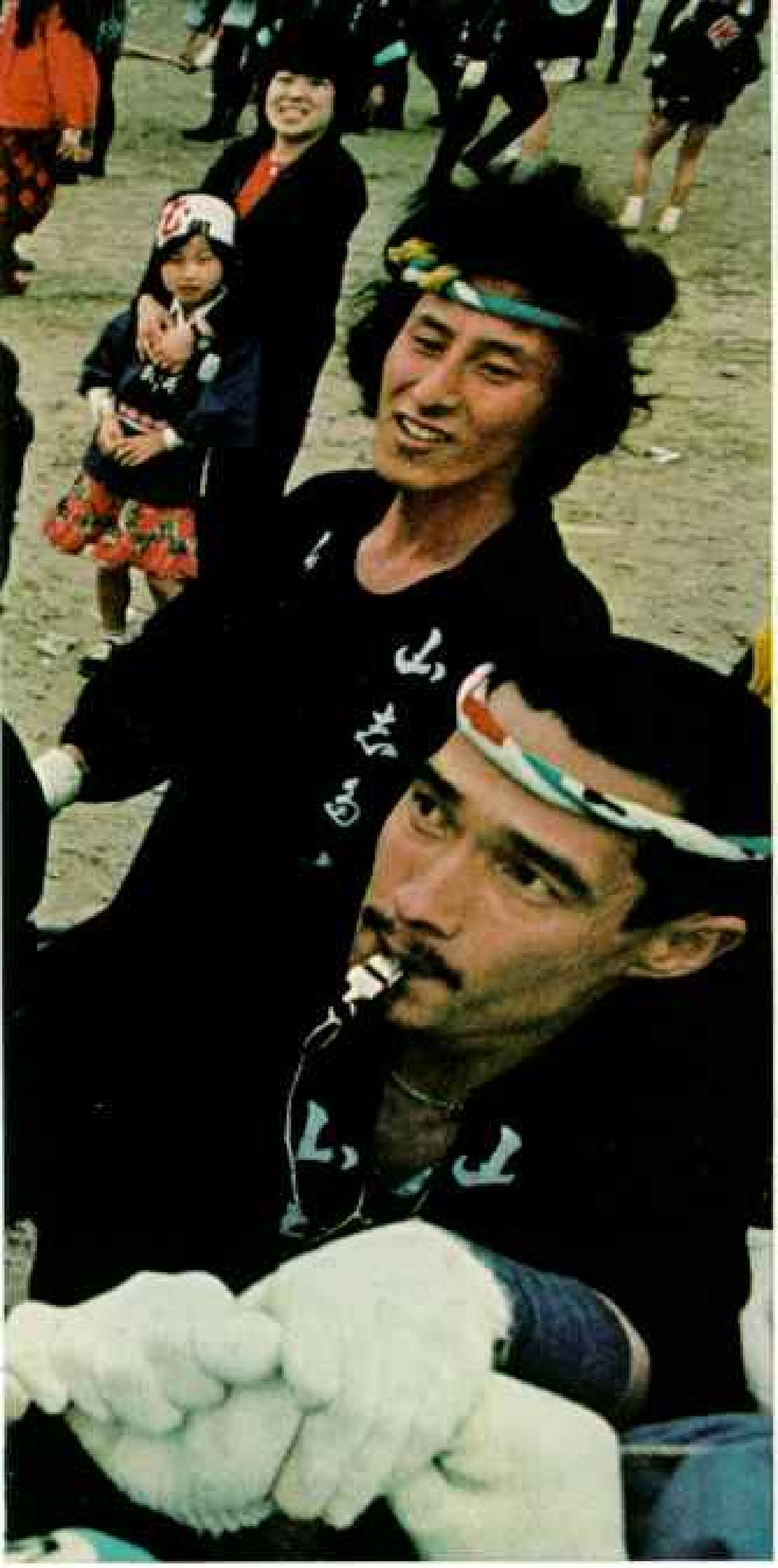
FINE-TUNED and ready for battle, a ten-foot-square kite emblazoned with the neighborhood insignia is raised by team members (**above right**). To make the kite, craftsmen split bamboo for struts that form the frame. Then a cover of lightweight rice paper is stretched and pasted drum tight over the bamboo lattice. Hemp fiber is twisted for the kite's lines, including 20 to 40 "bridle lines" that are tied to the flying line. The secret of a kite's success, fliers say, is the skilled adjustment of these bridles.

Such construction often becomes a lifelong craft passed from generation to generation. Says one man, at the age of 74, "I am still fascinated by the fresh greenness of bamboo and feel challenged to make a gallant kite."

With furious blasts of his whistle a captain (**upper left**) keeps his team in cadence as they haul on a line during a fight. Arm protectors guard against rope burns. An important job is taken on by the rear guard (**lower left**) behind the team, as he pays out or reels in line from a portable winch.

CASTING HIS FATE to the wind, a mother touches the hand of her firstborn son to the line of the kite bearing his name (**above**), as the neighborhood's team prepares to enter the fray. She hopes the gesture will bring success for the kite and a long, happy life for the boy. Other parents—those who are fearful of ill fortune should their son see his kite downed—leave the child at home and even try to avoid combat.

The role of a firstborn son remains the backbone of Japanese social structure. When a man dies, his eldest son usually inherits all his wealth—and responsibility for keeping the family unified. Such strong ties extend to the neighborhoods, where local associations help keep the community's identity strong.



Each son's family must pay for the kite and the refreshments, as much as $500. Some families must wait, saving money for years after their son is born. To beef up the arsenal each year, neighborhood dues usually pay for additional kites. In times past, the kites became so large and lavish that the expense threatened the local economy. Rulers had to impose restrictions. Even today, says one flier, "some people make great sacrifices for this event, even if they can't really afford to."

Aglow with delight, a girl watches dueling kites (**above**). Japanese girls have a separate holiday of their own, celebrated on March 3. The occasion features displays of exquisitely made dolls that represent members of the royal court.

LIKE SPIDERS in their webs, kites grapple in battle (**left**). Usually several become entangled; as teams keep their lines taut and haul violently on them, the lines saw on one another. Soon they start to fray (**below**) and finally snap.

Pandemonium reigns as competing teams of as many as a hundred men try to cut down each other's entries (**right**). Flags flutter overhead and a deafening roar rises from the running, stomping combatants. Trumpets blare and kite lines buzz above like angry bees. Special officials move in to quell fistfights and keep people from being trampled.

VANQUISHED gladiator grimaces at the sight of his once beautiful kite, tattered and soaked by rain. But his anguish is fleeting, for there are no winners or losers in this monumental contest. After the kite took its dive, a special rescue squad rushed to it and recovered every shredded scrap. Although many badly damaged kites are simply burned, those that represent firstborn sons are presented to their families to be kept as mementos. Others, more successful in battle, are carefully stored to fight again the following year.

As they bore this crippled kite back to its team, the fliers cheered as if they had won.

"Winning isn't important," says one contestant. "Flying is not done just for the competition—but once the lines start tangling, it is in our blood to fight." □

TEXT BY
JOHN ELIOT

Unseen Life of a Mountain Stream

ARTICLE AND PHOTOGRAPHS BY
WILLIAM H. AMOS

SOME YEARS BACK, on a crisp June morning, I lay on a sloping rock near an old wooden bridge, my body half immersed in the cold clear waters of a Vermont brook.

I breathed through a snorkel, and behind a diving mask my eyes roved as I overturned stones on the bottom. Occasionally I pressed the trigger of my underwater camera to photograph insects, crayfish, fishes—a wondrous assortment of creatures that inhabit even the smallest of New England's upland streams (foldout painting, pages 564-66).

Cramped, chilled, and uncomfortable—but thoroughly entranced by this underwater world—I clung to the rock literally by my toes. When my film at last was exhausted, so was I. Wriggling backward out of the water, I rested for several minutes before removing my fogged mask and turning to look around me.

Several tractors and farm trucks were drawn up on the bridge. Leaning on the rail, half a dozen farmers were staring silently at me. Finally one pushed back his hat.

"Ay-yah," he said simply, his tone clearly reflecting the group's attitude toward my occupation. The others nodded, and without another word they climbed into their vehicles and drove off. *(Continued on page 570)*

POLYCENTROPIDAE (RIGHT), 12 MM (1/2 INCH)

Knee-deep in a turbulent world, the author's son uses a homemade net to collect specimens (**above**) in a brook near his family's Vermont summer home. Surprisingly, millions of tiny creatures flourish in these cold, rushing waters. Holding fast to a strand of water moss (**right**), a caddis fly larva hungrily awaits a meal.

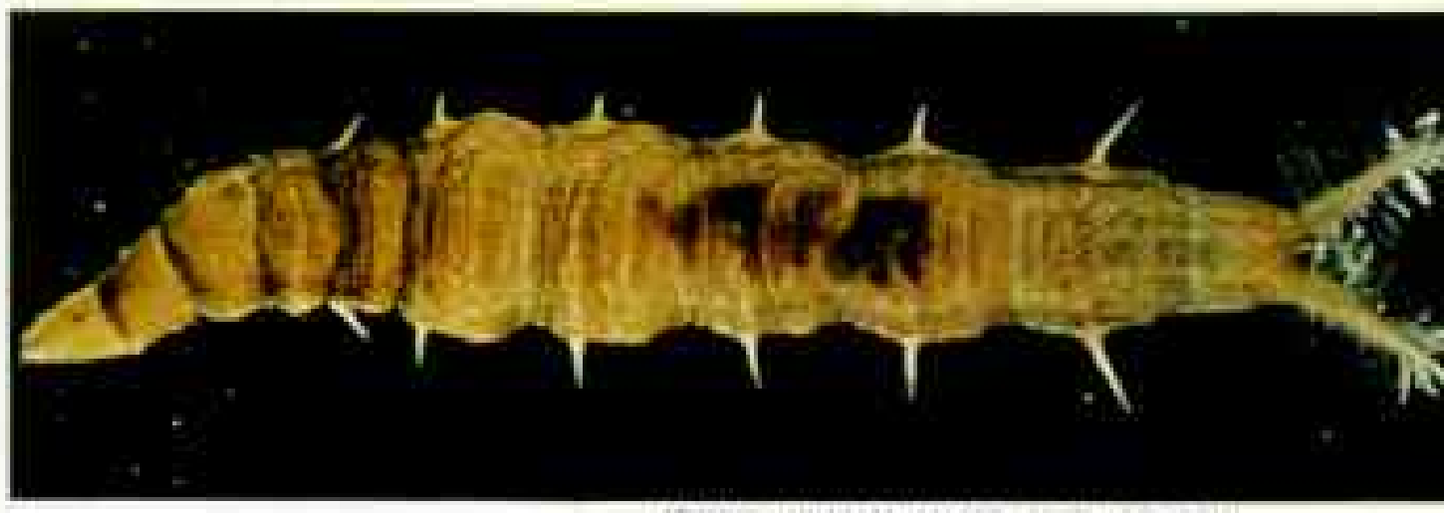

ASTERS
TWO-LINED SALAMANDER
CADDIS FLY
WATER SURFACE
WATER PENNY LARVAE
BLACK-NOSED SHINERS
MAYFLY NYMPH
NORTHERN WATER THRUSH
STONE FLY
CAST-OFF STONE FLY NYMPH CASING
NET-BUILDING CADDIS FLY LARVA
STONE FLY NYMPH
IMMATURE MOTTLED SCULPIN

PAINTING BY REID M. SEIDLER, NATIONAL GEOGRAPHIC ART DIVISION

Flippers as well as feeders, the specialized antennae of an ostracod help it move through the water. When the creature is in danger, the two halves of its shell close and fringing hairs interlock, sealing it shut. Pigmentation dapples the highly sculptured shell. Omnivorous scavengers, ostracods—also called seed shrimp—in turn provide food for caddis fly larvae and other predators that usually just wait for dinner to drift by (page 563).

