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Map of Top of the World

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THE NATIONAL GEOGRAPHIC MAGAZINE

Quebec's Forests, Farms, and Frontiers

BY ANDREW H. BROWN

FROM southern tobacco and sugar-beet fields to subarctic tundra in the north, I ranged the Province of Quebec. My journeys crossed the huge land, well over twice the size of Texas, from Gaspé cliffs in the east to gold mines and pioneer towns of the raw, rich west (map, pages 436-7).

Quebec turns two faces to the traveler. One shows wilderness, vast, lonely, almost uninhabited. The other is a far-flung pattern of fenced farmlands, green, lovingly tended, the sturdy *habitant's* "good earth."

French Canada's people offer a comparable contrast. With loyalty to their Old World language and traditions they blend frontier boldness and energy.

There's restful appeal in the old Quebec, where frugal country life exalts devotion to family and church.

In the new Quebec there is the hustle, vitality, and orderly complication of great newsprint, smelting, mining, hydroelectric, chemical, textile, and transportation industries. Before the pressure of this productive enterprise the wilderness is in grudging retreat.

Sacred Soil Rings Quebec City

My first goal was Quebec City. The fine old town is the sentimental as well as the political capital of its Province.*

On a sunny summer morning I climbed the high ramparts of Quebec City. Thick walls of the Citadel command fateful history and scenic grandeur in one majestic sweep (pages 434-5).

Beyond towers and tangled streets fields tilted up to blue Laurentian hills. Tin-roofed churches with swordlike steeples watched over distant villages. Close below curved the mighty St. Lawrence River.

Within my view was soil as sacred to the French of Canada as are Concord, Jamestown, or the Alamo to their southern neighbors. Quebec clings jealously to brave days of its past. The Province's motto is *Je me souviens* (I remember).

Jacques Cartier in 1535 brought his three tiny vessels here to the Indian village of Stadacona. The dusts of time had buried Champlain's "Habitation," built in 1608, the first permanent settlement at Quebec.

Fateful Battle Won Canada for Britain

To the west unrolled the Plains of Abraham. When Britain's Gen. James Wolfe stormed those heights one September dawn in 1759, the strategy of surprise, as much as shot and shell, sealed the fate of half a continent.

Within the Citadel itself, Roosevelt, Churchill, and Canada's former Prime Minister, William Lyon Mackenzie King, held history-making conferences in 1943 and 1944.

Down in the fascinating city we strolled along steep, narrow streets, savoring the charm of an 18th-century, French-provincial town. White and gray houses fronted on cobblestone squares ornamented with weathered but graceful statuary. Black, rust-pitted guns peered over solid walls.

Yet in this easy-going Old World setting Quebec offers all the comforts and conveniences of modern living.

We sauntered along Buade Street past the splendid Basilica (page 446). On Rue de la Fabrique we went into the store that stands, so they say, on the site of the town's first tavern.

In 1648 Jacques Boisdon was appointed

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Old France in Modern Canada," by V. C. Scott O'Connor, February, 1935, and "Quebec, Capital of French Canada," by William Dow Boutwell, April, 1950.

Richard Harrington

Trade Is Warm Even Though It's Below Zero Indoors

The Hudson's Bay Company store at Port Harrison, in far northwestern Quebec, is unheated and seems even colder than outdoors. The manager needs his caribou-skin parka, warm gloves, and fur-lined cap. The Eskimo couple has brought in a fine catch of red, white, and silver fox pelts. In exchange, the manager gives them aluminum tokens, like those lying beside the order pad. The Eskimos use the disks to buy coffee, tea, tobacco, matches, traps, ammunition, and other staples.

first and sole tavern keeper in Quebec. It was stipulated, however, that he settle "in the square in front of the church so that people may go there to warm themselves." Boisdon was enjoined to allow no one on his premises during church services.

Fine shops line Buade and Fabrique Streets. We couldn't resist buying samples of gay handmade woolen socks and sweaters, and gloves and a handbag made by a Quebec leatherworker.

We only looked at English silverware and china, Belgian glass, stylish furs, fine fabrics, carvings, and ceramics. But we bought six meringues in a famous French confectionery —and ate them on the spot.

Quebec a Religious Stronghold

As we wandered about the city, we were constantly reminded that Quebec is a stronghold of Roman Catholicism. Black-robed nuns and sandaled friars purposefully trod the streets. Churches by the dozen and convents and seminaries occupy choice lands.

Close to the Archbishop's Palace we visited the great Quebec Seminary and Laval University. Laval, one of 100 schools and colleges in the city, was established by the Seminary of Quebec, itself founded by Bishop Laval away back in 1663.

In the shadow of Louis XVI buildings we dropped down to Lower Town's musty alleys hidden away under massive stone walls. We threaded Sault-au-Matelot (Sailor's Leap), Sous-le-Cap (Below the Cape), Little Champlain, Du Porche, Mountain Hill, and St. Pierre Streets—byways recalling the streets of Rouen or St. Malo.*

Children chattered at our heels and got underfoot. Grinning, they heckled and wheedled, and some sang plaintive solos of *Alouette* and *Frère Jacques*, apparently thinking those the only French songs Americans could appreciate.

* See, in the National Geographic Magazine: "Coasts of Normandy and Brittany," by W. Robert Moore, August, 1943, and "St. Malo, Ancient City of Corsairs," by Junius B. Wood, August, 1929.

In one of the open fruit-and-vegetable markets, full of color, noise, and country smells, we drove a sharp bargain for a box of luscious Ile d'Orléans strawberries (page 466). We haggled with clear conscience, for all around us tongues clattered and arms waved as housewives and visitors bandied prices.

We joined the evening promenade on Dufferin Terrace, the long boardwalk that stretches in front of the Château Frontenac. Groups at the rail and on benches drank in the superb view over huddled, high-roofed old buildings of Lower Town and away down the St. Lawrence.

But strollers had eyes mostly for people walking in the opposite direction—and of the opposite sex!

Gabled and turreted Château Frontenac, the Canadian Pacific Railway's huge hotel, occupies the site where once stood the storied Château St. Louis, official residence of early governors of New France (pages 440, 444).

Horses' Hoofbeats Set Leisurely Pace

Old city or new city, Quebec promoted peace and well-being. The clangor of church bells was soothing. And the clop-clop of horses' hoofs was a metronome keeping us from hurry (page 443).

"Don't let our picturesqueness mislead you," a Quebec newspaperman warned. "Industries are booming in Lower Town, employing thousands of our people. We have newsprint mills and shipyards; shoe, furniture, and leather factories; canneries, textile mills, and bakeries.

"The huge war-built St. Malo Arsenal, with 26 million cubic feet of space, has been bought by the city, renamed the St. Malo Industrial Center, and parceled out to many diversified industries."

It was in Quebec I met Jean Marchand, and from him took a much-needed history lesson. We were lunching at the Garrison Club, third oldest men's club in Canada.

"How has this land of Quebec, once a British prize of war, grown up to be so French?" I asked my host.

"According to the history books," I went on, "British troops defeated your ancestors before the American Revolution. Didn't they take over all of eastern Canada? How did the 'conquered' French stage such a comeback?"

Jean smiled and laid down his knife and fork.

"Quebec City fell to Wolfe's troops. In 1763 the Treaty of Paris ceded all France's New World Empire east of the Mississippi, with the exception of New Orleans, to Great Britain," he recalled. "The French colonists' fate hung in the balance. But the British let the French stay on to keep their New World house in order.

"After all, reasoned the British, French explorers and *voyageurs* had opened up Quebec and Upper Canada. They knew how to live in a harsh country. They had the Indians' confidence—which the English lacked!

"That line of thought paid off. When the Americans under Gen. Richard Montgomery and Benedict Arnold attacked Quebec City in 1775-76, French and British stood side by side against them! The astonished Yanks withdrew.

"In 1760 we totaled only about 60,000 colonists and soldiers," Jean continued. "Today, less than two centuries later, three million French-speaking Canadians live in the Province of Quebec alone!

"We now outnumber our English-speaking 'conquerors' more than four to one. Once we squabbled over a continent. Now we argue politics over mugs of ale."

Quebec City would reward weeks of exploration, but my beat was a whole Province, biggest in the Dominion of Canada.

We drove away down the St. Lawrence north shore to Murray Bay (La Malbaie). We were heading for the Saguenay-Lake St. John district. Northeast of the Catholic mecca of Ste. Anne de Beaupré (page 469) the road narrowed, snaked up a mountain, and led into welcome rural solitude.

Farms Edge Forests

Fortitude endures in unpretentious country parishes like St. Tite des Caps and Les Chenaux.

Rail fences border clearings that hold the forest at bay and are home to the habitant. The country settler is farmer in the summer and woodcutter in the winter (page 467). He may stretch his income with wood carving (page 470), guiding "sports," with carpentry, trapping, or working on the road.

His wife must qualify as cook, nurse, farm hand, seamstress, and weaver. She may bear her husband a dozen children, or more.

We rolled on to Murray Bay. This trim town is trading center for American and Canadian summer colonists of the area.

At Murray Bay a group of country people entertained us at a *veillée*, a French-Canadian evening of singing and dancing.

François Villeneuve, leader, sounded forth with a bass voice round and rich as a note from a French horn. To the scratching of a fiddle they sang hearty paddling songs and hauntingly lovely *chansons du pays* (songs of the country).

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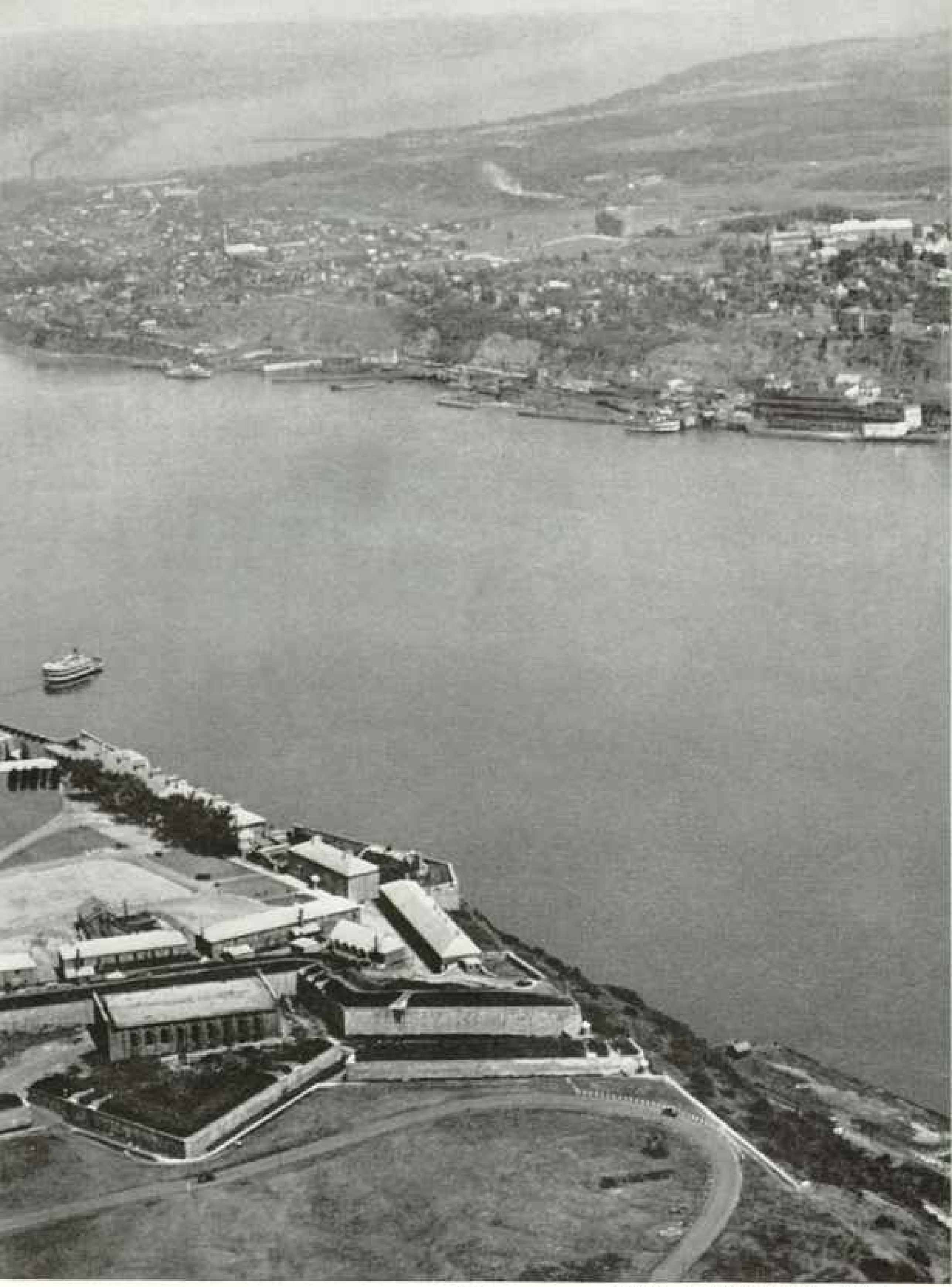
Ferryboats Chug Far Below Quebec's Citadel and Steep-roofed Château Frontenac

Troops still man the star-shaped Citadel, foreground, now outmoded for defense. No shot ever has struck its walls. The British built them in 1823–32 at a cost of $35,000,000—a gigantic sum in those days. The Plains of Abraham, scene of Wolfe's victory, reach two miles upriver from the fortress. Lévis lies across the stream.



411 National Geographic Photographer John E. Fletcher

French Canada's "Main Street," the Mighty St. Lawrence, Curves Past Quebec

Ocean ships, steaming to and from Montreal, pass below storied walls of Quebec Province's capital. The city's dock area begins at left. The river splits in the background around the haze-dimmed Ile d'Orléans. Ships mostly follow the channel at top right, where smoke rises from the Lauzon shipyards.

Opatican Lake
Lake Mistassini
Mistassini Post
Opemisca Lake
Chibougamau Lake
Obatogamau Lake
Mistassini River
Rupert River
Mamaon Lake
Peribonca Lake
Peribonca River
Lac Pipmuakan
Gouin Reservoir
Lake St. John
Pointe Bleue
Roberval
Dolbeau
Mistassini
Riverbend
Shipshaw Dam
Kénogami
Jonquière
Chicoutimi
Lac Kénogami
Saguenay River
St. Basile
Eternity Cape
Trinity Cape
Tadoussac
Baie Ha! Ha! Bagotville
Lac Laurent
Q U E B E C
LAURENTIDES PARK
Krumpt Lake
La Tuque
St. Maurice River
La Malbaie (Murray Bay)
Baie St. Paul
Les Chenaux
St. Tite des Caps
Ste. Anne de Beaupré
Lac Beauport
Montmorency Falls
Ste. Famille
St. Pierre
Ile d'Orléans
Beaumont
Lévis
Ste. Foy
Quebec
St. Lawrence River
St. John River
Rivière du Loup
St. Jean Port Joli
MONT TREMBLANT PARK
Lac Taureau
Grand'Mère
Shawinigan Falls
Trois Rivières (Three Rivers)
Lake St. Peter
Sorel
St. Francis River
East Broughton
Thetford Mines
Black Lake
Warwick
Ham Nord
St. Rémi de Tingwick
Ste. Elizabeth de Warwick
Asbestos
St. Georges de Windsor
Mégantic
Drummondville
Richmond
Windsor
Stoke Centre
Ascot Corner
Sherbrooke
Chaudière River
Chamberlain Lake
Chesuncook Lake
Jackman
Moosehead Lake
Kennebec River
Dover-Foxcroft
Dexter
Rangeley
Mont Tremblant
Ste. Agathe
Joliette
St. Calixte de Kilkenny
St. Jérôme
Montreal
Ottawa River
Lachine
St. Zotique
Valleyfield
Rouses Point
NEW YORK
Malone
Lake Champlain
St. Albans
Richelieu River
St. Hyacinthe
Granby
East Farnham
Knowlton
Magog
Bedford
Stanbridge Station
Newport
VERMONT
Connecticut River
N. H.
ONTARIO
MA

Seven Islands
Sept Iles
Clarke City
Moisie
Mingan
Mingan Passage
West Point
Port Menier
Anticosti Island
Godbout
Baie Comeau
Petite Madeleine
Ste. Anne des Monts
Mont Jacques Cartier
Shickshock Mountains
GASPESIAN PARK
Rivière au Renard (Fox River)
Gaspé
Cape Gaspé
Percé Rock
Bonaventure Island
Percé
Betsiamites
Matane
Metis Beach
Ste. Flavie
Ste. Luce
Rimouski
Bic
Corner of the Beach
Mont Ste. Anne
Grande Rivière
Cap d'Espoir
Gaspé Peninsula
St. Charles de Caplan
Trois Pistoles
Dalhousie
Campbellton
Jacquet River
Baie de Chaleur
Caraquet
NEW BRUNSWICK
Bathurst
Edmundston
Fort Kent
Van Buren
Grand Falls
Caribou
Presque Isle
Woodstock
Houlton
Mount Katahdin
MAINE
Millinocket
Danforth
Lincoln
Old Town
Bangor
Hudson Strait
Baffin Island
GREENLAND
Povungnituk
Port Burwell
Hudson Bay
Ungava Bay
Port Harrison
Fort Chimo
Kogaluk River
Kokatak River
Belcher Islands
UNGAVA
Hopedale
Burnt Creek
James Bay
Fort George
Goose Bay
Battle Harbour
Grand Falls
Blanc Sablon
Map Area
QUEBEC
Laurentian Mountains
Anticosti Island
Noranda
Rouyn
Val d'Or
Bourlamaque
Gaspé
Gulf of St. Lawrence
NEWFOUNDLAND
Gatineau River
Hull
Ottawa
Montreal
Quebec
ONTARIO
Toronto
N.Y.
VT.
N.H.
NEW BRUNSWICK
PRINCE EDWARD ISLAND
Baddeck
CAPE BRETON ISLAND
Sydney
NOVA SCOTIA
Halifax
Lake Ontario
St. Lawrence River
Ottawa River
Saguenay River
Manicouagan River
Outardes River
Betsiamites River
Matane River
Metis River
Ste. Anne River
Dalhousie River
Restigouche River
St. John River
Aroostook River
Penobscot River
Kennebec River
Androscoggin River
Chaudière River
Jacques Cartier River
Gaspé River
Jupiter River
STATUTE MILES
Drawn by Harry S. Oliver and Irvin E. Allaman

Then François and his friends, men and women, seized partners among us strangers. The fiddle's tempo raced. The room became a blur of whirling couples. Heels drummed the floor in sharp rhythms of *Le Galop* ("The Gallop") and *Les Oiseaux* ("The Birds").

At Murray Bay I put my car aboard the Canada Steamships Lines' cruise ship, *Quebec*. It was a glorious trip down the St. Lawrence to Tadoussac (page 457) and up the awesome gorge of the Saguenay.*

A saffron sunset silhouetted the great capes of Trinity and Eternity. They bulk above deep waters stained by forest distillations to the hue of polished mahogany. Our ship reached Bagotville at dusk. We drove to Chicoutimi, business center of the fast-growing district.

Empire of Aluminum

From Chicoutimi we sped six miles west to neat, shady Arvida and the world's biggest single aluminum-ingot smelter. Here 8,000 workers of the Aluminum Company of Canada, Ltd. (ALCAN), produce about a quarter of all the aluminum made in the world.

ALCAN's Yvon Cousineau showed me the immense works and the mighty Shipshaw hydro station that powers it.

The plant covers 529 acres. Every day huge buckets carry nearly two million pounds of molten aluminum from electric furnaces to ingot molds.

Wartime demand for the critical aircraft metal vastly expanded facilities. To get enough power to heat thousands of new smelting pots, Shipshaw dam and powerhouse were built.

"The electricity used to make one ton of aluminum," said Cousineau, "would light your house for 14 years!"

We felt ant-size wandering around Shipshaw powerhouse.

"Every second 42,000 cubic feet of water drop 210 feet to whirl 12 turbines and generators," Cousineau stated. "The product is 1,200,000 electric horsepower, of which a million goes direct to the Arvida aluminum works. Shipshaw contributes a sizable chunk of Quebec's six million developed hydroelectric horsepower."

It took 47,000 men (including 700 Tremblays, 65 of them called "Joe") to build Shipshaw. Work went on day and night through two and one-half war years.

Price Brothers & Company, Limited, have been leaders in development of the Saguenay region for more than a century. We went out to Lac Kénogami to call on one of the company's veteran employees.

Adolphe Tremblay had fathered 15 children and had worked for Price Brothers for more than half a century; yet he carried his 68 years and 230 pounds lightly.

"Bonjour, bonjour!"

Tremblay gave, and we returned, the universal greeting of French Canada. Here, deep in the thinly peopled kingdom of "*le pulp*," future newspapers get their start in life as dense, dark forests of spruce and fir.

After a firm handshake Tremblay led the way to an old-fashioned garden swing. Our portly host eased himself into one creaking seat. His wife, plump and jolly as her spouse, settled back facing her man.

Below Tremblay's front yard the road from Jonquière swung out to a wharf where two chunky pulpwood towboats lay moored. The rumble of tumbling water drifted up from a dam at the foot of the bay.

"Mos' of ma life I spen' on de bush," Tremblay said. "Many year I drive de logs on de rivière. Long tam I been gran' foreman on charge all de woods operation on Lac Kénogami."

Tremblay folded hands across his ample paunch. He looked up the lake that wound like a silver river between wooded shores. The water was flat calm, and flat-bottomed clouds with cottony tops drifted lazily overhead.

Tremblay turned back to give me some vital statistics of his active life. Proudly he told us that in 1945 Price Brothers printed his picture on the company's New Year card.

But Tremblay didn't want his 55 years' service to give us the idea he was an old man. He explained that in this rugged country many men his age took care of their parents. He beamed at his wife and gave her full credit for being so good to him.

"Ah, oui! Sure t'ing," he said. "Ma femme, she nevair so 'appy like w'en she spoil me."

Tremblay's goodly corpulence bore stout witness to decades of spoiling, with rib-clinging potatoes and pork, blueberry pie, country cream and butter, and beans baked with plenty of pork.

Permanent Wave for Wood Pulp

Next day I talked with Dr. H. S. Hill, director of research for Price Brothers' big newsprint mills at Riverbend and Kénogami, and with Dr. J. Edwards, his associate.

Quebec Province, they told me, produced more than half the newsprint made in

* See "Gentle Folk Settle Stern Saguenay," by Harrison Howell Walker, NATIONAL GEOGRAPHIC MAGAZINE, May, 1930.

Kodachrome by John E. Fletcher

Even Quebec's Capitol Has a French Look

Four out of five residents of the Province are of French origin; 81 percent are French-speaking. On the Parliament Buildings grounds, once an old cricket field, stands the statue of Honoré Mercier, a former premier.

Every Year Visitors from the United States Thrill to Quebec's Skyline, with Its "Trademark," Towering Château Frontenac

Old Lower Town edges the St. Lawrence River. The sloping elevator rises to Dufferin Terrace, skirting the hotel. On its right is the domed Upper Town Post Office.

Steep, Narrow Streets Reach Out Like Fingers from Place d'Armes, Hub of Old Quebec

City tours depart from this park where Huron Indians once traded with their French allies. At left rises the Monument of Faith.

Ektachrome by John E. Fletcher

Joan of Arc Rides on the Battlefield Where Britain Won Canada from France

The Maid of Orléans lifts her sword on the Plains of Abraham, where Wolfe defeated Montcalm in the fateful battle on the morning of September 13, 1759. Both commanders were mortally wounded.

↑ Massive Gates and Walls Remind Visitors that Quebec Once Was a Fort

A touring streetcar, recently replaced by a bus, passes Kent Gate. Three city portals have been restored.

↓ Shiny Outdated Victorias Afford a Leisurely View of an "Old World" Town

Carriages in Place d'Armes wait for customers from near-by Château Frontenac and other hotels.

Photograph by John E. Fletcher

Kodachrome by John E. Fletcher

A Wave, a Shout, and They're Off on a Wind-swift Dash Down Grooves of Ice

Young people climb up for their turn on Quebec's toboggan slide. The run levels out on Dufferin Terrace and ends beside the Château Frontenac. Hooks under the sleds drop to release them. Riders pull them back to the top.

Kodachromes by John E. Fletcher

"You're a Good Skate!" She Says, as Chivalrous Beau Ties Her Laces

All three soon will be gliding on the outdoor skating rink of the Château Frontenac. Crenelated windbreak wall is made from snow blocks "cemented" with water that freezes instantly in the crisp air.

Curlers "Soop" Furiously To Speed "Stone" to Target Center

One player has sent the stone down the rink. Curling teammates at Quebec's Winter Club wield brooms to slick the ice and remove particles from path of the 44-pound granite "teakettle." Medals stud Scottish caps.

Alaska color by Kenneth S. Johnson

Choir and Altar of Quebec's Basilica of Notre Dame Blaze with Splendor

The original church was built in 1647. Fire destroyed it twice—first under English bombardment in 1759 and again in 1922. Magnificently restored, the church is the Roman Catholic Cathedral of the Archdiocese of Quebec.

Canada and about a third of the world's total output.

The two scientists gave me a preview of a revolutionary new pulp-treating technique they had developed. The Curlation Process, they had named it, because it imparts a kind of permanent wave to wood-pulp fibers.

In the Bible Jacob served seven years for Rachel. Dr. Hill and his aides labored through seven long years of research and experiment before winning Curlation to their service. The work cost half a million dollars.

At the Riverbend mill I watched the first commercial Curlator treating a steady flow of sulphite pulp. (Sulphite and groundwood are blended to make newsprint.) By bending, kinking, and twisting the wood fibers, Curlation allows more complete utilization of the "cooked" sulphite pulp. Less wood goes down the drain as waste screenings.

"We've already obtained better than one-tenth more sulphite pulp per cord of wood," said Dr. Hill. "With the addition of new Curlator units we expect to be able to get 25 to 30 percent more pulp per cord. This will mean a saving of about 33,000 cords of pulpwood a year for our mills alone."

That represents a whopping woodpile and a big stretch of spruce and fir forest conserved.

Yvon Cousineau joined me on a ramble round Lake St. John. The lake is shallow and wide—25 miles in diameter. Dammed near the Saguenay River outlet, it's a reservoir conserving precious waters. Good farmlands, which grow crops of wheat, hay, clover, and oats, and support dairy industry, occupy the rim of the lake basin.

We stopped off at the Trappist monastery at Mistassini where monks practice modern methods in agriculture and stock and dairy management.

A jolly little priest, Father Georges, showed us the monastery. He chuckled continuously, as if our visit was delightful. We roamed quiet halls, nodding at black-garbed priests and brown-robed lay brothers. None may speak unless spoken to.

Moral Keys for Lockers

In the reading cloister we saw stalls for each priest and lay brother. Under every seat was a little two-doored cabinet for books and papers.

"Each man's book locker is secured with a special key," Father Georges informed us.

We saw knobs, but no locks or keys, and must have looked baffled.

"It's a moral key!" said Father Georges with merry relish.

The monastery library held a wide variety of books, from theological tomes to modern travel volumes, and from geological reports to the National Geographic Magazine.

In the refectory Father Georges pointed out his place at table. Forks and spoons were of olivewood, made in France. Father Georges used the same fork issued to him when he entered Mistassini. Its tines were worn to stubs.

"How long have you been here?" I asked.

"Thirty years," he answered.

"Have you ever been to Roberval?" Roberval is 55 road miles away.

"No, no. Too far!"

An expressionless bearded brother was preparing tables for the next meal. Father Georges glanced at him and whispered.

"He was a combat commander, a major, in the recent war."

Quebec's "Attic" a Storehouse of Riches

Flying far north from Lake St. John, I saw how Quebec is cracking the shell of isolation from the empty four-fifths of her territory. Looking to her future, the Province counts more and more on opening up the top-heavy attic of her enormous living space (map, pages 436-7).

Spectacular finds have crowned wilderness explorations for iron ore, titanium, and base metals. Matched with the huge backlog of untapped water power and forest resources, these discoveries are sending development ideas soaring.

J. H. ("Red") Lymburner, who piloted Lincoln Ellsworth on a daring flight across Antarctica, runs Mont-Laurier Aviation Company, Limited, based at Roberval.

Red sends his pilots out on all kinds of bush-flying jobs. They drop museum men on northern rivers to collect bear and caribou. They set down prospectors and surveyors in remote regions that are blanks on maps, and put ashore anglers on hard-to-get-to lakes.

Lymburner signed me up for a trip to the untamed hinterland.

Half an hour out of Roberval we left the last farm behind. We soared above the rumpled Canadian (Pre-Cambrian) shield that makes up about nine-tenths of Quebec Province. It's a region of old, old rocks, bristling with spruce forests and patched together with mossy swamps. A lacework of lakes and streams patterned the wide wilderness.

Six hours and some 700 miles north of Roberval, our pilot greased the PBY on to the swift Koksoak River. Canoes arrowed out from a prospectors' tent camp. Loading them was tricky as we fought prop wash and

surging river. The canoes swallowed gasoline, meat, fresh vegetables, canned goods, brooms, and axes.

Winging on to Fort Chimo, near Ungava Bay, we met Jacques Rousseau, director of the Montreal Botanical Garden, three other scientists, and their four Indian canoemen.

They had chartered our PBY to carry them across to Povungnituk on Hudson Bay. They would make a canoe traverse of bleak Ungava peninsula, studying plants and rocks along two river courses never before traveled by white men.

Fort Chimo airfield stands on the fringe of the northern tree limit. Next morning, early on our flight to Hudson Bay, the last spruce and larch trees dropped behind.

Across little-known Ungava peninsula lakes and shallow rivers meshed the flinty landscape, where nothing grew but caribou moss, dwarf willows, thin grass, and lichens.

Scientists Dare the Wilderness

Eskimos in white parkas waved to us as we spiraled down over the settlement of Povungnituk at the edge of the blue expanse of Hudson Bay. The pilot tipped the amphibian's nose toward the mouth of the Kogaluk River.

The expedition men piled dunnage into canoes and called "Au revoir!" They paddled ashore to set up camp. Weeks later in Montreal I met Rousseau again, safely back from his hazardous journey.

Five hundred miles southeast, almost at the center of the huge peninsula separating Hudson Bay from the Atlantic, they dropped me off on Knob Lake airstrip.

It was startling to catch sight of the raw scar of the runway after hours of flying over wilderness utterly devoid of any sign of humanity.

The earth airstrip was brick-red from iron in the soil. This was the vital metal—millions of tons of it in near-by hills—that was the magnet drawing the needle of man's interest to this remote spot.

Quebec believes these fabulous deposits may be the answer to the iron shortage that looms as postwar steel demands cut into reserves of high-grade Lake Superior ore.

The new iron ranges straddle the Quebec-Labrador boundary, 325 miles north of the St. Lawrence River. To get the ore to St. Lawrence tidewater will require pushing a 360-mile railroad through uninhabited rock-and-muskeg wastes.

Late in 1948 the Labrador Mining and Exploration Company Limited, announced that its field staff had proved up 300 million tons of ore, enough to warrant costly rail and harbor facilities.

At the airstrip I met Jules R. Timmins, the company's president, who had just ended an inspection trip.

"This iron development promises to be a great boon to Quebec Province," Mr. Timmins said. "We've gambled $5,000,000 on it so far. We're most hopeful the gamble will pay off, to the benefit of our companies, Quebec, Canada, and the United States."

All Equipment Air-delivered

Both Knob Lake airstrip and Burnt Creek base camp are in Quebec territory. The Newfoundland border is just "over the hill" to the south.

Burnt Creek camp (population 190) looked like a gold-rush town in a Hollywood western. As chief geologist Joe Retty showed me to the comfortable guesthouse, he said:

"Remember that everything you see here, from buttons to bulldozers, has been flown in."

We lounged before a crackling log fire while Dr. Retty briefed me on this new beat in the wild heart of Ungava.

"What we're doing now is tonnage drilling," he said. "With diamond and churn drills running 24 hours a day, we're taking the measure of the major ore bodies. So far, the ore's running better than 55 percent iron.

"I'll take you around the drilling locations in the morning. We've 'dozed out' 80 miles of roads to link 'em."

Before I'd rounded out my tour of drill sites, adits, and test shafts, my clothes, hands, and face were rust-colored with iron ore.

Next evening Norman Delmage, who runs the vehicle repair shop, drove me to a ridge-top overlooking the stark land. We were moved to silence by the space and freedom. There was solemn beauty in wooded valleys and mossy hills reaching to purple horizons.

The sun sank in a burst of flame. Dozens of lakes reflected the afterglow. Far below, twinkling lights of the drills were like single bright stars fallen out of the clear night. Somehow those dots of light pointed up the emptiness of that stern country—lonely, aloof, but strangely haunting.

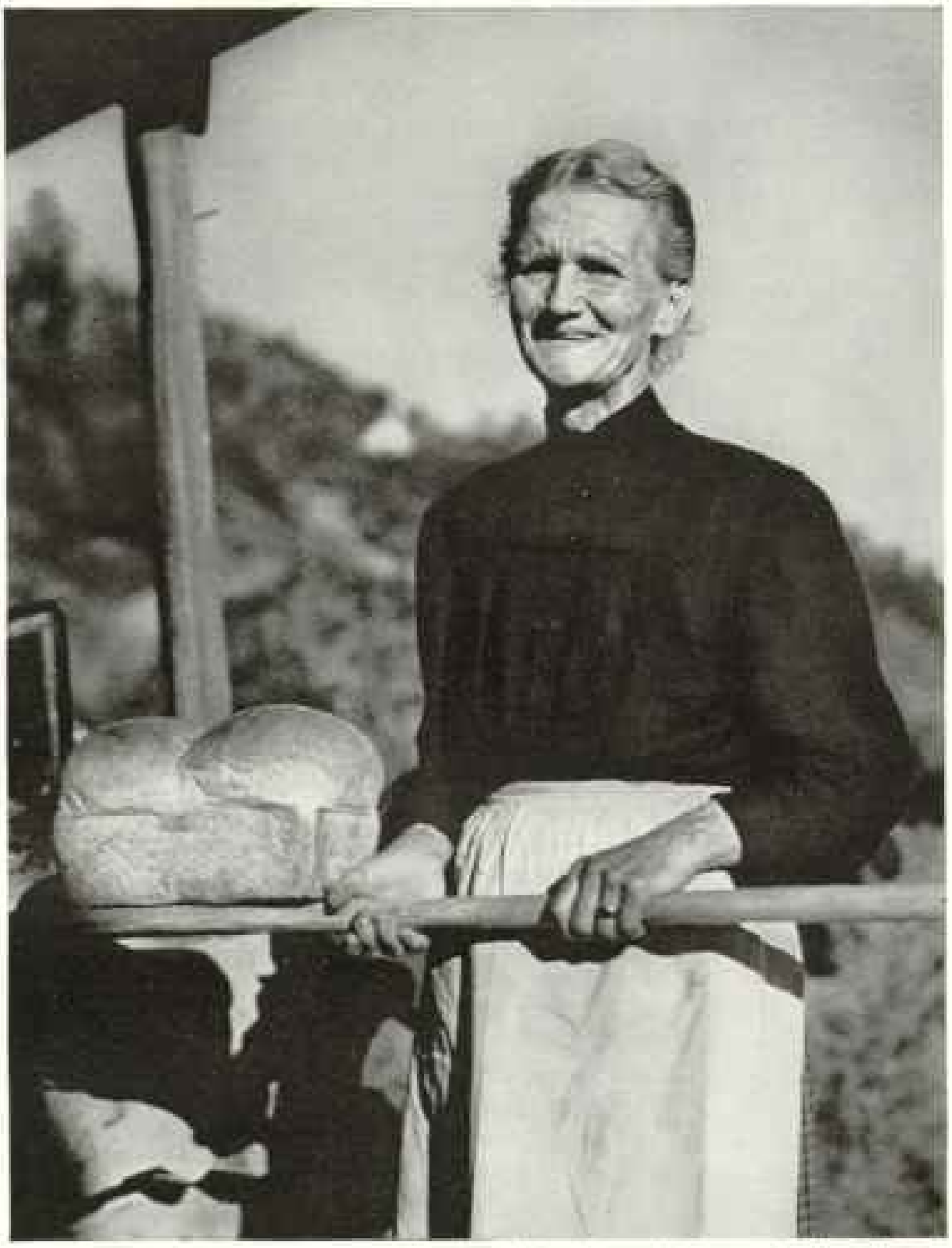
I flew out next day in a freight-hauling DC-3. Then it was ho for the Gaspé!

We got under way eastward through lush farming country.

Beyond hustling Rivière du Loup stretched the resort reach of the lower St. Lawrence. Overheated Québecois invade this cool coast in summer. They stop in Cacouna, Trois Pistoles, Bic, Rimouski, Ste. Luce, Ste. Flavie, and Metis Beach.

On both sides of the road narrow fields, sometimes only 100 feet wide, were jammed together. Rail fences divided long strips of hay and grain, potatoes and pasture. Old-time settlers along the river partitioned lands among their sons so each would have a bit of water front.

To make up for narrow width, the farm plots ran far inland. The land was split up again for the sons' sons, and so on. Roads finally ended the need for subdividing.



National Geographic Photographer Howell Walker

Who Wouldn't Be Proud of a Loaf Like That?

A woman of St. Basile on the Saguenay slides a piping hot, golden-brown loaf from her outdoor bake oven. Once almost an essential for all farm households in Quebec, the outdoor oven now is giving way to more modern appliances and is rare, even in remote sections.

Gaspé—a Scenic Climax

At Matane begins the Gaspé proper. The hills crowded close to the surf. Scenic climax came between Ste. Anne des Monts and Rivière au Renard (Fox River).

The road squirmed between twisted cliffs and lapping waves. It wove drunkenly up to the mountaintops. It edged out to dizzy-making view points above the Gulf of St. Lawrence, then wriggled back into the hills.

Wherever a stream slashed the mountains to reach the sea, a trim village stood. Farmers gave way to fishermen. Nets replaced plows and mowers (page 458).

Wood bobbed down rivers from the interior, where the Shickshock Mountains rolled to the horizon like waves of wind-blown hair.

Fox River, like its neighbor towns on the Gaspé tip, lives by the rich haul of cod from the Gulf of St. Lawrence (page 459). The place captivated us. Its frame homes and fish houses, painted yellow, green, orange, and red, looked like cottages on Christmas cards. Sandy lanes were pungent with the smell of seaweed and fish. The narrow harbor opened to the broad blue Gulf.

We met Phileas Tapp, a leading fisherman of the town, who invited us to call that evening.

The Tapp home was frugal and free of frills, like other country homes in French Canada. Everything was planned for use. Such dwellings reflect these people's preoccupation with work (unremitting), love and marriage (blessed with children), and God (always present, ever forgiving).

We entered by the big summer kitchen, passed through the winter kitchen, then the dining room, to sit in the pin-neat parlor. Religious pictures hung on the walls. A pump organ stood in the corner.

The Tapps, though descended from English stock, spoke no English.

"I've fished for 45 years, since I was 10 years old," Phileas said. "A hand line has always been good enough for me—no nets. I build my own boats and I built this house.

"I've only one son, but eight daughters. The daughters bring me more sons, though," he added, smiling at son-in-law Willie, who sat at Phileas's left.

"For 22 years I was the best fisherman on the coast with my brother. He drowned when a tempest overturned our boat. I was lucky to hold on to some bits of wreckage."

Phileas smiled again, saying, "Now for two years I am the best fisherman on the coast with my son."

Icy Water and Burning Sand

We went on to Gaspé, chief town of the region. Near here in 1534 Jacques Cartier set up a cross claiming the area for the King of France.

Gaspé town is terminus of Quebec's easternmost railroad, the Gaspé branch of the Canadian National Railways. That line serves the south shore of the Peninsula.

The sun beat down hot as we skirted bays and beaches of the tip of Gaspé. To cool off we plunged into numbing water near Corner of the Beach. Burning sands thawed us between dips as we listened to wavelets lapping the beach with a sound like tearing silk.

A few miles farther, over steep, forested hills, glorious Percé swept into view.

"There you are!" enthused Claude Melançon, our genial travel companion. "The Perron Boulevard is a golden belt circling the Gaspé. Percé forms the shining buckle!"

The famous village curved between green fields and blue sea. Just offshore, its sheer cliffs rosy in the sun, rode the great Pierced Rock (*Rocher Percé*) that names this place (page 455). Waves have worn an archway through the south end of the rock. Beyond lay Bonaventure Island, site of a famous gannet rookery (page 459).*

Percé Rock is a treasury of fossils. The American geologist, John Mason Clarke, estimated that more than four *hundred million* fossil trilobites and brachiopods, little marine animals, are locked up in the monolith.

From La Normandie Hotel we explored Percé. We climbed the red cliffs of Mont Ste. Anne. At low tide we walked across the bar to the Pierced Rock. We watched gulls in thousands tidy up the beaches where fishermen cleaned their cod.

Prominent French-speaking people summer at Percé. We went on a picnic with Léon Lortie, noted professor of chemistry at the University of Montreal.

Dr. Lortie told of sharing an airliner seat recently with a Sister of Ste. Anne. After more than 20 years at a mission station in the far north, the good woman was on her way to visit her family in Lachine, near Montreal.

"Though elderly, she was still full of pep," Lortie said. "She told me about an old godless prospector, abandoned by Lady Luck, who stumbled into her hospital to die.

"The Sister asked him to pray. He knew no prayers and felt they were useless anyway. Undismayed, the Sister told her faithless patient to repeat after her, 'Mon Dieu, je t'aime beaucoup' ('My God, I love you very much').

"The grizzled relic of the trails heard 'Mon Dieu' as 'Mon vieux' ('my old friend'), and snorted, 'Well, if you love me, why don't you kiss me?' So she did!"

As we drove southwest from Percé along the Gaspé coast, Claude pointed out a promontory.

"That's Cap d'Espoir," he said. "In English it means 'Cape of Hope.' Early British navigators paid heed to the name's sound but not its sense. They called it Cape Despair!"

At Grande Rivière we stopped at the Laval University (Quebec City) fishery station, a lobster hatchery and laboratory for study of the cod fishery.

Cod Swallow Rocks for "Ballast"

"A big cod is so voracious he'll eat anything bright," Jean Louis Tremblay, the director, told us. "That's why fishermen catch him so easily even on a shiny piece of lead with hook attached.

"We've taken a bunch of keys, a broken spoon, a watch, and a bottle top from cod stomachs. Cod love bits of wave-worn glass. We caught one that had gulped down a piece of a wine bottle. A scrap of label on it gave the name of the Atlantic liner that threw it overside.

"The greedy fish pick up glistening rocks in quantity. Fishermen say that when the cod sets out on a long journey, he takes on ballast."

In the little town of St. Charles de Caplan we called on Father Georges Hermel Rioux, priest of the parish, who has organized a highly successful agricultural cooperative. Last year *La Fraternité Coopérative* did $275,000 worth of business. It sold turkeys,

* See "Sea Bird Cities Off Audubon's Labrador," by Arthur A. Allen, National Geographic Magazine, June, 1948.

strawberries, lettuce, eggs, and dairy products.

Driving at a wild pace around the town, Father Rioux took us to see the big new refrigerator plant and flour mill.

Back in his study, he told us: "We have a stake in our people's intellectual as well as material success. I've organized a Study Circle. The response has been inspiring. We discuss everything from science and history to philosophy and morals.

"By necessity, I lead most of the meetings. Tonight I'm talking about glass, how it's made and what it's used for. While I do most of the talking about science and history, I get our agronomist or the Cooperative manager to discuss morals and ethics.

"The people listen more attentively to laymen on those subjects. I guess they feel a layman has no special spiritual ax to grind."

Off for Quebec's "Golden West"

We sped on west past the Cascapédia, Restigouche, and Matapédia Rivers, paradise for salmon anglers. We kept on, clear across the Province. I had a date in the gold district of western Quebec, 450 rail miles northwest of Quebec City.

There's nothing gentle about the country around Val d'Or, Bourlamaque, and Rouyn-Noranda. Forest fires have crackled over hundreds of square miles.

Gray banks of mine waste engulf woods and black ponds. Rock reefs, stripped of trees and soil, hide nakedness in fireweed and poplar. Stark lopsided headframes and sloping conveyor ramps are mine landmarks.

A neighbor across the car aisle spoke to me.

"Sure looks desolate," he said, "but it's the finest kind of blueberry land."

The speaker, G. R. (Ted) Provencher, and his partner ship 100 carloads of refrigerated blueberries a year from western Quebec.

"We hire hundreds of berry pickers," he told me. "They take their whole families out into the bush to a good spot, set up camp, and make a sort of picnic of the job. Even counting what goes into mouths instead of boxes, we probably don't take out more than a tenth of one percent of the available fruit."

Only 25 miles from the Ontario border I stepped off the train at Rouyn-Noranda. Gray smoke plumes flew from the twin 422-foot stacks of Noranda Mines, Ltd., biggest copper producer in Quebec and third largest in Canada.

"This is a copper-mining and smelting operation, and copper is our most important product," manager R. V. Porritt told me. "Yet we produce more gold than any other mine in Quebec."

Noranda Mines' shafts reach 6,000 feet below the surface. In 1948 43½ million pounds of copper came out of those depths.

At the mines of Senator-Rouyn Limited, manager J. C. Houston handed me one of the gold bricks his mine lives on.

"That's a loan," he said with a laugh, "for as long as you can hold it without sitting down."

It was a chunk of gold weighing 85 pounds. If I'd had a notion to run off with that mighty nugget, I'd have been a police prize worth more than $42,000!

From 600 tons of ore treated every day, Senator-Rouyn recovers only about one-sixth of an *ounce* of gold for each ton of ore.

Houston saw me prick up my ears at a worker's foreign accent.

"That's a Pole," he said. "Over 2,000 displaced persons from Europe, many of them Poles, have come into Canadian mining during the last year. We've taken on twenty and found them capable, ambitious workers. Some of them turned up wearing old United States Army uniforms, dyed black and minus the brass buttons. They'd probably traded the buttons for shoes or bread."

This tortured, elemental land has yielded riches far surpassing the haul of Spanish galleons. In 1948 alone western Quebec produced $61,605,431 worth of gold, silver, copper, zinc, lead, selenium, pyrite, and molybdenite. Gold accounted for $26,900,055 of this total and copper for $21,819,473.

Asbestos Is Top Mineral

In Quebec's Eastern Townships, the area east of Montreal between the United States border and the St. Lawrence River, I learned that neither gold nor silver, neither copper nor zinc, ranks first in value among Quebec's mineral products. At the top of the heap is fibrous, heat-hating asbestos.

Every year asbestos finds new uses; yet Quebec still supplies more than two-thirds of the world's requirements.

Quebec's gaping open-pit asbestos mines in the Eastern Townships suggest volcanic craters. Colossal holes-in-the-ground at Thetford Mines, Asbestos, Black Lake, St. Rémi de Tingwick, and East Broughton in 1948 produced 716,769 tons of the versatile mineral fiber.

In the Eastern Townships, textile and manufacturing centers such as Sherbrooke, Magog, Granby, and Drummondville were settled and named by English folk. Now they're growing more French every year.

Many of the places sound like south-of-England towns: Warwick, Richmond, Ascot

Corner, Knowlton, Bedford, East Farnham, Stanbridge Station, and others. As Frenchifying takes place, their names get a Gallic twist: St. Georges de Windsor, Ham Nord, Stoke Centre, Ste. Elizabeth de Warwick.

Villages here resemble those of New England. Elms and maples shade brick and clapboard homes and shops.

Pastoral Ile d'Orléans

I returned to Quebec City and went out to green and peaceful Ile d'Orléans (page 456).

We admired fine old Norman cottages, with their concave bell-cast eaves, built on the brink of bluffs overlooking the St. Lawrence. At Ste. Famille we paused at the oldest inhabited house on the island. It was put up 275 years ago.

Outdoor ovens used to be a common sight in rural Quebec (page 449). This house had a built-in brick oven in the kitchen.

From Ile d'Orléans we whisked along the new Quebec-Chicoutimi road to wooded uplands of the Laurentian Mountains. The air was tangy with the perfume of sun-steeped spruce. White-throated sparrows trilled their sweetly plaintive call, "Oh, oh! Canada, Canada, Canada!"

In these lake-dotted hills the Province of Quebec has set aside the Laurentides Park. It's a game preserve and angling paradise bigger than Yellowstone National Park.

We spent three memorable days at Lake Sept Iles (Seven Islands) Lodge, one of 16 comfortable fishing retreats within the park. By corduroy road, portage path, and canoe we reached lakes where loons laughed and brook trout leaped for the fly (pages 460, 461).

Driving along a road stretch still under construction, I caught sight of a big bull moose nonchalantly munching roots in a swamp hazy with dust from passing trucks. Instinct seemed to tell him that, as long as vehicles kept moving, he was safe!

From Quebec to Montreal we followed the real "Main Street" of the Province, the St. Lawrence River.

Shipping churned the great stream. Low-slung tankers labored against the current, inbound to Montreal and the Great Lakes. Fat freighters slipped down river, high in ballast or low with wheat.

Red spar buoys bobbed and rolled in the restless waters. Church steeples and high-tension towers topped green fields, groves of elms and willows, and rows of planted poplars.

The riverbanks, steep near Quebec, flattened out upriver. Halfway between the Province's two chief cities we came to Trois Rivières.

Here the St. Maurice River pours through three mouths into the St. Lawrence. There we saw a cluster of huge newsprint mills, turning out hundreds of tons of paper every day. Most of it goes into American journals.

Pulp and papermaking, fed by the yield of vast spruce and fir forests, is the first industry of Quebec Province. In 1948 Quebec produced 2,696,838 short tons of newsprint. Value of pulp and paper products shipped through Quebec ports to the United States reached $160,959,775, all paid in precious American dollars (pages 462, 463).

A 20-mile detour to the edge of the Laurentian hills brought us to Shawinigan Falls. The harnessed cataract runs paper mills and aluminum plants. It also powers the cellophane, caustic soda and chlorine, and chemical works of Canada's largest chemical products firm, Canadian Industries Limited, known as C-I-L.

Generators flash electricity, too, to calcium carbide, acetic acid, Vinylite plastic, industrial chemical, and stainless-steel and alloy plants.

An hour and a half southwest of Trois Rivières traffic thickened. Cross streets and stoplights slid past. Broad Sherbrooke Street gathered us up. We were in Montreal.

Montreal—Canada's Chief Metropolis

Canada's largest city is a center of tall buildings, tempting restaurants, and bilingual achievement.

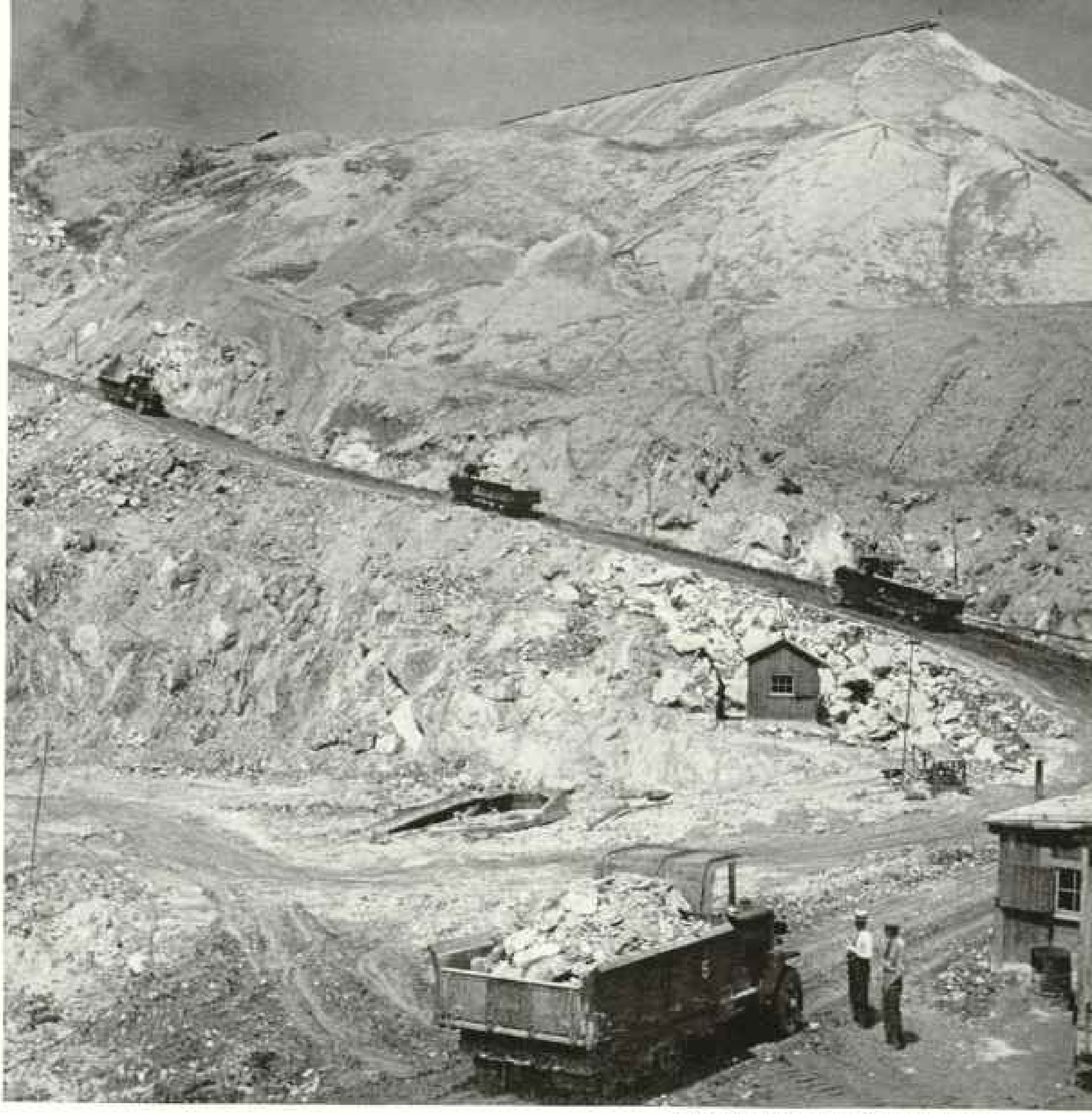
Counting in suburban towns, the population of greater Montreal is a million and a quarter, making the city the second largest (after Paris) French-speaking place in the world. About 20 percent of its people speak English as their native tongue.

Water-borne trade built the town. It is downstream terminus of Great Lakes freshwater traffic and also the head of ocean navigation. Last year more than a thousand oceangoing ships cleared its harbor, although it is a thousand miles from the sea and ice-locked from December to April.

Montreal is the Dominion of Canada's chief financial, commercial, and industrial center. Its Sun Life Building is the largest office building in the British Empire.

This metropolis is one of the world's leading grain-shipping seaports and is the largest fur market in Canada. Astride 37,526 licensed bicycles, economical Montrealers ride to work and picnics.

The University of Montreal, with mostly French-Canadian enrollment, and McGill University, in the main attended by English-



Harry Rowed from Canadian National Film Board

Half-tracks Haul Ten-ton Loads of Asbestos, Mineral That Helps Make Driving Safe

Asbestos is the basic material for automotive brake linings and also for wallboard, insulating materials, and many other heat-resisting products. In an open pit at Thetford Mines, the superintendent checks a truck; others climb a grade that reaches 25 degrees in spots. The hill in background is waste rock dumped from the mill that crushes the ore and separates out the fibers.

speaking students, between them instruct 22,500 boys and girls. Montreal University built a wartime addition to house refugee Polish engineers. Students called it the "Polish Corridor."

Ice Hockey, Favorite of a Skating People

The annual parade on St. John the Baptist Day is a highlight of the Montreal year. "La St. Jean Baptiste" is the festival of the patron saint of French Quebec. A kind of Fourth of July, it falls on June 24 and is *the* patriotic holiday in the Province.

In Montreal, as throughout Quebec, almost everyone skates. Ice hockey, the national game, stimulates a frenzy of enthusiasm whose only parallel, perhaps, is baseball's World Series. During the long winters Montrealers flock to their vast Forum to cheer on their puck-and-stick darlings, the Montreal Canadiens, and other teams.

Les Canadiens have won the championship of the professional National League in two of the last six play-offs. Both United States and Canadian teams make up the league. Many outstanding players started their life-on-blades on outback Quebec ice rinks.

Like most Montreal visitors, I climbed

Mount Royal. Its crest commands a wide view over the city and the silver St. Lawrence. How four centuries have changed this scene!

Jacques Cartier in 1535 ventured as far as Hochelaga, the Indian village on the Island of Montreal. Scaling Mount Royal, Cartier looked out with pleasure on a green and fertile land. Perhaps the peaceful vista stilled his disappointment that swift St. Lawrence rapids had shattered his dream of a western passage to the Orient.

English-speaking Quebeckers hold high office in industry, transportation, and mining; in education, retailing, and journalism. Montreal is headquarters for many of them. Americans have joined English and French Canadians investing millions in the Province of Quebec, which still offers the opportunities of a frontier land.

English and French Words Mix

English words and phrases have infiltrated the native French language throughout Quebec. Signs advertise *vêtements semi-ready* (semi-ready clothes), *salle de pool* (pool hall), and *lots à vendre* (lots for sale).

Hand-basin faucets marked for French users cost me scalded fingers. I turned the handle initialed "C," expecting cold water. Instead, boiling water and steam gushed out! Too late, I realized "C" stood for *chaude*, meaning "hot." The other faucet bore an "F" for *froide*, "cold."

Some hotels solve the bilingual hazard with faucets marked with stop-and-go dots of red and green on hot and cold taps.

The Québecois is proud to be known as a French Canadian. In 1948 he officially unfurled his provincial flag, the *Fleurdelisé*, a white cross on a blue field with a white fleur-de-lis in each corner. By a big majority, also in 1948, he re-elected the aggressively pro-Quebec premier, Maurice Duplessis.

Yet the citizen of Quebec holds himself in unshakable allegiance to Canada, his Mother Country. The Canadian red ensign waves everywhere in Quebec, often side by side with the new provincial standard.

Quebec reflects strengthening economic bonds between Canada and the United States. And, like the whole Dominion, Quebec lives inevitably in the American way of modern movie houses, soft drinks, and banner-bright filling stations.

Quebec Lures U. S. Travelers

Almost despite itself, the Province has succumbed to the allure of gleaming refrigerators, budget dress shops, lavishly stocked drug-stores, and—increasingly—self-service "groceterias."

United States travelers spent more than $90,000,000 in Quebec last year! The Quebec inn that flies the flag of the United States can't be blamed for wanting to make the wandering Yankee feel at home. A great many of the Québecois hoist the Stars and Stripes just because they like Yankees.

What strikes these visitors, as it struck me, is the all-pervading *Frenchness* of Quebec, a character that asserts itself despite all the pressures of English-speaking neighbors.

In the shaping of this Gallic personality no force is more potent than the Roman Catholic Church, which maintains an impressive hold on the people of Quebec.

This Church, of course, has been the French Canadians' rallying place from the very beginning. Explorer-priests carried God's Word into the wilderness. The church spire is the landmark of almost every Quebec village.

Roughly half the Province's French-Canadian people are named "Marie" and half "Joseph." Catholic girl children born in Quebec almost without exception are baptized with the first name Marie, in honor of the Virgin Mary. Boys are nearly all named Joseph, after the husband of Mary. Distinctive civil names come second.

Hundreds of Quebec town names honor saints. In the official Postal Guide of Canada I counted 606 Quebec post offices named after saints, from St. Abdon to St. Zotique and from short ones like Ste. Foy to mouthfuls like St. Calixte de Kilkenny!

Cling to the Old and Welcome the New

Quebec's typical Marie and Joseph bring up little Celeste, daughter of the Province, to cling passionately to ancestral language and traditions. Yet she shares, more and more, common customs with her Canadian sisters and American cousins who speak English.

She likes *chiens chauds* (hot dogs). She raptly watches Hollywood double features. And she and her mother count Monday blue no longer, with the help of an automatic clothes washer.

The pace of life quickens in this movie-and-machine age. But the Québecois, jealous of their leisure, refuse to sacrifice precious hours dedicated to play and prayer.

Claude Melançon told me: "We French Canadians have a secret. We always stop off along the way to enjoy life. We're willing to go without automobiles, if we must. But we won't go without a little time for fun and a little time for God—every day!"

Kodachrome by John E. Fletcher

Like a Phantom Ship Half-veiled in Mist, Percé Rock Breasts Blue Summer Seas

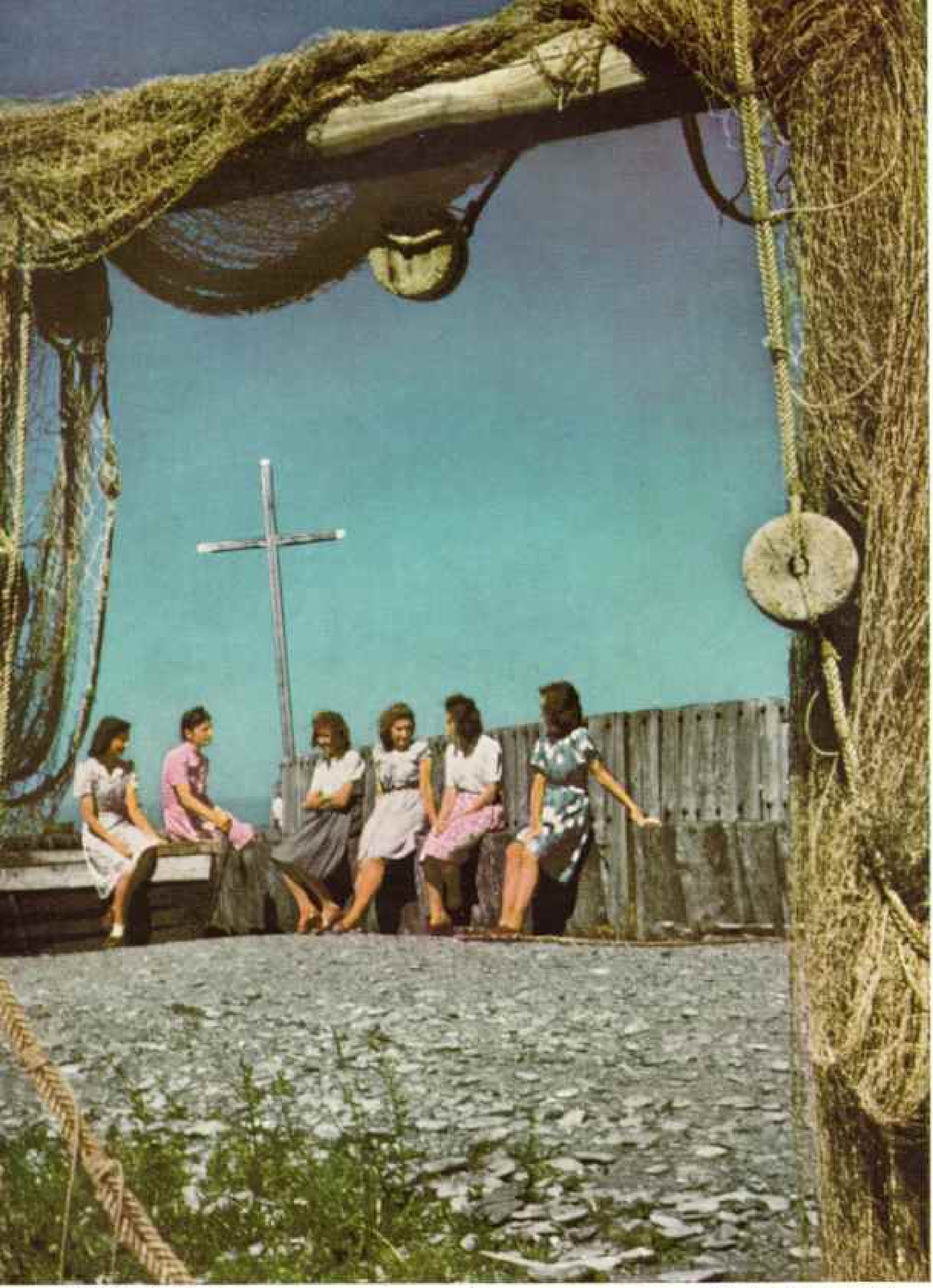
Bright sun routs fog from the bold coastline at Percé village, on Gaspé Peninsula's eastern shore. The girls have climbed to a height called Peak of Dawn. Cliffs just below are the Three Sisters. Rocher Percé (Pierced Rock) gets its name from a natural arch cut through it by waves. Visitors can walk out to its 288-foot cliffs when low tide exposes the bar linking island and mainland. The bold landmark is a fossil treasury. One geologist estimated it contains more than four hundred million fossils of tiny, extinct marine animals. In the distance lies Bonaventure Island, its cliffs noisy with nesting gannets, gulls, kittiwakes, auks, and murres (page 459).

Farmer Pichette's Oxen Throw Their Slow but Steady Weight into Mowing. Daisies Spangle the Hay

Ox teams are scarce today in the Province, but here a brace farms good land at St. Pierre on Ile d'Orléans, near Quebec City. The suspension bridge over the north channel of the St. Lawrence (left) joins the island with the mainland. Green hills in the distance are the Laurentian Mountains.

Centuries Have Brought Little Change to Peaceful Tadoussac. A Cruise Ship Docks Where Jacques Cartier Landed in 1535

Indians guided the explorer to a native settlement here. Later, Tadoussac became a leading fur-trade outpost. The chapel is two centuries old. During ice-free months, steamers constantly pass this spot, bringing in aluminum ore (bauxite) for the smelters of Arvida and carrying away ingot aluminum and newsprint from Saguenay mills.



Within a Frame of Nets, They Wait for Their Men To Come Home from the Sea

Wives and sweethearts chat happily while the sun shines at Petite Madeleine. A cross on the pier symbolizes the faith that must be strong when ocean storms lash the little fishing boats.

Kodachromes by John E. Fletcher

↓ Girl Cuddles Baby Gannet. Adult Birds (Right) Are Natty Dressers

Malou Melançon picked "Fluffy"—squalling in protest—off its nest in the Bonaventure Island rookery.

↓ Fishermen Break Out Balloons and Bunting for the Blessing of the Boats

At Fox River owners vie for the prize for best-decorated craft. The ceremony ends with a boat parade.

Kodachromes by Andrew H. Brown

↑ Expert Claude Melançon Catches a Panful of Trout in 15 Minutes

He casts a fly in Fox River, on the tip of Gaspé Peninsula. Quebec waters have produced many prize-winning fish. The Province's myriad lakes and streams hold trout, salmon, bass, pike, and muskies.

↑ Canoeists Strain at the Paddles Racing on Lac Beauport

Kneeling, they drive their slim craft with mighty strokes. This is a mixed tandem race. A boy and girl in each boat paddle on opposite sides. Lac Beauport, 12 miles from Quebec City, is also a noted ski center.

Kodachrome by Andrew H. Brown

Any Second a Jumping Trout May Shatter This Reflection in Lac Laurent

The clear pond is in the angling preserve of the Manoir Richelieu at Murray Bay. In this fishing country, 75 miles north of the hotel, lakes and streams by the hundred lie in folds of the rocky hills.

Kodachrome by John E. Fletcher

Fire Fighters with "Water Guns" Spray a Mountain of Barked Pulpwood at Quebec To Guard Against Fire During a Drought

Stubborn as a Thousand Mules, Headstrong as a Bronco Herd, Resistless as Stampeding Steers—That's a North Country Log Jam

A lumberjack leans on his pike pole to keep logs moving and prevent a jam from setting in the Gatineau River near Hull.

Kodachrome by John E. Fletcher

Kodachrome by John E. Fletcher

Fresh Snow Weights Trees—and Skis! But Who Wants To Hurry Through Fairyland?

Woods are hushed with a new quilt of snow. The party breaks trail up Mont Tremblant in the Laurentian Mountains northwest of Montreal. Near-by lifts carry skiers to the top of easy, intermediate, and expert runs.

Kodachromes by John E. Fletcher

↑ Snug Woolens Defy the Frostiest Morn, Snow Flies in a Jump Turn

Wide belt and smooth hickories round out the ski girl's trail gear. Ski poles pivot the man's tricky leap.

↑ Ice Blocks Wall a Cozy Corner Free of Wind and Full of Sun

Skiers take time off from the trails in an icy solarium at Sun Valley Farm near Ste. Agathe.

Kodachrome by John E. Fletcher

Kodachrome by John E. Fletcher

Pickers Comb Red Berries from Lowland Strawberry Fields. Wide-brimmed Hats Ward Off Hot Sun

This field near Beaumont looks across the St. Lawrence to Ile d'Orléans, island of rich fruit, vegetable, and dairy farms and of old Norman-style houses (page 456).

"That's Two-and-a-Half Pounds, Madame. A Fine Piece of Fat Pork!"

A farm wife near Baie St. Paul doesn't have to go to town to buy meat for her family. The butcher brings his pork and beef, liver and lamb in a small, ice-cooled wagon right to her door. He drives through the countryside, stopping at each house.

Outdated newspapers provide wrapping sheets. The itinerant butcher weighs this woman's choice on a balance scale.