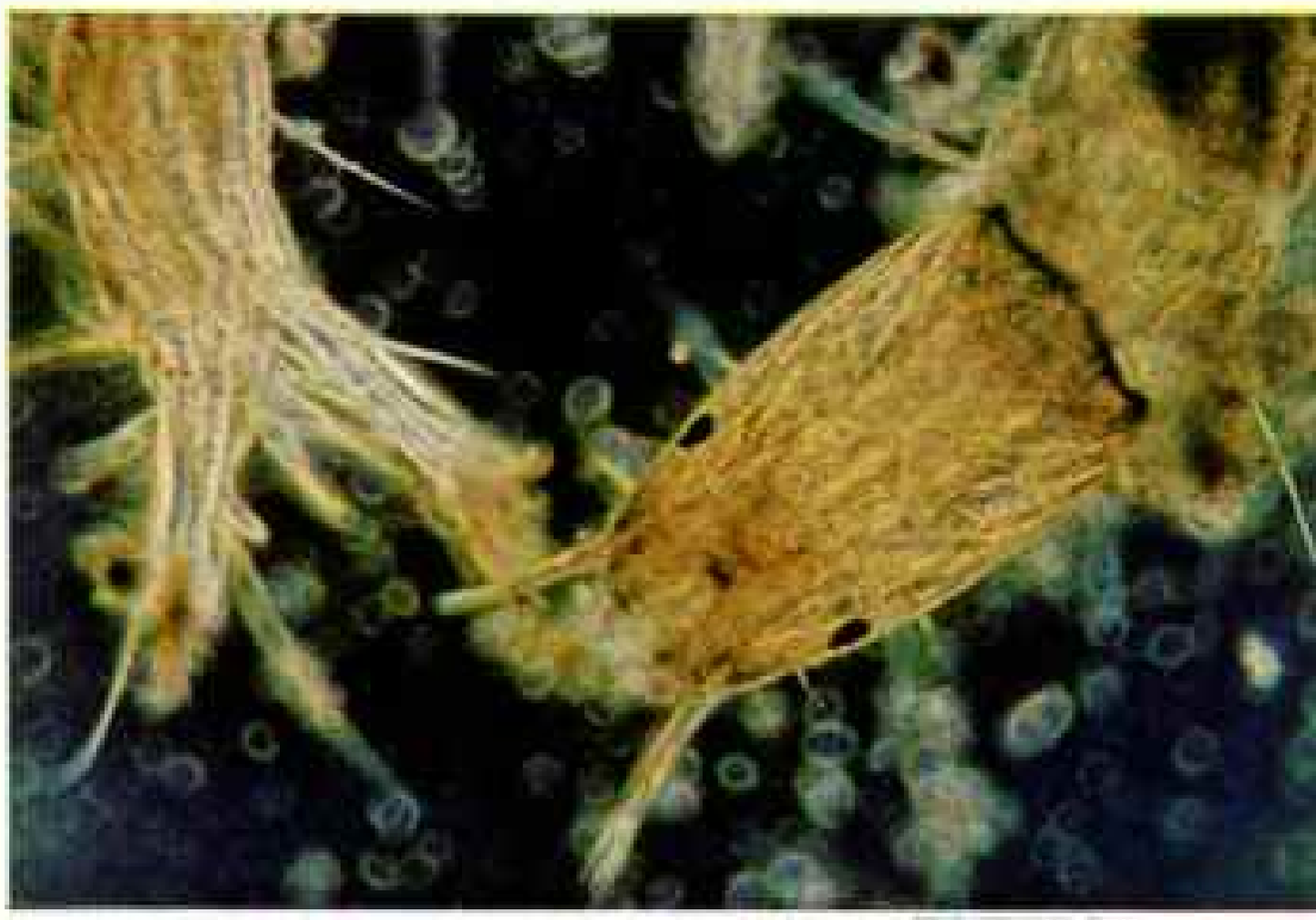
THIS PAGE FOLDS OUT

Thriving on a liquid diet, this water mite feeds by injecting a tissue-dissolving fluid into its prey's body, then ingesting the mixture. Some of the arachnid's organs are visible through the translucent body wall. The mite's young sometimes attach themselves to passing insects as parasites on wild voyages through the swirling brook.



ATHERIX VARIEGATA WALKER, 11MM (1/2 INCH)

Host to a strange world of aquatic inhabitants, water moss (**above**) flourishes under riffles and waterfalls rich in carbon dioxide. Providing shelter from the maelstrom, as well as from predators, moss harbors the water mite (small red dot at lower right), snipe fly larva (**right**), very young midge larvae (**middle right**), insect eggs whose developing embryos are just visible (**bottom right**), and a small snail (**below**) that feeds on algae and other plant matter.



TERRESTRIAL, 7MM

PHYSA, 5MM

INSECT EGGS, 2MM

(Continued from page 562) I swallowed my embarrassment; explanation would have been futile. My practical Vermont neighbors probably had never closely examined the watery microcosm I had just invaded; nor could I have expected them to share my sense of exhilaration at the discovery of every bug and worm and crayfish.

As a naturalist and teacher of biology, I have roamed the world studying the life of many distinctive environments. Coral reefs, sand dunes, small ponds, and the slopes of living volcanoes all have provided me with memorable adventures.*

Brook Life Comes in All Sizes

It was inevitable, then, when Vermont attracted my family for holidays, that I should begin to seek out the small creatures of neighborhood upland brooks. Shortly after the episode at the bridge, we acquired 26 acres on a Vermont hillside between St. Johnsbury and Lyndonville. The land encompasses two brooks, beaver ponds, rock ledges, meadows, and dense stands of hard- and softwoods.

The larger of our two streams, Stark Brook, supports all the lesser life forms I had hoped for. But it also attracts much bigger animals: Deer and an occasional bear come here to drink, and by the banks I have found tracks of porcupine, skunk, fisher, bobcat, and of course the ubiquitous raccoon.

Not far away another, considerably larger, stream, Houghton Brook, passes through the domain of our friends Frank and Jenny Green. I study their brook to complement mine, for in size it fits nicely between Stark Brook and the Passumpsic River, a Connecticut River tributary into which both streams flow.

Intensifying my search, I have improved my equipment. One new tool is a tubular microperiscope with a built-in light source that enables me to peer horizontally into crevices and find new marvels of stream life.

Take for example an odd creature I found clinging to a stone in the streambed: Its body was translucent, many-segmented, and decorated with tufts of whiskers. But what especially distinguished the tiny animal was how it gripped the rock surface.

The adult net-winged midge resembles

*William H. Amos also wrote: "The Living Sand," National Geographic, June 1965, and "Teeming Life of a Pond," National Geographic, August 1970.

Precariously braced, author William Amos aims his underwater camera into a rushing waterfall. "It's like working in a frigid whirlpool bath," he says. "After a while, your arms congeal and your legs don't work."

Bill finds a colony of net-winged midge pupae (**right**) clinging to a rock with adhesive pads, their fanlike respiratory filaments extended. Later they will metamorphose into small, mosquitolike flies.

CHARLES RYE, ABOVE; ELEPHANGOCERIDAE, 5MM (1/5 INCH)

PSEPHENIDAE, 7MM

DYTISCIDAE, 8MM

Master of survival, the coppery-colored larva of the riffle beetle (**above**)—also known as a water penny—lives beneath a shieldlike exoskeleton. Clawed legs help the larva cling to stones, and the shape of the shell aids the passage of water around it.

In its adult form, another aquatic beetle (**right**) uses the air-filled bubble behind its abdomen for breathing. Surface tension around the bubble allows the exchange of gases between bubble and stream. Oxygen from the water can enter, and carbon dioxide from the beetle's respiration can escape.

numerous other small flies. But the larva (page 576) possesses one of the few piston structures in all the animal kingdom. In the most torrential reaches of a brook, it hangs on literally with suction cups. Half a dozen of these projections on the larva's underside hold it fast when a pistonlike part in the middle of each cup retracts to create powerful suction.

Clinging to a stone, the midge larva can withstand the violent force of rushing water. Releasing its cups a few at a time, the creature creeps like a minute caterpillar through water flowing as fast as eight feet a second.

The immature net-winged midge is just one of the fascinating creatures, as bizarre in appearance as in behavior, that I found in my brook's crevices. Humans seldom look for them, but anyone who is patient, and properly equipped, can see their strange adaptations.

The tiny larva of one insect weaves flawless nets between brook-bottom stones to catch prey. Another, clinging almost flat against a boulder, resembles nothing so much as a miniature battle shield. Then there is a swift-water dweller, no bigger than a pencil point, that can regain a lost perch, if dislodged by the current, by reeling itself in on a line.

Swift Stream Seems a Hostile World

"What's so special about a brook up here?" my son Steve wanted to know the first time I took two of my boys wading in Stark Brook.

I countered with a question of my own: "What do you think lives in this one?" Steve and his brother Bob thought for a while, then agreed that a brook must be a pretty hostile place for any life at all, except for a swift and hefty trout.

"But trout are near the top of the food chain," I pointed out, "so they never can be as abundant as smaller creatures. Would you believe that here in this brook you can find a thousand animals in a single square foot?"

The boys scoffed, but soon became believers. We donned face masks, thrust our heads beneath the surface of our brook, and entered a different world. Totally new impressions flood the senses. Sounds are magnified: the hiss of air bubbles effervescing in riffles, the roar of rushing water, the knocking of cobblestones and the booming of boulders as they shift against one another in the current, the whisper of sand agitated on the floor of pools.

Incredibly clear water is held in subtly colored rock basins. Shimmering bands of light race across the streambed, patterns projected through the swirling, sun-filtering surface above. The water refracts light like a prism, projecting a psychedelic show of color. Multitudes of pulsating, quicksilver bubbles sweep by my face mask.

We reach out and stroke velvety green mats of water moss, with its long serrated leaflets. Requiring large amounts of dissolved carbon dioxide, the moss grows directly beneath riffles and waterfalls, and in headwaters recently emerged from the ground, where plenty of this gas is still held before escaping into the air.

Darter Swims or Sinks

A garbled bellowing sound comes from Bob's snorkel. Head still underwater, he points abruptly downward. I see an almost perfectly camouflaged darter rushing up from the bottom to snatch an insect caught in the torrent. Then the fish drops back to the quieter water of the streambed. A brook darter has no air bladder to maintain equilibrium, so it sinks to the bottom, an efficient habit for self-preservation in so small a fish.

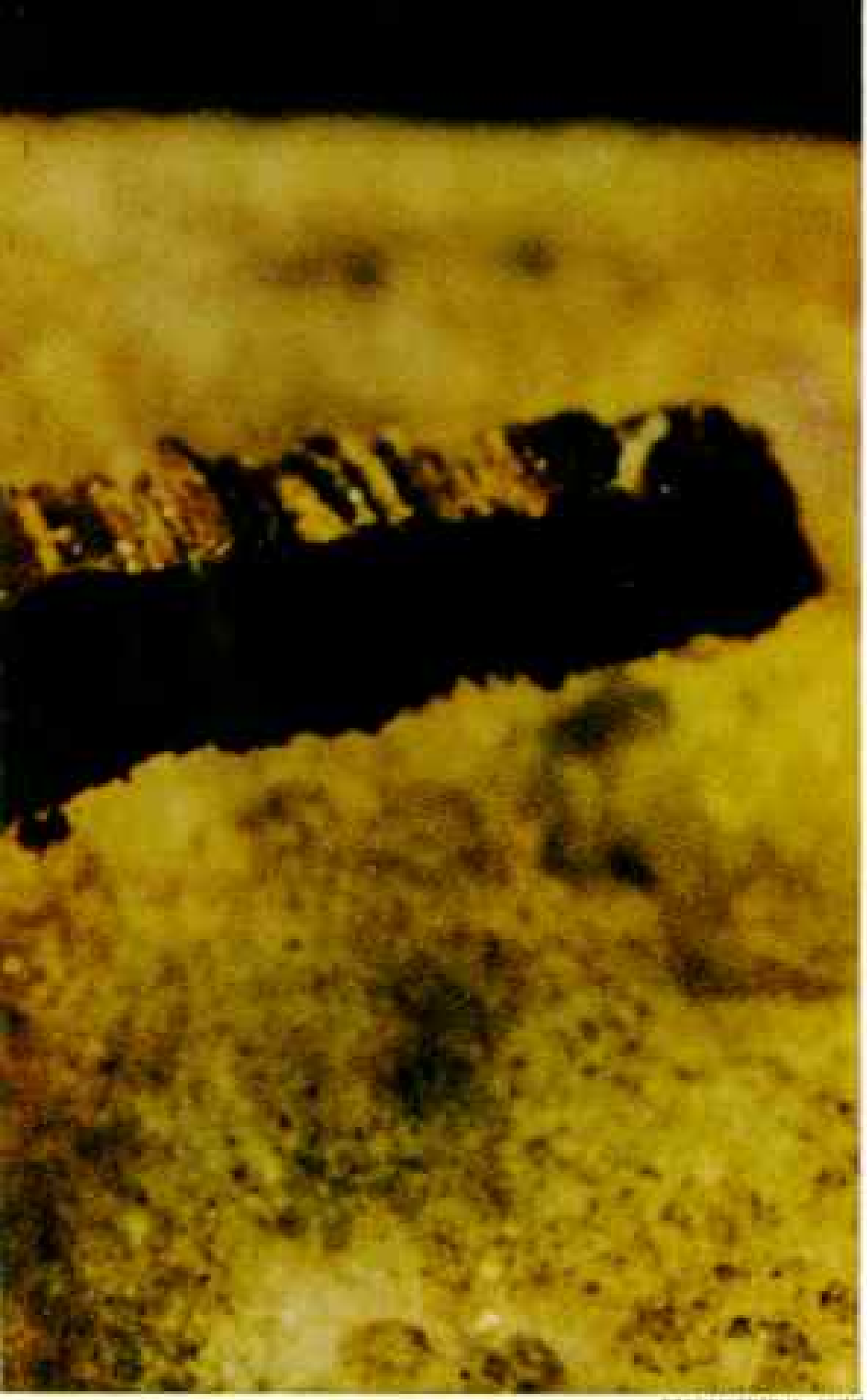
I have explained to my children that a brook is a very new body of water, just sprung to life from ice-cold mountain springs and hundreds of tiny rills. An average stream may flow a foot and a half a second; in a riffle area it accelerates to three or four feet a second, and perhaps twice that in a waterfall. The most rapid white water, though superoxygenated, supports very little life.

A brook carries a strip of high-velocity water in the upper middle of its cross section. Current along the sides and bottom is retarded by irregularities of the streambed. The jet stream in the center is pretty much devoid of life, although it will carry a few struggling creatures, or may be briefly entered by a charging trout in pursuit of prey.

My current meter shows that water speed in a brook drops markedly toward the bottom, and to nearly zero in the lee of a large rock. Directly on the surface of a submerged rock the boundary layer of water, only one or two millimeters thick, is very nearly still. Here, then, is a special place for plants and animals to live, provided they don't protrude upward into the swifter flow.