A Farmer Puts a Refractory Pig Out for an Airing

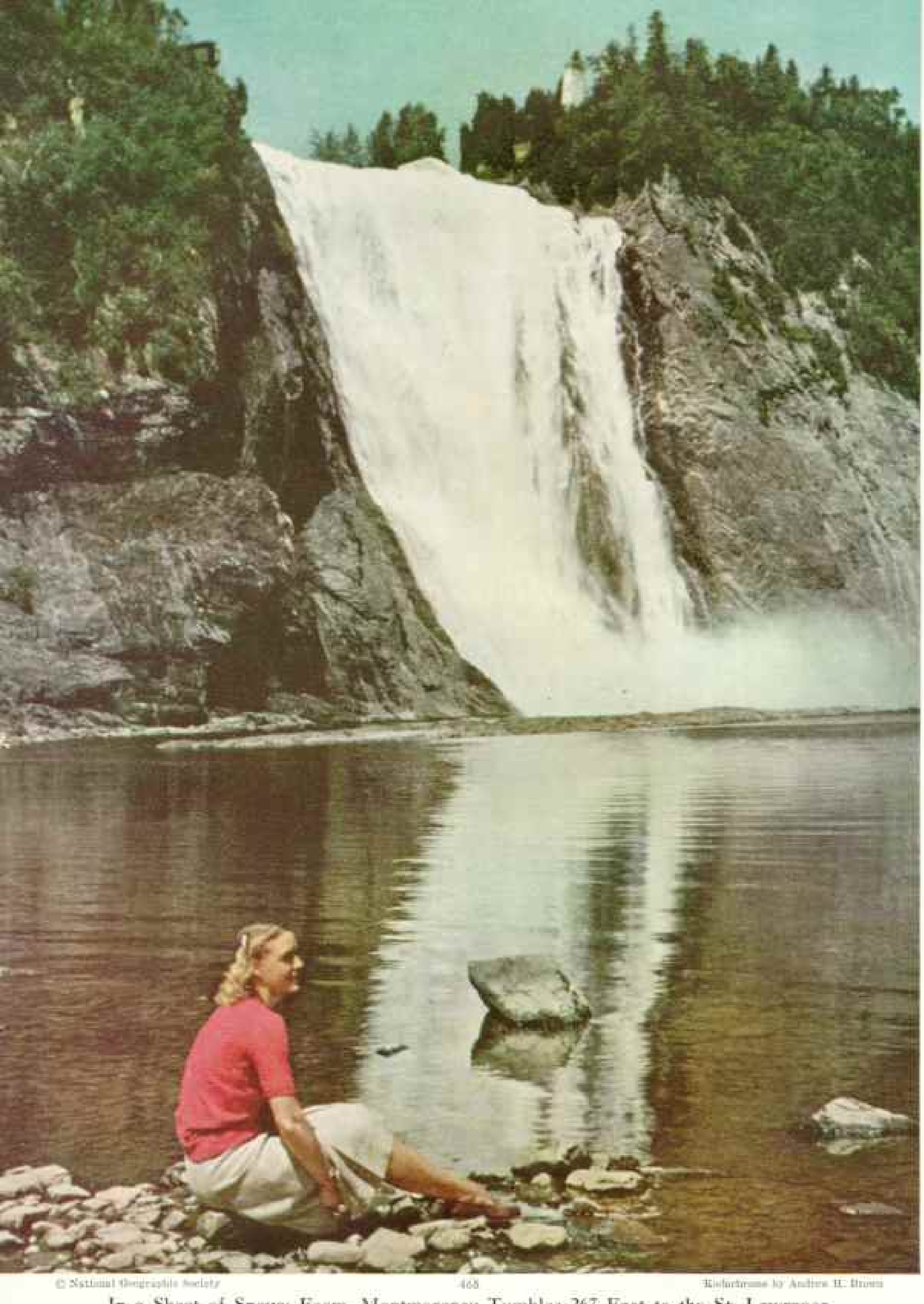
The squealing, kicking porker preferred the cool shade of the barn to the sun of the sty. This farm building near La Malbaie (Murray Bay), built of hand-hewn squared logs, is nearly 100 years old.

To the French-Canadian *habitant* (country settler) his land is his wealth; he clings to it passionately.

In 1947 there were 1,061,200 pigs on Quebec farms; only milk cows were more numerous.

Kodachrome by John E. Fletcher

Kodachrome by Andrew H. Brown



Richardstone by Andrew H. Brown

In a Sheet of Snowy Foam, Montmorency Tumbles 267 Feet to the St. Lawrence

Once the main north shore road crossed the brink of the falls, seven miles from Quebec City. In 1856 the suspension bridge collapsed, carrying a carriage and three people over the brink. One old bridge tower is visible here.

^ Dogs and Horses Still Earn Their Keep in Old Quebec

Photographers use dog carts at Montmorency Falls as "props." Signs tell mileage to far-off spots.

v Pilgrims Throng to Ste. Anne de Beaupré, Many Seeking Cure by Miracle

Heart of the shrine is this unfinished Basilica. Sights include stacks of abandoned crutches.

^ He Shapes a Lifelike Bison and Carves Out a Livelihood for Himself

Stanley Bouchard works in his shop near Baie St. Paul. From wood he fashions figures of farmers, animals, household utensils, and religious figures. Chief Quebec wood-carving center is St. Jean Port Joli.

v She Works at Her Loom in Quebec's Hustling Handicraft Revival

When the machine age undermined home industry, Quebec set up the Provincial School of Handicrafts. Graduates train farm families to work during slack seasons at weaving, rug making, and other rural arts.

Nomads of the Far North

By Matthew W. Stirling*

Chief, Bureau of American Ethnology, Smithsonian Institution

At the beginning of the 16th century a meager 300,000 hardy nomads constituted the entire native population of the far north, an immense area comprising Greenland, peninsular Alaska, and all of Canada save the southern and far-western parts.

These people lived off the country, defying winter storms and temperatures that sometimes went to 60° F. below zero or more; building homes of bark, skins, or snow; clothing themselves with fur; eating game and fish—in short, adapting themselves to Nature in its harshest moods.

Paintings Combine Art and Research

In the 16 paintings which follow, W. Langdon Kihn has pictured them as they lived in the early days and as some of their descendants still live. He has painted them in traditional attire and characteristic surroundings, consulting old drawings and copying original costumes and implements.

Among these people only three major linguistic stocks are represented: Algonquian, Athapascan, and Eskimauan.

Algonquian,† spoken by such tribes as the Micmac, Naskapi, Montagnais, Chipewyan, and Cree, extended from the Gulf of St. Lawrence to the Rocky Mountains in southeastern Alberta, where it was spoken by a Plains tribe, the Blackfeet.

Athapascan was used throughout the great drainage basins of the Mackenzie and Yukon Rivers. Characteristic Athapascan tribes were the Tanana, Kutchin, Hare, Yellowknives, Nahani, and Slaves.

The Chipewyan, Caribou-eaters, and Beaver, due west of Hudson Bay, lived more like their Algonquian neighbors to the south; the Sarcee were essentially a Plains tribe; and the Tahltan, Sekani, Carrier, and Chilcotin of the western Rocky Mountains reflected the culture of the northwest coast tribes.

Eskimauan was spoken along the entire Arctic coast, including the Arctic archipelago, from Yakutat Bay, Alaska, to Newfoundland. Beothuk, the curiously isolated aboriginal language of Newfoundland, has been extinct for more than a century.

The Algonquian region of the North is an extension of the Eastern Woodlands culture area. Probably its nuclear group was the Chippewa living in the western Great Lakes area, whose influence spread northward.

It is a region of forests, lakes, and rivers with no high mountain ranges. The Indians are migratory and live by hunting and fishing.

The Athapascan area has many lakes and rivers but is somewhat more varied. In the west it incorporates the northern extension of the Rocky Mountains.

The central Athapascan area, drained by the Mackenzie, is a flat or rolling country, heavily forested with spruce, pine, birch, and poplar. The winters are long and severe, although snowfall is not heavy. The summers are warm and comfortable, but plagued with biting flies and mosquitoes. The most important game animal is the caribou. Moose and bear are fairly abundant, as are numerous small mammals.

Northeast of this forested area lie the Northern Plains, or Barren Grounds, summer grazing ground of caribou and parts of it a home of the musk ox. This bleak, frozen desert extends 2,500 miles from the delta of the Mackenzie River to Labrador.

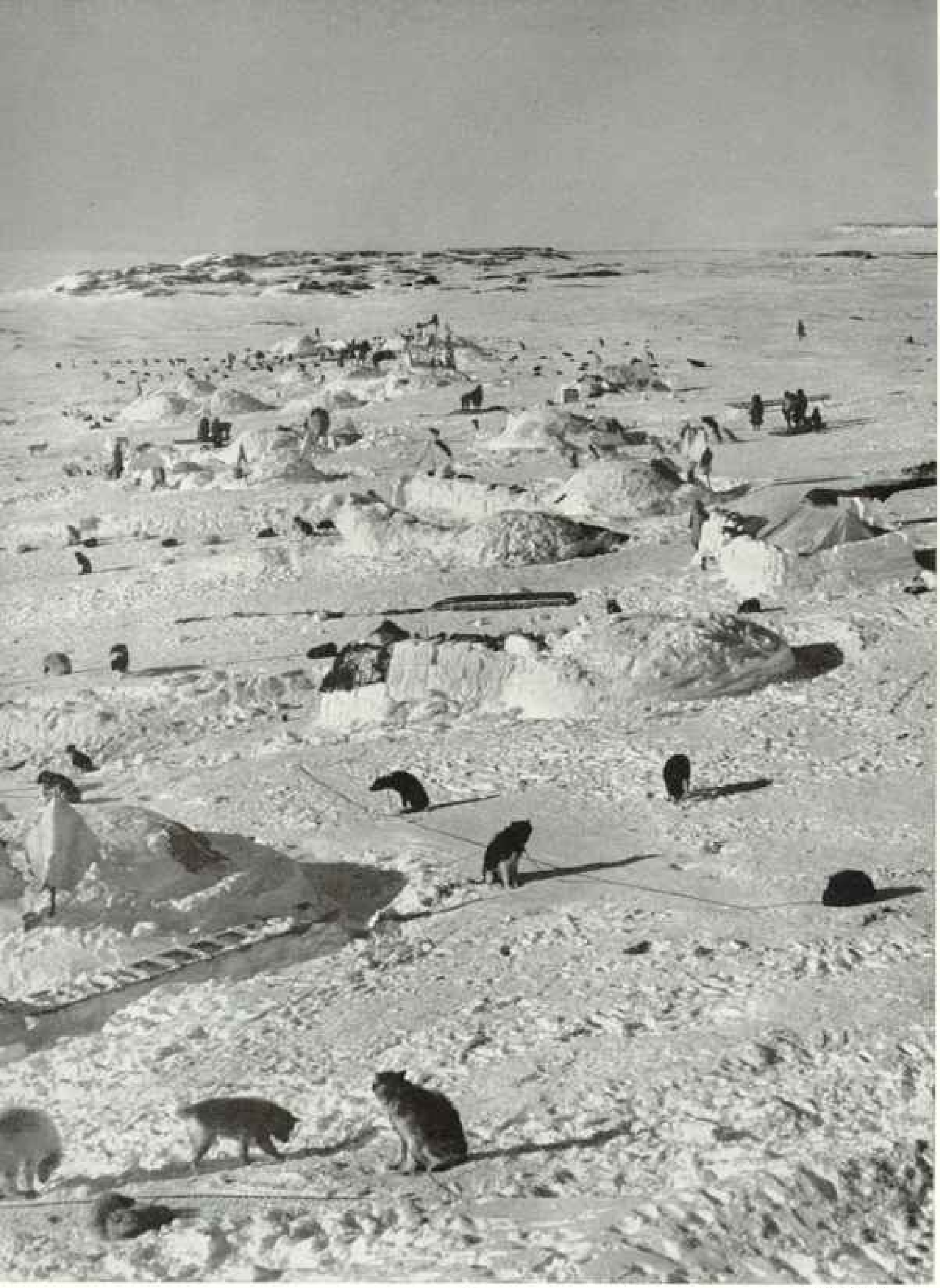
The Indians now penetrate the Barren Grounds in the summer in search of skins and furs, but the territory is predominantly Eskimo.‡ The drainage basin of the Yukon is similar to that of the Mackenzie in many respects, but is more mountainous. Wildlife is similar, and salmon in season are important to the native economy.

The terrain occupied by the Eskimauan stock is a region primarily of seacoast and tundra, and largely treeless and frozen throughout

* This is the seventh in a series of authoritative articles by Dr. Stirling on the American Indian, illustrated with W. Langdon Kihn's paintings. Mr. Kihn, a distinguished painter of Indian subjects, was commissioned by the National Geographic Society to illustrate the comprehensive series on American Indians. To gather data, he traveled to Indian reservations, excavation sites, and over areas populated by Indians long before the white man came, noting costumes, customs, scenic backgrounds, utensils, and ornaments of the tribes shown. Thus the paintings combine artistic beauty with a wealth of accurate information. See, in the National Geographic Magazine: "America's First Settlers, the Indians," November, 1937; "Indian Tribes of Pueblo Land," November, 1940; "Indians of Our Western Plains," July, 1944; "Indians of Our North Pacific Coast," January, 1945; "Indians of the Southeastern United States," January, 1946; and "Indians of the Far West," February, 1948.

† The Algonquian linguistic stock takes its name from the Algonquin, one of the numerous tribes speaking this language.

‡ See "Canada's Caribou Eskimos," by Donald B. Marsh, National Geographic Magazine, January, 1947.



472 P. H. Manning

Except for the Tent, This Snow-hut Village Could Have Been Photographed a Century Ago

The Eskimo were getting ready to set out on a seal hunt when the picture was taken in March, 1944. Each snowhouse was home for about five persons and ten dogs. Snow-block tunnels are the entrances to these domed igloos near Coppermine, Northwest Territories (pages 484, 485, and 501).

most of the year. This severe environment presented a challenge which the Eskimo had to meet or die (page 495).

Typical of both the northern and western Athapascan tribes were the Kutchin, who lived in the region between the upper Yukon and the lower Mackenzie Rivers. Formerly they were called Loucheux. They are divided into eight groups whose customs differ only in minor details.

The major part of Kutchin territory lies north of the Arctic Circle where in winter temperatures around 50° F. below zero are not uncommon. The summer climate is by comparison extremely warm, sometimes as high as 90° F.

In addition to the large mammals hunted throughout Athapascan territory, such as caribou, moose, and bear, mountain sheep are found in the western part. In the spring and summer birds, including many varieties of waterfowl, are abundant. Fur-bearing animals, especially muskrats, are numerous in the sloughs and swamps of the lowland areas.

On the headwater streams of the Yukon, salmon are a source of food, while whitefish are of greatest importance to the tribes inhabiting the drainage area of the Mackenzie River. Many other species also are taken.

Tribes Fish in Summer, Hunt in Winter

In the early summer months the tribes fish for food. They hunt mainly during the winter and late summer. Fish on migration are taken in the rivers in nets or in basket traps. Large lake trout weighing up to 30 pounds are caught with hooks in all seasons.

What the buffalo was to the Plains tribes the caribou is to the Indians of the far north. The Kutchin usually take caribou by means of a large circular corral with a funnellike entrance having extended wings. The extremities might be a mile apart (page 498).

This type of hunt is a community venture. Throngs of Indians howling like wolves drive the herd into the entrance of the pound. When the animals are in the enclosure, the hunters block the entrance and shoot them with arrows as they attempt to escape.

Individual hunters stalk both moose and caribou with bow and arrows or capture them in snares. In this type of hunting the Indians display a remarkably intimate knowledge of the habits of the animals.

Magical aid was normally sought by the hunter. A common method, also practiced in parts of Asia, was to use the shoulder blade of a caribou on which were incised images of the animal. This was then held over a fire until cracked by the heat. The cracks indicated the directions in which good hunting would be found and also presaged whether the luck would be good, bad, or indifferent.

No tree fruits exist in Kutchin territory, but several varieties of berries are abundant in the summer, as are certain edible roots and tubers.

When large quantities of meat or fish are procured in the summer, they are dried on racks and smoked. Then they are stored in baskets of birch bark, tightly packed with dried and pounded berries and kept for lean seasons. In winter Nature has provided a natural deep-freeze. Meat is cached in pits dug into the frozen ground.

Normally food is cooked in containers of bark or skin filled with water. The water is brought to a boil by the addition of hot stones.

The costumes of the Kutchin men were tailored from dressed caribou skin and resembled somewhat the dress of the Eskimo. The coat had a pointed tail both in front and behind and was decorated with fringes along the edges.

Further embellishment was embroidery made from porcupine quills dyed in different colors and from rows of Dentalium shells. The trousers sometimes were in one piece with the moccasins; sometimes the moccasins were detached. In winter a hood was attached to the coat.

The clothing of the women was similar, excepting that usually the coat was more ample to allow the baby to be placed under it, and there was no tail in front. Detached mittens were worn in cold weather, fastened to a line passed over the neck (page 479).

Porcupine Quill Embroidery a Fine Art

The finest porcupine-quill embroidery in America was that of the Athapascan tribes, and it is probable that the art originated among them.

The typical winter shelter of the Kutchin and their neighbors is a gable-roofed log house made by setting up logs vertically for the walls and laying them horizontally for the roof. The roof is made weatherproof by the addition of moss and turf. The door is provided by omitting a few upright logs at one end and hanging a skin over the opening.

When the Kutchin are on the move, they live in dome-shaped structures made from converging poles covered with skins. This is a variation of the commoner conical tepee found among the tribes to east and south. The northern tepee is covered sometimes with skin and sometimes with bark and is not so tall and steep as the familiar Plains Indian structure.

National Geographic Photographer Russell Walker

To Lace Snowshoe Frames, a Montagnais Uses Moose Hide

His tribe and the related Naskapi were skillful at this handicraft, making snowshoes in three or four forms for different purposes, some almost round, some long and narrow, some flat, some with upturned toes (pages 478 and 480). On Pointe Bleue Reservation, Quebec, this provident Indian prepares in summer the equipment he will need to work his trap line several hundred miles to the north.

When they travel, the Kutchin use a sled made of two runners with both ends turned up. On these is constructed a built-up platform. The sleds are drawn by the women, since dogs are not used for this purpose.

The lot of the women was harder than among most other Indian tribes.

In addition to hauling the heavy loads when moving camp, the woman had to retrieve game killed by the male hunters and bring it to camp. She dried the meat in summer, made all clothing, dressed skins, repaired snowshoes, and performed virtually all of the camp drudgery.

When a new camp was selected, the men, arriving first, awaited the coming of the women with the lodges and camp paraphernalia and then lounged around while the women set up the camp.

Women were beaten by their husbands for disobedience.

Strangely enough, all the cooking was done by men. The men always ate first, selecting the choicest items for themselves and throwing what was left on the ground for the women.

In early days mothers frequently killed female children to spare them the hardships of a woman's life.

Although game was abundant at times, there were often periods of want and famine. Old people, sick or no longer able to care for themselves, were frequently abandoned by their families in the wilderness.

The Kutchin used a peculiar type of cradle in the form of a legless chair with a back rest, in which babies were carried in a sitting position (page 479).

Most of the northern tribes did not use a cradle but substituted the moss bag, a simple skin sack with a lining of moss which could be changed frequently. This practical device was adopted by the wives of many of the white traders who lived in the north woods (page 477).

Chiefs Had Little Real Authority

Among all Athapascan groups, political organization was loose. One early explorer said of them: "The authority of the chief is limited, for the Indians are very unruly and not at all disposed to submit to authority.

"The chiefs are chosen either for their wisdom or courage, and not at all on account of birth. They have no insignia of office, and as for privileges they have all that they can take, and none that the others can withhold from them.

"The chiefs and old men are all who are entitled to speak in council, but any young man will not hesitate to get up and give his seniors the benefit of his wisdom."

The most influential individuals among them were the shamans, or medicine men. They allegedly cured the sick by singing incantations over them and driving out the evil that afflicted them.

Any person harboring a grudge could hire a shaman to send sickness into an enemy. The shaman was also a prophet who foretold success or failure in hunting or warfare. He could stir up winds or drive away a storm.

Punishment for crimes against society was entirely in the hands of the offended persons. For adultery only the woman was punished. She could be beaten or cast off.

Richard Harrington

What Well-dressed Baby Sitters Wear Around Port Harrison

These teen-age girls look after their little brothers and sisters or the neighbors' children. The hood is voluminous, large enough to accommodate a good-sized child. The *artiggi*, or "dickey" flap, is gaily ornamented with braid, beads, coins, sometimes spoons. The long tails of the coat are convenient when the wearer sits down on a block of ice. As much from vanity as from modesty, the grimy cotton dress has become part of the costume.

For murder, the relatives of the victim avenged his death. If a shaman had been paid to kill him, the shaman was regarded as innocent. Revenge was taken against the individual who paid him.

The Kutchin once practiced slavery. The slaves were either persons captured in warfare or any individual in the tribe who happened to be without friends or relatives.

Early observers regarded the Kutchin as the most warlike of the Athapascan tribes. Most of their fights were with the Eskimo, but sometimes they fought also with their Indian neighbors. The Kutchin seem to have been the aggressors in most instances. Usually the motive was purely mercenary, the desire to capture the possessions of their opponents.

Among the material possessions desired were women. Indian women usually submitted docilely to their captors, but Eskimo women often bided their time patiently in apparent submission, awaiting an opportunity to take revenge.

Considerable prestige was gained by individuals as a result of war exploits, and this furnished an additional stimulus for fighting.

When a war party was organized, a dance

feast was held to stir up the proper military spirit. On the way to their objective the warriors killed every creature they encountered.

Warfare Treacherous and Ruthless

Upon meeting their prospective victims, they would act as friends until their hosts were off their guard. They would then grasp their knives and kill men, women, and children, except such women as they wished to capture for wives. A man who had thus killed an enemy in "warfare" advertised the fact by tattooing on his arm a line for each victim.

In times of plenty the Kutchin were enthusiastic over sports and amusements. They liked singing, dancing, and story telling (page 483). For the dances music was furnished by drums and whistles.

Long stories were told by old men and women whenever they could get an audience. Usually these stories were about war or mythological beings, but sometimes adventures met with on an interesting trip or hunt were recounted.

Gambling and dice games were played with sticks. Sports involving tests of strength, such as tug of war and wrestling, were very popular. Sometimes in the tug-of-war contests men were pitted against women.

Wrestling is still the most favored sport. At the beginning of a tribal wrestling match the two smallest boys are pitted against each other. The winner then takes on the next larger boy, who rushes in before his opponent can get his breath. Thus the contest continues without pause until the wrestlers are the strongest men.

One of the better wrestlers may throw three or four opponents until, perhaps from exhaustion, he in turn is thrown and leaves the field to his conqueror. Finally the champion of the group is reached.

Since he is almost always fresh and his adversary tired, it takes an exceptionally able man to wrest his title from him.

When the male champion has been determined, the women have their turn, the contest beginning with two little girls.

An Exciting but Risky Game

In winter the Kutchin play an unusual and rather dangerous game.

Four trees, growing more or less in the form of a square and about 30 feet apart, are selected, and two rawhide thongs made from moose skin are stretched diagonally between the trees so that they cross in the form of an X, about 20 feet above the ground.

At the point of intersection a small leather platform about a foot square is attached. The participants stand on this tiny platform in turn and jump up and down.

Each time the player lands on the square the elasticity of the cords throws him higher, until he is thrown more than 10 feet above the platform. The higher he bounces the more difficult it is to keep his balance.

The object is to see who can complete the greatest number of jumps before falling to the ground far below. Of course each participant finally comes a cropper, to the hearty amusement of the spectators.

A similar game is the bouncing of a person, generally a woman, on a moose skin held by many people. This is reminiscent of the popular blanket-tossing game of the Eskimo.

In many ways the customs of the Kutchin resemble those of the Tutchone, Tahltan, and Carrier tribes to the south. All have much that is characteristic of the more spectacular tribes of the northwest coast—competitive potlatch feasts, slavery, and the idea of prestige through the acquisition of wealth.

On the other hand, the Kutchin share with the Eskimo many traits, such as tailored skin costumes, the use of built-up sleds, and wrestling as a favorite sport.

Other customs, particularly those concerned with the hunting, snaring, and trapping of animals, they share with their Athapascan neighbors and the Algonquian tribes to the south and east. In short, there is little in the lives of the Athapascan tribes, other than their language, that is characteristic of them alone.

The Cree, who were probably an offshoot of the closely related Chippewa, are the largest and in many respects the most typical of the northern Algonquian tribes.

They occupied the territory south of Hudson Bay, almost to the Great Lakes, spreading eastward to the base of the Labrador Peninsula and westward to the northern Great Plains. There one branch, the Plains Cree, took on a typical Plains culture like their neighbors, the Blackfeet and the Assiniboin. They were true nomads, moving their camps seasonally with the movements of game and fish.

The Woodland Cree were expert at handling their light, portable, birch-bark canoes, and most of their extensive travels were performed on the lakes and rivers of their territory.

Their dress consisted of tight leather leggings reaching to the hip. A leather strip was passed between the legs and under a belt around the waist, the ends hanging down in front and behind.

Richard Harrington

A Cree Mother at James Bay, Quebec, Carries Her Twin Babes in Moss Bags

Among the tribes of the far north this device took the place of the cradleboard used by their southern neighbors. These infants are wrapped in flannelette inside cloth covering, but the aboriginal form was a moss-lined skin sack (page 474).

In cold weather a fur cap was worn, sometimes decorated with the tail of a fur-bearing animal. When needed, a fur robe was thrown over the shoulders. Moccasins were regular footgear, and in cold weather mittens were used.

The women wore a skin dress fastened over the shoulders with cords and hanging to the knees. A belt encircled the waist. In cold weather detachable sleeves were added to the over-all garment.

Otherwise Honest Cree Cheaters in Trade

The early traders said that the Cree from childhood on were experts in fraud and cunning with respect to trade, but that in all other matters they were scrupulously honest and trustworthy. They were also described as being amiable in disposition, extremely generous, and of model behavior until liquor was introduced.

Physically they were a handsome people. The famous trader and explorer, Alexander Mackenzie, said of them: "Their eyes are black, keen and penetrating; their countenance open and agreeable . . .

"Of all the nations which I have seen on this continent, the Cree women are the most comely. Their figure is generally well proportioned, and the regularity of their features would be acknowledged by the more civilized people of Europe. Their complexion has less of that dark tinge which is common to those savages who have less cleanly habits."

Another account described the Cree in general as being more inclined to be lean of body than otherwise, a corpulent Indian being "a much greater curiosity than a sober one."

Men of status usually had more than one wife, and if one of a man's wives died, it was considered his duty to marry her sister.

Before the introduction of modern trade goods, the Cree used containers of birch bark and stone. Their arrowheads and axes were

made of stone, while knives, fishhooks, and awls were of bone.

Vegetable fibers were woven into twine for sewing the bark covers on their canoes and for making fish nets. The common type of dwelling was the conical tepee covered either with skins or birch bark (page 482).

In former times Cree men decorated themselves with tattooing, sometimes covering the entire body. The women usually contented themselves with two or three simple lines on the face.

Their mode of living began to change rapidly with the coming of the fur traders in the latter part of the 17th century. They diverted much of their energy to the trapping of fur-bearing animals which they brought to the trading posts in exchange for commodities of white manufacture.

A primary factor in their breakdown was the large-scale introduction of alcoholic spirits by the traders. Smallpox, brought in by the whites in 1786, reduced their numbers from 15,000 to about 3,000.

Warlike Naskapi Tough as Their Land

The northernmost of the Algonquian group are the Naskapi and the closely related Montagnais, who occupy the entire peninsula of Labrador excepting for its northern and western coast. The customs of the Naskapi, basically Eastern Woodlands, have been considerably modified by severe climate and by their proximity to the Eskimo tribes occupying the Labrador coast (page 480).

Formerly the Naskapi were in a continual state of warfare with their Eskimo neighbors, but for the past century they have associated amicably.

The Naskapi are highly nomadic. In the winter they travel in the interior in search of game, principally caribou, hares, rabbits, moose, and ptarmigan. Eggs of wildfowl are extensively eaten in all stages of incubation.

These people are experts in the use of traps and snares, like members of the other northern tribes.

In early days they made traps in great variety, according to the type of game being sought. In general, throughout the northern regions deadfalls were used for flesh-eating animals and snares for the herbivorous types.

Caribou are caught in snares, shot from ambush, or speared from canoes while they are swimming (page 490). Their flesh is preserved by drying, after which it is pounded and made into pemmican.

The Naskapi, like the other nomadic groups, are only loosely organized, but they have shamans who act as medicine men and prophets and are supposed to foretell the movements of game and weather.

Their clothing varies with the season, since weather becomes almost as warm in the brief summer as it is cold in the winter. A man wears a long dressed coat of caribou skin made in the shape of a frock coat, leather breeches, leggings, moccasins, gloves, and a fur cap. The leather coats are decorated with brilliant painted designs in red, blue, yellow, and brown.

In the summer the Naskapi travel in birch-bark canoes and in the winter they use the toboggan, drawn both by men and by women. They wear unusually broad snowshoes, almost round in shape (page 474). In addition to the usual type with frame and netting, they sometimes use an oval form made of flat boards.

Their Eskimo neighbors wear very crude snowshoes that appear to be inadequate imitations of those made by the Naskapi.

The early-day Naskapi lived in skin-covered conical tepees, both in winter and in summer. In winter they sometimes made a crude sort of snowhouse by constructing a frame of spruce boughs, which was covered with snow.

They lived in alternate abundance and want. Sometimes after a long period of hunger followed by a successful caribou hunt, they would gorge themselves with incredible quantities of meat.

With the coming of spring and summer, swarms of biting flies and mosquitoes appear. No white travelers passing through the interior of Labrador have failed to reserve their best eloquence for describing the insect pests.

The Micmac were an important Algonquian tribe that occupied Nova Scotia, including Cape Breton Island, the northern part of New Brunswick, and Prince Edward Island (pages 493, 499, and 503).

They were a fierce and warlike group, and their country supported a fairly dense population. Early they became enemies of the English and friends of the French, a condition which existed for more than two centuries. They lived by hunting and fishing, and their dwellings were tepees covered with skins, birch bark, or matting.

For clothing they wore leather garments made more in the style of New England Indians than that used by their northern neighbors. Like the Naskapi, however, they painted their costumes in bright-colored patterns.

They had a more advanced type of political organization than the northern tribes, their chiefs apparently having some real authority.

 Painting by W. Langdon Kihn

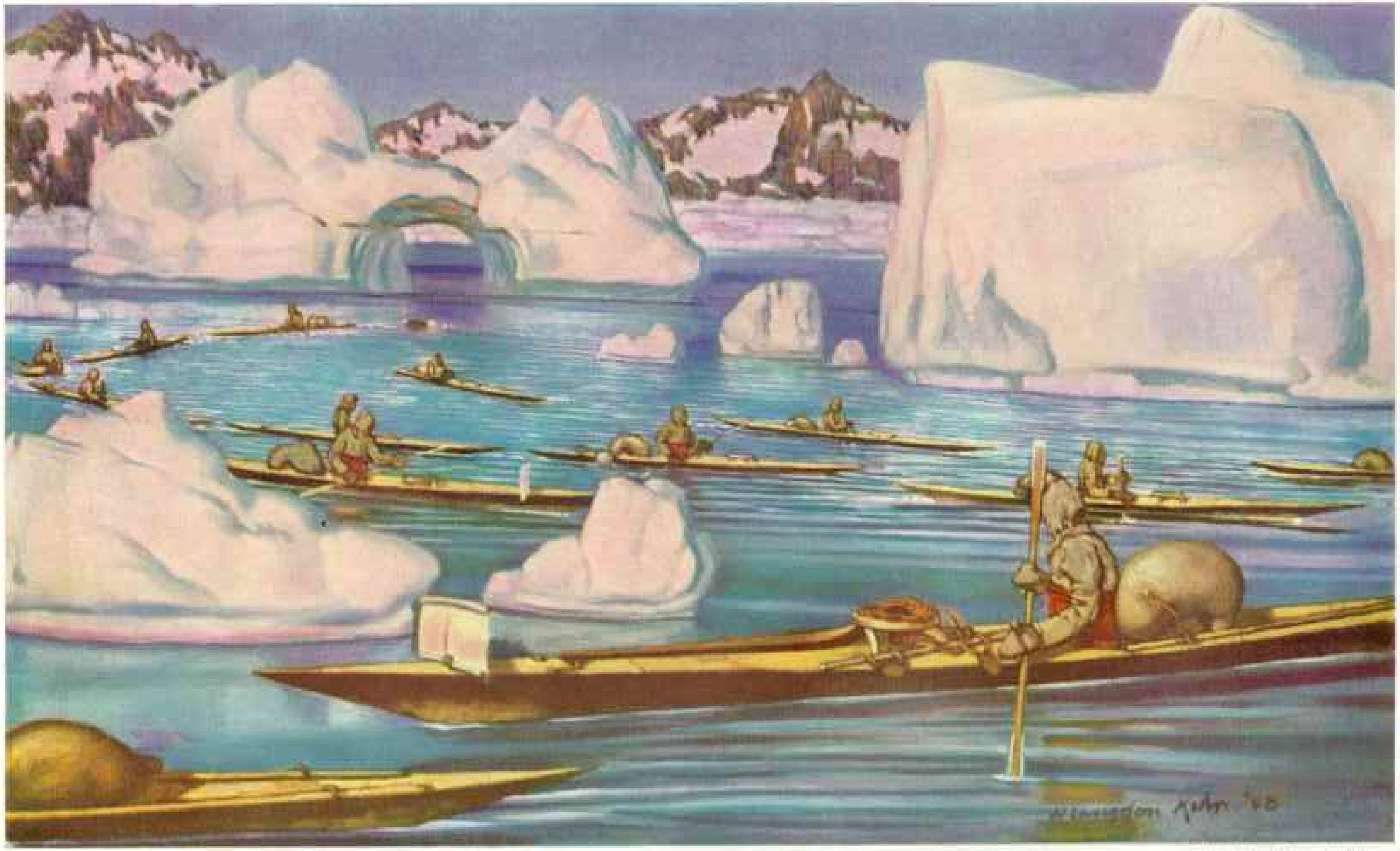
A Kutchin Mother Cradled Her Baby in Birch Bark, Wore Trimmed Hair Feathers

To tattoo chin and cheeks, Alaska Indians pulled a soot-coated thread under the skin with a needle.

Painting by W. Langdon Kihn

In Winter Camp the Naskapi Busied Themselves with Preparations for the Trail

Here is a scene typical of the Gulf of St. Lawrence district in Quebec in the early days. The woman at the right is smoke-tanning a caribou hide, while the brave at the left is icing sled runners. In the center, amid the conical tepees, is an oven-shaped lodge constructed in the form of an Eskimo igloo. The snowshoes, rather short and nearly round so that they were easily maneuvered in mountain treks, are of a type also used by the Montagnais, a closely related tribe. Clothing worn by these Indians in cold weather was made of skins decorated with brightly painted designs.