PSYCHOPSYCHE, 25MM (1 INCH)

LINNEPHILUS, 10MM



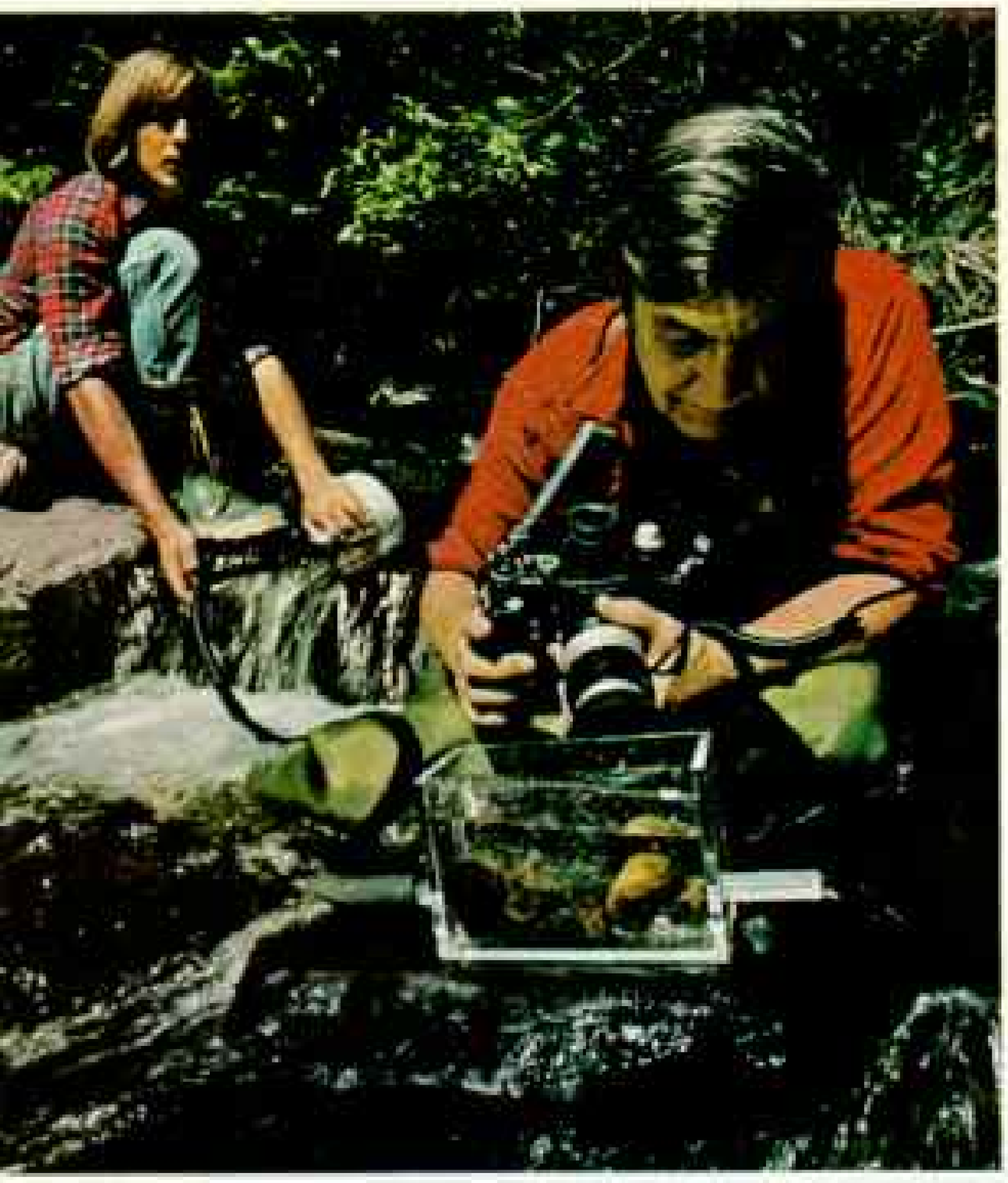
Architects in rushing waters: Using silky threadlike substances from their mouths, ingenious caddis fly larvae build protective cases out of the material most prevalent in each particular niche of the brook.

One species uses twigs cut precisely to length (**left** and foldout painting, pages 564–66). It spins a sticky thread to anchor itself to a rock and, facing into the current, extends hair-fringed legs to catch free-floating food. Another kind builds a house of stone (**left center**) from rock fragments that also serve as ballast. If the case is caught up in the current, its weight allows the insect to settle quickly in the first quiet pool it reaches.

A third, bottom-dwelling caddis fly cements grains of sand together (**bottom left**). A fourth species builds a case of plant debris and weaves a net in the fork of a twig (**below**); all mesh segments are exactly the same size. When dinner is snared, the caddis fly rushes out to eat.

"We just altered the brook a bit," says the author, who diverted water through a special tank (**below**) to simplify photography.

One brook resident, the net-winged midge larva (**bottom**), is one of the few creatures on earth equipped with a piston. Suction cups on its abdomen act as cylinders; the inner portions withdraw to create a powerful vacuum for clinging to rocks.



BLEPHARICERIDAE, 6MM (ABOUT 1/4 INCH); CHARLES NYE (ABOVE)

During the school year I teach biology at St. Andrew's School in low-lying Delaware. "What *is* it like inside a mountain brook?" my students insistently inquire.

"First," I suggest, "imagine yourselves so small that every stalk of moss with its leaflets is like a tall, bushy, storm-whipped tree. But the forest floor is very quiet, even though a hurricane is raging above. Likewise, down in the water among the tough, anchoring moss filaments, a quiet, miniature world exists, populated with all sorts of life."

For examples, I show my students highly magnified photographs of scenes and inhabitants within the water moss. On the leaflets —they are not true leaves—grows a coating of sparkling one-celled diatoms, tiny plants whose glassy silica walls reflect light. Extremely small creatures browse among them, some feeding on the diatoms, others devouring fine organic matter.

I introduce my pupils to long, slender roundworms, and to tiny oval crustaceans—ostracods—that look like two-valved clams with jointed legs (page 567). There are bizarre one-celled protozoans, and busy rotifers anchored in place by secretions from glands leading through their pairs of toes.

Brook Diverted Into Study Tank

To collect most brook animals, all I need is a simple fine-mesh net. When a companion makes a disturbance upstream, lifting stones, pushing over rocks, and altering the flow of water, the suddenly unsheltered creatures are swept by the current into my net.

It is difficult to keep most brook animals alive in a container away from their cold, oxygen-rich native stream. A technique occurred to me that allowed me to photograph my subjects in their natural surroundings. Why not divert the brook itself through a photographic tank, suitably furnished with authentic stones, gravel, and sand? The life-giving water would still immerse the animals, which would only have to be lifted from stream to tank. Craftsmen in the National Geographic Society custom equipment shop made the tanks in several sizes, allowing close-up pictures otherwise impossible to obtain.

In the brookside artificial stream I can watch the animals go about their normal business of feeding, constructing shelter, and other behavior. Each has its special preference

National Geographic, April 1977

in living space, and many construct sturdy houses. I observe a caddis fly larva build its symmetrical case out of precisely cut twigs to form a tapered dwelling, square in cross section (pages 574-5).

Another caddis fly larva constructs an underwater stone house worthy of a master mason. A little, humped turtlelike case, it is open on the bottom. The larva creeps slowly over rocks, always in fast-moving water, while it browses on the algal coatings of rocks. A larger stonemason caddis larva builds a beautiful case of rock fragments, cemented together with silk. Elongated stones along each side may serve as ballast.

The virtuoso, perhaps, among caddis fly larvae is one that weaves an elegant mesh net, strong and easily repaired, between rocks or broken twigs lodged on the bottom. The uniformity of the mesh size, accurate to tenths of a millimeter, is determined by precise weaving motions of the larva's head, from which silk issues forth in double strands.

Before building a net, the larva finds where the current flows most swiftly through rock fissures. The nets of individual larvae are well separated; with a rasping sound, each insect warns away intruders from its territory. The total number of nets in a favorable brook area can reach thousands.

Billowing out in the rushing current, the caddis fly net catches anything that comes along, animal or vegetable. The larva itself lies in a woven tube adjoining the lower part of the net. Periodically it emerges to sweep food from the meshes or to clean out debris. When a large object rips the net, the insect quickly makes precise repairs.

Villainous Blackfly Adapts Adeptly

If I have to visit the stream in June, blackfly season, I slather myself with fly dope, that viscous tarry stuff that old-time woodsmen swear by. When I return to the house, Catherine, my wife, calls through the window, "Bill Amos, don't you dare come in until you wash that awful stuff off!"

Detest the blackfly you may, but few brook animals are better suited to life in rapid water than this tiny insect. Although the flying adults seem to be everywhere, the larvae are found only in well-defined areas. They crowd together in sunny, shallow areas of brooks, where water slips smoothly, without turbulence, over a flattened rock. The masses are readily visible, often forming a dark mat on the brink of the submerged stone.

Somewhat urn-shaped, the larva anchors its thicker, bulbous end to a silken rug it has spun on the rock surface (painting, pages 564-6). The upper end, which waves about in the current, bears a darkened head and a pair of short "arms," each terminating in a fan-shaped fringe of curved bristles that filter food from the current.

"What on earth is that little thing doing?" exclaimed my younger daughter, Alison, as we watched blackfly larvae in Stark Brook.

She had seen one of them dislodged from its rock and whipped away downstream almost out of sight. Yet unbelievably, it checked its whirling descent and began to return slowly against the heavy current to its original feeding place. The insect seemed to make its way upstream without visible effort; it was neither swimming nor crawling on the bottom.

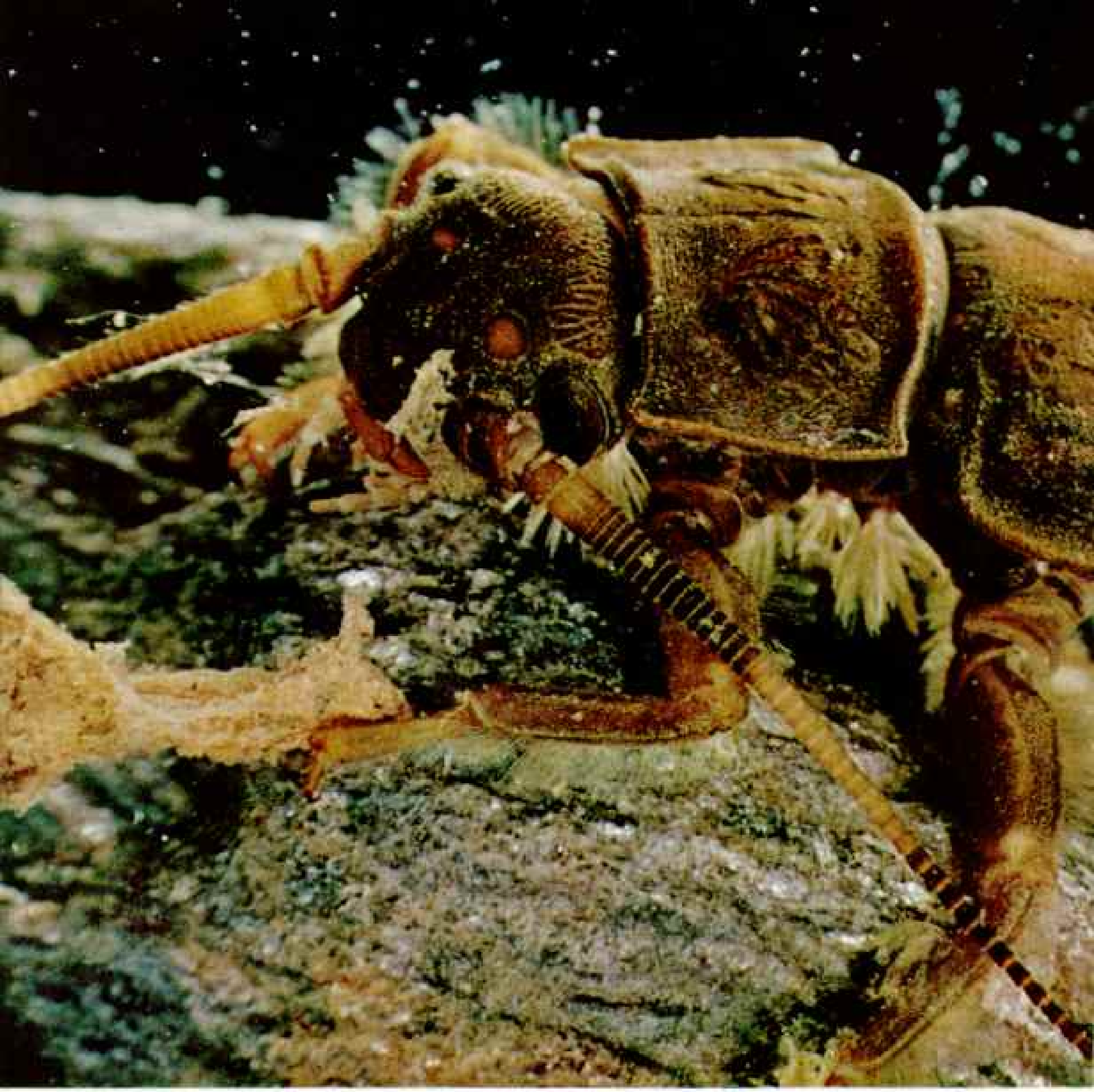
"What you can't see," I explained to Alison, "is the silken safety line, fastened to its original rock hold, that the larva spun out when it lost its grip. As soon as it reached slower water, it started reeling the line back with the head and its hooked appendage. Watch a minute, and you'll see it get back."

Larvae Look Like Fossils

One day a graduate student assistant, Sam Fitz, was following me along the stream as we scanned the underwater scene through our face masks. Suddenly Sam chortled, "I'm famous! I've just discovered a living trilobite!" It was a spoof, since trilobites have been extinct for many millions of years, but Sam, a marine biologist, was unfamiliar with freshwater forms of life.