Painting by W. Langdon Kihn

Eskimo in Tricky Kayaks Run Down Walrus, Kill Them with Harpoons, and Tow in the Carcasses Buoyed by Inflated Skins

Approaching the game head on with his precarious craft, the hunter lies forward, shielding himself from his quarry by the white, sailfike blind mounted on the bow. As soon as the walrus is killed, it is secured to balloonlike seal floats, which keep it from sinking. From these animals the Eskimos get meat for food, ivory and bone for making tools and ornaments, leather for ropes and boat covers, fur and membranes for rainproof clothing, and blubber oil for their lamps.

Painting by W. Langdon Kihn

Such Was a Cree Spring Camp in 1860-70, When the Red Man Wrested a Livelihood from Virgin Forests

The birch-bark tepees of the early days in northwest Manitoba have been replaced by canvas shelters and tents. Nowadays factory-made canoes supplant the hand-made craft which the tribespeople in the painting were wont to build. The descendants of the old-time hunters still trap muskrats, but their methods have been completely modernized. On a recent visit the artist found that they retain few of their traditional customs and costumes. They were one of the first tribes to sell furs to the early European companies, and many of their women, noted for good looks, married French voyageurs.

Painting by W. Langdon Kihn

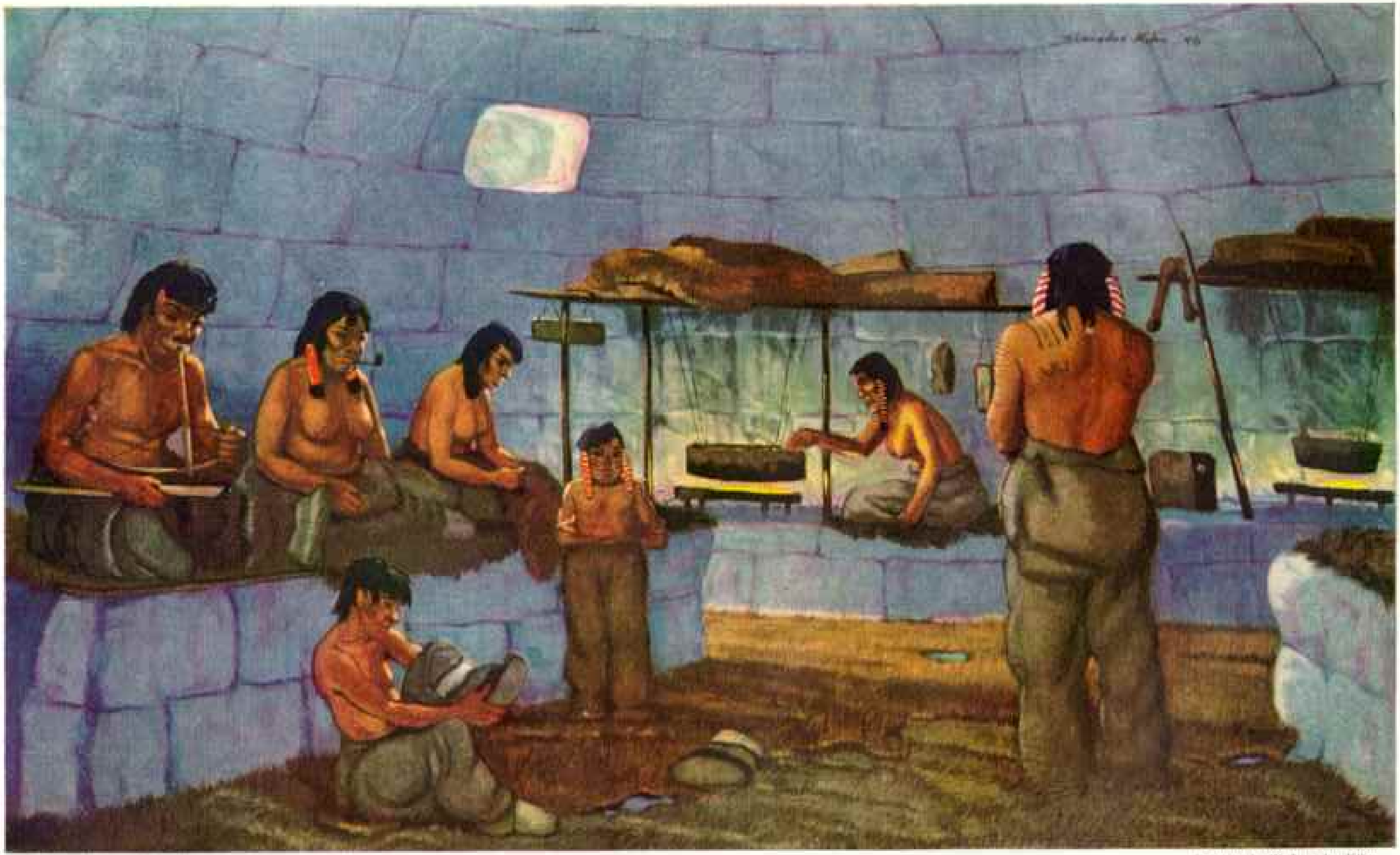
Kutchin of the Yukon River Basin Performed Tribal Dances To Stir Up Fighting Spirit, Mourn a Leader, or Celebrate Gala Days

When the artist visited these Indians, formerly called the Loucheux ("Squint-eyed"), in a village of 25 log cabins on the Porcupine River, Yukon Territory, he was disappointed to find them living and dressing like white trappers. They invited him to a Hudson Bay jig to music of a fiddle and banjo. He had to develop his painting from 19th-century English drawings and costumes now in the Smithsonian Institution. In the old days special feather ornaments and face paints were used in ceremonies before the setting out of a war party or after the death of a chief, and at social gatherings the antics of animals and birds were imitated.

 Painting by W. Langdon Kihn

Only Central Eskimos Build Winter Igloo Villages; Alaskan Eskimos Constructed No Snowhouses Save as Temporary Shelters

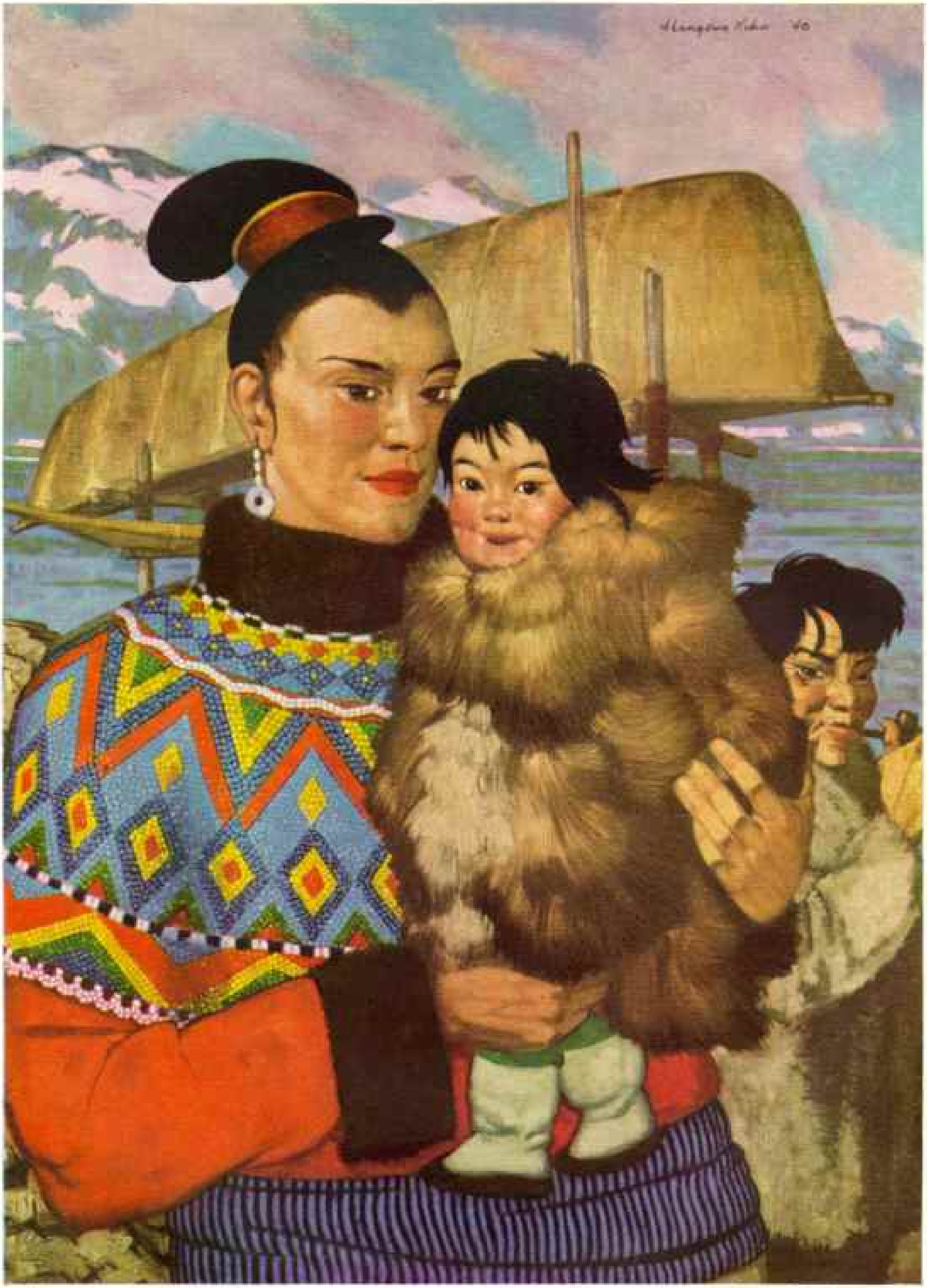
In the foreground Central Eskimos are readying for migration sealskins or pokes packed with seal oil. A snow shovel lies at left near a man loading skins and caribou antlers on his sled. In the middle distance are an upturned sled and *mukluks* (skin boots) drying in the sun. White fox skins are suspended from the harpoon on the right. A small skin is pegged to the side wall of the igloo entrance.



Painting by W. Langdon Kihn

Though the Outdoor Temperature Is Subzero, a Hudson Bay Snowhouse Is Torrid Inside, Possibly 90° F. or More

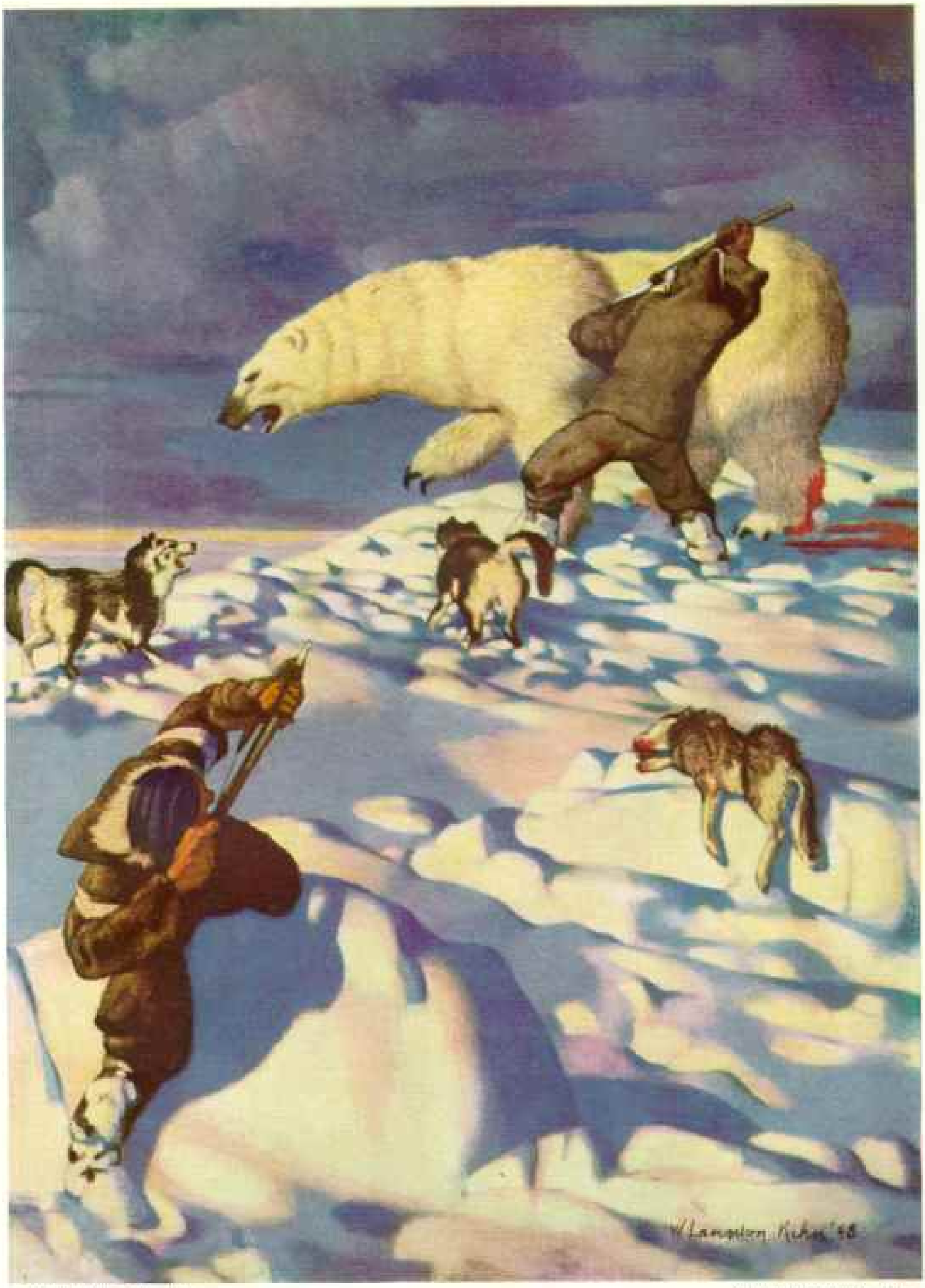
For comfort the occupants strip to the waist. The woman in the background is cooking in a shallow stone dish over the flame of seal oil. Such fires serve for cooking, heating, and lighting. The pane of the window is made of ice. On the low balconies or platforms and on the floor, figures are seated on spread skins. The man at left is drilling ivory with an Eskimo bow drill. The little girl standing is playing a native string game like cat's cradle. When sitting around indoors, these people are seldom idle. Husbands and sons make tools and weapons, wives and daughters clothing.



Painting by W. Langdon Kihn

Hair Done Up in Traditional Style, This Greenland Mother Wears a Cape of Beads

Although her costume shows white man's influence, the child's furs and the skin boat are typically Eskimo. Implements found prove that her forebears were among the first American aborigines to contact Europeans.



Painting by W. Langdon Kihn

While Dogs Harry the Polar Bear, an Eskimo Stabs Him with a Knife Lashed to a Stick

Because Huskies were valuable draft animals, the natives used few in such dangerous hunting. Here one has been killed. The man in the foreground is aiming a sinew-reinforced bow.

Painting by W. Langdon Kihn

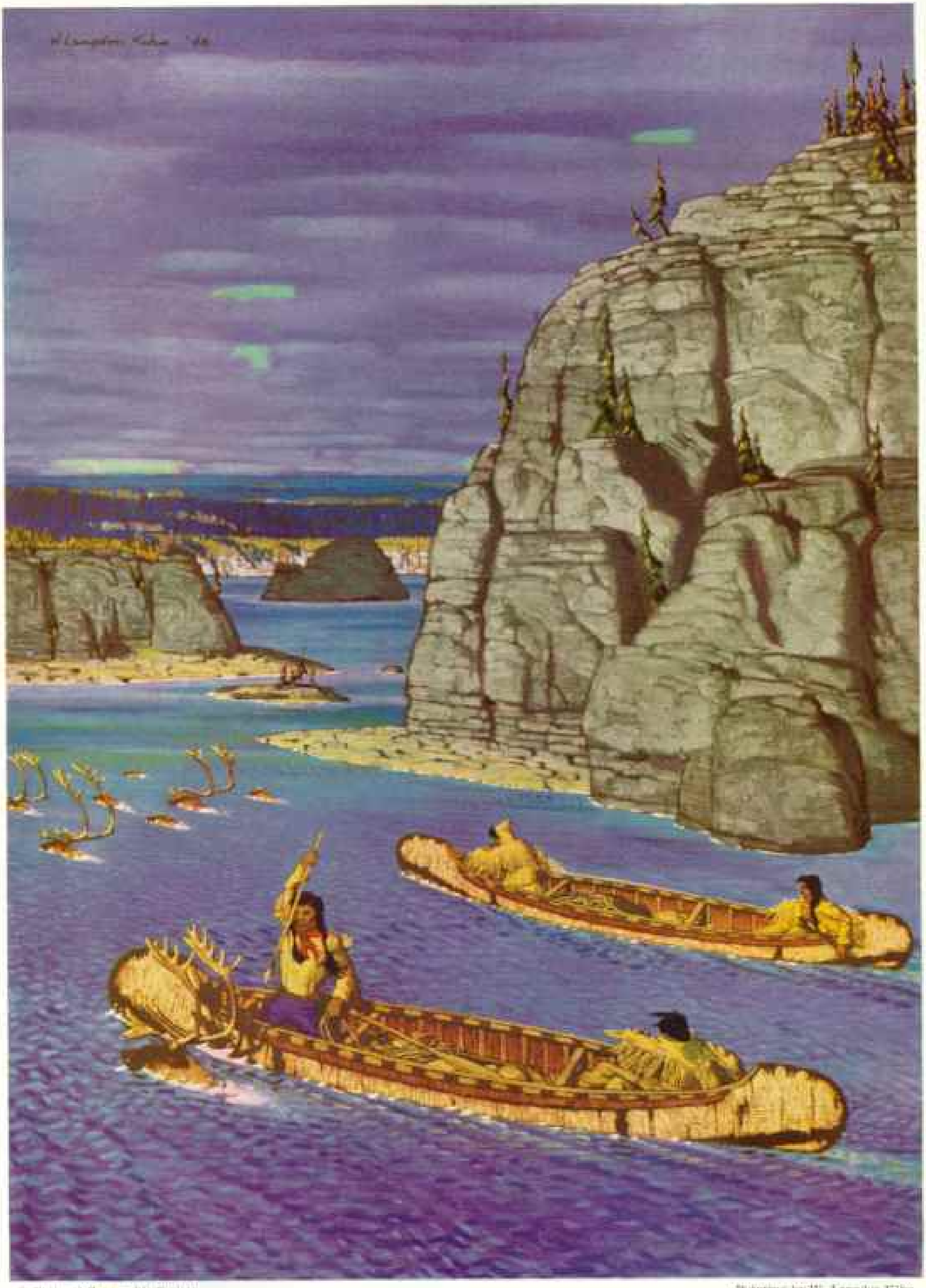
A Real Treat Is in Prospect as Eskimo Women Cut Up a Beluga, or White Whale, the Small Species Specially Prized as Food

At the mouth of the Mackenzie River on the Arctic Ocean, the artist saw this scene enacted many times. A mirage such as is visible in the distance is common when wind and sunlight are right. On the rack near the water, strips of blubber are sun-drying. The cutter at left is using the crescent-shaped knife highly prized by the Eskimo. In aboriginal times these blades were fashioned from thin slabs of ground slate. Nowadays, of course, factory-made steel has replaced the stone.

Painting by W. Langhorne Kihn

By the Eerie Light of the Aurora Borealis, Central Eskimos March Toward the Coast To Begin the Winter Hunt

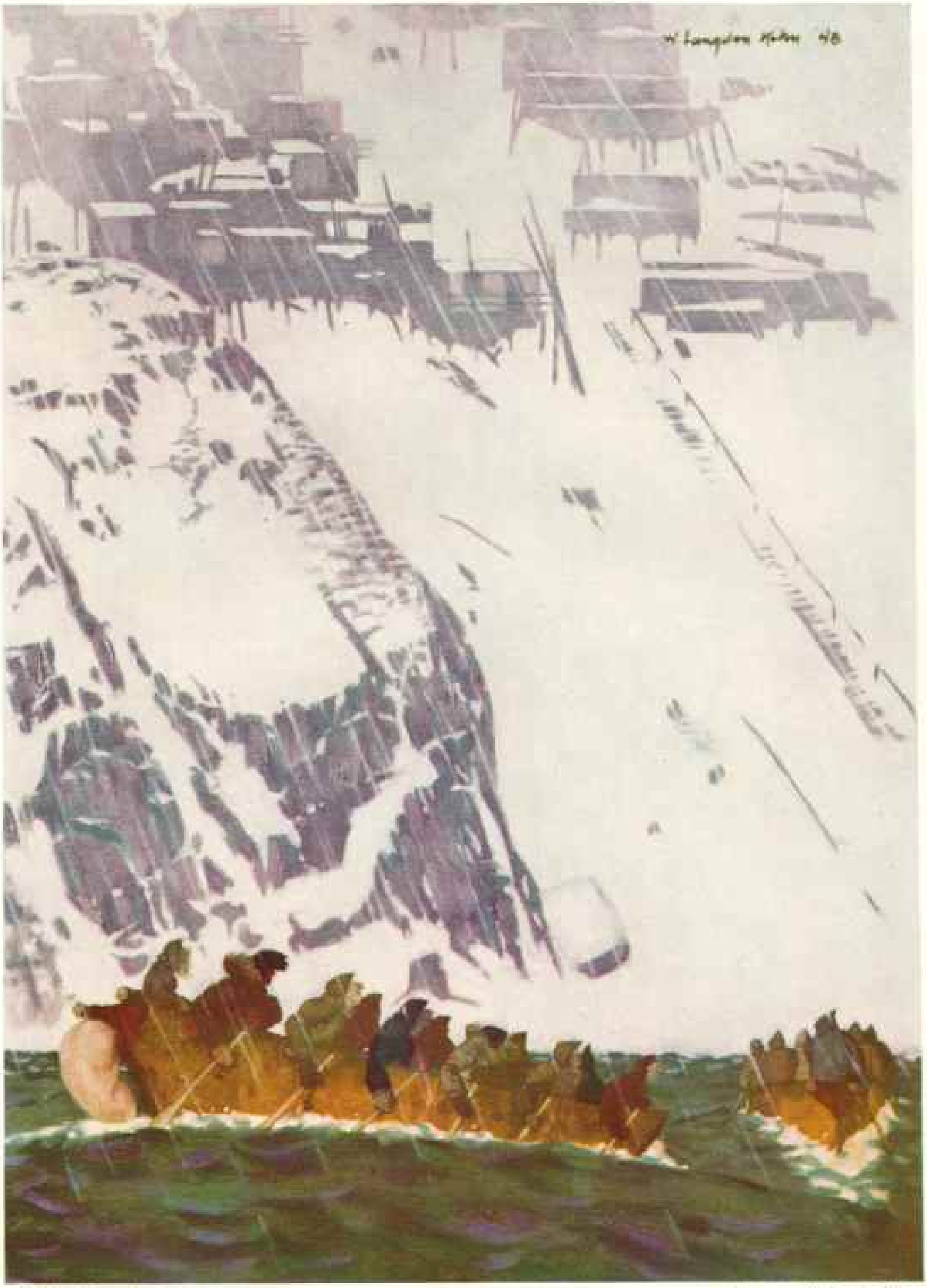
At the end of spring they go inland in pursuit of caribou and remain to fish in the lakes and streams, living in much the same fashion as the Indians, with whom over the centuries they have exchanged cultural traits. During the cold months, however, when they dwell on the ice in temporary snowhouses and subsist primarily on seals and walrus, their mode of life is entirely different and peculiarly their own. The semiannual migrations are necessitated by the search for food. Heaped on the sledges are spoils of the chase and firewood gathered for use on trail and in camp. The display of northern lights is of the familiar curtain type.



Painting by W. Langdon Kihn

Yellowknives of Great Slave Lake Spear Caribou Which Attempt to Escape by Swimming

After driving the animals into the lakes and streams, these and other Indians overtake them in canoes.



 Painting by W. Langdon Kihn

King Island Eskimos Come Home to Their Cliffside Village in a Walrus-skin Umiak

The men work as stevedores and sell ivory carvings in Nome. Inflated seal poke at stern floats captured game.

 Painting by W. Langdon Kihn

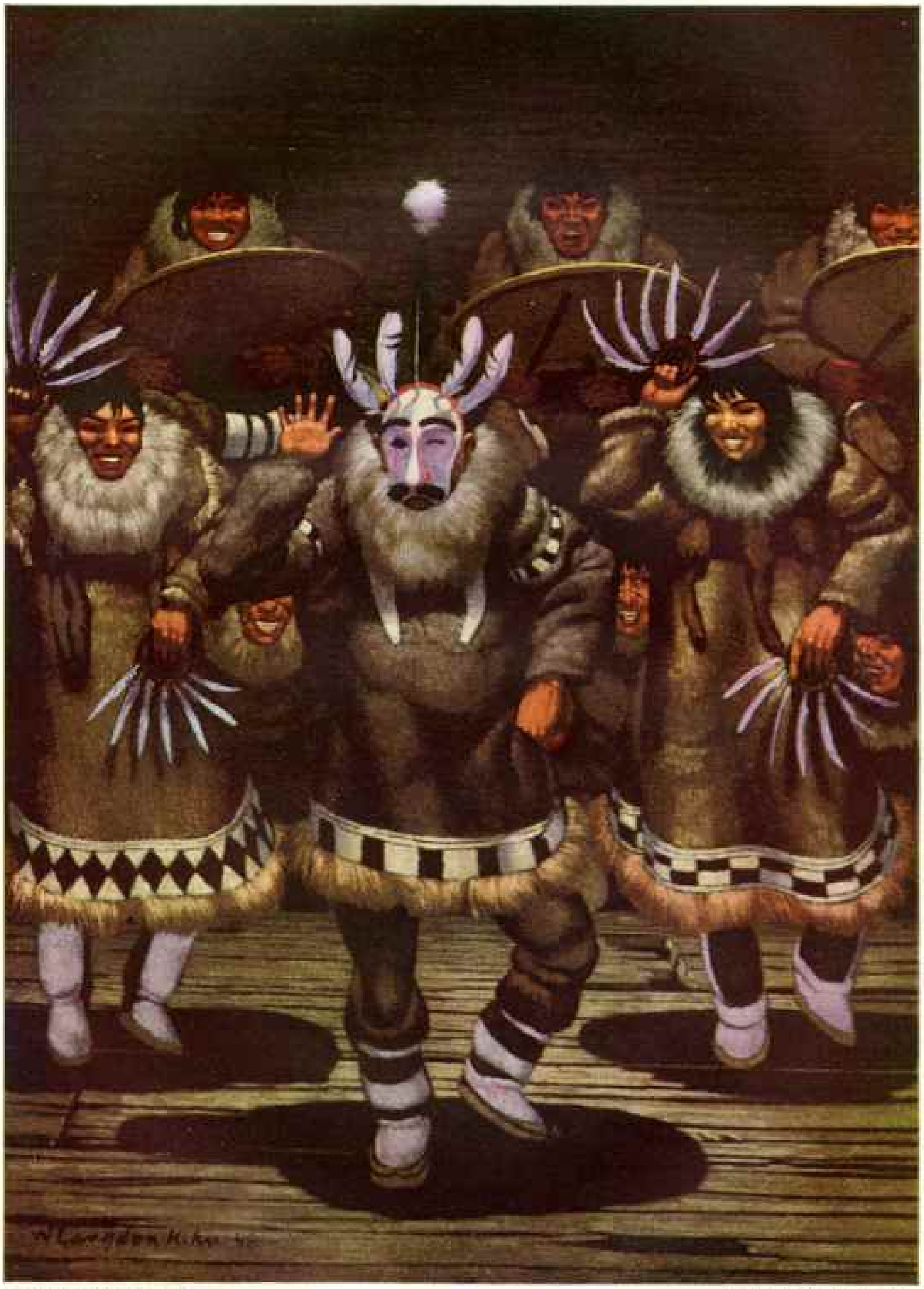
Old-time Chipewyans Come Across Vast Fields of Snow To Trade at Fort Prince of Wales, Churchill, Manitoba

Here the artist has reconstructed the period of about 1770. Fort Prince of Wales was destroyed by the French in 1782, but some of the wall still remains. Since the territory between here and The Pas is the land of the caribou, tepees are represented as covered with hides. The sleds are of the toboggan type, different from the runnered sledges. Northernmost of the western Algonquians, these Indians ranged west of Hudson Bay as far north as the Caribou Eskimo.

Painting by W. Langdon Kihn

In Summer Camp Beside a Bras d'Or Lake, about 1879, Micmac Tribespeople Make Everything Shipshape for Winter

The woman in the foreground is applying pitch to render a canoe watertight. Characteristic is the raised gunwale or rail amidships designed to prevent waves coming aboard in heavy weather. The worker at the right is scraping a hide with a wooden scraper, while one of her companions watches the cooking. The fringed costumes are now seen only in museums. Fearless and warlike, these people occupied all of Nova Scotia, including Cape Breton, Prince Edward Island, and northern New Brunswick. They were probably some of the first Indians encountered by the earliest explorers of the northeast coast of America.



 Painting by W. Langdon Kihn

Alaskan Eskimo Comedians Do a Take-off of a Kutchin Dance

The Eskimo, ever one of the most cheerful and fun-loving of all American natives, excelled at mimicry.

During historic times they took up the practice of agriculture to a limited extent.

The Unique Eskimo

The unique and in many respects the most remarkable group of aborigines in the New World was the Eskimo. Spreading across some 6,000 miles of Arctic coast from East Cape, Siberia, to eastern Greenland, these people exhibit a surprising uniformity in physical type, language, and customs. In no other part of the world did an aboriginal group extend itself so widely over land.

Although the Eskimo are unmistakably of Asiatic origin, many ethnologists prefer not to refer to them as "Indians" but as a group apart. The matter of nomenclature is unimportant, since the term "Indian" in any case is arbitrarily applied.

It would be easy to explain their individuality by saying that the Eskimo were late arrivals from Asia who, already adapted to an Arctic environment, spread rapidly along the uninhabited Arctic coast, by-passing the established tribes.

Archeology proves, however, that this was not the case. In the western part of their domain remains have been found which date back 2,000 years or more. These remains—and we are not certain that still earlier may not be found—show that these ancient people were true Eskimo who already had a well-developed culture.

Dire Necessity Mother of Invention

Many obstacles to human existence that Nature imposed in the extreme north had to be overcome before the Eskimo could wrest a wintertime living from this environment.

First, because he had to be able to travel effectively, he invented the toboggan and the sled to carry his loads over the deep snow.

Later he learned to make the sled more effective by breeding large dogs to draw it.

For travel on slippery ice he used ice creepers. To prevent snow blindness, visors were used, and goggles were carved from ivory and wood, with narrow slits to cut down the pitiless reflected light of the sun on the limitless snowfields (page 484).

To shelter himself in a region of extremely low temperatures and freezing blizzards, in areas completely devoid of wood or stone, he invented the snowhouse (pages 472, 484, 501).

Life in a snowhouse would be impossible without heat. Lacking other fuel, he learned to burn, in lamps of pottery or stone, oil derived from the fat of sea mammals. This same flame furnished him with light and with heat for cooking (page 485).

To hunt on the sea ice in the bitter winter cold, he had to protect his body from the freezing temperatures. Therefore he made fully tailored fur-lined garments of skins, complete with mittens and hoods.

To take the wily sea mammals on which his existence depended, he devised specialized weapons such as the harpoon and the compound recurved and sinew-backed bow. The latter was a necessity because of the absence of suitable wood.

He invented scores of devices to improve his basic tools—swivels and buckles for his dog harness and bone and ivory shoes for his sleds, the runners of which he learned to ice to reduce friction.

To all of his needs he adapted the products of Nature—shoulder blades of walrus for snow shovels, walrus tusks for ice picks. Sinew and baleen were used in place of fiber for cordage. From flat pieces of slate he made knives and harpoon points.

Many of these devices were adopted in modified form by the Indian tribes adjoining Eskimo territory, and some of them spread to the benefit of tribes thousands of miles away. Among items probably originally derived from the Eskimo are the tailored skin clothing and the dog travois used as far away as the southern Plains.

The strongest influence from the Eskimo, however, is to be found among the northern Athapaskan and Algonquian tribes, such as the Kutchin and the Naskapi, whose culture is strongly colored by the Eskimo. The bark-covered canoe may have been derived from the Eskimo kayak.

All evidence points to the origin of the Eskimo and most of their culture in north-central Asia, but archeological work has not progressed as yet to the same degree in Siberia as it has in America.

Bering Sea People Came 2,000 Years Ago

Unlike the relatively uniform Eskimo culture of Arctic America, we find along the Arctic coast of Siberia several different languages and culture groups. These were produced evidently by separate northern movements of peoples from the interior of Asia following the long river systems which flow from central Asia into the Arctic.

Traits resembling those of the ancient Eskimo can be found as far west as the Ob River and as far south as Lake Baikal.

One of these movements more than 2,000 years ago reached the shores of Bering Sea in easternmost Siberia. Here these people found a great abundance of walrus and seals, which supplied a large part of the necessities

Donald B. March

From Far Perry River She Brought a Sick Child to Aklavik

This smiling woman with tattooed chin (page 479) maintains the characteristic cheerfulness of the Eskimo. While she and her family were on a hunt east of Cambridge Bay, her little boy fell ill. A plane came to the rescue, carrying her and the infant to the hospital on the Mackenzie River Delta. She wears a flowered cloth coat instead of the old-time skin jacket.

of life, as well as plenty of fish and birds.

In their skin-covered boats the crossing of Bering Strait presented no difficulties, and they were soon settled in permanent villages on the intermediate Diomede Islands and St. Lawrence Island to the south. Others established their settlements on the Alaska mainland. Since the sea furnished them with all essentials, they felt no immediate need of leaving their coast and island towns to penetrate the American interior.

These early arrivals are known to archeologists as the Old Bering Sea people.* They are the first Eskimo of whom we have definite knowledge, although a still earlier Eskimo people coming from the North Pacific coast of Asia may have preceded them into Arctic America.

They lived in communities composed of small rectangular houses excavated in the ground. These structures had floors of stone and walls of driftwood and whale bones laid horizontally between stakes. The roofs were probably of wooden rafters covered with turf. Entrance was by a long, low tunnel which protected the interior from the weather.

They did not construct platforms in their houses as did the later Eskimo. They cooked their food in round-bottomed pottery vessels and made open, shallow pottery lamps which furnished heat and light. Most utensils, such as plates and spoons, were carved of driftwood.

Water transportation was by boats covered with sealskin. These were of two types, the kayak and the umiak, still used by the Eskimo.