What he had just seen was the larva of a beetle, a water penny. With its many armor-like body plates completely obscuring the soft parts of its body, head, legs, and white-tufted gills, it did indeed resemble those fossil creatures from ancient seas. The water penny wears a fringe of bristles that fit rock-surface irregularities, sealing off the animal from the current. With an almost flat profile, it moves about in the boundary layer, where water velocity is slowed.

It didn't take long to learn that animals of a cold-water brook fall into only a few feeding patterns: They scrape films of algae off



PLECOPTERA, 30MM

Living nightmare, a stone fly nymph lurks on a rock (**above**), waiting to lunge at anything that moves—frequently mayfly nymphs and midge larvae. Fittingly, stone flies themselves provide a favorite meal for trout. Another voracious predator, the bottom-dwelling dragonfly nymph (**left**), employs an ingeniously hinged lower lip that folds down to nab food and bring it back to the mouth.

rock surfaces; they catch organic food drifting in the current; they burrow into soft loose bottoms in search of decaying material; and they prey upon one another. Mostly though—whether trout, insect, or rotifer—brook creatures depend on the current: They wait for food to come to them.

Competition isn't much of a factor in their lives. To small animals the stream bottom is a vast world, not easily colonized. In all my brook watching, I have yet to see two animals bump into each other clearly by accident.

Many Ways to Lay an Egg

On their individual timetables, the adult females of each insect species begin egg laying, some dropping eggs on the water surface, some walking down underwater from a rock, some even diving into the torrent to find precisely the right spot. Many, however, lay eggs along the shore, where hatchlings can enter the water directly. Some even deposit eggs on overhanging limbs.

Later, when the aquatic young metamorphose into adults, some simply pop up to the surface, perhaps in an air bubble, and fly off at once. Others, such as stone flies, crawl out, still as nymphs, onto exposed rock where they undergo their final molt, leaving their brittle cast-off skins on sun-dried stones.

All brook animals appear very sensitive to changes in water velocity and pressure. I can almost sense the tugging current as I watch a stone fly nymph or a scuttling crayfish make its way from one spot to another.

Largest of the brook's inhabitants, the streamlined brook trout is superbly adapted to its environment. Few other sizable fish can withstand rushing water so well.

In Stark Brook, Bob and I frequently observe a large trout that is lord of the pool nearest our house. More than once we've watched this fish jump completely out of the water to snatch a hovering insect.

"Now that takes coordination!" says Bob, admiringly. I agree; the feat requires astonishing timing and precision.

The fish must sight the insect through two media, water and air, each with different light-bending properties. It must zero in on the exact position of the moving prey. Then the trout has to thrust itself upward with a burst of power, taking into account the increased water velocity near the surface.

COTTUS BAIRDI, 3 3/4" (ABOUT 1 1/2 INCHES)

At the top of the food chain, fish rule this watery kingdom. The mottled sculpin, or miller's-thumb (**left**), spends most of its time lurking in crevices between stones, searching for a meal—often stone fly or mayfly nymphs. Such creatures join hosts of others as the brook widens into a stream, then ultimately flows into a broad-backed river.

It must snap with unerring accuracy at the still-flying insect, catch it, and—without slamming into a rock—return to its haven in the depths of the pool. Maybe the trout is not intelligent by human standards, but its brain nevertheless is a marvelous computer.

Life Thrives Under the Ice

When winter overtakes the brook, what happens to its residents? Not a great deal. Any New England country dweller will tell you that moving water seldom freezes solid. A northeastern Vermont brook is bound to be warmer than the sub-zero air of January. If ice covers the brook surface, it is welcome to the water dwellers, for its mantling snow serves as an excellent insulator, guaranteeing a comparatively comfortable and stable environment of flowing water beneath.

Throughout the winter, insect larvae remain in place and continue to feed, although some pupate and metamorphose, emerging as adults in winter or early spring. Fish keep surprisingly active. Plants may spend the winter as seeds or spores, but some survive in their summer form.

The great winter danger to brook life is not freezing, but ice scour. When sheets of surface ice break free, they smash downstream, denuding rocks of plants and animals.

In the spring, snowmelt enormously increases the volume of water and its rate of flow. Huge boulders may be dislodged and go bumping down the streambed, breaking other rocks and altering the channel. In the grip of the spring flood, banks are undercut, trees are uprooted, and water is discolored from the heavy load of sediment carried downcountry. Yet if plant and animal populations suffer, they miraculously restore themselves. By the time warm weather returns, life forms again abound.

Our Vermont bedroom faces north, where Stark Brook lies hidden, tucked in its ravine. Late of a soft summer evening, with windows open, Catherine and I listen to the stillness of the hill country. It's a silence punctuated by night birds' calls and the rare cry from the deep woods of some four-legged mammal.

The cool, murmuring music of Stark Brook lulls us. But the sound reminds me, before I quickly fall asleep, of the thousands of lives contending at that moment with the current. I imagine the myriad small creatures feeding, swimming, crawling about, constructing new houses, weaving new nets to capture food.

The vastness of the universe will always awe me, but my mind keeps harking back to the comment, its author now lost to memory, that nature is greatest in little things. The brook and its inhabitants, an infinitesimal part of our world, compose a watery miniuniverse very special to me. A close-in look has given root to endless wonder. □

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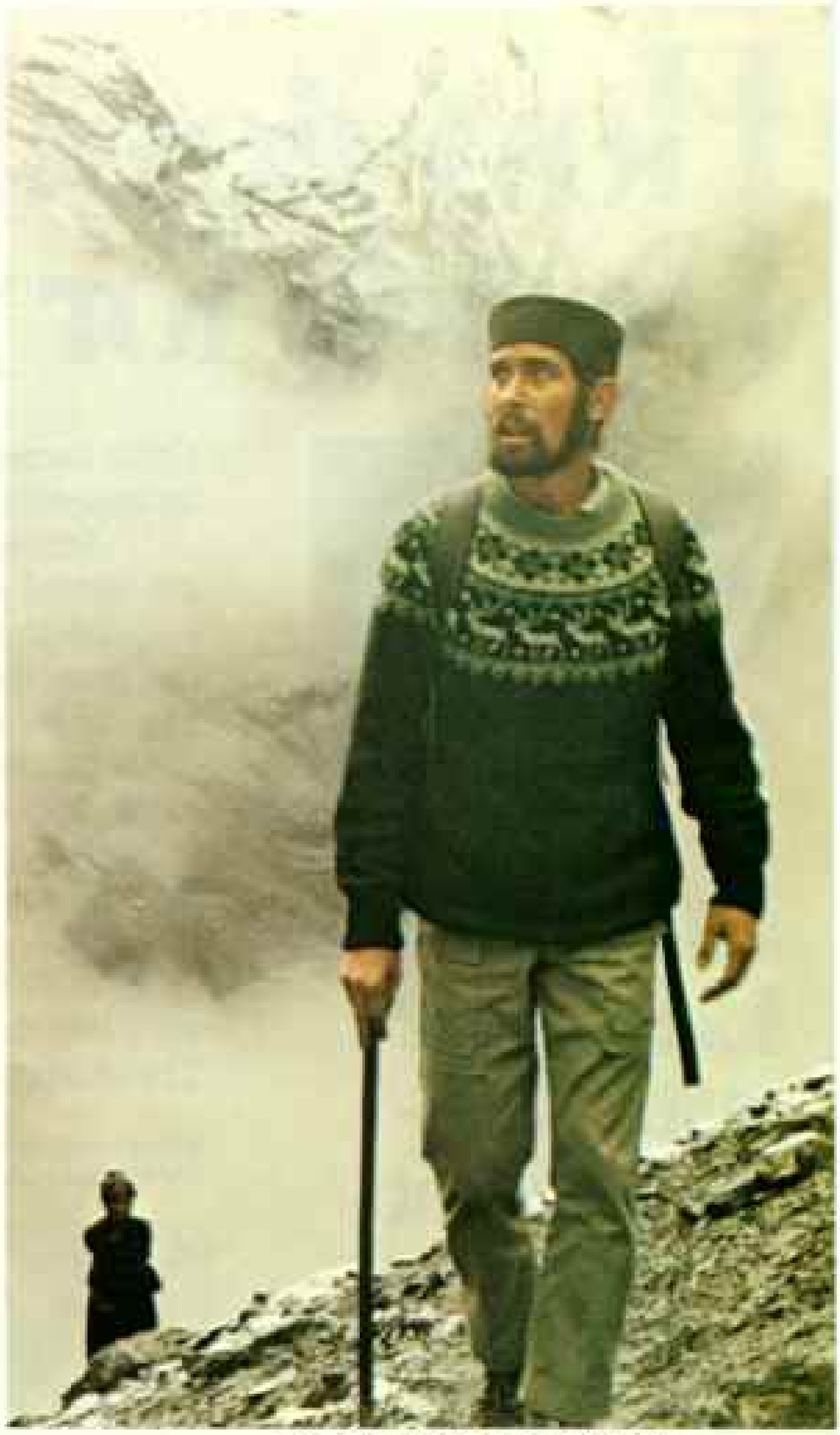

JOEL F. ZISKIN (LEFT) AND CHIR ASOMBATANA

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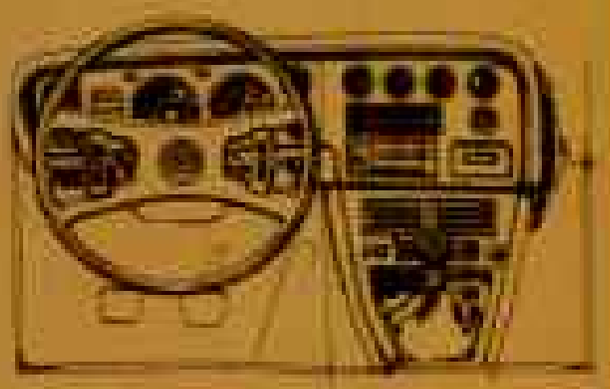

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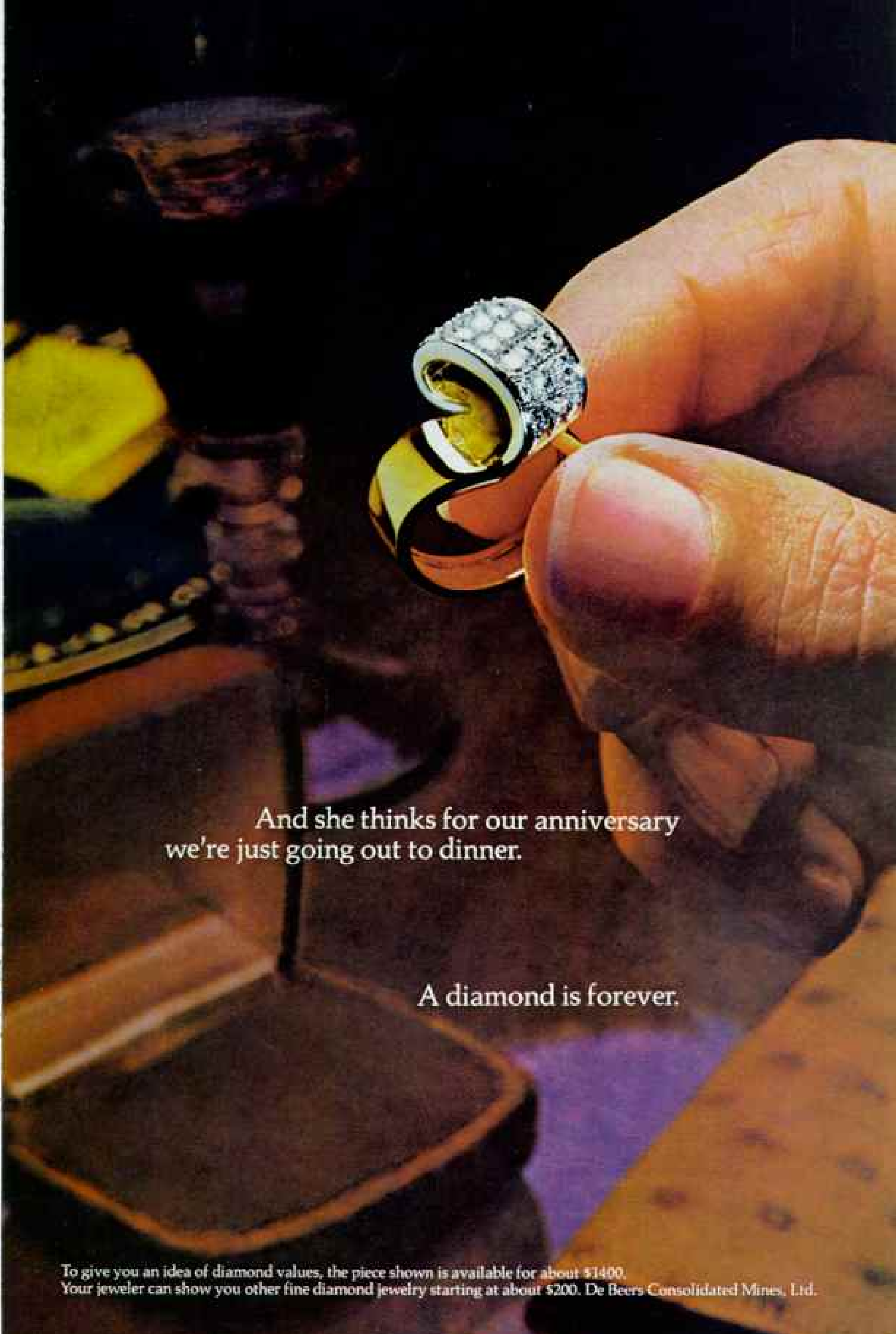
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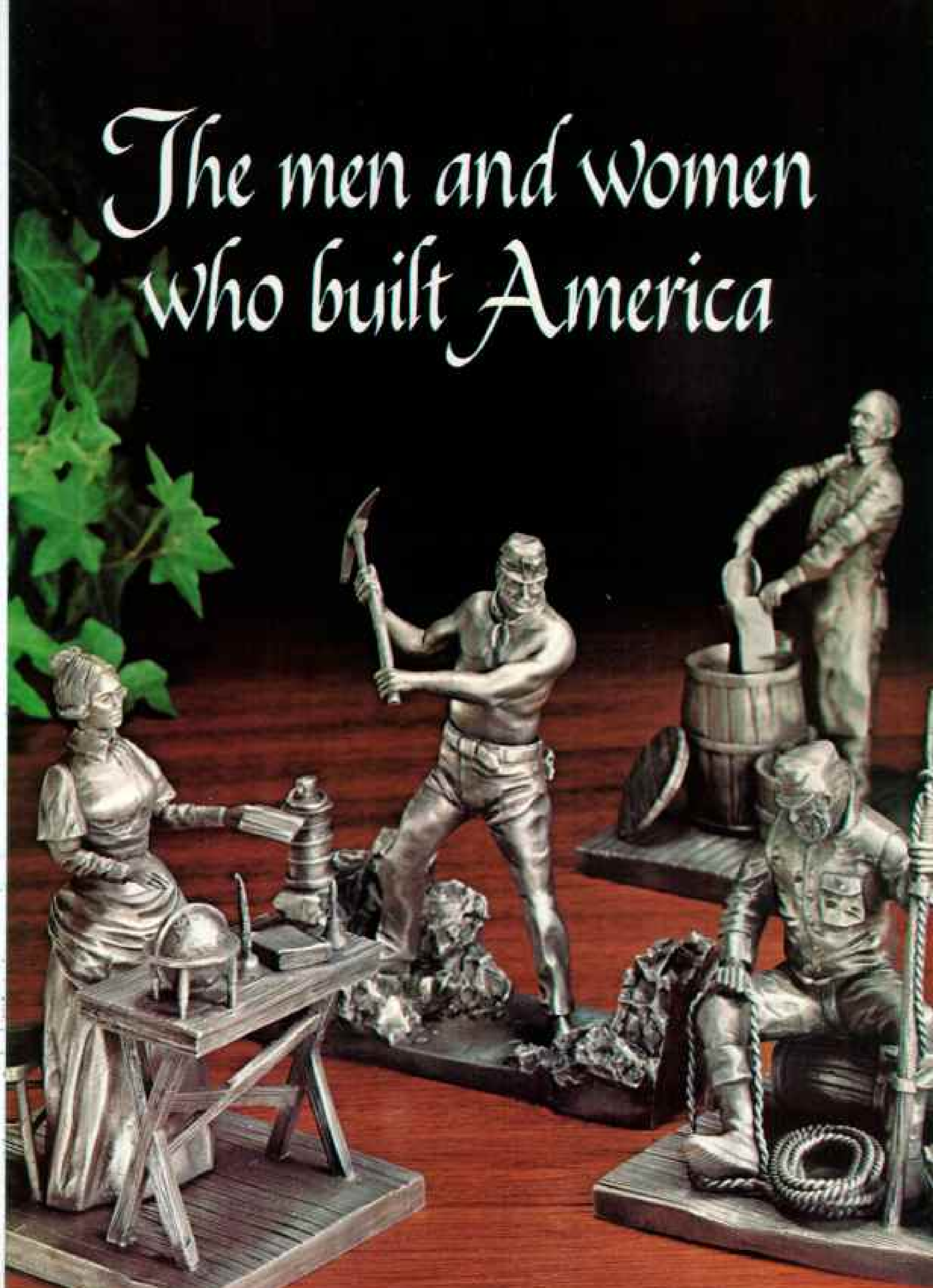

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Each of these figures is a work of authenticity as well as artistry. Finely sculptured, accurately detailed, and lifelike in every respect. Every garment, every tool, every accessory is totally authentic. So carefully and painstakingly recreated that you can actually see the delicate feathers of the quill on the Schoolmarm's desk . . . the pencil tucked in the Shopkeeper's shirt pocket . . . the rippling muscles of the Miner as he swings his pickax . . . even the coarse fibers of the Harpooner's whale line.

Each figure, moreover, is an original work of art, created *exclusively* for this collection by the world-renowned artists and craftsmen of The Franklin Mint. And each will be truly representative of a major section of our country—captured by the sculptor's art at a single moment in time.

In all, the collection will portray twelve stalwart Americans—men and women who built our cities, tended our farms, tamed our wilderness and shaped our nation's proud heritage. From the *Logger* of the Pacific Northwest to the Southern *Tobacco Grower*. From the *Railroad Worker* of the Plains States to the Midwestern *Farmer's Wife*. From the *Foundry Worker* of the Northeast to the *Cowboy* at his campfire in the great Southwest.

Crafted of fine pewter

Throughout America's history, pewter has been prized for its softly gleaming lustre and enduring beauty. Thus, it is especially fitting that these beautifully sculptured figures of the people who shaped America's heritage should be crafted of pewter. *Fine* pewter—the very highest quality of pewter produced anywhere.

Each figure, moreover, will stand on its own sculptured base, which will also bear the title of the work, the signature of the sculptor, and the distinctive mintmark of The Franklin Mint.

Issued in strictly limited edition

The Men and Women Who Built America will be issued in strictly limited edition. It is available by subscription only, and there is an absolute limit of one set per subscriber.

Thus, the total number of sets issued will be permanently limited to the exact number of individual subscribers. When each subscriber has received his sculptures, the master sculptures and molds will be *destroyed* and these limited edition works of art will never be produced again.

The sculptures will be issued systematically, at the rate of one every other month. And the original issue price of $70 per sculpture will be billed to the subscriber in two equal monthly installments of $35 each.

Subscription deadline: May 15, 1977

The Men and Women Who Built America is a unique artistic tribute to the men and women of every region who shaped our nation's heritage. Combining art and history, these sculptured pewter figures will be a continuing source of enjoyment and inspiration. A collection to be admired and displayed with pride, now and throughout the generations to come.

To acquire this magnificent collection of pewter sculptures, the Subscription Application at right must be mailed by May 15, 1977. There is no need to send any payment at this time. Simply mail the application to The Franklin Mint, Franklin Center, Pennsylvania 19091. But please be sure your application is postmarked no later than May 15, 1977.

THE MEN AND WOMEN
WHO BUILT AMERICA

The complete collection will consist of the following twelve figures, representing the men and women of every region who shaped our nation's heritage.

The Harpooner	The Riverboat Pilot
The Shopkeeper	The Railroad Worker
The Foundry Worker	The Cowboy
The Schoolmarm	The Miner
The Farmer's Wife	The Logger
The Tobacco Grower	The Vineyard Keeper

Specifications: Each figure will be individually crafted of Fine Pewter. Every figure will stand on its own sculptured pewter base. The underside of the base will bear the signature of the sculptor and the distinctive mintmark of The Franklin Mint.

SUBSCRIPTION APPLICATION

The men and women who built America

Must be postmarked by May 15, 1977
Limit: One collection per subscriber

The Franklin Mint
Franklin Center, Pennsylvania 19091

Please accept my subscription for The Men and Women Who Built America, consisting of twelve finely detailed pewter sculptures.

These sculptures are to be sent to me at the rate of one every other month. I need send no money now. The issue price of $70.* for each sculpture will be billed to me in two equal monthly installments of $35.* each, beginning when the first sculpture is ready for shipment.

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The Franklin Mint

The Shopkeeper shown approximately actual size.

Detail of figure enlarged to show fine detail.

How did an American Ford Granada compare in tests of smoothness and quietness of ride with a $20,000 German Mercedes?

Read how German engineers rated both cars after 7 days of testing.

For 1977, a new Ford Granada was brought to Germany for a scientific ride comparison with a Mercedes-Benz 450SE (U.S. sticker price: $20,689*). The Granada was a standard production car equipped with optional 250CID engine ($96.) and automatic transmission ($186.). Testing was conducted by an independent German engineering firm.

View of test site in Bavaria, Germany.

Test 1: Smoothness test.

To test for "riding smoothness" the German engineers drove the Granada and the Mercedes at various speeds over a variety of roads in northern Germany, ranging from cobblestone to smooth highway. Using a sensitive electronic recorder, they measured vibration levels.

Test results: Analysis of the engineers' data showed that in three out of the four test conditions there were "no major differences" in smoothness between Granada and the Mercedes.

Test 2: Quietness test.

In the next series of tests the cars were evaluated for "quietness" of ride. Again, they were compared over a variety of German road surfaces at speeds from 30-55 mph. A sound meter recorded their interior decibel levels on the dBA scale.

Test results: Analysis of the data showed that in all tests the Ford Granada consistently rode as quietly as the Mercedes-Benz.

The Granada idea...

...was to offer American drivers classic styling and great riding comforts—at a sensible price.

You've read what this Granada did against a $20,000 Mercedes-Benz in Germany. Take a Granada test drive of your own and see for yourself.

FORD

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

1977 Ford Granada. Sticker price: $4,088, excluding taxes, title, destination charges. WSW tires, $39. (Photographed in Garmisch, Germany)

"These tides could generate power for 700,000 homes!"

Some see in the tide's ebb and flow a limitless power supply: undeveloped! Others say tides promise too little power, too far from anywhere, too late. Who's right?

Tidal power specialists point to the Bay of Fundy whose tides display majestic power; 100 billion tons of water rising as much as 50 feet, then draining, twice daily—a 200 million horsepower potential each day. They talk of one Fundy site where a tidal generating plant could net 7½ billion KWH. Enough to power 700,000 homes. And Fundy is one of the world's 50 prime sites! True, construction costs are high. But tidal power is pollution-free, environmentally tolerant. Enthusiasts say, "develop it!"

Others doubt tides will ever make a significant contribution. They point to the problems: remoteness of most potential sites, limited application to date. Only two tidal plants exist in the world. None in North America. Tidal power critics call for energy sources promising more power, closer to needs, in less development time.

Where to turn? Petroleum provides 70% of today's energy. Supplies are limited. They'll run low in the forseeable future. We must prepare with an energy policy that encourages development of non-petroleum power sources. Of course, tides should be investigated. Wind and sun too. But let's concentrate on coal for electricity, petroleum substitutes; and on perfecting nuclear power. We urgently need to set energy priorities in terms of a national policy blueprinting responsibilities of consumers, producers, and government.

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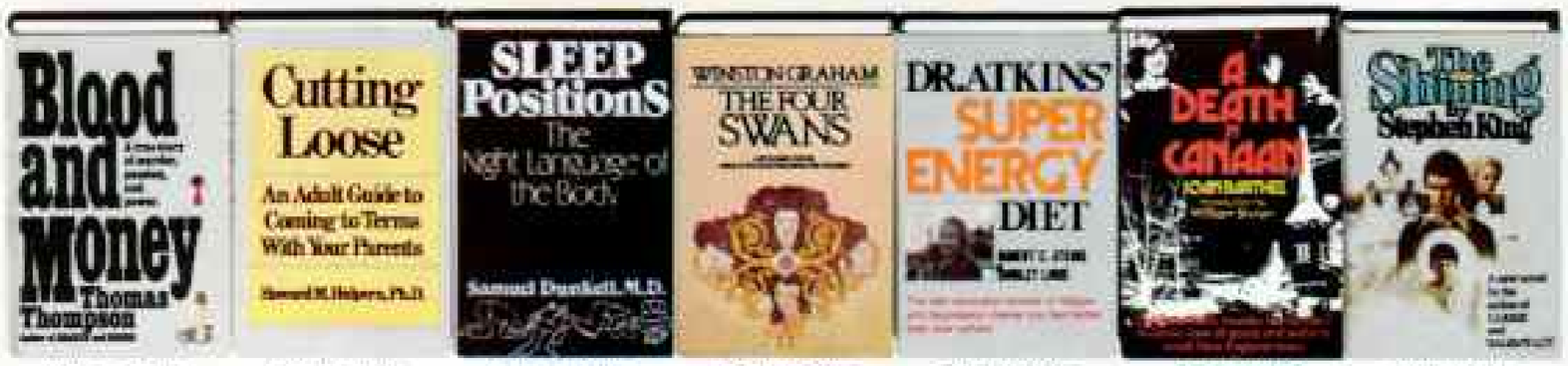

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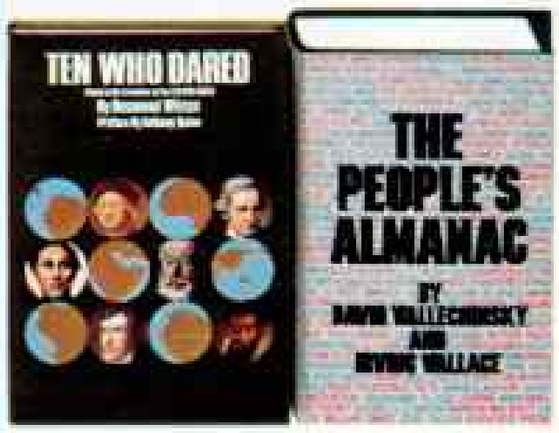