The kayak is a small, rakish one-man canoe, completely decked over with skin excepting for a round manhole in which the occupant sits. When the waterproof garment of the Eskimo is fitted over the manhole, the kayak is unsinkable. It is maneuvered by a light, double-bladed wooden paddle, and is essentially a hunting craft. So skillful are the Eskimo at handling it that when it capsizes they can right themselves immediately by means of the paddle (page 481).

* See, in the National Geographic Magazine: "Discovering Alaska's Oldest Arctic Town," by Froelich G. Rainey, September, 1942; and "Exploring Frozen Fragments of American History," by Henry B. Collins, Jr., May, 1939.

The umiak is known as the woman's boat. It is a large open craft something like a whaleboat. Like the kayak, it consists of a frame covered with skins. It is propelled by oars, the only instance of the use of oars in the New World. It will carry a considerable number of people or a sizable cargo (pages 486, 491).

The Harpoon Indispensable to Eskimo Life

The weapon with which these people hunted and one of the most important possessions of these and the later Eskimo was the harpoon. This was a complex spear, with a detachable head of ivory or bone attached to a line and float, indispensable for hunting sea mammals.

Among most tribes having the ceramic art, changes in pottery types and decorations constitute the medium on which the archeologist most depends for indicating different time periods. In the case of the Eskimo, a much more abundant and sensitive period marker was the harpoon head.

Both its form and manner of decoration changed with the different periods, so that the age of a prehistoric Eskimo site can be determined by the harpoon heads found in it.

For travel on land these early Eskimo used small sledges with low, heavy runners, as well as toboggans made from strips of baleen. Both were drawn by human power, the only dogs being a small-sized breed apparently raised for food.

Stone tools were knives and adzes and wedges for splitting driftwood. Harpoon heads and other objects of carved ivory were decorated with pleasing curvilinear designs lightly scratched on with sharp flint gravers.

Drilling was done with the bow drill. The drill shaft was supported in the socket of an ivory or wooden "mask" fitted over the mouth of the operator, and the shaft made to revolve rapidly by means of a turn taken around it with a bow string. The bow was manipulated back and forth with the free hand.

Clothing tailored from seal skins or bird skins, and waterproof garments made from seal intestines were similar to those used by present-day Eskimo.

For several centuries the Old Bering Sea people prospered. Some changes took place

Donald B. Marsh

The Eskimo Shaman Ruled Through Fear

To proclaim his power over death, this tyrant wizard buried himself for three days in a frozen lake, his superstitious followers declared. They believed he could make walrus tusks grow out of his jaws and that he could call up or dismiss storms and sickness at will (page 502). Despite his alleged powers, he now requires white men's sunglasses to avoid snow blindness. In the old days he wore slit goggles carved from ivory or wood (page 484). Frost creates the illusion of graying hair.

Donald B. Marsh

Canadian Eskimo Form a Human Chain To Corral a Herd of Reindeer in a Northwest Territories Roundup

Often called "camel of the far north," the reindeer provides the native with food, clothing, and transportation. Its flesh is eaten; its pelt is fashioned into parkas.

Carl J. Lemon

Brought from Siberia, Reindeer in Alaska Once Were Plentiful but Now Number Only 40,000

Wolves, caribou, and lack of care by the Eskimo during the war caused the herds to shrink. The native prefers the reindeer to the dog for long-distance travel. A single deer can draw 200 pounds on a sled an average of 25 to 35 miles a day over a two-week period.

Melville Bell Grosvenor

On the Spruce-clad Shores of Bras d'Or Lake, Micmac Youngsters Clamber Aboard Their Bus When School Is Out

At Eskasoni Indian settlement, Canada has supplied a school, farming equipment, Diesel tractor, trucks, goats to furnish milk until land is cleared to support cows, and a community store whose profits go to playgrounds and athletic programs. Now the descendants of Indians who fought beside the French, instead of making tomahawks, bows and arrows, spears of moose bone, and stone knives for scalping, learn bricklaying, carpentering, and other tasks that help them earn a living (pages 478, 493, 503). Almost all the Micmac speak English. Their language is remembered in place names such as Mabou, Whycocomagh, Shubenacadie, etc.

Donald B. Marsh

Neither Eskimo Girl Nor Little Polar Bear Looks Happy

On a fox hunt, three men of the Mackenzie River Delta found this cub and its mother and brother in a den. The adult polar bear, because of its size and strength, is the only really dangerous animal of the Arctic (page 487).

in their manner of making and decorating their tools and utensils, but they were minor ones.

On the Alaskan mainland the tribe extended itself a little to the north, where a group developed called the Birnik people by archeologists. Others moved to the south but remained a coastal and a maritime people.

About a thousand years ago a period of sudden change and expansion took place. New traits and ideas from Siberia broke through the old conservatism.

At this time iron in small quantities was acquired from Asia. The use of iron engraving and carving tools produced a conspicuous change in art styles. Decorative designs became bolder and more rigid. The art of flaking stone tools was abandoned, and ground-stone implements generally made of slate took their place.

The whaling harpoon was introduced from the Pacific coast of Asia. Many new and ingenious minor hunting aids were adopted, such as bird arrows, bird bolas, and fishhooks.

The Bird Bolas an Ingenious Weapon

The bird bolas was an ingenious device consisting of a number of ivory balls attached to strings. The hunter hurled it at birds, and when any part of the bolas struck a bird, the remainder whirled about, entangling the victim in the strings.

Improvements were made in the complex sinew-backed bow. With its increased power the archers began to wear wrist guards to protect them from the rebound of the bow string (page 487).

For warfare body armor made from bone plates came into use. With the increased food take resulting from these inventions population increased. Houses became larger, and with population pressure a strong eastward movement began along the Arctic coast, a movement which did not stop until the entire coast was populated as far as eastern Greenland in the north and Newfoundland in the south.

These Eskimo are known to archeologists as

the Punuk in their Bering Sea habitat and as the Thule in the eastern Arctic. The rapidity and vast extent of this population spread are explained in part by the fact that until Hudson Bay was reached they encountered no human inhabitants along their line of migration.

From Hudson Bay to Greenland, however, they came into contact with another people who had settled this region long before. This rather primitive group, known as the Dorset to archeologists, possessed a culture related in some ways to the Eskimo. In other ways it was more like that of the Indians.

At this time the Dorset remain an archeological mystery, but their closest antecedents are found along the Pacific coast of Asia. Although no traces of them have been found in the West as yet, archeologists are inclined to believe that they were a very early Eskimo group that crossed into America before the Old Bering Sea people, traveling eastward and finally settling the area east of Hudson Bay from Labrador to Greenland. Upon the arrival of the Thule they disappeared, in part being displaced and in part merging with them.

Once the Arctic coast became populated in this manner, approximately A. D. 1000, minor local differences began to appear among the many Eskimo groups that settled along the far-flung coast until in modern times we classify them roughly as the Western, Central, and Eastern Eskimo.

First Meeting of Europeans and Eskimo

Excavations in Greenland have demonstrated that the Inugsuk Eskimo, who were descended from the Thule, came into contact with the Norse in the 13th century. This earliest material evidence known of the meeting of Europeans with American aborigines, gives archeologists a definite point of departure in dating the early phases of Eskimo culture.

Islands of the central Arctic coast were formerly occupied extensively by the Thule people. Most of these sites were abandoned long ago. Within the last thousand years the land has risen from the sea in this area to a height of more than 30 feet, closing passages and making the sea so shoal in many places that whales no longer visit the section.

The Thule, who depended largely on whales for their subsistence, were compelled to leave the region.

One important change in the manner of life of the Eskimo has been adoption of seasonal migration. In the winter they lived on the sea ice, hunting sea mammals, and in the summer they moved inland in search of the caribou and other land animals and fished in the lakes and rivers. Most typical are the Central Eskimo.

During summer they lived in skin-covered portable tents, each family often going its separate way. When they returned in the winter to the sea ice, they congregated in communities of snowhouses.

The men wandered far across the ice in search of breathing holes of seals, where they would wait patiently for the seal to appear so that they could spear it. Another method was to set nets made of baleen under the ice where the seals would become entangled in them. On warm days the seals sometimes emerged through their breathing holes to bask on the ice, where the hunter would stalk them with his harpoon.

This type of hunting required skill, patience, and an intimate knowledge of the behavior and habits of the game. This knowledge was acquired early in life by small boys, who accompanied their fathers on hunts and shared their hardships in the severe climate.

Snowhouses, not used so far as known by the early Eskimo, nor by the Alaska Eskimo, were hemispherical in shape, built of compact snow blocks and locked with a key block at the apex of the dome. Platforms of snow were built inside next to the wall. These were covered with furs and used for lounging and sleeping (pages 472, 484, and 485).

When the interior of the newly built house was heated, a glaze of ice formed over the interior, making it strong and compact. Light was admitted by "windows" made of ice.

The ingenuity of the Eskimo is illustrated in the use of the stone or pottery lamp. In a woodless region, life on the sea ice would be impossible without it. It consists of a shallow bowl of stone or pottery. The fuel is seal or whale oil and the wick is of twisted moss or some other absorbent.

How the Eskimo Lighted Fires

In aboriginal times the Eskimo made fire by striking together two pieces of iron pyrites, driving a spark into a piece of tinder, or through friction produced by means of the bow drill. The lamp which furnished light during the long winter night also produced enough warmth to heat adequately the almost airtight winter houses, and over it the Eskimo of the coast cooked their food.

The costumes of the Eskimo, differing somewhat regionally, were also remarkably adapted to the severe climate. The coat, closed in front as well as behind, had a conical hood that hung down the back or could be worn over the head.

Merl La Voy

To the Eskimo a Whale Is a Veritable Gold Mine

These folk of Point Hope, Alaska, are cutting out the gill bone, valuable for household implements. The flesh is used for food, the blubber for oil to burn in lamps. From the intestines waterproof garments and food containers are made. Baleen, the strong, tough, horny material from the creature's mouth, takes the place of vegetable fibers in making lines for harpoons and nets to capture seal under the ice (page 488).

In the Eastern and Central groups it was cut away at the sides and had a long tail down the back, looking for all the world like a modern European man's full-dress coat. This tail served a useful purpose when the hunter was obliged to sit for long periods on a block of ice or snow.

Trousers were knee length, and long skin hip boots and mittens completed the costume.

The clothing was similar for both sexes, except that the coat of the woman was more ample so that a baby could be carried on the back underneath it. The Eskimo did not use the cradleboard or moss bag of the Indians. The material for clothing was generally of caribou skin, but seal skin was often substituted.

In Alaska garments were also made of bird skins or those of small mammals sewed together. Light rainproof costumes were made from the intestines of sea mammals.

The modern Eskimo apparently devised the built-up dog-drawn platform sled to facilitate his long seasonal migrations.

Like their Indian neighbors to the south, the Eskimo have little if any political organization. Lacking chiefs, the family is the principal group unit. The most influential individuals among them are the shamans, who influence the actions of the group leaders.

The Eskimo believe in a large group of Nature spirits and also in a number of more abstract beings who exert powers of good or evil. By means of various talismans they conjure up these spirits at need and communicate with them.

The shaman of course is the one mostly concerned with this activity (page 497). An endless series of myths and stories deals with these and other supernatural beings and the adventures of culture heroes.

Shaman Doctors' Treatment Rough

As among other tribes, the shaman is also the doctor. When the Labrador Eskimo medicine man is called, he is blindfolded. The patient lies on his back on the ground, and the shaman, when worked up to a proper state of frenzy, throws himself on his victim and begins to chase the evil from its hiding place. Meanwhile, the patient is on the receiving end of a series of violent blows and jerks.

As the spell develops, the shaman gives vent to hideous sounds, shouting as the evil spirit supposedly flees to another part of the body. After a time the shaman announces that he

Melville Bell Grosvenor

Micmac Children Learn Three R's Instead of Hunting, Trapping, or Building Wigwams

Nova Scotia's 2,500 Indians formerly lived on 19 scattered reservations. They relied for meager income on selling ax handles, baskets, moccasins for tourists, and picking blueberries in season. In 1942 the Canadian Government concentrated relief efforts on two settlements, Eskasoni, Cape Breton Island, and Shubenacadie, on the mainland. Now 750 Micmac live at Eskasoni in a clean, white village of 160 new homes built from timber they cut in the woods and sawed in their mill. The wall diagram was done in crayon by a student.

has succeeded in ousting the spirit and getting it under his control.

If it escapes and again gets into the body of the victim, the shaman continues until the patient either recovers or dies. In the former case the reputation of the doctor is enhanced. In the latter, he merely ascribes his failure to some outside interference. In any case he collects a substantial fee for his efforts.

When a Labrador Eskimo is seriously ill, his relatives move him outside before death if possible. If he dies in the house, a hole must be cut in the side of the house, through which the body is removed. The hole is then closed up to prevent the ghost of the departed from returning through it, as it would had the body been taken through the door.

For disposal, the body is flexed and bound, then wrapped in skins. The burial bundle is placed near a rock or on a hilltop and covered with stones to protect it. Burial in the earth is prevented by the hardness of the frozen ground. For the same reason the Naskapi neighbors hang their dead from the limbs of trees when death takes place in winter.

Among other functions, the Eskimo shaman interprets dreams, makes or breaks up marriages, and foretells and controls weather and the movements of game animals.

Despite his preoccupation with the world of the supernatural and his hard manner of life, the Eskimo is by nature a cheerful and fun-loving person (page 494). For this, and because he has managed to maintain himself in the face of incredible natural difficulties, he gains full respect as one of the most admirable of all primitive peoples.

Indians Indispensable to Fur Traders

By the middle of the 19th century the agents of great European trading companies had penetrated to the farthest reaches of the northern woodlands, establishing posts in search of furs. Because of the long cold winters, fur-bearing animals were abundant and their skins of fine quality.

The Indians, whose nomadic mode of life and skill at hunting made them ideal trappers, were an indispensable aid to the traders, who furnished them with guns and steel traps as well as with other modern adjuncts of living.

The Indian quickly adopted the textile

Donald B. Marsh

At Aklavik a Post Set in Frozen Ground Takes the Place of the "Old Apple Tree"

The swinging children come from far and near to attend school at All Saints. Most of these Eskimo girls live on the Mackenzie River Delta, but some are from as far east as Coppermine and Cambridge Bay.

clothing and metal tools and cooking utensils of the white man, so that he soon lost most of the externals of his native culture.

Missionaries followed the traders and did to the native's beliefs and ideas what the trader had done to his material culture.

Any advantages that the Indian might have derived from these aspects of civilization were snowed under by the moral and physical destruction wrought by the introduction of liquor and epidemic diseases such as smallpox, measles, typhoid, tuberculosis, and venereal infections.

The Eskimo have undergone much the same transformation but in less degree, the least affected being the more inaccessible Central Arctic tribes. The bow and arrow have given way to the gun. Skin clothing, especially in summer, has been replaced by European-style garments of cloth.

The Eskimo with his native mechanical genius has adopted the gasoline motor to propel his boats, and the phonograph has become as important to the igloo as was formerly the blubber lamp.

Records have now become one of the important stocks in trade of the traders, and the Eskimo asks for recordings of his favorite Hollywood crooners with as much selectivity as the teen-age American public. This modern type of entertainment has proved a great boon during the long winter nights.

Many of the Naskapi and Kutchin still live in conical tepees, but these are covered with canvas. They still hunt the moose and caribou, but with modern rifles. They paddle with their old skill on the turbulent rivers and lakes, but in factory-made canoes.

In the more remote regions, remnants of the old culture are still strong; in others they have almost disappeared.

Tribal territories have been changed and constricted as the white man continues to move on inexorably. Only the old people remember the past, and, like mankind the world over, sigh for the "good old days."

Busy Fairbanks Sets Alaska's Pace

By Bruce A. Wilson

AT FIRST glance, the main street in Fairbanks, Alaska, looks much like Main Street anywhere.

Weathered frame shops are wedged between glistening concrete buildings. Automobiles and trucks are angle-parked along the curbstones. Shirt-sleeved townspeople and farmers in dusty overalls mingle on the sidewalk.

"This could be Ohio or Kansas," I told myself.

Then I began to see the differences.

Eight airline offices stood within half a block—in a city of 8,500. They are busy almost 24 hours a day.

Groups of Eskimos and Indians passed, high-cheeked bronze faces grinning above business suits and calico dresses. A boy skipped beside a panting, heavy-furred Malemute sled dog.

A block away the concrete paving ended. Along the gravel road log cabins and frame houses stood side by side.

Even the phrases dropped by tired old men lounging in the hotel lobby were different: "The diggin's at Fortymile . . . sluiced for two months . . . struck color below Dawson. . . ."

This is Alaska, I reminded myself. My hotel room is only 120 miles south of the Arctic Circle.

The Air Age Brings a New Boom

"Forty years ago we were a gold-rush boom town," former Mayor Hjalmar Nordale told me. "Today we're an air-base boom town. I don't think we'll ever be a normal city."

Most of Uncle Sam's World War II air bases have been closed. But Ladd Air Force Base (page 512) at Fairbanks, jumping-off place for Soviet pilots who ferried thousands of Lend-Lease aircraft to Siberia, today is busier than ever.

Civilian construction crews and GI's rush an expansion program for which $60,600,000 of the $176,600,000 outlay authorized for developing an Arctic defense system in Alaska has been earmarked.

Twenty-six miles southeast of Fairbanks the Government is spending $35,300,000 to complete Eielson Air Force Base, capable of handling huge long-range bombers still on the drawing boards.

Three times a week a reconnaissance squadron at Eielson sends heavily gadgeted B-29's over the North Pole for weather information.

This "golden heart of Alaska" has become one of the strategic cities of the world. Bomber squadrons leaping across the Arctic ice pack from Fairbanks might well be the "minute men" of another war.*

At Heart of Big Trade Area

Like the hub of a wheel, Fairbanks lies near the center of a vast trade area encompassing hundreds of square miles of Alaska's rugged interior. Supplies come from southern coastal ports over the Alaska Railroad (page 520) or the graveled Richardson Highway (page 506). Fairbanks distributes them by truck, river boat, and airplane.

Core of this sprawling network is Second Avenue, Fairbanks's main street (page 508). One man, more than any other, has given Second Avenue its 20th-century appearance.

Austin E. (Cap) Lathrop (page 515) skippered the freight schooner of which he was part owner to Alaska in 1896.

He hauled freight and men bound for the gold fields; later opened a drayage business; turned his hand to many and varied projects. His industry and business acumen have brought him a sizable fortune in the 53 years since he first arrived in Alaska.

Cap has never made a cent out of gold mining, fishing, or trapping, Alaska's three leading industries. And he has poured his profits back into the Territory instead of taking them Outside to spend.

He put $250,000 into two theaters and $500,000 into a four-story apartment building which houses his radio station, KFAR, and his daily newspaper, the *News-Miner* (page 509). These three white concrete structures and the vanilla-hued Federal Building dominate the downtown scene.

Besides his Fairbanks properties, Cap has an interest in Alaska's largest coal mine, and owns banks, theaters, and apartment houses in several other northland cities.

But Cap, past 80, doesn't even have a desk for himself. He spends all his time on the move, inspecting his properties and pitching in where an extra hand is needed.

Luxury on the Arctic Fringe

Even Cap's business rivals admit his luxurious theaters, with indirect lighting and cushioned seats, and his steam-heated apartment brought Fairbanks its first—and welcome—touch of elegance.

*See, in the National Geographic Magazine: "Our Air Frontier in Alaska," by Gen. H. H. Arnold, October, 1940; and "Strategic Alaska Looks Ahead," by Ernest H. Gruening, September, 1942.

Bob Hunter, E.P.G.

Richardson Highway, Alaska's Longest, Links Fairbanks with the Sea at Valdez

Here a truck climbs past Worthington Glacier (upper left) through 2,722-foot Thompson Pass, in the Chugach Mountains. Over this 371-mile artery move tons of supplies from coastal ports. The first automobile trip over the Richardson, in 1913, required 54 hours (page 519). Today's vehicles make it in half a day. The highway is passable from June to October. "Roadhouses" every 30 or 60 miles offer all services.

Today most residents live as easily here on the fringe of the Arctic as the average American. They are used to normal comforts and many luxuries.

Next to my hotel was a women's dress shop. In the window was a silk-taffeta evening gown studded with rhinestones. The price was $159.50.

"Can I sell a dress like that?" repeated the proprietress. "Many of them! The women of Fairbanks are extremely style conscious. Each year, when I go East to buy, the New York dressmakers are astonished at my selections. They still think we live on an iceberg!"

An Army officer's wife, admiring a hat, added her testimony. "During the past six months in Alaska," she said, "I've worn my evening dresses more often than I did during five years in the States."

I wandered past well-stocked grocery stores. Prices on fresh fruits and vegetables were high. Farmers in the surrounding Tanana Valley supply some produce. The rest is shipped from Outside. A few ex-GI's are flying fresh foodstuffs from Seattle.

Bananas were 25 cents each. A loaf of bread was 25 cents. Fresh strawberries started at 75 cents a box.

The overall cost of living in Fairbanks is roughly 50 to 60 percent higher than in Seattle.

Silver Dollar's Clank Still Heard

Like most of the Alaska interior, Fairbanks is still silver-dollar country.

Any coin smaller than a quarter was a rarity until Cap Lathrop decided admission to his theaters was worth exactly 55 cents. He had to import sacks of nickels and dimes to make change.

Fairbanks didn't bother much with pennies until a chain grocery moved in with goods at prices like 19 or 29 cents. Air base payrolls

introduced paper dollars just before the war. But the heavy clank of silver dollars still drowns out the crinkle of "folding money."

I strolled away from the downtown area. Abruptly the streets became gravel. Some blocks were lined with boardwalks or jogging footpaths. Sturdy log cabins, some 30 or 40 years old, crouched beneath the trees.

One-third of Fairbanks's homes are cabins. Graehl, an unofficial "suburb" of retired prospectors, consists almost entirely of aging log cabins. The builders had no metal materials. Wooden pegs fasten the logs. Roofs, insulated with layers of dirt, in season are gay with wild flowers.

In the cabins, modest frame dwellings, and beautiful colonial mansions of Fairbanks people live much as we do in stateside cities of 25,000. Most of them enjoy every modern utility except piped-in drinking water. Homes that lack their own wells buy from water wagons at 25 cents for five gallons.

Most of Fairbanks's letters reach farthest points in the States within three days by air mail. Packages sent by ship and rail take four to six weeks and longer. Lacking variety in entertainment, Fairbanks reads avidly. In every home I visited, I saw many magazines and books.

Summer Is the Busy Season

During the summer, however, Fairbanks has little time to relax. Into about 95 days between killing frosts must be crammed all the prospecting, mining, farming, and much of the other commercial activity.

During the nine-month winter parties are held, and stay-at-homes turn to their bookshelves.

Forty-seven years ago the present site of Fairbanks was a stretch of uninhabited woodlands. In September, 1902, an Italian prospector, Felix Pedro, struck gold on a near-by creek. A few days later, 13 miners and traders met on "Pedro Creek" to organize the mining district. I talked with Otto Nilsson, the only living survivor of that meeting.

"Our chairman was 'Whitehorse' Smith," Otto said. "We named the place after one of his friends, Senator, later Vice President, Charles W. Fairbanks of Indiana.

"After the meeting I went out to stake my claim. I passed up creeks worth $130,000 a season. I staked on Little Eldorado and worked the creek 34 years, but I never found the pay streak.

"Today I've got enough to get along on, but that's all." Otto is past 80. His home is small and his furnishings modest.

Hundreds of prospectors rushed to the Fairbanks diggings. At the Klondike they had stopped in shallow streams to pan their gold. They found most of Fairbanks's gold deeply buried in permanently frozen ground. A few men made fortunes, but many—like Otto Nilsson—have little to show.

Giant Dredges Extract Gold

Today most gold taken in the Fairbanks area is mined by the United States Smelting, Refining and Mining Company. I drove to their Cripple-Ester field, one of several near Fairbanks.

A giant gold dredge, larger than the average two-story house, gnawed at a riverbed. An endless chain of buckets scooped up the gravel. Inside the dredge the gold was extracted. A long wooden "neck" spewed out the worthless gravel and rock.

Hydraulic crews worked a few hundred yards ahead of the dredge. They had turned their "giants," or nozzles, on an exposed embankment, and powerful streams of water bit into the permanently frozen ground, thawing it for dredging operations (page 514).

Dredging outfits cost millions of dollars. Returns must be great to repay the investment.

Most of the gold mining workers come to Fairbanks each spring from homes in the Pacific Northwest. From April to October the dredges work 24 hours a day to take full advantage of the brief summer thaw.

Alaskans are noted for unusual avocations. I met a striking example at the Cripple-Ester camp. Pete Maas, who came from the Netherlands 15 years ago, bakes bread at night and hunts for prehistoric bones during the day.

Each morning Mr. Maas and his lean police dog, Bola, set forth on a careful inspection of the ground most recently torn up by the gold dredge. They have made dozens of valuable discoveries, recognized by leading authorities.

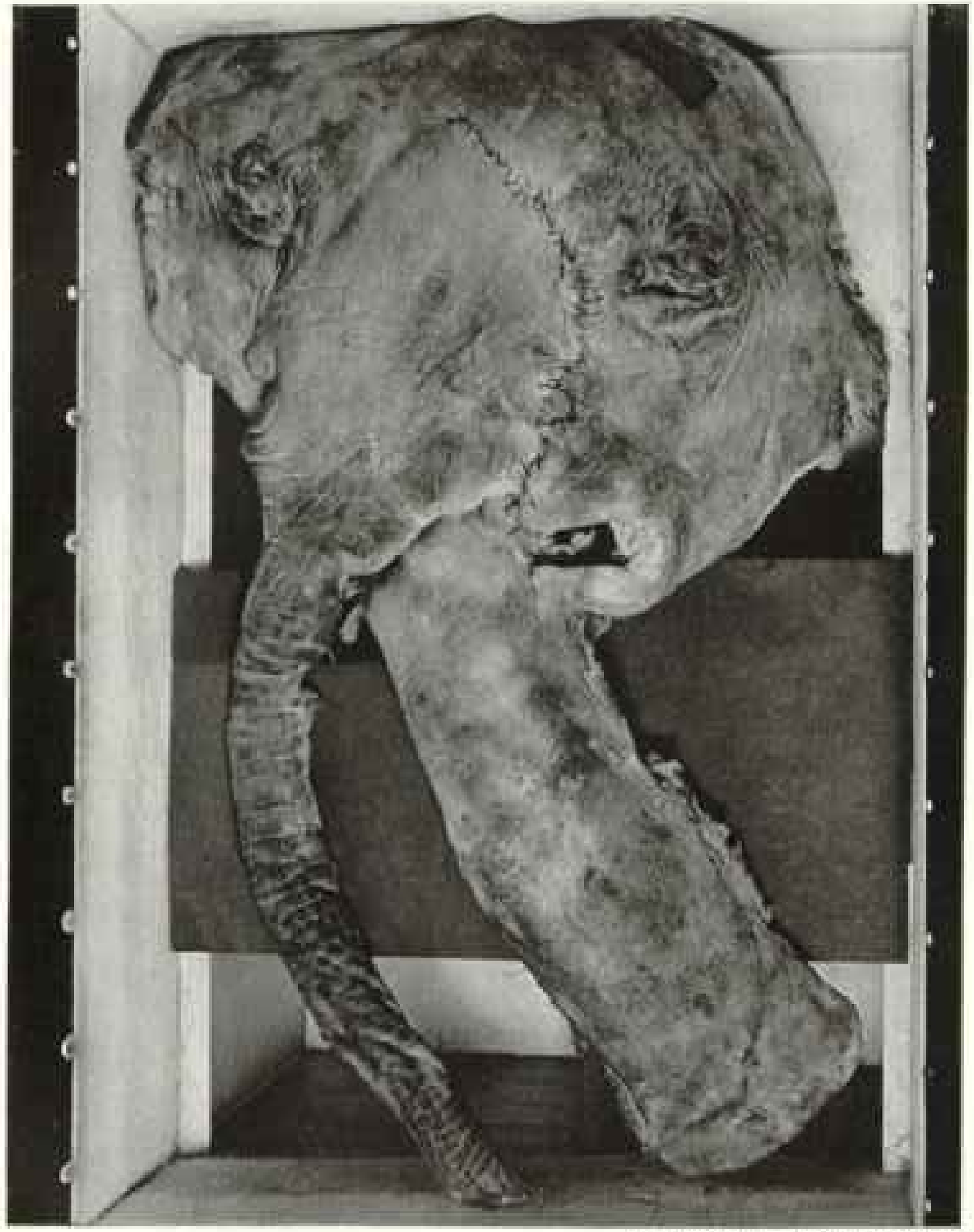
A recent find made by "hydraulickers" in this prehistoric deep freeze near Fairbanks was part of a young mammoth, an extinct elephant, with flesh, hide, and hair intact. In the past such animals have been studied locally by University of Alaska paleontologists and others. The animals, however, decomposed quickly once they thawed out.

This specimen was packed in dry ice and flown to New York. There, in a glass-topped home freezer, it was put on exhibition at the American Museum of Natural History in New York City. It was the first time the museum had displayed the flesh of a prehistoric animal.

Pan American Airways

Gleaming New Concrete Buildings Elbow Weathered Frame Shops Along Second Avenue, Fairbanks's Main Street

Along this street farmers and prospectors from miles around buy tools, groceries, and airline tickets, see a movie, or have clothes pressed in a "pantorium." Dominating the thoroughfare is a 4-story structure housing Austin E. (Cap) Lathrop's radio station and daily newspaper (page 505).



American Museum of Natural History

Alaska's Deep Freeze Yields a Prehistoric Baby Mammoth

In a home freezer, the American Museum of Natural History, New York City, displays head, trunk, and foreleg of this young elephant uncovered by gold miners in frozen earth near Fairbanks (page 507). Flesh, hide, and hair are intact, although the animal lived at least 15,000 years ago. Stitches close a gash probably caused by the jet from a miner's hose.

O. C. Sweet

They're on the Air To Banish Northland Loneliness

Announcer Ed Stevens interviews an Eskimo lass, Miss May Amoagak, and her puppy in a KFAR sidewalk forum. Sixteen hours a day this Fairbanks radio station beams its programs across hundreds of miles of tundra, mountain, and glacier. Prospectors in remote camps listen in on portables packed along with gold pans and picks. Even Eskimos huddle about their receivers.

The creature lived at least 15,000 years ago, and may be considerably older, for it is not known how long it remained frozen beneath the tundra (page 509).

While the great bulk of Alaska's gold today is extracted by dredges, a small legion of prospectors still seek their "big strike" with tents, picks, and gold pans (page 514). Back in Fairbanks I found one "laying in" his summer's supplies.

Dave Winters, a young ex-GI from Montana, explained his quest: "We've got roads now. From them we can get into thousands of acres the old-timers couldn't even touch. We can take more equipment, and stay longer."

The big profits today, he said, would come from interesting a large mining company in the claim rather than from the gold a prospector actually pans. Dave estimated his outfit and summer's expenses would total $3,000.

Some prospectors have learned to fly and purchased their own airplanes. This movement gained impetus some time ago when a bush pilot flew a prospector into the wilderness in June, but was killed in a crash a few weeks later. He left no record of the prospector's location. The deserted miner reached Fairbanks afoot in late October, a few days ahead of freezing wintry weather.

Alaska Uses Planes as Taxis

In Alaska airplanes are used as trains, buses, trucks, streetcars, and taxicabs. Weeks Field, on the edge of the city, is bordered on one side by a row of busy hangars. Dozens of airplanes take off and land daily.

Within 20 minutes I saw seven planes come in—a flying sportsman back from scouting caribou herds; a bush plane with three Indian passengers; a Navy transport from the Government oil project at Barrow; a missionary completing his first solo; a Pan American clipper from Seattle; another bush plane from Nome; and a third from Anchorage.

In the offices of Wien Alaska Airlines I met Noel Wien, one of the handful of old-time bush pilots who pioneered Alaska aviation in the early twenties. As late as 1941 they flew ancient planes without radios, and generally without weather forecasts.

"Our Fairbanks landing field was a ball park in the early days," Wien recalled. "I had a Fokker with no brakes. I had to touch ground smack on the edge of the field, then zigzag to slow down and stop."

Frank Pollack, now in business Outside, is another veteran of Alaska air lanes. "The ball park had no lights," he said. "Once, in pitch darkness, I took off across the field, instead of down the 'runway,' and carried a pine tree in my wheels to 11,000 feet before I could shake it off."

Both Wien and Pollack have logged more than a million miles flown in Alaska. Noel's brother, Sig, has flown 750,000 miles north of the Arctic Circle, more than any other man, it is claimed. Jim Dodson, another old-timer, on two separate "mercy flights" has helped deliver Indian babies while flying his plane.

Villages Rely on Bush Pilots

Today multi-engined planes, well equipped with safety devices, connect Fairbanks with Juneau to the southeast, Anchorage to the south, and Nome to the west. But dozens of isolated trading centers and fishing villages in the interior depend on bush planes for practically all their supplies.

One morning I took off on a typical bush flight with Johnny Lynn, a young Alaska Airlines pilot. Our single-engine Bellanca was crammed with mail, packages, rifles, a keg of nails, a truck tire, a baby's high chair, a roll of linoleum, and crates of canned goods.

We droned over desolate reaches of tundra, then wild, undulating foothills streaked by snow gullies. At a small mining camp named Chicken, Johnny eased the Bellanca into a tiny rough clearing fringed by trees. A truck bounced onto the field to receive the mail.

The population of Chicken consists of 12 or 15 gold miners and their families. The children, and many of the grownups, worship Johnny Lynn. Often they hand the young pilot lists of things they need. Johnny fills the orders in Fairbanks, and delivers on his next trip. Many old-timers refuse to go aloft unless Johnny is in the cockpit.

At Jack Wade, another small mining camp, we landed on a thin strip of gravel beside a river. At Boundary, one mile from the Canadian border, our "airport" was a mountainside that sloped down for 300 feet, then sharply up.

Johnny's final stop was Eagle, on the Yukon River. Here he drifted over the Yukon, lifted the Bellanca over a 30-foot embankment, and settled down on a former Army parade ground. At each stop frontier Alaskans crowded about, eager for mail and news of Outside.

Most of the supplies which Fairbanks distributes through its vast hinterland are shipped from Seattle to Seward, then moved on the 470-mile Alaska Railroad, operated by the Department of the Interior (page 520).

Fairbanks's 40 Eskimos all work on the railroad. They were brought from Barrow and Wainwright on the Arctic Ocean to relieve a wartime manpower shortage. They live in their own colony of shacks near the

Gold Lured Him to Fairbanks; Contentment Keeps Him There

In years of prospecting, J. N. Nettleton saw many fellow sourdoughs strike it rich. Such luck always eluded him, although he hunted doggedly until in his late sixties. Now almost 80, he lives alone in a log cabin near Alaska's interior metropolis. Here he does his own laundry, chops a young man's quota of wood daily, and tills a garden in summer.

"I'm here because I love Alaska," he told the author. "I'm never going to leave it." Dozens of such old-timers, many of whom remember the 1904 gold rush, live in and about Fairbanks. To reach remote diggings, today's younger prospectors use airplanes.

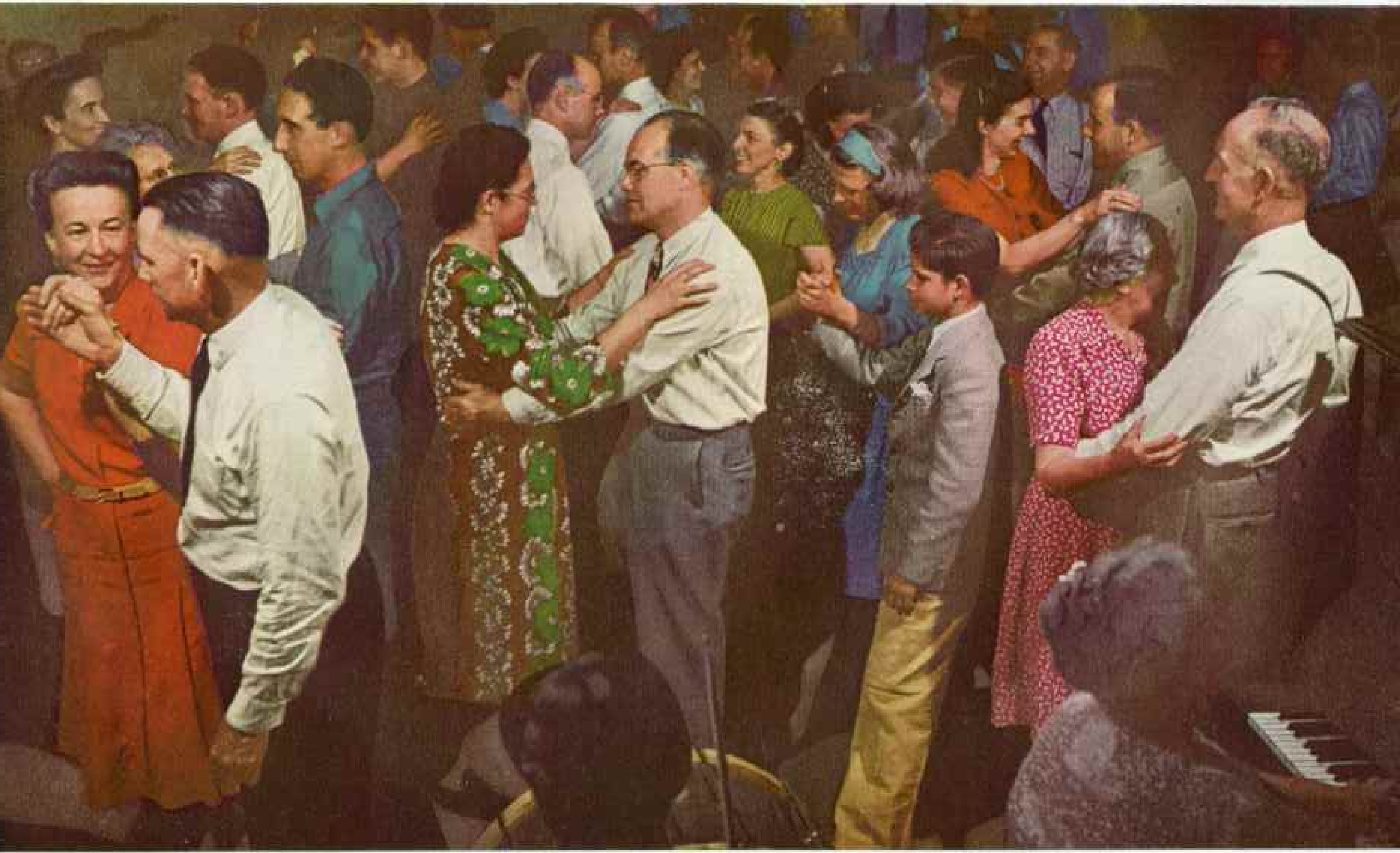
"The old boys couldn't have found all the gold up here," said one, an ex-GI, as he set out to pan stream-bed gravel for yellow treasure.

Artist relief by O. C. Sweet

Interior Alaska's Bustling Metropolis, Built on Gold, Plays a Vital New Role in Arctic Defense Strategy

Military projects have pushed Fairbanks's population past 8,500. Ladd Air Force Base (upper right) is a strategic link in our Arctic defense. Laboratory units seek new ways to combat cold. To miners and farmers for miles around, the city on the Chena remains a supply center.

No Jitterbugging at Fairbanks's Sourdough Dance Club! Mom, Dad, and Youngsters Prefer Two-step, Waltz, and Schottische



▲ Water, Shot from a "Giant," Smashes a Gold-bearing Cliff

After overburden is washed away, dredges excavate ore. Hydraulic mining near Fairbanks frequently uncovers frozen prehistoric animals. Flesh of a mammoth, found recently, was flown to a New York museum.

▼ With Gold Pan and Patience He Woos Elusive Lady Luck

This prospector, using the old-time method, looks for "color" in a river bed. Gold particles, if any, cling after sand and pebbles are poured out. Such miners often sell or lease proved claims to large companies.

↑ Summer Means Swimming, Even 120 Miles South of the Arctic Circle!

Fairbanks temperatures range from 40° below zero to 90° above. These young Eskimos cool off in a pond carved by a gold dredge. A summer sports event is a baseball game played under the midnight sun.

↓ Alaska's Sourdough Millionaire Scorns Luxury, but Enjoys Hogs

Capt. Austin E. Lathrop came north in a schooner in 1898. Now past 80, he owns a newspaper, theaters, radio station, apartment houses, and other properties in Fairbanks. Here he inspects prize swine.

Summer Warmth Turns Near-by Lake Harding into a Playground for Fairbanks Swimmers, Anglers, and Hunters

Here, outfitted for fishing and watching a floatplane taxi to moorings, are Dorothy Herring, "Miss Fairbanks" of the 1946 winter carnival, and Jack Boulet. The lake was named for Warren G. Harding, who in 1923 became the first President to visit Alaska while in office.

Elaine G., a Stern-wheeler, Plies Between Fairbanks and Yukon Ports. Shallow Draft Lets Her "Walk" over Sand Bars

Each spring this craft churns down the Chena and Tanana Rivers to the Yukon, hauling passengers and large freight to isolated trading posts. *Elaine G.* draws only 18 inches of water. To ease passage around sharp bends, barges are pushed rather than towed.

Amid White Men's Trappings, Eskimos Cling to Ancient Customs

About 40 of these native Alaskans live in Fairbanks. This group, in furred parkas and mukluks, sings old songs. Accompanist Silas Negovanna, ex-GI, scrapes whining notes from a musical saw.

Thumb Sucking Helps Ease the Tedium of a Pickaback Journey

Eskimo mother and child have forsaken native costume for brighter modern attire. Menfolk of the Fairbanks Eskimo colony, brought south to relieve a wartime manpower shortage, work on the Alaska Railroad.

railroad yards. I found their homes clean and comfortable.

Their leader, a pleasant, stocky elder named Wilbur Itchaak, told me, "As long as we're treated decently, we'll stay. We like it here."

With Wilbur I attended Sunday afternoon Eskimo services at the Presbyterian church. The young white minister paused after every two or three sentences for Wilbur to translate. Most of the men understand English, but some of the women do not.

Fairbanks's second artery to the coast, the 371-mile Richardson Highway, winds from Valdez through a breath-taking panorama of mountain passes, canyons, lakes, and woodlands. It is a gravel road, passable between June and October (page 506).

One hundred miles southeast of Fairbanks, the Richardson is touched by the northern tip of the Alaska Highway.* More and more tourists are driving to Fairbanks from the States. Many bring trailers.

Roadhouses Offer All Services

I talked with a family of four which had just arrived from Seattle. They covered the 3,000 miles in nine days. Their expenses were $213, including $81 for gasoline and oil, $35 for rooms, and $50 for meals.

The motorist can count on a "roadhouse" every 50 or 60 miles along the Richardson and Alaska Highways. In Alaska, roadhouses are informal combinations of hotel, restaurant, and filling station. Their food is delicious, and their sleeping quarters clean.

Most Fairbanks visitors, however, still arrive by airplane from Seattle or by steamship to Seward and the Alaska Railroad to Fairbanks. The housing situation is extremely tight, and so far Fairbanks's tourist trade is below prewar levels.

In my hotel lobby, I was introduced to Bobby Sheldon, who made the first automobile drive from Fairbanks to Valdez, in 1913.

"There was only a horse trail to follow," he recalled. "But my Model T Ford then made the 371 miles in 54 hours. The mud was up to the hubcaps much of the way."

One of my most stimulating evenings in Fairbanks was spent with Donald MacDonald, a veteran Alaska engineer who helped plan the Alaska Highway. Mr. MacDonald's dream has been a railroad or highway tunnel plunging under the 55-mile-wide Bering Strait to connect Russia and America.

Through the heart of Fairbanks winds the Chena River. A few miles downstream its waters pour into the Tanana River, a major tributary of the mighty Yukon.

Churning stern-wheelers, some patterned directly after historic Mississippi River boats, still carry passengers and freight to isolated trading centers along the Yukon (page 517).

I visited the *Elaine G*, a small stern-wheeler which delivers freight on barges from Fairbanks to interior ports. Tied to the banks of the Chena near downtown Fairbanks, she looked much like a two-story houseboat.

Women were scrubbing her decks and children romped on the stairways. Men were loading heavy wooden crates onto the two long, low-slung river barges.

"*Elaine* pushes the barges," explained "Doc" Gordon, captain and owner. "We have better control than if we tried to tow them around sharp bends."

Each of the 110-foot barges drew three feet of water and had a freight capacity of 150 tons. They are heavily loaded when *Elaine* shoves off for her six-months' run up and down the Yukon. Sons and sons-in-law are Doc's crew. The whole family goes along.

Another use for the Chena River is log drives. During the winter logging crews slash white spruce out of the Chena Valley for 100 miles upstream.

The drive begins when spring breaks. For six to eight weeks crews armed with pikes and dynamite battle jams all the way to the mill in Fairbanks. An average drive consists of from 10,000 to 20,000 logs.

Despite railroad, trucks, and airplanes, Alaska still leans heavily on the dog team. Hundreds of trappers and traders in the interior have three or four dogs chained near their isolated cabins. During the winter they hit the long, twisting trails to cover their trap lines or visit trading centers.

Many Still Use Dog Teams

Jeff Studdert, a veteran dog-team man, has a kennel on the outskirts of Fairbanks. There he boards sled dogs during the summer. They greeted me with a pandemonium of barking and howling.

Alaskan Malemutes weigh 60 to 85 pounds. A good sled dog can pull nearly 100 pounds for 10 to 12 hours a day.

To keep his own dogs in physical trim in midsummer, Mr. Studdert harnesses the team to a truck. Panting and lurching, the powerful Malemutes pull the truck, in second gear, through the streets of Fairbanks.

One of Alaska's greatest dog-team drivers, Leonhard Seppala, greeted me with an armful of squirming white puppies at his cottage near Fairbanks.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Alaskan Highway an Engineering Epic," by Froelich Rainey, February, 1943.

Across a Snowy Wasteland Runs the 470-mile Alaska Railroad

Here, heading south from Fairbanks to Pacific coast ports, a train with double-header engines puffs through a valley in the Alaska Range.

The railroad, operated by the Department of the Interior, runs several freight trains daily between Fairbanks and the southern terminals at Seward and Whittier.

Under a stepped-up schedule born of World War II, thrice-weekly passenger trains now cover the route in 12 to 14 hours. Formerly, the trip required two days, with an overnight stop at Curry, the halfway point.

Numerous branch lines serve gold camps and the Matanuska Valley coal and farming centers. A new track extension runs 26 miles southeast of Fairbanks to Eielson Air Force Base.

This farthest-north railroad on our continent was officially opened July 15, 1923, with President Warren G. Harding driving a golden spike at Nenana.

Ruth Robertson from Press Syndicate

Long Mounds of Refuse, Like Giant Earthworm Casts, Pile Up in the Wake of a Gold Dredge Near Fairbanks

Floating on a tiny man-made lake, the machine (center) gnaws through muskeg, or deeply frozen land previously thawed by powerful water jets (page 514). Endless chain buckets scoop up the gold-bearing sand and gravel to be washed.

Bradford Washburn

Amos Burg

Live Steam, Shot Through a Forest of Pipes, Thaws Alaska Ground for Gold Mining

Near Fairbanks, shirtless workmen toil in the summer sun to couple hose leading from boilers to upright pipes. After the earth is softened, pipes are removed and a giant dredge (background) moves in to scoop up and wash gold-bearing gravel. Water jets (page 514) are used where "pay dirt" is closer to the surface.

Seppala, a short, lithe Norwegian, was drawn by the gold rush to Nome in 1900. During the next 20 years he traveled more miles by dog team and won more races than any other driver, it is said.

"My dogs are not Alaskan Malemutes," he said. "They are Siberian dogs, smaller than Malemutes, but less sensitive to cold and much less temperamental."

With his Siberians, Seppala won the $10,000 All-Alaska Sweepstakes three times. The Sweepstakes was a gruelling 408-mile run over desolate, wind-swept trails, truly the Kentucky Derby of the northland.

Seppala's last long Alaska race was in 1925, when he and his famous Siberians took part in a highly publicized dog-team relay carrying antitoxin to diphtheria-stricken Nome. Since my visit, Seppala has moved Outside.

A branch road off the Steese Highway leads through the heart of the Tanana Valley farming area. Like Matanuska Valley and the Kenai Peninsula, Alaska's other agricultural centers, the Tanana is devoted largely to truck farming and some dairying.

Truck Farming in Tanana Valley

The growing season, averaging 90 days, is supercharged with 16 to 20 hours of sunlight daily during May, June, and July.

Most of the farms are operated by pioneers who homesteaded and cleared virgin land.

Killing frosts in late spring and early autumn drove some of them back home. And in the early days even a successful crop didn't guarantee a profit, because many Fairbanks grocerymen had year-round contracts with Seattle wholesalers to provide 100 percent of their foodstuffs.

But the influx of Army construction workers opened a market for everything that would grow. A farmers' marketing cooperative offers additional assurance of a fair return.

Bert Stimple, one of the valley's most successful farmers, arrived on a boat from California in 1936 with $300 and a motorcycle.

George A. Fairbanks

Up He Goes in an Eskimo Blanket Toss at Fairbanks's Winter Carnival

Spectators crowd the Chena River bridge to watch this favorite northland sport. Performers, striving to outdo one another in altitude, are shot aloft from a stretched blanket or walrus hide held by a dozen persons. Experts always land feet first. Other events of the annual celebration are dog races, parades, a grand ball, and the crowning of a carnival queen.

Today he has a wife, a comfortable log cabin, and a prospering potato farm.

Near the Stimple farm is the hilltop campus of the University of Alaska, the Territory's only institution of higher learning. Alaskan farm problems are studied at the Agricultural Experiment Station.

Mining and engineering are emphasized, and during the winter it is not uncommon to find bearded, 60-year-old prospectors poring over homework in geology and mineralogy.

From the university I could see tiny snow-crested mountain ranges jutting from the southwestern horizon. A student pointed out the twin peaks of Mount McKinley, where the North American continent reaches its highest elevation at 20,257 feet above sea level.

McKinley's north peak, more than 19,000 feet high, was first reached in 1910 by two Fairbanks sourdoughs carrying an American flag, a 14-foot spruce flagpole, and a sack of doughnuts. Three years later a party of four became the first to climb the higher south peak.*

These conquests of McKinley, I reflected as I drove back to Fairbanks, were nothing more than extensions of the grit that created Fairbanks and flows strong in its lifeblood today.

Bush planes still use tree-fringed clearings and twisting glacial streams as routine landing strips; hardly a winter passes without dog teams driving across the tundra on rescue missions; and Second Avenue commerce would wilt if it lost the pack-size purchases of men who live alone in log cabins.

Fairbanks, heart of a young frontier and a focal point in patterns of global airways, has good reason to believe in a future as golden as its past.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE: "Over the Roof of Our Continent," by Bradford Washburn, July, 1938.

Top of the World

The National Geographic Society's New Map of Northlands

THE new National Geographic Society map, Top of the World, covers one-sixth of the earth's surface, but by far the greater part of the world's industry, commerce, and military power is encompassed within its borders.*

The 1,850,000 member-families of The Society who receive the new map with this issue of their NATIONAL GEOGRAPHIC MAGAZINE will find it a useful complement to the large new map in colors of Europe and the Near East that they received with their June, 1949, number.

Drawn on a scale of 1:14,000,000, or 221 miles to the inch, it bears 5,057 place names and gives complete coverage of an area usually found only on two maps, one of Canada and the other of the Soviet Union.†

Here, on a sheet 28½ by 29½ inches, is unfolded the entire picture of the important northlands, drawn from the newest available data.

The tremendous amount of mapping in the far north since World War II is reflected in The Society's new map by much more detail in shore lines and shapes.

As navigation of aircraft in the Arctic is admittedly difficult, the accurate delineation of coastline is an important aid to pilots.

The U. S. Air Force mapping program has added much to our detailed knowledge of Alaska. Canada has made great strides in the extreme Arctic regions.

Among the Canadian Arctic islands, Victoria has become two islands through the discovery of a strait which cuts off what formerly was mapped as its northeast peninsula. Banks Island's shore line shows extensive alteration.

In the Parry Islands, Borden has become twins, and what formerly was called Isachsen Island has been found to be a peninsula of Ellef Ringnes Island. Bathurst Island has turned out to be an archipelago.

Most spectacular are the large new islands shown in Foxe Basin to the west of Baffin Island, one of which has been named Prince Charles after Great Britain's infant Prince. They lie north of the Foxe Peninsula, which was explored and accurately mapped in the early 1930's.

The National Geographic Society first showed this change on its 1936 Canada map and has added on several later maps other details of the area as they became known. Some charts dated 1949 still show the old conception of the short, stubby Foxe Peninsula, and of an eastern shore for Hudson Bay, also some 15 years out-of-date.

Flights over North Pole Now Commonplace

Flights over the North Pole are commonplace now for the U. S. Air Force. Never a day passes without a polar flight by a weather-observation or training plane.‡

In less than a year and a half one Arctic reconnaissance squadron flew over the geographic North Pole a hundred times. Its investigations included study of the extremely complicated northern magnetic area. The new map shows the north magnetic pole as the center of this area at 73° N., 100° W., on Prince of Wales Island.

This unit, the 72nd Reconnaissance Squadron, U. S. Air Force, learned valuable lessons in Arctic aerial navigation and in global flight.

Flying over large glacial areas formerly marked "unexplored" on navigation maps, its planes tested cold-weather equipment and undertook to establish safe procedures for year-round Arctic flights. The squadron exceeded 5,000 hours of flying time and traveled a million miles.

"Flying over the Pole isn't so easy as flying from Washington to San Francisco," one Army flyer pointed out. "It is dreary and unexciting work, but no more difficult than other flying north of the Arctic Circle."

The squadron met with many flying oddities in the far north. Although the average mission was of 20 hours' duration, in summer it was carried out in continuous daylight, and in winter in continuous darkness.

Temperatures at a 3,000-foot altitude frequently were registered at 90° Fahrenheit higher than those on the frozen ground. In winter it was warmer over the North Pole than at the squadron's base, Ladd Air Force Base, Fairbanks, Alaska. In winter skies were clear, with no thunderstorms and little icing. In summer skies always were cloudy.

* Members may obtain additional copies of the Top of the World map (and of all standard maps published by The Society) by writing to the National Geographic Society, Washington 6, D. C. Prices, in United States and Possessions, 50¢ on paper; $1 on linen; Index, 25¢. Outside United States and Possessions, 75¢ on paper; $1.25 on linen; Index, 50¢. All remittances payable in U. S. funds. Postage prepaid.

† Published as supplements to the NATIONAL GEOGRAPHIC MAGAZINE in June, 1947; and December, 1944, respectively.

‡ See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Arctic as an Air Route of the Future," by Vilhjalmur Stefansson, August, 1922, and "First Flight to the North Pole," by Lt. Comdr. Richard Evelyn Byrd, September, 1926.

In February and March of this year a six-engined Consolidated Vultee B-36, world's largest bomber, was tested in Arctic flying. At about the same time the United States Air Force was testing radio-controlled bombs near Fairbanks.

Last autumn and winter a five-plane squadron of Boeing B-50's, first of their kind ever tried out in Alaska, spent four and a half months in Arctic flying.

Trained to Survive Rigid Arctic

This winter, for its third season, the U. S. Air Force's Arctic Indoctrination School at Marks Air Force Base, Nome, Alaska, will teach flying officers and enlisted men the techniques of survival under rigid Arctic conditions. Sixty students take the one-week course at one time. More than 1,000 were trained last winter.

Newcomers to the Arctic learn how to build icehouses, kill seals and remove their nutritious livers, and drive dog sleds; how to recognize safe and unsafe shelter sites in frozen wilderness; how to make fish traps and to dress and smoke game; and how to tan skin and make skin and leather rope.

They are taught also how to distinguish poisonous plants such as the water hemlock, of the parsnip and carrot family, and three varieties of poisonous mushrooms from edible growths; how to operate standard signaling devices like mirrors, smoke signals, reflectors, and rockets under Arctic conditions; and how to establish a position in barren wasteland by sun shadow, duration of day, the magnetic compass, and the stars.

They learn that not Arctic cold alone, but also wind chill makes the north a savage land. A wind of only 10 miles an hour at a temperature of 40° below zero, Fahrenheit, can freeze exposed human tissue in one minute.

Increased knowledge of Arctic flying has permitted two thrilling rescues from the Greenland icecap in recent years. In February, 1947, the *Kee-Bird*, a B-29, was forced down in remote Daugaard-Jensens Land. Lt. Bobby Joe Cavenar, flying from Westover Air Force Base, Massachusetts, landed beside the wrecked plane and safely removed the eleven stranded members of its crew.

A C-54 transport plane went down on the icecap near Narsarssuak in December, 1948. Lt. Col. Emil Beaudry flew in to rescue the 12 airmen.

Canada and U. S. Operate 150 Arctic Weather Outposts

Both rescue planes were C-47's, equipped with skis and Jato rocket propulsion units.

In far-northern Canada, in general north of the 75th parallel, the Canadian Government's Department of Transport and the U. S. Weather Bureau now jointly operate four weather stations, with personnel divided equally between the two countries. These stations are located at Resolute Bay on Cornwallis Island, at Isachsen Peninsula on Ellef Ringnes Island, on Eureka Sound, and at Mould Bay on Prince Patrick Island. A fifth, Alert, is planned near Cape Sheridan, on Ellesmere Island.

Officers in charge are Canadians and their first assistants are from the United States. The land where the stations are located, all the buildings, and airplane runways for each are owned by Canada. Technical equipment is supplied by the United States.

The U. S. Air Force supplies all these stations with rations, blankets, and other material by air, and removes members of the staff who become ill and need hospitalization. Several appendectomy cases have been rushed out of the far north to hospitals.

Personnel live chiefly in Quonset huts. Neither the United States nor Canada has experienced any difficulty in obtaining an ample supply of volunteers to man these frigid outposts. Women are not included, since there are no facilities for them.

Mainly for its own purposes, the U. S. Air Force also operates meteorological stations such as those at Stephenville, Gander, Goose Bay, and Narsarssuak.

South of the 75th parallel in Canada the Canadians man many stations of their own, and the United States has stations in Alaska. In all, there are some 150 weather outposts in the American Arctic.

Texas northers and Middle West cold snaps are, generally speaking, the result of cold masses of heavy Arctic air which descend in vast sweeps from the North Polar region. The conflict between these cold air currents and warm, moist air from the equatorial belt produces most of our major changes in weather. Thus accurate information from the points where weather originates not only is valuable to our armed forces, but is of extreme importance to a Middle West farmer or an Alberta wheat rancher.

It is also important to everyone who flies. As of July 1, 1949, there were 6,443 airports in the United States, exclusive of flying fields maintained for personal use.

Denmark has taken over most of the weather stations established by the United States in Greenland during the war. It has enlarged and improved them and now makes their observations available to the United

States.* The Danes also are conducting a scientific expedition in Peary Land, at the northernmost tip of Greenland.

For many years Americans have sung of Greenland's icy mountains, but aside from those lying immediately adjacent to its shore line, no one has seen them. If such there be, they are covered by the Greenland icecap.

A French polar expedition led by Paul Victor has just completed its second summer in Greenland in an attempt, among other investigations, to determine the shapes and sizes of some of that huge island's hills and valleys by using sonic devices to penetrate the icecap.

Alaska and Canada Hold Immense Natural Resources

Both Alaska and northern Canada are rich storehouses of valuable minerals.†

Alaska has yielded about two-thirds of a billion dollars in gold and another one-fourth billion in other metals, including copper, silver, platinum, tungsten, lead, and tin, since its purchase by the United States in 1867. Mines of the Yukon and Northwest Territories produce some two to three million dollars in minerals annually.

Port Radium at Great Bear Lake is one of the world's greatest known sources of radioactive minerals, but the actual rate of production is a security secret.

Port Radium is connected to shipping on the Mackenzie River by water through Great Bear Lake and River, with a short truck road link near Fort Norman.

At Yellowknife to the south, on Great Slave Lake, a newly discovered gold field is now a rich producer. Supplies for these two mining areas of the far north are handled largely by air.

Canada has completed a road north from the railroad at Grimshaw to reach Great Slave Lake at Hay River. Winter tractor trails constitute the principal overland supply lines.

Oil is produced and refined at Norman Wells to supply the needs of the mines and local transportation. This oil field is the source of the much-disputed wartime Canol pipe line built to supply oil to the Alaska Highway.‡

The oil derives from an ancient coral reef similar to those being discovered in central Alberta. It is now believed that a series of these oil-producing formations may be found in the valleys east of the Rocky Mountains, all the way north from Turner Valley, south of Calgary, to the Arctic Ocean. The new discovery at Leduc, near Edmonton, has further strengthened this hope.

In the Colville River district of Arctic Alaska lies the 37,000-square-mile Naval Oil Reserve No. 4. Since 1944 this area has been extensively explored for oil. Last July the Navy announced that discoveries had indicated reserves far more widespread than expected.

Natural gas deposits, tests indicate, may be in commercial quantity. A well drilled six miles south of Point Barrow will meet all fuel requirements for heating and cooking at Navy installations there.

Five deep wells have been dug and three others are being drilled. All except one have produced "shows" of oil and gas, the Navy announced.

Untapped Mineral Resources

The new map shows one of the most important New World northern discoveries, in the Burnt Creek area along the Labrador-Quebec boundary. Exploration here by the Labrador Mining and Exploration Company Limited, which has rights over a tract of 24,000 square miles, has disclosed an enormous quantity of high-grade iron ore.§

However, before this ore can be marketed, it will be necessary to build 360 miles of new railway from Seven Islands, St. Lawrence River port, to the field.

A complete city and a large hydroelectric plant must be built. Even then, if this ore is to reach the mills of Pittsburgh and the Great Lakes area, a St. Lawrence ship canal likely would be necessary.

Another giant mining project is under way to the south, near the Gulf of St. Lawrence.

Near Lake Allard, 20 miles north of Havre St. Pierre, ground was broken last spring for what may prove to be one of the world's largest high-grade deposits of titanium. Formerly a near-monopoly of India, titanium is a component of high-grade alloys and also yields pigments for paints.

A 27-mile railroad must be built to bring the ore to the docks at Havre St. Pierre. The ore will be refined at a new electric smelting plant to be erected at Sorel, Quebec.

* See "Milestones in My Arctic Journeys," by Willie Knutsen, page 543.

† See, in the National Geographic Magazine: "Strategic Alaska Looks Ahead," by Ernest H. Gruening, September, 1942; "Canada's War Effort," by Bruce Hutchison, November, 1941; "Canada's Awakening North," by Lawrence J. Burpee, June, 1936; and "Gentlemen Adventurers of the Air," by J. A. Wilson, November, 1929.

‡ See "Alaskan Highway, an Engineering Epic," by Froelich Rainey, National Geographic Magazine, February, 1943.

§ See "Quebec's Forests, Farms, and Frontiers," by Andrew H. Brown, page 451.

Huge mineral areas remain untouched in both Alaska and Canada. As more easily obtainable supplies in the United States and southern Canada are used up, these northern lands will undoubtedly be developed more and more fully. The area now is a "cold storage house" for future industrial materials.

Mining, fishing, and military service take citizens of the United States to the Arctic, but growth there of a stable civilian population is slow.

In all of Alaska, Yukon, and the Northwest Territories the population numbers probably 110,000. Most of the inhabitants are Indians and Eskimo. Only a fraction of the few white residents plan to make their permanent homes in the northlands.

Across the polar sea from the North American Arctic stretches the vast expanse of the Eurasian northlands. Between the two lies tiny Iceland, which stands as a model, demonstrating what men can do at the Arctic Circle.* With few natural resources, its energetic people have turned the little country into a modern nation with good roads, modern industry, and a sound financial position. Iceland became a sovereign state in 1949.

This spirit also is to be found in Norway. Immediately after German capitulation in 1945, determined people returned to their ruined homeland in far-northern Norway and began to rebuild. Largely because of their own efforts, the country has now been greatly rehabilitated.†

Norway is pushing a new railway line into the far north. Construction has reached the Arctic Circle and is continuing to the port of Bodø. The Swedish railway system reaches Narvik, Norway, shipping point for Swedish iron ore from the Kiruna region.

Soviet Aetivity in Northland

In Soviet Russia the new push to the north has reached great momentum.

In contrast to the Northwest Passage, which has been navigated in its entirety only three times, the Northeast Passage has become a busy shipping route in summer.

After some three centuries of intermittent attempts, Baron Nils Adolf Erik Nordenskiöld effected the Northeast Passage in 1878-79. This feat, like Amundsen's Northwest Passage, remained a signal accomplishment for many years.

In 1932 the Soviet scientist-sailor, Otto Schmidt, piloted the icebreaker *Sibiriakov* through the Northeast Passage from Archangel to Bering Strait in two months and four days. This feat resulted in the establishment, by a decree of December 17, 1932, of the Central Administration of the Northern Sea Route. This agency has been the chief force in Soviet Arctic development.

Weather stations, numerous enough to make reliable weather reports and predictions over the whole Arctic route, have developed a technique of predicting movement of the Arctic ice far in advance.

During World War II reports on Arctic weather were exchanged by the United States and Soviet Russia. This exchange has been continued ever since.

The new map shows how the Pechora, Ob, Yenisei, Lena, Indigirka, and Kolyma, all among the world's big rivers, empty into the Arctic Ocean. With their tributaries they afford many arteries which lead in from the main Arctic ship route and penetrate deeply into the vast interior.

In summer products from mine, forest, and field are shipped out and supplies for the many interior centers are brought in. In winter the thick ice converts these rivers into natural highways for tractor trains and other ice-traveling vehicles.

At the mouth of each of these rivers an important town has grown up. New towns in the interior indicate newly opened mines, sawmills, or other industrial centers, many of which have received government supplies of forced labor. Most of them, as shown by the new map, bear names strange to most Americans—Sredne Kolymsk, Tiksi, Verkhoyansk, Magadan, Elgen Ugol, Seimchan, Aldan, and Vilyuisk, for example.

Murmansk, most northern of all the world's large seaports, has probably well over 100,000 population. Served by the railway built in World War I, this port was the most important inlet for the vast Lend-Lease shipments of World War II from the United States and other allies. Murmansk and the railway are outlets for big new mining developments on the Kola Peninsula (Kolski Poluostrov).

Kirovsk and Kandalaksha have both grown into large mining towns. Kirovsk is the center of the rich Khibiny district, which produces copper, nickel, iron, and many other minerals. The world's largest known concentrations of apatite and nepheline lie here.

* See, in the National Geographic Magazine: "American Soldier in Reykjavik," by Cpl. Luther M. Chovan, November, 1945; "Ancient Iceland, New Pawn of War," 21 ills., July, 1941; "Walking Tour Across Iceland," by Isobel Wylie Hutchison, April, 1928.

† See, in the National Geographic Magazine: "Norway Cracks Her Mountain Shell," by Sydney Clark, August, 1948; "Norway, an Active Ally," by Wilhelm Morgenstierne, March, 1943; "Norway, A Land of Stern Reality," by Alfred Pearce Dennis, July, 1930.

The warmth of the Gulf Stream makes Murmansk the only ice-free Russian port except those on the Black Sea. Archangel, an important lumber port which lies five degrees farther south, is icebound in winter. The railway connection between Archangel and the Murmansk line was built during World War II.

The new railway from Kotlas to Vorkuta, another World War II project, taps the oil fields at Ukhta, where radium mines are reported, and the coal fields at Vorkuta, north of the Arctic Circle.

Vorkuta is believed to have 30,000 inhabitants, and Ukhta (not to be confused with Ukhta in Karelo-Finnish S.S.R.) about 40,000.

Igarka, on the Yenisei, has become a big timber center, with a population of more than 25,000. The mining center of Norilsk, about 30,000, is connected with the port of Dudinka by a railroad, the world's northernmost, opened in 1938.

Since the beginning of World War II innumerable conflicting reports on the status of the B. A. M., Baikal Amur Magistral, the second trans-Siberian railway, have arisen. The most recent Russian transportation map shows a bit of construction from Taishet to Bratsk.

The other end, from Komsomolsk to Sovetskaya Gavan, and from Komsomolsk to the old trans-Siberian line near Khabarovsk, is well established.

This new trunk line is scheduled to run from Kuibyshev in European Russia to Magnitogorsk, Akmolinsk, Pavlodar, Barnaul, Stalinsk, Abakan, and Taishet.

In the far east, gold mining on the Kolyma River has led to the establishment of new towns and the rapidly growing port of Magadan on the Sea of Okhotsk. The new highway shown on the map connects the gold fields with the port.

This region between the Lena and Kolyma Rivers is known as the cold pole of the Northern Hemisphere; yet at Verkhoyansk, where the temperature sometimes goes to 90° F. below zero, wheat and vegetables grow to maturity. Some melons are raised.

Most of the old Russian Empire is contained in the Russian Soviet Federated Socialist Republic, which is one of the sixteen constituent republics of Soviet Russia.

Table of Airline Distances

The R.S.F.S.R. is divided into six territories, 47 regions, six autonomous regions, and twelve autonomous republics. The autonomous republics are: Bashkir, Buryat Mongol, Chuvash, Dagestan, Kabardino Balkar, Komi, Mari, Mordov, North Osetian, Tatar, Udmurt, Yakutsk.

Great-circle distances in statute miles between 18 important points in North America and 20 in Eurasia are shown in a table especially computed for the Top of the World map.