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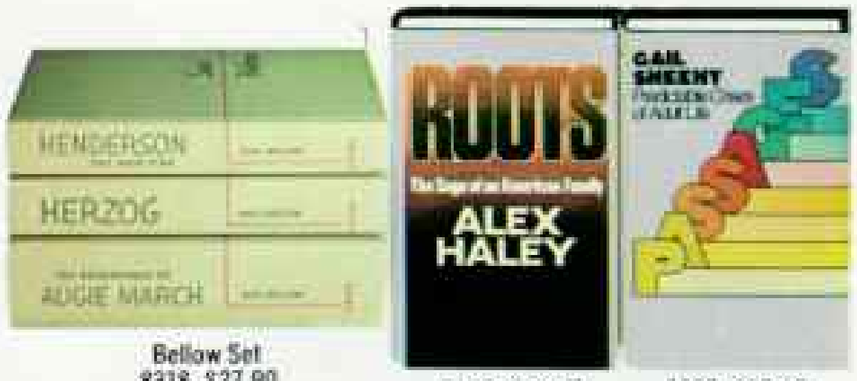

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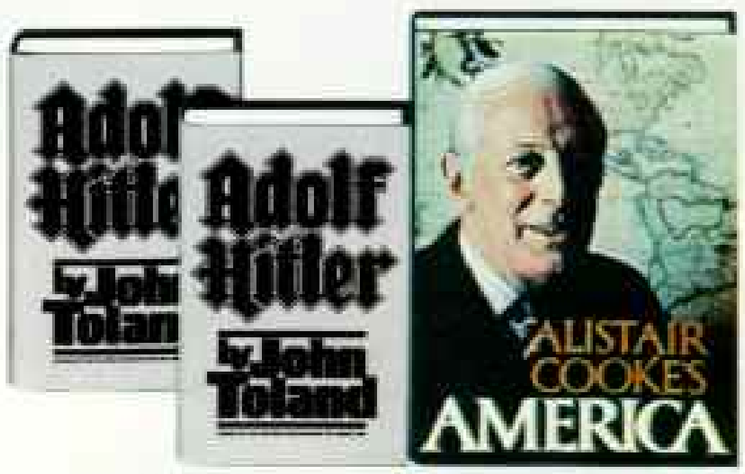

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I'm a dreamer. Sometimes at dawn I like to imagine it's the middle of the day. I see a city with no traffic jams. No parking problems. No housing problems. No crowds. No noise. No crime. Oh well, maybe someday. It won't happen overnight.

But I believe in my city and the people who live here. Maybe that's why I don't mind sweeping up after them.

Atlantic Richfield Company believes that one of our national goals must be to make the city a place where people can work together and live together with pride. Without fear. When you have the opportunity of expressing your opinion on this issue, we hope you will. Be an involved American. Consider the facts. Take a stand. Get involved.

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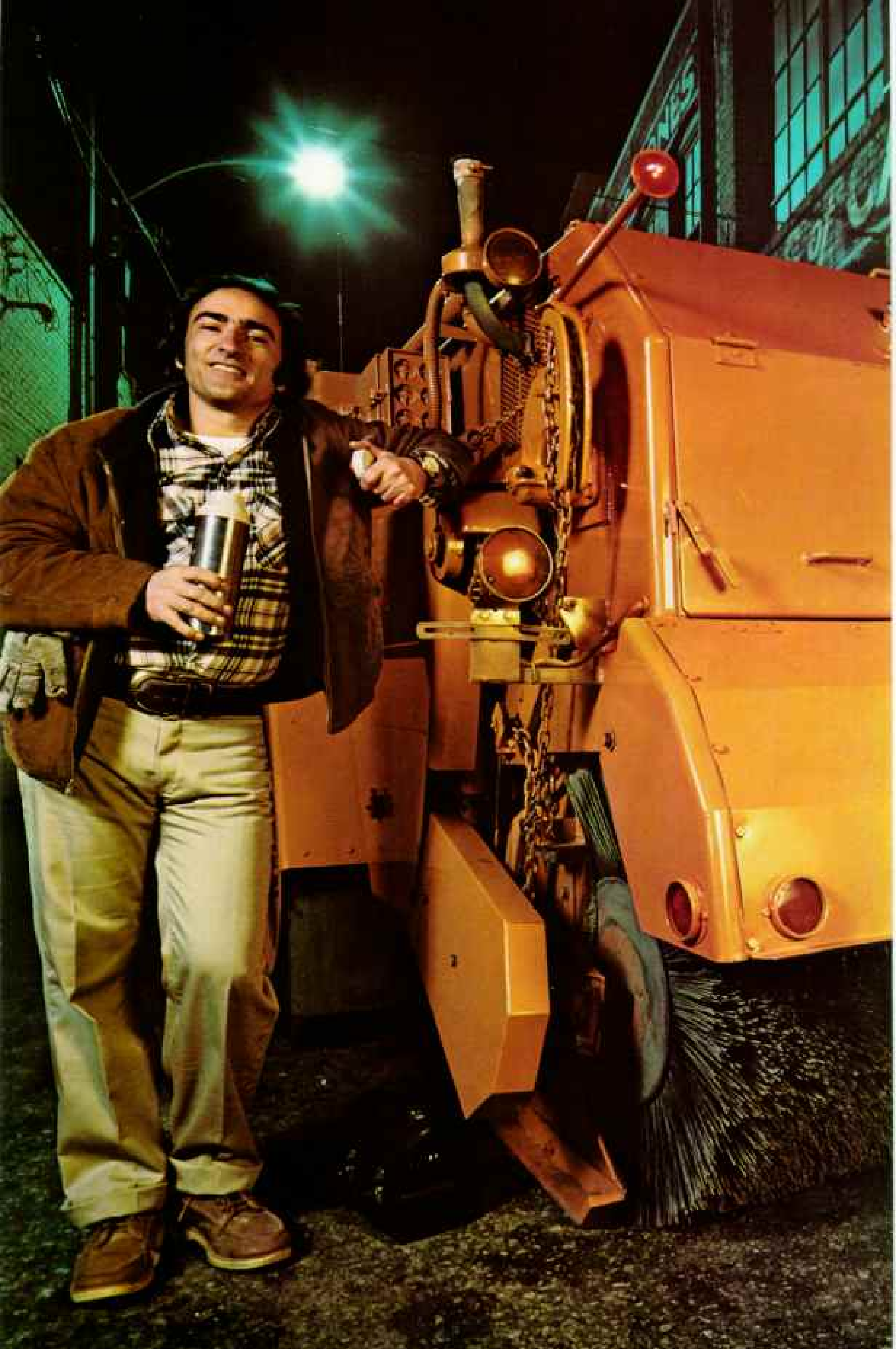

The lost art of looking up.

In recent times the art of looking up has become in danger of being replaced by an opposing view. A view that is filled with short cuts, but devoid of dreams. A view where progress is worshipped while standards are ignored. A view that has not only endangered our environment, but ourselves as well.

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Vitamin A	88	12	30
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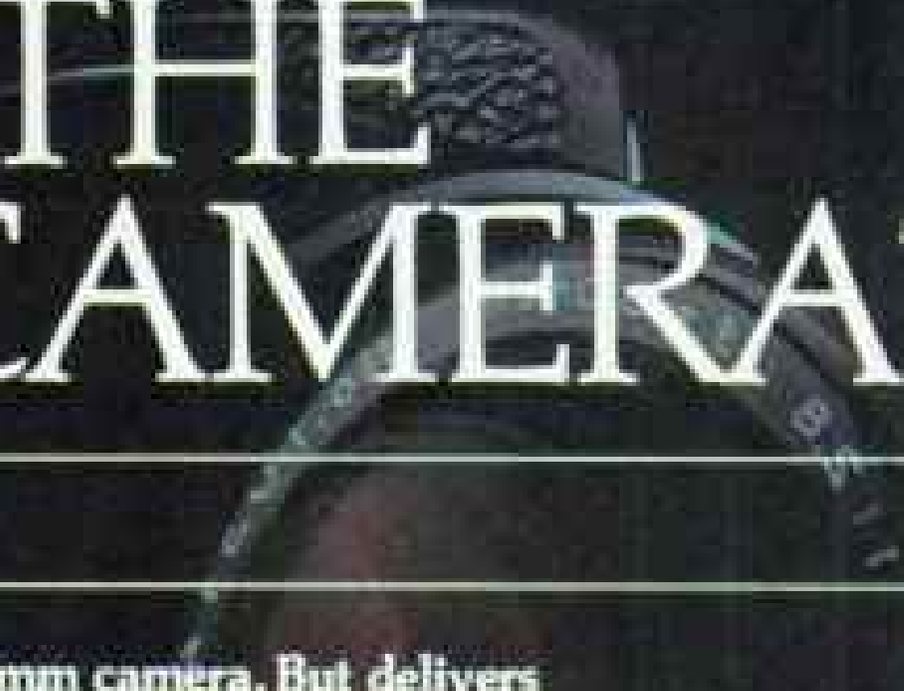

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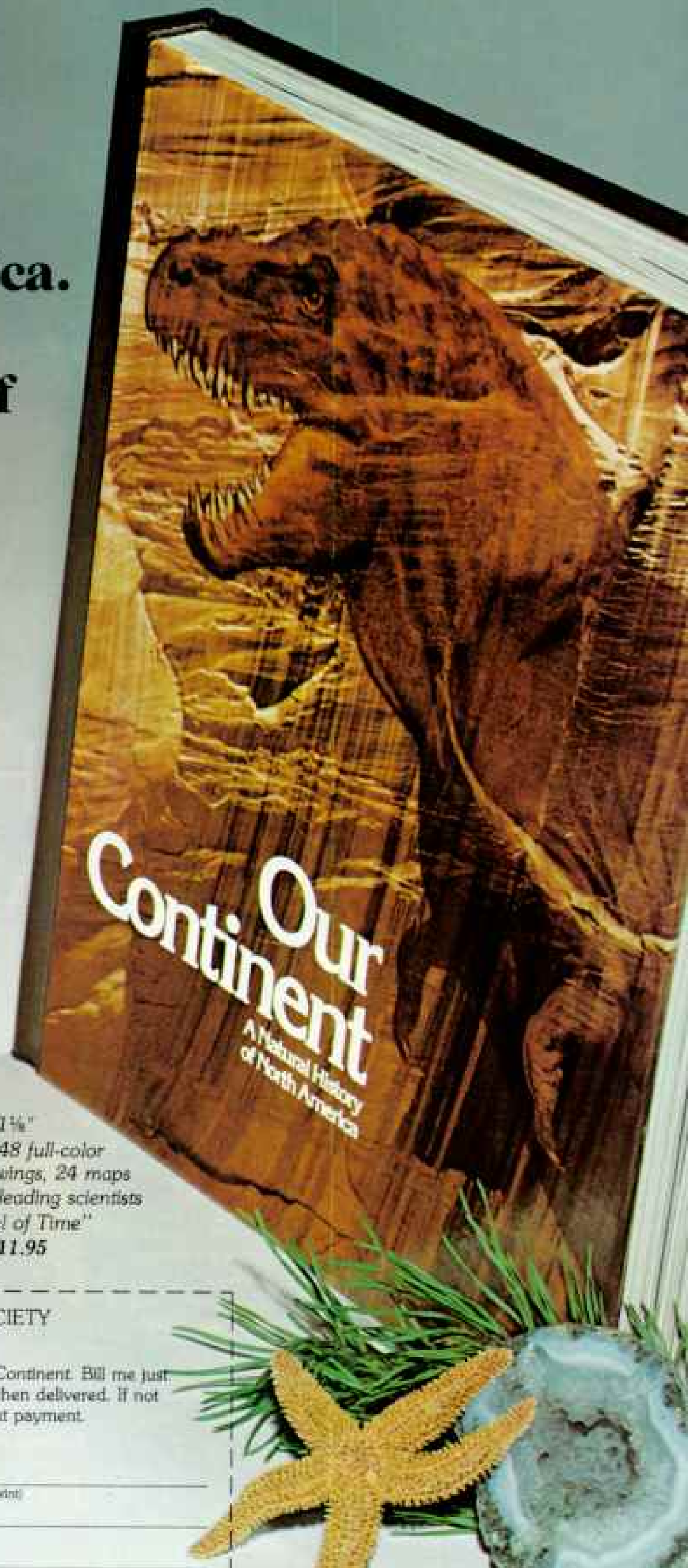

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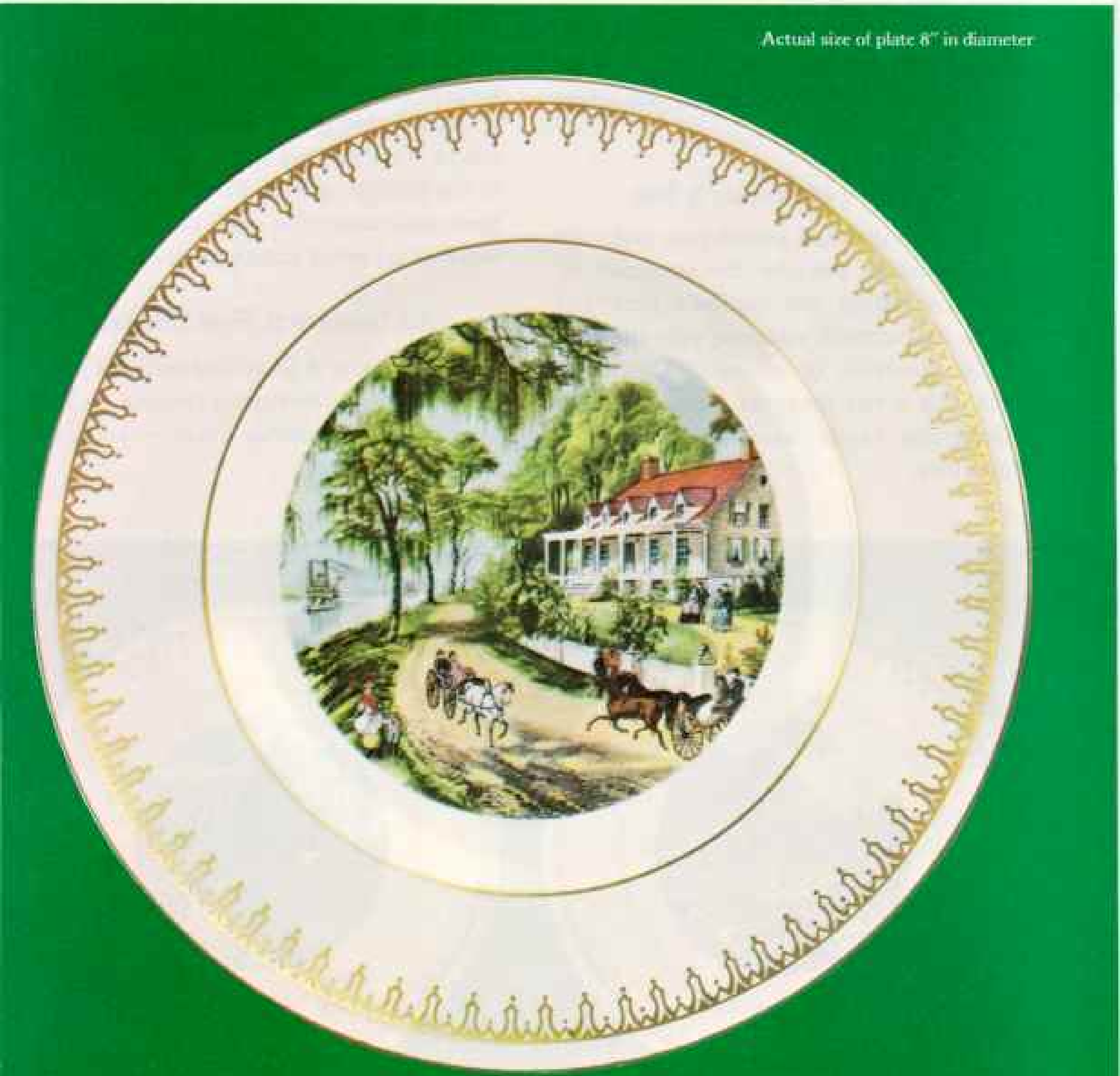

Home on the Mississippi

Continued on next page ►

The Currier & Ives Plate Collection

Currier & Ives created art that captured life in 19th century America. The tranquility of rural life, the splendor of America's mountains and plains, the excitement of our frontier and the grace of clipper ships and riverboats — all of these and more are recorded in their works. Now you can enjoy the best of Currier & Ives beautifully reproduced on 12 flawless Bing & Grondahl porcelain plates.

The Best of Currier & Ives

The 12 individual works that make up this collection portray the romance of America during our nation's first 100 years. By carefully selecting only the best of the hundreds of works of Currier & Ives, this series presents a panorama of Americana rarely available to today's collectors.

The Beauty of Bing & Grondahl Porcelain

To reproduce a Currier & Ives scene accurately on a beautiful porcelain plate demands precision craftsmanship of the highest order — a quality for which Bing & Grondahl is world renowned. Since 1853 Bing & Grondahl has produced porcelain in exclusive editions for Royalty and the wealthiest families of Europe. Bing & Grondahl's plates bear the symbol of appointment to the Royal Danish Court. This symbol will be on every plate in the Currier & Ives Plate Collection — your assurance that each plate is truly a work of art and a masterpiece of design.

An Important First Edition

In 1895 Bing & Grondahl issued a plate that was to become most famous — *The world's first Christmas Plate* — recently valued at $2,750.

American Homestead — Spring

Yosemite Valley

Now, in 1977, Bing & Grondahl, in cooperation with the Danbury Mint is issuing another first edition — The Currier & Ives Plate Collection. *These plates are the only plates of their kind in the entire world.*

A Strictly Limited Edition at a Guaranteed Price

To enhance its heirloom value the Currier & Ives Plate Collection will be issued as a strictly limited edition. It is available only by advance reservation and only until *April 30, 1977.* The original issue price of $38.00 per plate is guaranteed to each subscriber throughout the series.

Guaranteed Satisfaction Convenient Acquisition Plan

Each plate in this collection will be crafted with the most demanding attention to every detail — perfection of porcelain, precision of register, fidelity of color to match the original Currier & Ives scene, and 2 bands of 24 kt. gold hand applied to each plate.

Should you receive any plate that fails to meet your own standard of excellence you can return it for a replacement or a refund.

To subscribe to this important collection, simply complete the reservation application below and mail it.

Actual size of plate 8" in diameter

The Old Grist Mill

The Sleigh Race

NG

PREFERRED RESERVATION APPLICATION

The Danbury Mint
10 Glendinning Place
Westport, Conn. 06880

All orders must be postmarked by April 30, 1977

Please accept my reservation to *The Currier & Ives Plate Collection.* I understand there will be 12 porcelain plates in this limited edition series and that the plates will be issued one every two months at the guaranteed price of $38.00 per plate (plus $1.25 for shipping and handling costs).

I need send no money now. I will be billed for the first plate 30 days prior to shipment and invoiced for each subsequent plate as the individual plate is issued. I may cancel this subscription at any time and any plate may be returned for a full refund if upon receipt I am not completely satisfied.

Name _____

Address _____

City _____ State _____ Zip _____

Signature _____

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Fun and frugal 5-speed.

Exit dull, sluggish economy cars. Enter Datsun's spicy 200-SX. Sweet-handling. Tasty appointments. And no bitter price to swallow.

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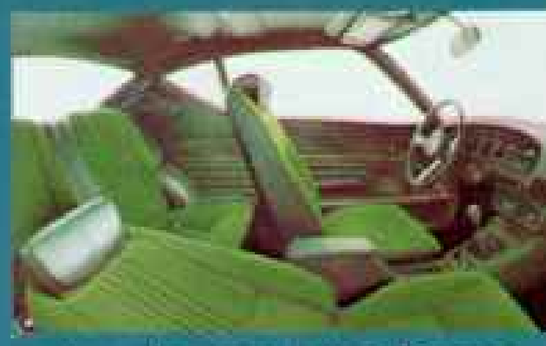
All for $4399.
(M.S.R.P. not including destination charges, taxes, license or title fees and optional tape stripe and mag type wheel cover package.)



Suddenly it's going to dawn on you.

DATSUN SAVES

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Recently, such a program was tested to reduce blood cholesterol. It included skim milk, lean meats, plenty of fruits and vegetables, and Mazola pure corn oil.

Result: blood cholesterol was reduced an average of 17 percent. Couldn't your family benefit from such a meal program? Mazola suggests you ask your doctor.

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NOTE TO PHYSICIANS:
The complete report mentioned above was published in the "Journal of The American Dietetic Association" Volume 62, February 1973.

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cpc

Simulated projection

A Kodak Ektasound Moviedeck projector. Of course.

This Kodak sound projector is, above all, easy to use. You can watch your movies without setting up a screen or turning down room lights. Just pull out the built-in viewing screen. It's ideal for small audiences. Of course, you can project onto a traditional screen.

Every time you show your movies, you will enjoy the easy-to-use automatic threading and automatic rewind features.

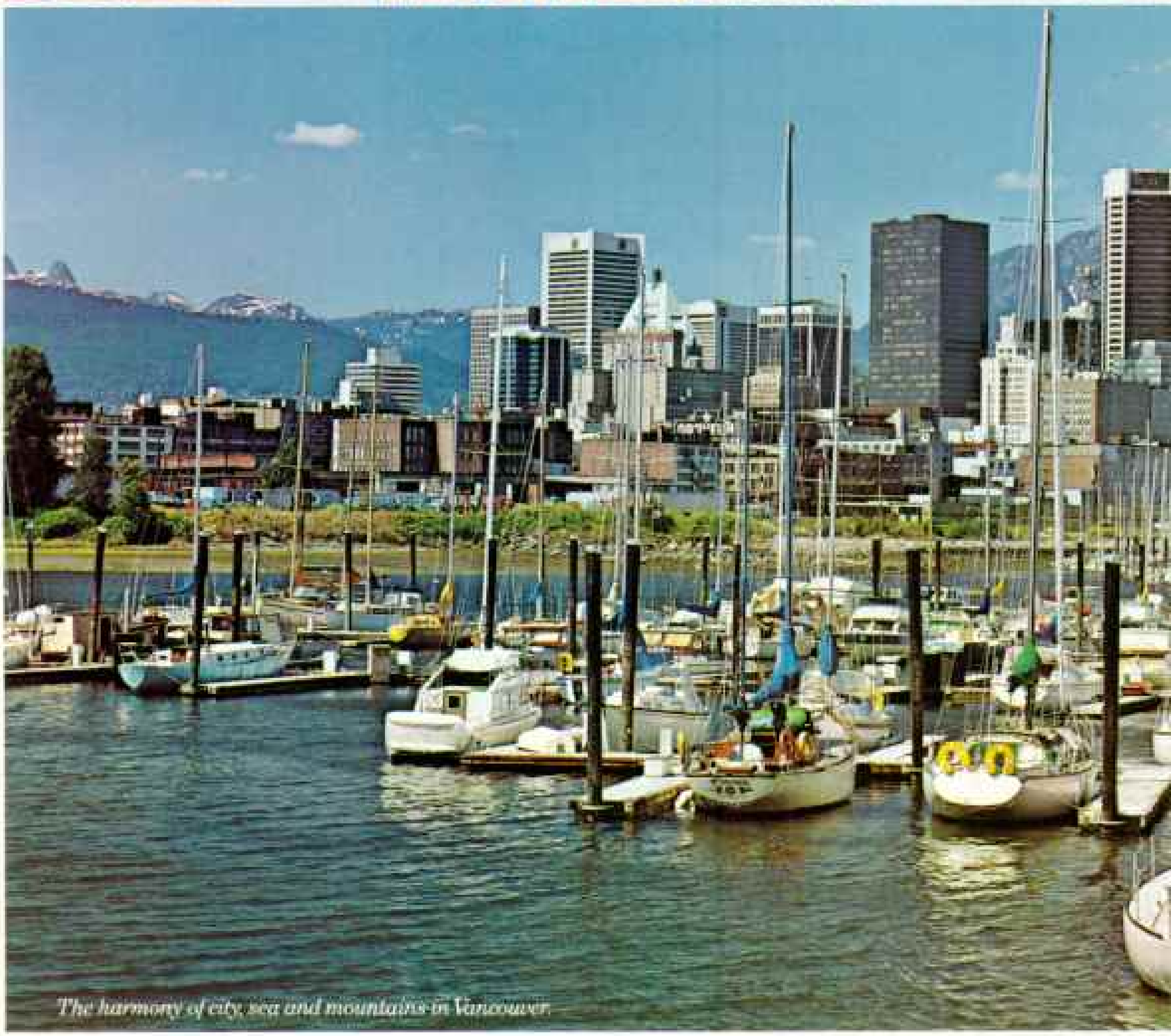
And talk about versatile! You can show both sound and silent super 8 and 8 mm silent film at the flip of a switch. An instant rerun feature lets you replay previous scenes in just seconds.

The Kodak Ektasound Moviedeck projector is so handsome, you'll want to leave it out on a bookshelf or next to your stereo equipment. There are two models. One offers sound playback. The other offers both playback and recording capabilities. Ask your photo dealer for a demonstration and you'll really appreciate the ease in showing sound movies.

Kodak Ektasound Moviedeck® projectors.