Comparison of these figures shows, for example, that Washington, D. C., and Seattle are virtually the same distance, about 4,200 miles, from Murmansk, Russia. Within this range from Murmansk lies our greatest concentration of population and industry, extending from the northwest Pacific coast through Minneapolis, Chicago, Detroit, Cleveland, Pittsburgh, New York, and the whole of northeastern United States.

In contrast, conventional shipping distance by land and sea from Seattle to Murmansk, including the crossing of the Pacific and Siberia, measures some 11,000 miles. There is less disparity in shipping distance from New York to Murmansk, because the ship routes closely follow the great-circle route and are only about 400 miles longer than the shortest air route.

The shortest routes from Winnipeg to Igarka or from Fairbanks to Murmansk and Leningrad lie almost exactly over the North Pole.

In the Eastern Hemisphere the borders of the new map extend from Tokyo in Japan to Istanbul in Turkey and through central Europe to the Brittany peninsula. Northern Japan, most of the U. S. S. R. from Vladivostok to the Caucasus, and all of northern Europe from Bucharest to Brest fall within these lines.

The new Russian industrial concentrations in the far east along the Amur, in the Lake Baikal region and the Kuznetsk Basin, in the Urals, and in the Arctic littoral are accurately mapped.

In both hemispheres the far-northern reaches, where East and West so nearly meet, are of particular interest. Until recently men have usually thought of their new frontiers as lying either to the east or west. Special polar charts have been made, but their main appeal was to a limited group of explorers and geographers.

The National Geographic Society's new map graphically portrays for the layman the reasons for the newly heightened interest in this area of the world.

Today East and West are largely developed. The modern pioneer seeks his wilderness to the north or south. The frigid northlands gradually are yielding their secrets to man.

Freedom Train Tours America

329 National Geographic Photographer John E. Fletcher

The Pride of the Marines Guarded Freedom Train's Treasures on Its 37,160-mile Journey

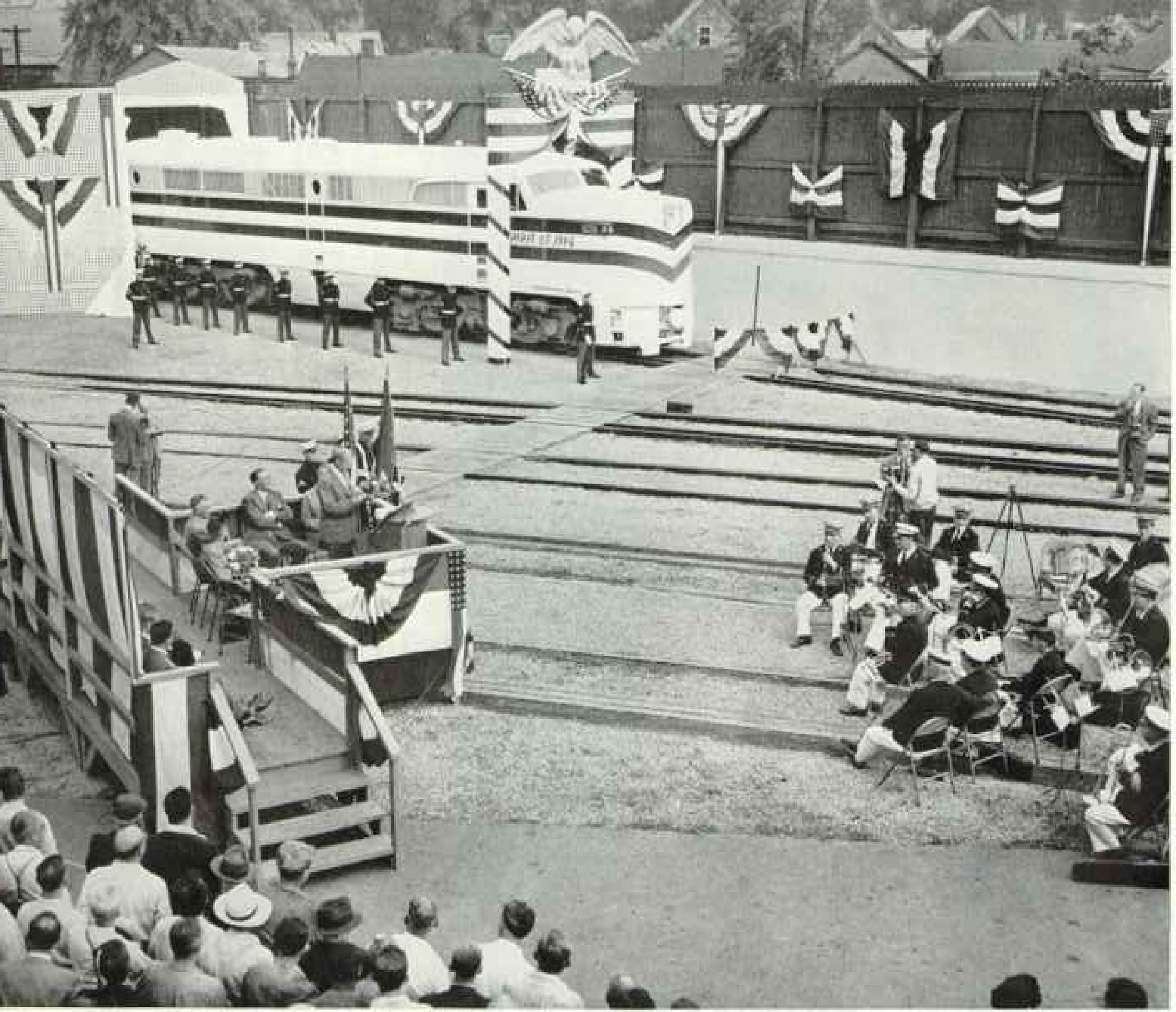
To show Americans many priceless documents marking milestones in their country's history, a special streamliner, the Freedom Train, began a country-wide tour of the United States on September 17, 1947. At the conclusion of its run last January it had welcomed 3,521,841 visitors in 326 cities. An average of 641 persons an hour poured through its three exhibition cars to inspect the rare cargo.

Here T/Sgt. F. J. Schauf (right), who rode the train during most of its trip, checks the day's schedule with one of the specially selected 27-man guard of United States Marines.

Historic papers exhibited ranged from a letter written by Christopher Columbus in 1493, announcing his discovery of the New World, to the Charter of the United Nations, signed in 1945. Other highlights of the display included the Mayflower Compact, Thomas Jefferson's original draft of the Declaration of Independence, George Washington's copy of the Constitution, and Abraham Lincoln's handwritten script of his Gettysburg Address.

Of the 127 documents, 30 were war papers—25 of them about World War II. Twelve others dealt with "revolt and protest." These began with the Magna Carta (1215) and ended with the American Revolution and the Treaty of Paris 568 years later.

Additional millions may soon have an opportunity to see the Freedom Train. Under terms of a bill recently passed by Congress and signed by the President, the Federal Government will acquire and operate the exhibit.



A Glistening New Streamliner Awaits Its Christening "Spirit of 1776"

Addressing the audience is Winthrop W. Aldrich, chairman of the American Heritage Foundation which sponsored the tour. Terming it a pilgrimage to reaffirm America's faith in free men, Mr. Aldrich said: "Without faith in the individual you cannot have millions of free, educated, resourceful, independent, self-reliant men and women."

Later his daughter, Mrs. Elizabeth B. Redmond, smashed against the gleaming engine a bottle of water from the Atlantic and Pacific Oceans, the Great Lakes, the Gulf of Mexico, and the Mississippi and Potomac Rivers.

A holiday air prevailed at the ceremonies held outside the American Locomotive plant in Schenectady on September 4, 1947, where civic officials and factory workers gathered for the send-off. Afterward the engine left for the Army Quartermaster installation base at Alexandria, Virginia, where the Freedom Train was made up.

American Locomotive Company

Sixteen Months Later the 2,000-h.p. Diesel Electric Rolls to a Final Stop in Washington, D. C.

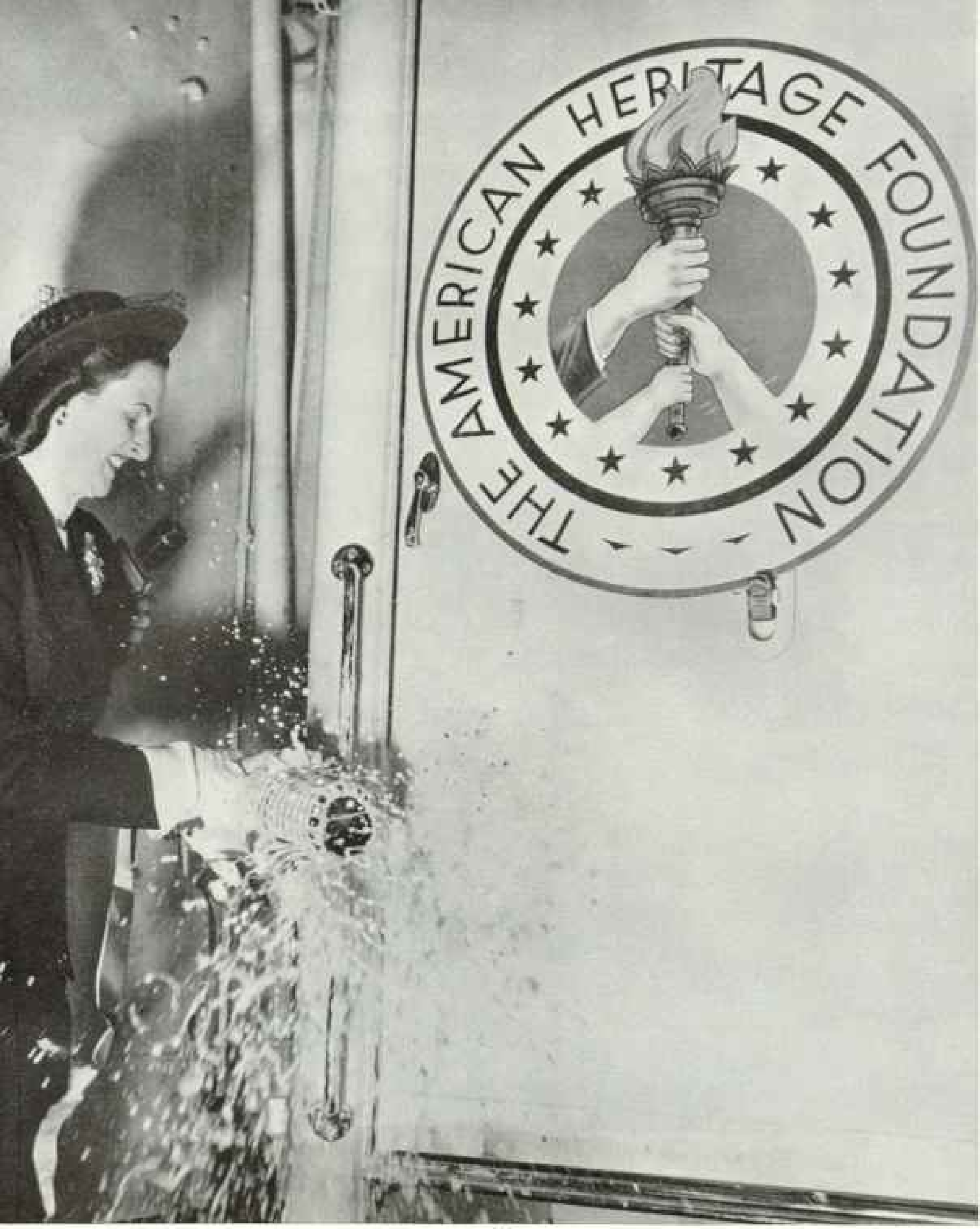
Almost 100,000 Washingtonians visited the Freedom Train when it concluded its tour in the Nation's Capital during Inauguration Week. Supreme Court Justice Tom Clark, then the Attorney General, who conceived the Freedom Train, stands (hat in hand) on the platform.

Even without its cargo, the train was unique in railroad history. Consisting of an engine, three exhibition cars, three sleeping cars, and an equipment car, it was painted gleaming white with single bands of red and blue running down its full length.

Superimposed on the stripes of the first car was a gold spread eagle and in gold letters on the next car were the words "Freedom Train." These alternated in the rest of the train.

Approximately 20,000 tons of steel were welded into the inner and outer walls of the exhibition cars. The vaultlike enclosures were considered virtually burglarproof. No thefts were ever attempted, however.

National Geographic Photographer
John E. Fletcher



532 Arms

Dedication Day Was the 160th Anniversary of the Signing of the Constitution

Two weeks after the Spirit of 1776 received a water christening, the complete train got a champagne sprinkling in Philadelphia, where the Constitutional Convention met in 1787. Here Mrs. Arthur C. Kaufmann smashes a bottle across a car door to mark the official opening of the exhibit. A few minutes later the first visitors stepped inside as the train began a three-day exhibition in the Quaker City.

Irving Berlin's popular song, "The Freedom Train," was introduced at these ceremonies, September 17, 1947.

The train called first at cities along the eastern seaboard, then swung south and west. It visited all of the 48 States. In the course of the longest journey in railroad history, none of the 9 civilians or 27 servicemen aboard traveled free. The American Heritage Foundation paid for their tickets.

333 National Geographic Photographer John E. Fletcher

On a National Geographic Society Map, Marine Guards Trace Their Zigzag Course

Quartered in the Freedom Train sleepers, the alert Marine detachment worked split guard shifts 24 hours a day. In addition they doubled as unofficial guides.

Such unusual duty involved the Marines in many odd experiences. The "Mystery of the Disappearing Stripe," for instance, still provokes laughs from the servicemen. It happened in Brooklyn one exhibition day when the Freedom Train's three horizontal stripes of red, white, and blue suddenly blended into just two—red and blue. The Marines were puzzled at first, then amused when they discovered the cause.

Over 4,000 high school girls had been standing in line, their lips on a level with the white stripe. One girl impulsively kissed the engine. The others followed suit, and their lipstick completely blotted out the white line!

534 National Geographic Photographer B. Anthony Stewart

This 14th-century Copy of Magna Carta Opened the Exhibit

King John, yielding to the demands of English barons, set the Great Seal on the Magna Carta at Runnymede in 1215. The pact, regarded as the first milestone in the march to English democracy, stipulated that no free man "was to be taken, imprisoned or outlawed, or in any way destroyed, except by the lawful judgment of his peers."

"... Life, Liberty, and the Pursuit of Happiness ..."

Thomas Jefferson's original draft of the Declaration of Independence, in his own handwriting, spellbinds two Washington youngsters. This carefully guarded manuscript bears editings by Benjamin Franklin and John Adams, as well as changes and additions made by Jefferson prior to its presentation to the Continental Congress.

The Freedom Train had a special meaning to another boy, Colin P. Kelly 3d. This seven-year-old son of the heroic Army flyer killed early in World War II, saw for the first time the letter written by President Roosevelt on December 17, 1941. The letter urged the appointment of young Kelly—then but a year old—to the United States Military Academy in 1956.

National Geographic Photographer B. Anthony Stewart

"The World Will Little Note . . . What We Say Here . . ."

Refuting its maker's prophecy, Lincoln's handwritten copy of his brief but memorable Gettysburg Address delights President Truman and Chief Justice Fred M. Vinson.

Lincoln spoke at the Pennsylvania town five months after the crucial battle of July 1-3, 1863. His speech was impromptu, from notes. Later he wrote it out and made five autographed copies.

Murals at left of showcase depict the theme of Lincoln's life and achievements, tracing his rise from log cabin to White House.

The President and Chief Justice were among scores of high Government officials who inspected the Freedom Train during its first visit to Washington in November, 1947.

International News

536

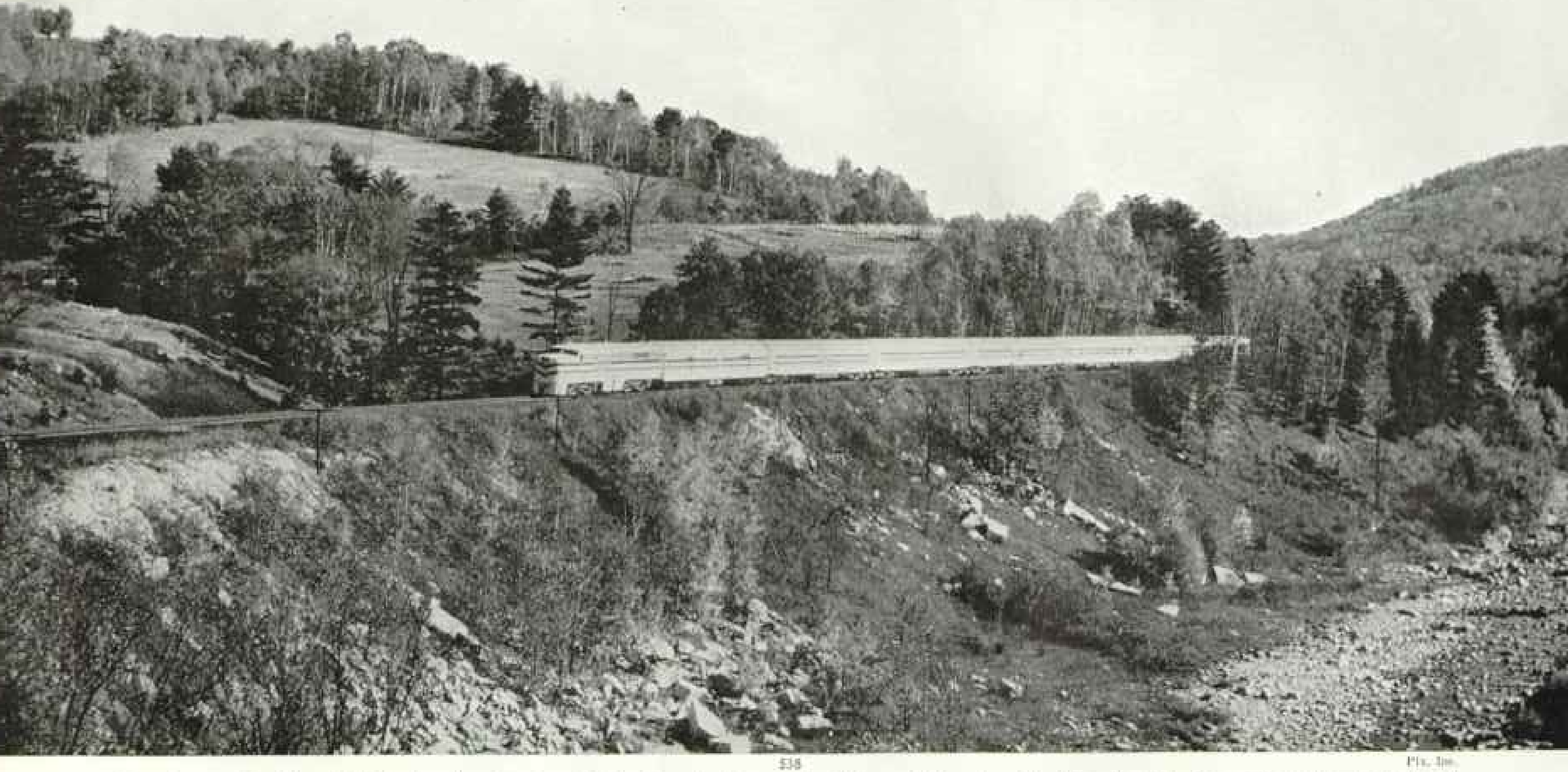
Patient Clevelanders Weave Snakelike as They Queue Up for the Freedom Train

Peak daily attendance during the tour was 14,615 and the low was 6,049 people who braved a fierce storm. The one-millionth visitor was a 16-year-old Oklahoma girl who traveled 60 miles in a blizzard to see the exhibit.

515 Aeme

Visitors Often Waited Four or Five Hours Outside the Train To Spend a Half-hour Within

In New York City the line started in Grand Central Station and ran 15 blocks, with people standing four abreast. Although 10 a. m. was the standard opening time, in many cities lines began forming before dawn.



Running on Presidential Priority, the Freedom Train Streaks Across the Vermont Countryside, Carrying Its Story Throughout the Land

Despite a tight schedule, the "blue flag" special never was late or missed a date. Every grading, bridge, and crossing was carefully guarded, all switches spiked. The train utilized facilities of 52 railroads; a round-trip ticket for the whole journey would have stretched 78 feet!

Visitors Reaffirm Their Faith in the American Way by Signing the Freedom Pledge Scroll

Like these hundreds in a Green Bay, Wisconsin, parkway, 80 percent of the Freedom Train's visitors signed the pledge, most of them during Rededication Week which preceded the train's arrival in each city.

As a build-up for the train's appearance, an area director visited each community six or eight weeks in advance to set up committees. Towns often vied with each other for the best showing by staging huge parades, pageants, and rallies.

Nearly half the population of Burlington, Vermont, turned out to greet the Freedom Train. Rededication Week saw George Washington, Paul Revere, Betsy Ross, and other colonial figures walk the streets as part of a historical celebration. In this little New England town, 10,529 spectators filed through the exhibition cars in a single day.

A record-breaking two-hour parade, drawing an estimated 250,000, climaxed Rededication Week in Dover, Delaware. A pouring rain couldn't dampen festivities in Elizabeth, New Jersey, where a great crowd, huddled beneath umbrellas, swarmed to meet the train.

Barbara Horner from
Green Bay Press Gazette

340 National Geographic Photographer B. Anthony Stewart

"Crooked" Walls Aroused Curiosity; Encouraged Visitors to "Turn the Corner"

The irregular pattern broke the monotony of a straight-wall exhibit and speeded spectator traffic. Documents were recessed in steel cases in the light-green walls and covered with bulletproof glass.

"When You Invest in Government Bonds, You Invest in Freedom"

Large-denomination savings bonds intrigue two youthful Schenectady visitors. Small bronze stars held the certificates in their cases. In the first month 1,100 of these pins vanished into souvenir hunters' pockets.

Acme

541

Acme

"That's the Flag Our Troops Raised on Iwo Jima"

Sgt. John A. Brown points out to Johnny Markel of Brewster, New York, the very flag that six gallant Americans planted atop Mount Suribachi on February 23, 1945, during one of the fiercest battles of the Pacific. Five Marines and one Navy Medical Corpsman—three of whom were later killed in action—braved enemy fire to raise Old Glory in one of the most stirring episodes of American history.

The Iwo Jima banner was borrowed from the Marine Corps Museum at Quantico, Virginia, for the Freedom Train's "Flags of Freedom" section. Commodore Perry's emblem, the SHAEF (Supreme Headquarters, Allied Expeditionary Force) standard, and General Eisenhower's flag were also featured, as well as the ensign flown from the U.S.S. *Missouri* when the Japanese formally surrendered in Tokyo Bay.

Tailor-made Lucite Envelopes Were the Documents' Travel Attire

National Archives employees Mary Handley and Margaret Mangum seal the documents in colorless, clearer than glass, plastic cases. These covers, one inch thick, protected the valuable papers and books from deterioration during the long tour.

The Freedom Train's cargo was so old and delicate that in hot weather 32,000 pounds of ice were consumed every twelve hours to maintain a uniform temperature of about 75 degrees throughout the cars.

The train's next tour will be aimed primarily at children, according to officials of the National Archives, which is authorized by the congressional bill to acquire and operate the train.

International News

"This Heritage of Freedom I Pledge To Uphold . . ."

Members of the Sons of the American Revolution in Boston donned colonial costumes to greet the exhibit. Here Capt. Raymond Bowley looks on as Natalie Gearin of Somerville, Massachusetts, signs the Freedom Scroll.

All visitors were invited to sign, thus signifying their faith in the American democratic way of life. Even several thousands who were unable to visit the train mailed in their signatures. The pledge contained nearly three million names at the conclusion of the tour (page 539).

Seeing history instead of reading it was a treat for school children. In Boston, as elsewhere, whole classrooms adjourned to the railroad station when the Freedom Train pulled in.

Myer Ostroff from International News

Milestones in My Arctic Journeys

By Willie Knutsen

I HAD JUST come back to Boston from one of my Arctic trips when a casual acquaintance invited me to dine.

On my dinner plate, with other delicacies, was a yellow-green mound of wax beans. I lifted a forkful of the vegetable to my mouth. Without thinking, I mumbled half-aloud:

"Mmn-mm! Tastes just like seaweed."

My host arrested his knife, halfway through a slice of beef, and glared at me.

"What did you say, Mr. Knutsen?" His tone was icy as a Greenland glacier.

Confusion flushed my face, for I knew he was offended.

Following the maxim that the best defense is a strong attack, I boldly repeated in a firm voice:

"I said these beans taste just like seaweed."

"That's what I thought you said."

Conversation lagged for the rest of the meal.

Actually, my remark had been a compliment. I like raw seaweed very much, and not just because it's "good for me." It is perhaps the best antiscurvy food that's widely available in the Arctic.

Seaweed is to me just as palatable as—well, as wax beans!

As the saying goes, "It all depends on the point of view." I've found there's nothing that broadens the point of view so much as 12 years in the Arctic.

New Weather Posts Stud the North

Last year I was executive officer, a civilian post, at one of the new Canadian-United States weather stations that stud the Arctic islands of Canada.

My location was Prince Patrick Island, in latitude 76° 30′ N. Prince Patrick is next-to-most-westerly of the huge chunks of land composing the Arctic archipelago of North America.

Like stones in a stream, those islands cause swirls and eddies in the ice-jammed ocean currents which ebb and flow between Baffin Bay and the Arctic Ocean.

Never before has attention been so sharply focused on the air and sea frontiers of the circumpolar "land crown."* There Eurasia and North America face each other across ice-locked seas. Until recently the rigors of those wastes have held at a distance all but explorers, adventurers, and a few Daniel Boones of science.

My assignment to Prince Patrick Island was only the most recent milestone on the long, long trail of my 12 years in the far north. I hope that when I come to the end of that trail, I'll look back on that experience as one of my *earlier* Arctic adventures!

That wish reveals my plight: I am hopelessly—and happily—caught in the siren toils of the North.

The Arctic is tremendous. So far, men have made no more impression on it than would a mouse nibbling at a whale. One still can travel a thousand miles in the far north and never see a trace of human activity.

New Island, Nearly as Big as Connecticut

An island 4,100 square miles in area (nearly as big as Connecticut) was discovered just last year (1948)! Prince Charles Island was found, not in remote high latitudes, but in Foxe Basin, just north of Hudson Bay.

Yet in this "backward," almost unpeopled Arctic, I've sat with tawny Indians, just off the trap lines, on swivel chairs in an Army post exchange. We were drinking Cokes and sodas, not black tea or hot deer fat.

Between the Arctic Circle and the North Pole jeering "cat" skinners have clattered past me, as I thrust along on skis, in vehicles ranging from huge tractors to nimble snowmobiles.

I've watched Eskimo in Baffin Island shuffling contentedly around a juke box. They had no trouble keeping time to music written to tempt terpsichorean talent in Hollywood and Harlem, not in snowy wastes north of the Arctic Circle. Between dances they ate popcorn and ice cream.

In my wildest boyhood dreams I would never have tolerated the thought that one day I would do military duty in the North as "Officer in Charge of Pigs"!

A Norwegian Born in Brooklyn

To hear me talk—in accents of the Hansens, Olsens, and Nilsens—you'd never guess I was born in Brooklyn. But I was, within a harpoon's throw of Prospect Park. Both my parents were Norwegians (page 544).

When I was a year-and-a-half old, my mother took me back to her home in Tromsø, north of the Arctic Circle. That's where I spent half my young life, among the fjords, tundra, and stark mountains of Europe's attic.

My earliest travel experiences were among the colorfully clad nomad Lapps. As a boy I visited their summer camps near Tromsø.

In 1932 I made a summer crossing of Lapland from the Norwegian coast, through Finn-

* See "Top of the World," page 524.

Ilmil Halvorsen

In Subzero Cold the Author Thinned Paints with Gasoline

Willie Knutsen studies his ship, *Quest*, frozen in the ice at Loch Fyne, east Greenland (page 549). It is March and the temperature 25° below zero. Knutsen found unthinned paint separated into tiny pearls on the canvas. From Lapland came his coat of reindeer skin; his Finnish shoes are of the same material. A Norwegian fur-lined sealer's cap keeps his ears warm.

ish Lapland, and into Swedish Lapland.*

The clouds of mosquitoes and black flies dimmed the sun like smoke from a forest fire. There were two of us, a Swedish student and I. We were frequently up to our waists in the swampy tundra and had to wade a hundred streams.

On my return from this trek I developed a bad case of bronchitis. The doctor said I'd be wise to give up wilderness travel and settle for a white-collar job.

I hope he reads this!

My love of the outdoors and of the tough, self-reliant people who live at civilization's fringe translated itself into a desire to paint and carve those folk in their life's setting.

It was not long before I found myself in that paradise of Arctic artists' dreams—Greenland!

At the beginning of my Lapland trip I had met Count Gaston Micard. He was setting out on a summer trip to ice-capped Greenland, the world's largest island, belonging to Denmark.

"Would You Like To Go to Greenland?"

"Willie," he said, "I'm going to make a winter trip to Greenland one of these years. Would you like to go?"

I swallowed hard and said, "Yes, sir! I'd do anything to get there."

In 1936, when I was 24 and an art student in Durham University, England, I saw a newspaper story announcing the imminent departure of Count Micard on a year-long expedition to northeast Greenland.

I wrote to him at once, reminding him of our conversation four years earlier. Could he use a good man on the trip?

A week later I had to return to Oslo, Norway. I found a job in an architect's office. On a Monday morning I reported for work. Five minutes after I sat down at my desk a telegram was handed to me.

"Come immediately." Signed: "Micard." The wire came from Tromsø.

A week later, architecture forgotten, I was at Micard's side as we sailed out of Tromsø headed for northeast Greenland.

Our vessel was Sir Ernest Shackleton's *Quest*; Count Micard had chartered it from

* See, in the National Geographic Magazine: "Nomads of Arctic Lapland," by Clyde Fisher, November, 1939; and "Lapland's Reindeer Roundup," 14 color photographs by Göran Algård, July, 1949.

U. S. Coast Guard Official

Ringsel, Author's Escape Ship from Norway, Brings New Weather Observers to Torgilsbu

In August, 1940, just four months after the Germans invaded Norway, Knutsen set sail for Greenland in the *Ring Seal*. The Germans did not detain him, probably because he was born an American citizen in Brooklyn, though he had returned to Norway as an infant. The picture was taken in southeast Greenland from the U. S. Coast Guard cutter *Northland*, Capt. (later Rear Admiral) Edward H. Smith commanding. It was "Iceberg" Smith who arranged for Knutsen to return to the United States (page 558).

the Norwegian shipping firm that had bought it from its British owners (page 549).

As for Greenland and me, it was love at first sight! I still thrill recalling the wonder of jagged mountains, blue fjords, and glittering icebergs (pages 552-3).*

At Cape (Kap) Stosch in Godthaabs Gulf (Golf) the *Quest's* crew helped Karl Nicolaisen and me rebuild an old Norwegian trapper's hut.

Karl and I planned to trap foxes and hunt seals and walrus for a year.

Then the *Quest* sailed up to the head of Loch Fyne fjord and froze in for the winter. Members of the ship's party also spent the winter trapping foxes.

Of our catch, 90 percent were white foxes and 10 percent blues, the latter six or seven times more valuable than the whites.

The crop of foxes and other wildlife in the Arctic seems to depend, to some extent at least, on the prolificacy or scarcity of lemmings.

Lemmings are those small, mouselike rodents that in some years inhabit the northern tundra by the millions. The cycles of their abundance and scarcity present a biological puzzle.

In the early fall Karl and I found lemming burrows dotting the tundra like holes in a Swiss cheese.

Lemming Army, Locked in Ice

The first sharp October freeze laid a clear skin of ice on the bays strong enough to support us and our sleds. Karl and I crossed to the west shore of Godthaabs Gulf next day to set some deadfall traps for foxes. The ice was so clear we seemed to be gliding over flat-calm water.

* See "Greenland from 1898 to Now," by Robert A. Bartlett, NATIONAL GEOGRAPHIC MAGAZINE, July, 1940.

Eigil Halvorsen

Even on the Deck of the *Quest*, Count Micard Put Up His Umbrella

"Wherever he went," the author says of Count Gaston Micard, leader of two Greenland expeditions, "he carried a silk umbrella patterned with streaks and splotches like a World War II jungle camouflage suit." Mr. Knutsen describes the far-traveled French count as "certainly one of the kindest and most considerate of leaders" (page 551).

Nearing the shore, we stumbled on an amazing sight.

A frozen army of lemmings was marching to meet us! Hundreds, perhaps thousands, of the tiny creatures were struck motionless there before us, like ancient flies entombed in amber.

They all were heading in the same direction, toward the open fjord. We reconstructed what had happened.

Many Arctic travelers have been astonished to come upon lemmings in numberless hordes parading into the sea to certain death. This odd example of mass suicide isn't fully understood. One reasonable explanation seems to be that the little animals run afoul of the sea while on migration from overcrowded dwelling places.

These lemmings had met their icy fate when they streamed into shallow slush near shore. A hard freeze that night locked them fast in their transparent prison. They had walked their last mile.

Our hut at Cape Stosch was about 20 feet by 10; it had been built of wood that drifted across the polar seas from Siberia to northeast Greenland. Karl and I piled sod all around the cabin to seal it against winter winds.

Karl Nicolaisen

Author Sits on the Musk Ox That Nearly Killed Him by an Unexpected Charge

While Mr. Knutsen was quietly painting near Cape Stosch, this east Greenland musk ox "broke the rule" and suddenly attacked him. Labb, ordinarily a timid dog, was snoozing beside his master, but came to life and flew to meet the charging beast. This delaying action gave the author time to clear his jammed gun and shoot the animal. Karl Nicolaisen, hearing the shot, ran up and snapped the scene (page 550).

There were double-deck bunks for Karl and me and a third, smaller bunk for Labb.

Labb was my dog, half Husky and half St. Bernard. He would place his great forepaws on the edge of the table and eat from a plate just like Karl and me.

Labb (*labb* is Norwegian for "paw") was a pampered pup. He had lived with a maiden lady in Tromsø who had utterly spoiled him by feeding him cakes and chocolate creams. No wonder he weighed 80 pounds!

When we first went ashore in Greenland, Labb was afraid of his own shadow. The sled dogs darted at the first musk ox we encountered, snarling, barking, and wagging their tails with the joy of the chase.

Not Labb. He put his tail between his legs and made sure I was always between him and the nearest *Ovibos moschatus*.

Fair game for Labb was the little lemmings. When he saw one of them (he could have crushed two under one paw) the hackles rose on his neck and he would bark bravely. Yet even those tiny creatures startled him, when they made quick movements trying to escape.

Resignedly we accepted the fact that Labb was a Ferdinand among dogs.