Fine dining at the heart of beautiful Montreal

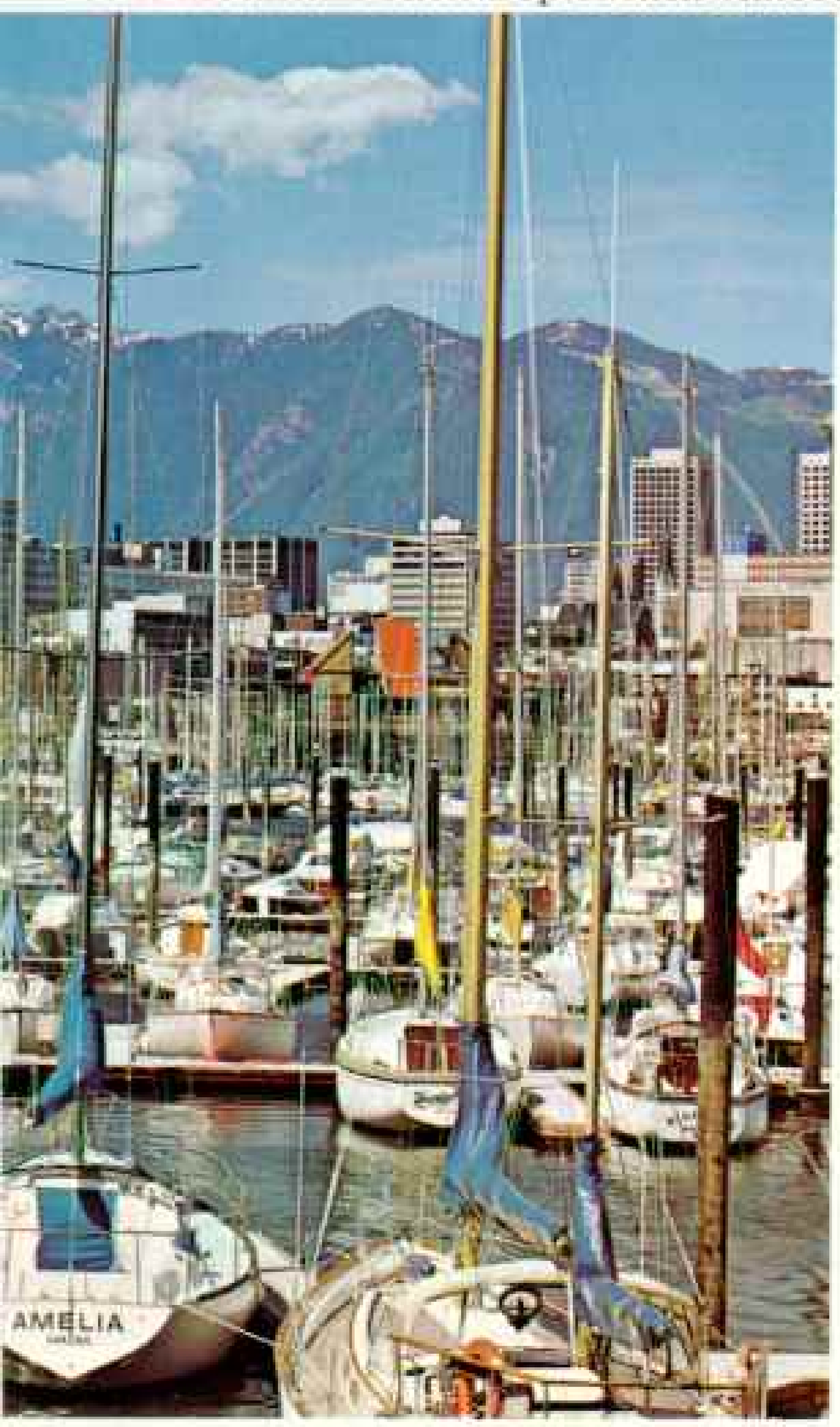
Good country living in Atlantic Canada



The harmony of city, sea and mountains in Vancouver

CANADA. SO MUCH TO GO FOR

When you come to Canada, you come to cities that invite you to share their warmth and excitement. Cities with everything from the life and laughter of old French Canada, to the magnificent mountain backdrop of lush Vancouver. And right next door to the cities, you'll find wide open country, clear sparkling lakes, lots of sunshine and lots to do.



Come for a weekend or come for a month. Come whichever way suits you best–by road, air or rail. Whatever kind of vacation you want, at whatever price, you'll get more than your moneysworth in new experiences and great good times.

Come to Canada.

It's easy to make your own arrangements. Or, talk to a travel agent soon. Then come on! There's so much to go for. Canada

6 big reasons why Dodge is America's number one maker of van-type vehicles.

When it comes to selling vans, nobody does it like Dodge. Because our van-type vehicles, like Dodge Sportsman, have got it where it counts.

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Dodge Sportsman has got the space you need when you're carrying cargo or kids. It's over 53 inches high from floor to inside roof. And that's no small matter.

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Sportsman's got it. With convenient quick-disconnecting three-passenger rear seats and single rear door. Sportsman's the kind of vehicle that can make a campground seem like home. Without making your home look like a campground.

3. Maneuverability.
Dodge Sportsman's got a shorter turning circle than comparable Ford or Chevy models. This gives it the kind of handling that makes it easy for you to get around. And easy to get the lady of the house behind the wheel.

4. Comfort.
Sportsman doesn't just carry passengers, it does it in style. Optional seating for up to fifteen on B300 Maxiwagon. With options like high-back Command swivel seats for driver and front passenger.

5. Styling.
Who says utility can't be beautiful? Just ask any of the ladies who are taking to our Sportsman like never before.

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After all, Sportsman is a Dodge. And we've got a reputation to think of. So Sportsman has that Dodge dependability and service we've always delivered.

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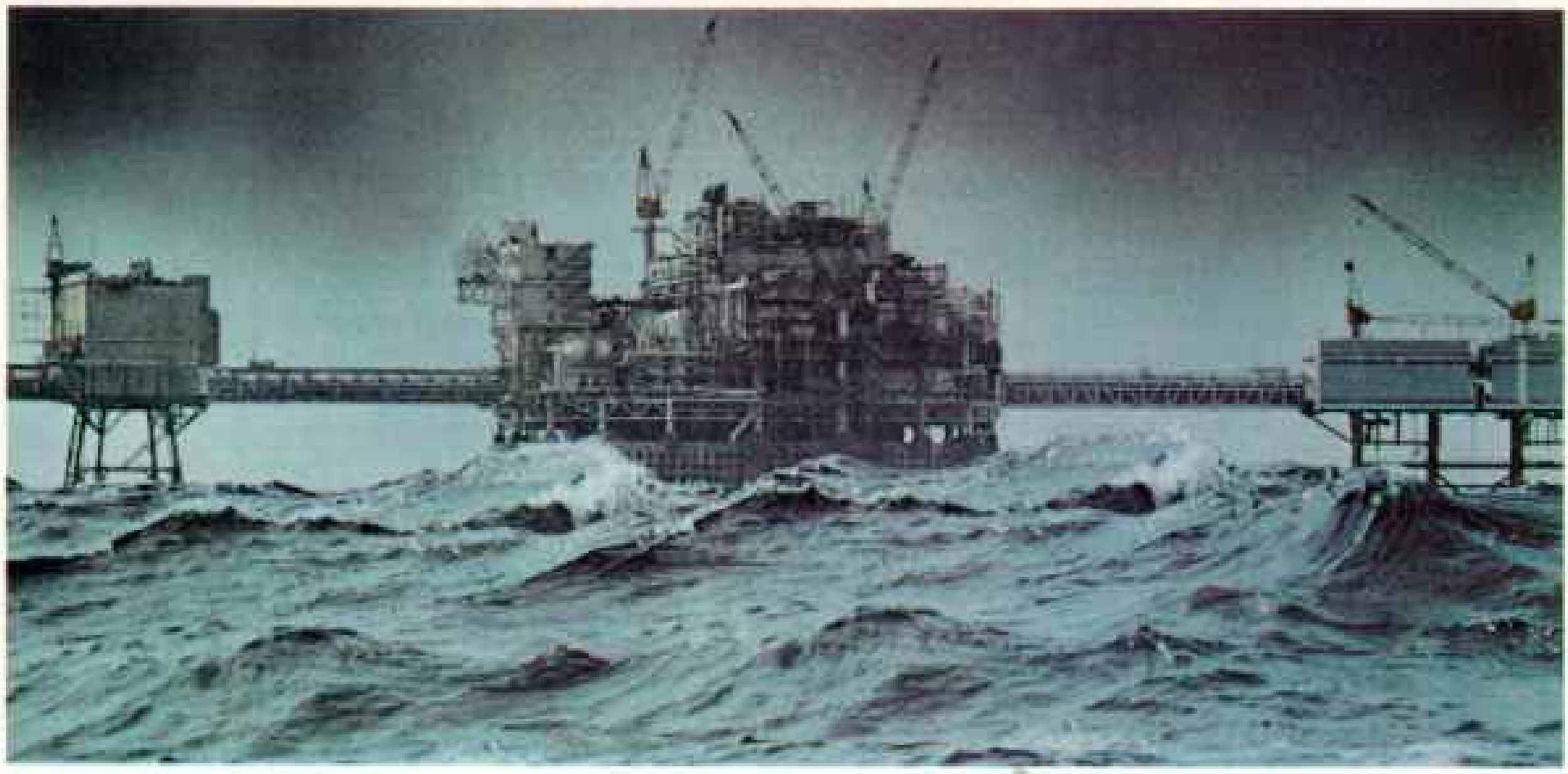
The North Sea is one of the most forbidding spots on earth to drill for oil. Even on a nice day like today.



For years, experts believed a major oil field was buried beneath the North Sea. But even if they could find the oil, they weren't sure they could get it out. Especially during stormy winter months when gale force winds and eighty-foot waves made operations even more hazardous.

Relying on ingenuity instead of weather.

When Phillips Petroleum finally did strike oil in the North Sea, they knew conventional production methods couldn't stand up to the task. So they built a city that could. A city at sea called "Ekofisk."

A city so efficient, it can recover oil and natural gas, separate them on the spot, then pump both to terminals hundreds of miles away via separate underwater pipelines.

A city so accommodating, it will feed, sleep and entertain over 400 people in its own five-story hotel.

A city so far reaching, a satellite communications system must be used to link its most distant points.

A city so advanced, it has changed the whole concept of offshore oil production.

But even more important than what's gone into Ekofisk is what we're getting out of it: sorely needed oil and natural gas from a place where it could never be produced before.

Where do we go from here?

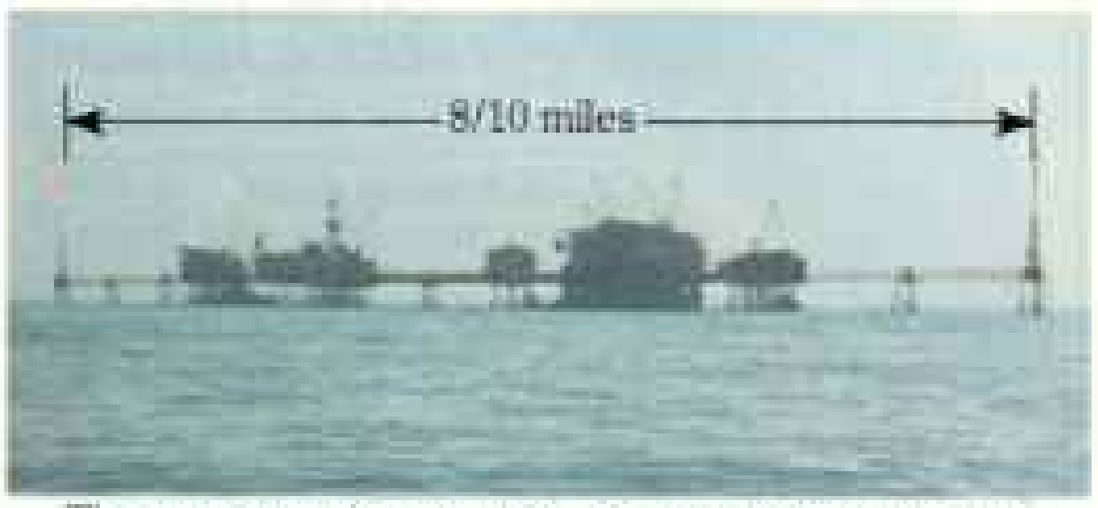
Soon, the people of Phillips Petroleum will be drilling even deeper into the oceans with a unique ship that uses computerized underwater thrusters to maintain its position with amazing accuracy.

In the future, Phillips seismic crews will be able to determine their location in uncharted jungles using a remarkable ground-to-satellite communication system.

Searching the world over for oil, then turning it into fine products for your car. At Phillips Petroleum we have a word for it: Performance.

The Performance Company

PHILLIPS 66



The vast sea makes even the 13-story tower look small.

"Before I put my Olds wagon in this garage, I put this garage in my Olds wagon."

When I drove my new Custom Cruiser home, I picked up this specially-designed lightweight garage on the way. Which should give you an idea how Olds builds its full-sized wagon. Practical dimensions outside, plenty of room inside for the 1009 pounds of materials needed for my new garage.

I can flip the tailgate down for loading, or sideways like a door, with the window up or down. Even the hinges are concealed for easier loading. I ordered the new rear-facing third seat because you can open it with one hand without climbing in; also the roof rack with adjustable crossbars.

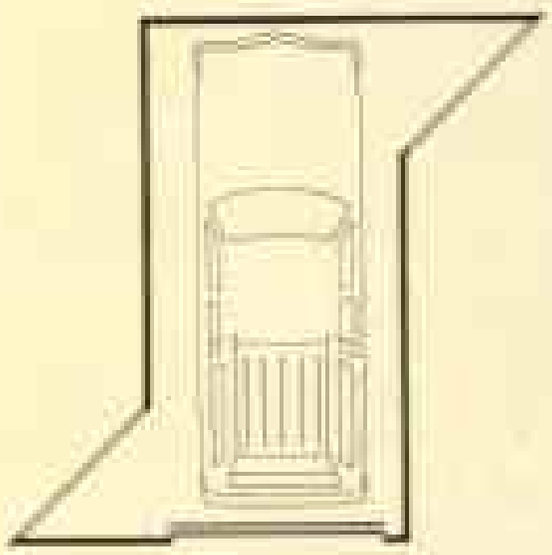
Yet this is more than just a roomy station wagon. It's an Oldsmobile.

It doesn't ride like a wagon. It's smooth, quiet, and a luxury to drive. Standard equipment includes Turbo Hydra-matic transmission, power brakes and steering, steel-belted radials. And it includes a 350 V-8 that can still give good gas mileage. (EPA estimates: 19 mpg in the highway test; 14 mpg, city. Your mileage depends on how you drive, your car's equipment, and its condition. In California, EPA estimates are lower.)

And this is one wagon that's built for comfort. There's cut-pile carpeting that runs the length of the loading space and up the sides. Lockable storage areas, under the floor and in the left side. The electric rear window is standard.

Oldsmobile took a big load off my back when they built the Custom Cruiser. It's not just a spacious wagon. It's a car that looks good in any garage.

They really built one for me!



Garage is 10' x 20', with added triangular wings: total 225 sq. ft. For complete building plans and list of materials, write Oldsmobile Div., Dept. W-1, Lansing, MI 48921.

Oldsmobile

CUSTOM CRUISER

Can we build one for you?