One day in the spring Labb and I wandered

By the Light of the Midnight Sun, Count Micard Drives His Dog Sledge to Cape Mary To Hunt Walrus

Eskimo can find their way even in a blizzard by following the lines of the hard blown snow that parallels the prevailing wind direction. As it is May, the party traveled at night, because the snow was too soft in daytime.

Shackleton's Old *Quest* Lies Ice-locked in a Greenland Fjord

After months of Arctic darkness, the February sun is just peeping over the southern horizon. Dimly seen to the right are sledges and igloos that house the expedition's Eskimo dogs.

Ice has ridged against the *Quest* as she lies in Loch Fyne near Gael Hamkes Bay (Bugt), east Greenland. She was purposely frozen in to allow the expedition to hunt and to conduct scientific exploration during the winter. She arrived August 15, 1936, and sailed away August 1, 1937.

In this husky ship the famous British explorer, Sir Ernest Shackleton, sailed on his fourth voyage to the Antarctic in 1921; he died aboard her on January 5, 1922. The *Quest* carried Count Gaston Micard and the author to Greenland in 1936.

Shackleton was knighted after his 1908-09 expedition reached "farthest south"—97 miles from the South Pole. In 1914 he sailed southward again on an ambitious expedition to cross the Antarctic Continent by way of the South Pole between the Weddell and Ross Seas. This bold effort was cut short when his ship, *Endurance*, was crushed and sunk by the ice of the Weddell Sea.

The *Quest* was a Norwegian sealer, *Foca I*, when Shackleton bought her. Completely overhauled, the veteran ship has recently resumed sealing voyages under the Norwegian flag.

Eigil Mathiesen from Three Lions

Capt. Robert A. Bartlett

Puppies Replace Dolls and Teddy Bears for Eskimo Youngsters near Angmagssalik

First visitors to treeless Greenland always wonder where the natives get the wood from which their crude shelters are built. Much of the timber, like these big logs, is driftwood, probably from Siberia. The boy wears sealskin bootees and a furry cap made from the soft fur of a newborn seal. Sled dogs on the island rarely molest Eskimo children.

out for a morning's sketching in the hills back of Cape Stosch. A small herd of musk oxen was grazing on the plain at the foot of the mountains.

Having lots of meat, we weren't interested in hunting. A lone bull on outpost guard stood motionless, as if cut in granite.

We climbed a mile or so to the top of a small plateau. On my drawing block I started to sketch in the bold lines of snow-patched peaks. Labb snoozed at my side.

Suddenly I heard the clatter of hoofs behind me. Wheeling about, I saw a musk ox charging head down. The animal's heavy chocolate-brown hair quivered with each stride.

Musk Ox Charges, Gun Jams!

With a single motion I dropped my crayon, swept up my rifle, and slammed back the slide to cock it. In my frightened haste the shell jammed in the chamber!

Perhaps some special sense told Labb that something had gone wrong. Anyway, reversing his timid character, he flew to meet the oncoming musk ox, barking like a mad demon. He leaped for the burly creature's throat.

The musk ox slid to a stop and shook his shaggy mane to throw off his attacker. Labb danced around him. Distracted by the dog, the musk ox forgot me. I cleared my jammed rifle, stepped up close to avoid any chance of hitting Labb, and fired into the beast's ear.

Labb was frantic with delight. He dashed back and forth between the slain musk ox and his master, growling at the animal and jumping up on me to lick my face.

"Labb, old boy, you saved my life!" I gave the dog a mighty hug.

The musk ox was a female. We followed her tracks back over the brink of the hill. Part way down the slope a set of small tracks turned from the big ones and trailed off.

It was clear what had happened. Sniffing Labb and me up above, the mother had warned the youngster at her side that danger lay ahead and sent it off back down to the herd. Then she rushed up to the plateau, determined to destroy the enemy that she fancied threatened her calf (page 547).

A year later, when I was back in Greenland, I met Alwin Pedersen, authority on the musk ox. He was with the Danish expedition under Count Eigil Knuth. I told him about the incident narrated above. He just laughed.

"Absurd!" he said scornfully. "No musk ox ever charged a man. You must have dreamed it."

Two days later Pedersen and I and a few dogs came suddenly on a small herd grazing in a grassy swale. When danger threatens (usually attacking wolves), musk oxen ordinarily form a tight defensive ring, rumps together and massive heads with heavy horns lowered outward toward the enemy.

On this occasion the animals were strung out feeding. Pedersen clapped his hands, expecting the sharp cracks to scatter them from our trail. But all nine fooled him and charged us instead!

I'll never forget the look of bewilderment on Pedersen's face. He was witnessing the upset of a principle as incontrovertible to him as the rising and setting of the sun.

Quickly recovering from his shock, Pedersen joined me in cutting the dogs loose from their lines. The bare-fanged canines stopped the galloping musk oxen. Instinctively they went into their protective football-huddle-in-reverse.

Dog Friendship Is Precious

The importance of dogs as companions in the North can't be exaggerated. Many a traveler who would surely have gone out of his mind with loneliness has found comfort and fellowship in his dogs.

Good dogs always are alert in an emergency. Gerhard Antonsen was the most famous trapper in all northeast Greenland. The Scandinavian hunters knew him as the "King of Revet" (Revet was the location of his main cabin).

Antonsen was marooned by a bad storm at a hut far up Tyroler Fjord. The wind raged that night and finally broke the door catch. The King pulled out his *tollekniv* (Norwegian sheath knife) and stabbed the blade into the door frame to hold the door until he could fashion a new turning catch.

Antonsen found a piece of wood and sat down to the job. A mighty gust of wind struck the door like a sledge hammer. The knife was torn from the door frame and with diabolic aim flew across the room and pierced Antonsen's left eye.

With a shriek the King came to his feet and pulled the offending weapon from his eye. Blood poured down his cheek.

But the worst thing was that he could not see even with the undamaged eye. In some strange sympathetic paralysis, the right eye was as blind as the knife-split left one.

Antonsen collected his nerves from the frightful shock. Early in the morning he piled his sled with blankets and furs, hitched up his dogs, lay down on the sled, and told the faithful animals to go home.

Hours later he was delivered to his main cabin, where he fumbled around until he found his first-aid kit. He dressed the wound and resigned himself to waiting for help. He still was totally blind.

The King had made an arrangement with the Danish weather station at Eskimonæs (Daneborg) to come looking for him if an unusually long interval passed since his last visit. Eskimo soon found the hunter at Revet and took him to Eskimonæs.

Under competent care Antonsen regained sight in the unhurt eye. When he went home to Norway for further treatment, the doctor was able to give him back limited use of his left eye also.

"You know," the doctor told him, "if that accident had happened in the city, with bacteria and irritants in the air, I doubt that we could have saved your sight."

"Doctor," Antonsen said, "if I hadn't had the help of my dogs, I doubt that I would be *alive* today!"

During that winter of 1936-37 Karl and I made three trips up Loch Fyne to where the *Quest* was ice-locked near the shore. I used to wander over the hills with Count Micard, certainly one of the kindest and most considerate of leaders.

Count Micard Had Been Everywhere

Micard had been everywhere. He had a restless hunger to see far places.

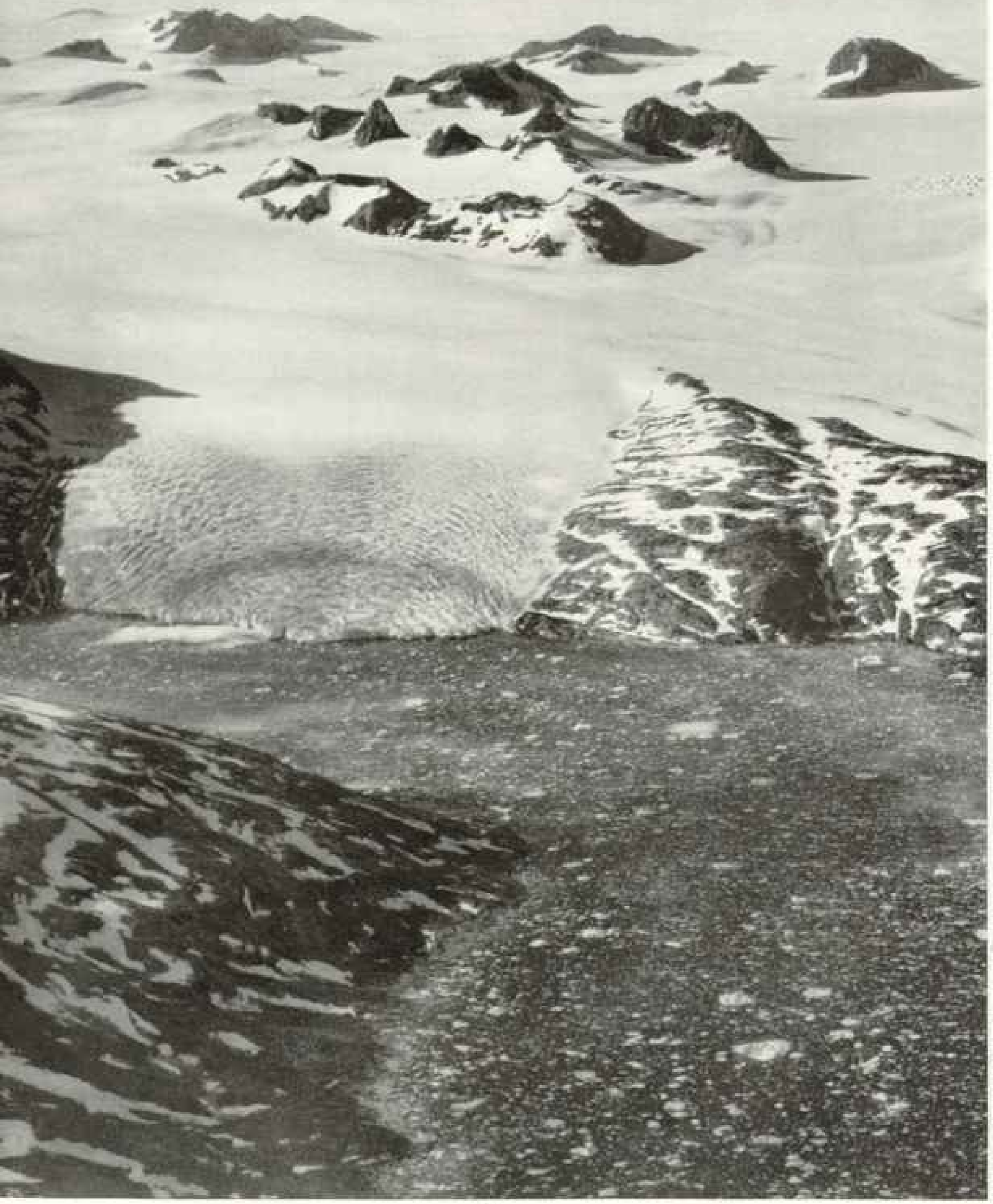
Moreover, Micard was a profound man. I've seen him sit for five hours at a time in one spot, just drinking in the moods and aspect of the immense Greenland landscape.

Like many out-of-the-ordinary men, Count Micard had eccentricities. Wherever he went, he carried a silk umbrella patterned with streaks and splotches like a World War II jungle camouflage suit (page 546).

For his trips behind the dog team he had the men make him a sled with two armchairs, set back to back in the middle. One faced forward, the other aft. When sun or storm beat too rudely in the Count's face, he moved to the other chair and turned his back on the elements! (Page 548.)

Many a Paris restaurant might have picked up tips from the food served on the *Quest*. Count Micard brought with him a Norwegian cook who had been specially trained in French dishes.

Soufflées, mousses, and crêpes suzettes made our mouths water, but were so taken for granted that no eyebrows lifted when they appeared on the table. Yet one of Count Micard's favorite dishes was raw polar-bear meat, ground up like hamburger.



551

Millions of Tons of "White Lava" Spill Through Gaps in Greenland's Mountain Wall

Hundreds of huge glaciers, such as these near Cape Cort Adelaer, pour majestically from the icecap into bays and fjords around the rim of Greenland. Some move 70 feet a day. The inland ice apparently fills a vast land bowl ringed by jagged peaks; it squats astride four-fifths of Greenland, the world's largest island.

MATS, Official

Icebergs Calve from the Glaciers and Set Out on What May Be a Long Voyage

Some of these east Greenland bergs strand alongshore; some scatter in ocean eddies; others big enough to survive sun and wave drift with currents around the south tip of Greenland and up the island's west coast. Most bergs that eventually cruise into transatlantic shipping lanes are born in west Greenland.

Capt. Robert A. Bartlett from Gendreau

Slim Kayaks, Built for Work, Also Serve for Play

When fishing and sealing are dull, Greenlanders compete in kayak rolling (page 496). Each man capsizes his sealskin-covered craft and from head-down position rights himself with a dextrous twist of the paddle. He may spin over and over. Handling a skittish kayak is like riding a bicycle: you're all right as long as you keep moving! This welcoming committee came out to meet the late Capt. Robert A. Bartlett's schooner, *Effie M. Morrissey*, at Angmagssalik.

In 1938-39 Count Micard and I returned to Greenland. We were co-leaders of what we called the Norwegian-French Expedition to Northeast Greenland.

Our ship was the *Ringsel* (*Ring Seal*), renamed the *En Avant* (*Forward*) in recognition of Count Micard's support (page 545). In the summer of 1938 we sailed to the Greenland coast in the vicinity of Clavering Island. Then we turned north inside the pack ice.

This was the region where the U. S. Coast Guard and Army played cat-and-mouse a few years later during World War II with invading German weather observers. With the help of Danes of the Greenland Sledge Patrol, the American forces finally harried the last of the Nazis out of the country in 1944.*

Shelf Ice Forms Landing Stage

To set up our main outpost, called Micardbu (Micard Hut), we sailed the *En Avant* along the coast of Germania Land to about latitude 77° N. Tying to the land-fast ice (the shelf of thick ice that stays locked to the shore, often for years), we unloaded tons of supplies and equipment.

The ship wintered some 30 miles to the south at the north end of Store Koldewey Island.

From Micardbu we transmitted weather reports three times daily by radio to Norway via Spitsbergen. Two scientists directed studies of cosmic rays, the aurora borealis, and earth radiation (heat loss to the atmosphere).

We built a hut at Thomas Thomsen's Nose, north of Micardbu, as a jump-off place for sled trips north along the coast.

On reaching the cabin one day, I found about 40 packages of our favorite goat cheese scattered around half an acre of snow. There was a hole in the hut almost big enough to walk through standing up.

The marauder obviously was a polar bear. He had happened to stumble upon the goat cheese cases, and had thrown them outside, broken open every separate paper package, and taken a generous bite out of each one!

We killed ten polar bears that winter. Four of them we got with gun traps.

Near our unmanned food depots we set a box, open at one end, on legs to lift it above snow level. Into the closed end of the box we inserted a sawed-off rifle with the stock removed. To the trigger was attached a cord that led to a chunk of meat placed in the center of the trap.

A curious and hungry bear would put his head in the box to grab the meat, thereby pulling the trigger string—and adding a bearskin to our collection.

Polar bears are magnificent animals. We killed them only for food and to keep them from molesting our supply dumps. Their strength, courage, and cunning are proverbial (page 487).

I've heard a number of well-documented stories of polar bears attacking human beings. Usually such attacks are provoked. There was, however, the sobering and tragic experience of the artist John Tutein in east Greenland.

Tutein had taken his canvas out to the tip of the land-fast ice on Cape Broer Ruys in the summer of 1921. With his back to the shore, he painted the scene of icy seas and distant mountains.

Tutein's brother, Peter, in a cabin a mile or two away on the shore, happened to look out the window and saw a bear plodding up behind the preoccupied artist. Before Peter could move to shout or fire a warning shot, the big white beast smashed John's head with one swipe of a mighty paw.

Christmas Dinner, Delivered "on the Hoof"

On Christmas Eve at Micardbu we cleared the supper dishes from the table, and the cook began to set it for next day's holiday feast.

"Hope you boys aren't too hungry," he said. "We've eaten up all the fresh meat. The Christmas menu will be canned pemmican and dehydrated vegetables."

Someone who'd stepped outdoors came bursting in, shouting:

"There's a musk ox stumbling around in the dark just outside the hut! Pass me my rifle!"

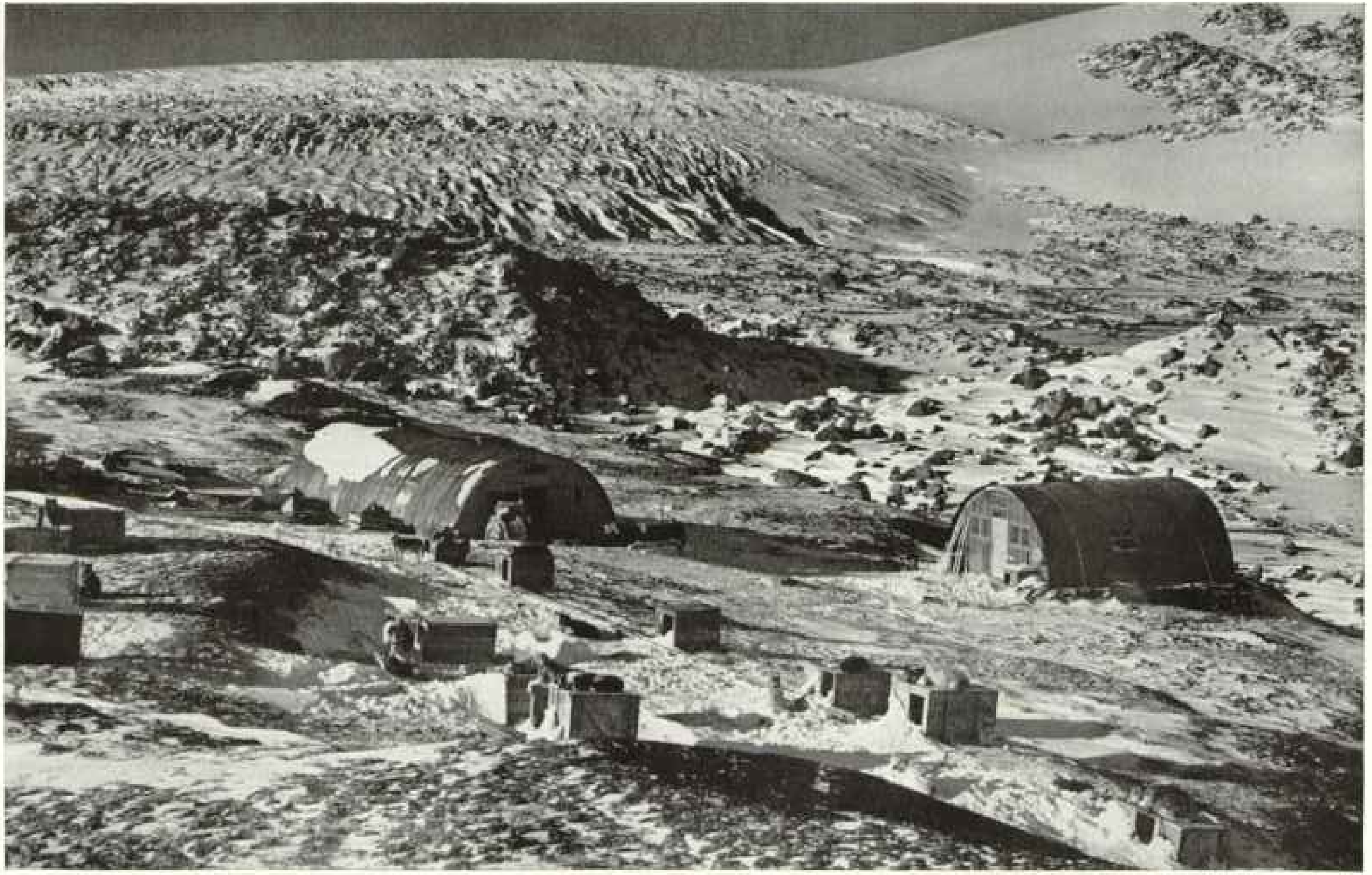
With what a glow of wonder and gratitude we feasted next day on the musk-ox steaks so providentially provided!

In May of 1939, just as we were laying detailed plans for the summer's explorations, Count Micard fell ill of some strange malady we weren't able to treat. We radioed Norway for help. The *Veslekari* hurried westward to our aid. It carried a small seaplane.

The *Veslekari* approached as close as it could south of Shannon Island. The plane landed among the floating ice off Micardbu and evacuated Micard and me to the ship.

Thanks to the prompt transportation and material aid, the Count made a speedy recovery back in Norway. Meanwhile, I tried

*See, in the National Geographic Magazine: "Americans Stand Guard in Greenland," by Andrew H. Brown, October, 1946; "Servicing Arctic Airbases," by Robert A. Bartlett, May, 1946; "Greenland Turns to America," by James K. Penfield, September, 1942; and color illustrations in September, 1941, and May, 1943.



Maj. Robert B. Kirkes, Jr.

An Ice River Wrinkled with Age Slowly Melts Away, Leaving Piles of Rocks Beyond the Weather Station

Like many Greenland glaciers, this one is shrinking. The outpost at Cape Cort Adelaer, southeast Greenland, built by U. S. forces during World War II, is now manned by Danish personnel. Sled dogs bark beside their supply-crate houses along "Husky Row." From temperature, barometric pressure, wind data, and other information radioed from dozens of such northern stations, weather forecasts are made for North America and the North Atlantic.

V. Paulsberg from Three Lions

Once a Year This Lonely Beach Bustles with Activity When the Ship Comes To Exchange Supplies for Furs

The Norwegian flag flies above the trappers' hut on bleak and barren Wollaston Forland, east Greenland. Two men base here, trapping foxes and hunting walrus and polar bear. Small boats from the *Polarbjorn* bring food, bags of coal, and equipment ashore. After decades of Arctic service, this veteran Norwegian ship burned and sank last spring on the Newfoundland sealing grounds.

to get support for a second year for our Greenland expedition.

But it was the period of Munich and the verge of war, and we had to call back the boys from Greenland and wait for more tranquil times.

I Escape from Norway

In April, 1940, the Germans invaded Norway.* In July I managed to get away for Greenland in the faithful *Ringsel*, her old name restored. The Nazis apparently were afraid to interfere with the expedition because I, the leader, was an American citizen.

I haven't been back to Norway since that fateful summer.

Our first stop was at Angmagssalik. It and Scoresbysund are the only two important towns in east Greenland.

Capt. (now Rear Admiral) Edward H. ("Iceberg") Smith, on Greenland Patrol in the U. S. Coast Guard cutter *Northland*, dropped anchor there, too. Learning I was an American citizen, he offered to arrange for me to go to the United States.

Captain Smith took a dim view (as I must admit I did myself) of my returning to Norway to surrender myself to the tender mercies of the Nazis.

Because I'd been lucky enough to be born in Brooklyn, I was taken to Julianehaab, southwest Greenland, transferred to the U.S.S. *Campbell*, and landed safely in New York.

Back to the North Again

After marrying an American girl; after a year in Juneau, Alaska; and after my first child, a girl, was born, I was commissioned a Second Lieutenant in the U. S. Army Air Forces in March, 1943—and headed blithely for the Arctic again.

I was assigned to the Arctic Search and Rescue section of the Air Forces. After a period of training, I was sent north to the new airfield at Frobisher Bay on Baffin Island.

Baffin Island is north of trees. In summer Arctic shrubs leaf and wildflowers bespangle the hills. In winter the land is a desolation of rocky emptiness, ridged with snowdrifts and dotted with blue-green ice where gales have swept clear the hundreds of small lakes.

Despite its wild, inhospitable setting (or perhaps because of it!) Frobisher Bay generally was considered the preferred far-north military station during the recent war. Here was the camaraderie of a frontier outpost. The GI's liked the freedom from spit-and-polish soldiering.

It was a small base manned by just enough men to do the job. That job was operating a landing field and sending out weather reports to stations making forecasts to aid the heavy flights across the North Atlantic.

Part of my duties was to take charge of the kennels where we kept our Huskies always ready for a possible rescue mission, should a plane be forced down in our territory.

Once I had to take a new cook overland to Lake Harbour to replace an ill soldier who had the chow chore. It was in the bitterest time of the winter, January, 1944.

We set out with two teams of 12 dogs each. The new cook lay bundled up on one sled.

It was a grueling four-day trip. The temperature the second night dropped to 54° F. below zero. At suppertime we were half frozen after building an igloo to sleep in. We tapped a bottle of medicinal spirits that we carried for emergencies. It was frozen to slush.

Long Walk Saves a Cook

The second day the new cook said he wouldn't go any farther. If this was the Army, he'd take it in the swamps of New Guinea. So he said!

I spoke a little more roughly to him than the book allows an officer to do. Then I lifted him out of the sled, where he lay huddled in a blue funk, and told him to get moving.

"If I lay shivering on a sled, my blood congealing from inaction, I'd be ready to give up too," I told him.

That cook *walked* the rest of the way to Lake Harbour. When we arrived, he took my hand.

"Thank you, Lieutenant," he said. "I'm sure glad you made me stick it out."

"That's all right," I answered. "I've felt like quitting plenty of times myself."

In the summer of 1944 I went to Goose Bay, Labrador, as commanding officer of the Search and Rescue unit at that important ferrying base. Thousands of bombers stopped off at Goose Bay during the war en route to the battle fronts of Europe.†

With that tremendous air traffic, and because most of the pilots were relatively inexperienced youngsters, it was inevitable that a few planes should come to grief in the utter wilderness that surrounds Goose Bay for hundreds of miles (page 568).

If our missions were sometimes sad ones,

* See, in the National Geographic Magazine: "White War in Norway," by Thomas R. Henry, November, 1945; and "Norway, an Active Ally," by Wilhelm Morgenstierne, March, 1943.

† See "Newfoundland, Canada's New Province," by Andrew H. Brown, National Geographic Magazine, June, 1949.

Willis Mouton

Gossiping, Nursing, Pipe Smoking: Greenlanders Love To See and Be Seen

Old-fashioned topknot headdress sets apart the woman with her infant in the baby pouch *(amaut)* at Angmagssalik. She and the other women and girls sit in a woman's boat, or umiak (pages 486, 491, 497). On the decks of their kayaks, behind, Eskimo men carry inflated sealskins, used as floats when harpooning seals (page 481), and baskets for coiled lines.

there was some recompense in exploration of the virgin, unspoiled bush country. The land was imperfectly known even to the Indians and half-breed trappers who reap its harvest of mink and fox, beaver and marten.

We poled and paddled up rivers alive with trout. On the mountains we shot caribou and bear. Many a fat goose and duck found their way into the cook pot at our camps deep in the forest.

I often gave thanks to the fates—*and* the military authorities—who were kind enough to let me do war work for which I was cut out by training and inclination.

I was called away from an outpost installation job at Indian House Lake to head a rescue attempt. We hurried south to the heavily wooded lake country between Goose Bay and the Gulf of St. Lawrence.

A B-17 (Flying Fortress) en route from Maine to Goose Bay had developed engine trouble inland from the airfield at Mingan on the St. Lawrence. The pilot had ordered the crew to jump by parachute, as the plane was losing altitude through a thick overcast.

After five of the nine men had jumped, the plane had leveled off, and the pilot had been able to nurse it back to Maine. He gave the approximate location of the area where his men had leaped. That's all we had to go on.

Campfire Smoke Locates Men

Several aircraft joined in the search. Four days later we spotted a campfire in the hills. Landing in a lake near by, we picked up three of the five missing men.

"Where are the other two?" I asked.

"We've hiked three days downriver from where we landed," one of the boys said. "We thought we heard a shout from one of the other fellows, but couldn't find any track of them."

After taking the three men to Mingan, we went looking for the other two. One of the rescued boys told us where to look for the rescued men's parachutes dangling in the trees.

We caught sight of the chutes near a tiny heart-shaped lake. I told the pilot of our small plane (a type called "Norseman," appropriately enough!) to "sit down" in the oversize puddle.

With one of my men I set out for the parachutes, hoping to find clues near by leading us to the two who had vanished. The Norseman flew back for more men and equipment.

Next morning we were back at the lake,

U. S. Air Force, Official

Plywood Door and Doorstep Are "Props" for a Family Portrait

This Baffin Island mother has made good use of scraps discarded by the U. S. Air Force base at Frobisher Bay. Her summer tent was made from food sacks; heavy cloth serves as door hinges. Eskimo used cast-off GI clothing and blanketing for many purposes, but no military footwear could tempt them to give up deer- and seal-skin boots.

still stymied by a cold trail. The plane came humming back from Mingan.

A pilot had to land short on that pond lest he run into the cliffs on the opposite shore. The Norseman (unfortunately with a pilot green at water landings at its wheel this time) struck the water at an angle and flipped over on its back.

We ashore watched horrified, but were relieved to see three men crawl out on the upturned floats of the plane. After getting their wind, they pulled a fourth, obviously injured, companion from under the water.

With an anxious eye cocked at the slowly settling plane, we frantically pumped up a rubber life raft. As we paddled out to the wreck, we noticed our flimsy craft was filling with water. It leaked!

When we reached the belly-up plane, we pulled out the raft repair kit. Hastily patching the hole in the rescue raft, we at last got the four men ashore.

The pilot was hurt. We signaled a plane flying above, not a floatplane, to send in another Norseman to take out the injured man.

Finding no trace of the two still-missing chutists in the vicinity where we knew they'd come down, we had no choice but to drag the lake. We found them.

A later rescue, in this same bush and lake region, had an amusing end.

One of two men who parachuted from a disabled plane was quickly rescued, the same day that the accident occurred.

We sighted the second man on the side of a steep hill, but it was getting too dark to land and pick him up. We assumed he'd stick by his chute and be there when we bushwhacked in the next day.

We made a very tricky landing in inches of water on a shallow stream, the water closest to the hill. When we reached the collapsed parachute, our "victim" was nowhere in sight.

We knew that if he'd been hurt he would have left a note to that effect. Therefore, we dropped back down through the evergreen thickets to the stream.

"I Like It Here"

From a little distance off we saw our man comfortably stretched out on one of the plane pontoons. His bare legs were dangling in the water. When we came within talking distance

he said, "Hi, there!" and waved a hand in casual greeting.

"You fellows came too soon," he said. "I thought it took days to find a guy in this country. Had the best time I've ever had in my life! Wonderful fishing. I shot a couple of ptarmigan with my pistol. I like it here."

Our jaws dropped. We sat down on the pontoon for a smoke. Presently our enigmatic new acquaintance spoke up again.

"Well," he said, "guess there's still a war on. Let's go!"

Back at Goose Bay, tragedy and comedy both played a part in an almost incredible incident.

One afternoon a friend and I were chatting in the Operations building. We both heard an explosion up in the sky at the same instant. Rushing out, we looked up at the solid overcast at about 8,000 feet elevation.

Moments later assorted pieces of a Mosquito aircraft that had gone up for a test flight started to drop out of the cloud deck. Also, lamentably, one body tumbled down, stripped of its parachute.

Toronto Gautrau de Pinsun

Hour After Hour the Seal Hunter Waits for His Quarry

Clothed in caribou skins, Matomiak stands stooped and still as a statue over the seal's breathing hole in the sea ice along the coast of Canada's Northwest Territories. He may even fall asleep on his feet, which rest on a piece of bearskin. But if a seal comes up for air, the hunter will awake and strike instantly with his harpoon (page 497). He will haul the quarry out with the cord attached to the spear. Snow knife is handy to the right.

Then I was amazed to see an open parachute drift out of the clouds, a man swinging below it. But when the chute had fallen some distance, I saw also that the man was tangled in the shrouds of the chute and was dropping head down!

We jumped into the nearest jeep and drove as if to a fire, across sand, concrete, and through scrub. As luck would have it, the chutist was plummeting right toward the middle of one of the great concrete runways.

Braking the jeep to a screaming halt at the spot where it seemed the chute would drop, I shot out of my seat and rushed to intercept the falling man.

Just as the flyer's head was about to strike the paving (the blow would almost certainly have been fatal), I managed to flip the plunging figure over by the shoulders. The lucky chutist struck on his rump instead of his head and was only bruised. He was soon completely well again.

When the Mosquito had exploded, one of the two-man crew apparently had been killed instantly. The pilot had been knocked unconscious. When he came to, he had found himself falling with his parachute pack twisted

Dr. R. J. S. Tickle

Early Explorers Found Thule by Flat-topped Mount Dundas. Now the Peak Guides Planes to a Near-by Airstrip

Thule, northwest Greenland, is an important link in the chain of far-north weather stations. Paths lead from Danish settlement (foreground) to Eskimo town (right).

C. J. Hubbard

Across Drifted Snow at Resolute Bay, Cornwallis Island, a Tractor Hauls Quonset Hut Parts for the Canadian-American Weather Base

Chesney Twombly

Visitors Come Ashore from an LCVP at Slidre Fiord, Only 675 Miles from the North Pole. Cargo Sled Makes a Bridge Through the Surf

New staff men and supplies are brought every year by a U. S. Navy or Coast Guard icebreaker to this most northerly weather station in the Western Hemisphere, in Eureka Sound, Ellesmere Island. Four such outposts in Canada's Arctic islands are manned jointly by Canadian and United States personnel. The air-borne tractor, weighing about 5,500 pounds, simplifies hauling and grading at stations ships can't reach because of the ice.

Capt. Robert A. Bartlett

Bead Collars, Fine Boots, and Striped Pantaloons Are Fashion "Musts" in Greenland

Most colorful touch is the thigh panel on the tight sealskin trousers, composed of hundreds of bits of brightly dyed leather sewn in mosaic pattern. Each beaded collar weighs two pounds or more; no two are alike. Boots are often red or blue. Eskimo women, like these of Angmagssalik, devote hours to making costumes.

Elaît Halvorsen from Three Lions

Snowy Owl's Long, Dense Feathers Grow Right to the Tips of Its Toes

Even the bill of this cold-climate dweller is half-concealed by a feather "muffler." On Clavering Island, east Greenland, the photographer crept up on the mother owl guarding her nest, hidden in heathy growth. Slaty-brown bars helped conceal her against dark tundra sprinkled with white blossoms of firemoss (*Cassiope tetragona*). The big bird, about two feet long, is fiercely predatory; it hunts lemmings, mice, Arctic hares, birds, and even fish during day and night. Unlike most owls, the snowy is not primarily nocturnal. This is an adaptation to its far-north range, where the sun shines 24 hours a day in midsummer.

out of place. By superhuman effort he had managed to pull the rip cord—and passed out again.

In opening, the shroud lines of the chute had ensnarled his feet, jerking them above his body and putting him in the helpless head-down position.

"Perfection in Search and Rescue"

My superior officer, making a formal report, termed the incident "perfection in search and rescue—arriving before the accident."

The American commanding officer at Goose Bay during most of my duty there was the veteran North Country flyer Lt. Col. Bert R. J. ("Fish") Hassell.

Fish is a restless character. While at Goose Bay he used to wander into every nook and corner of his base. He discovered that the mess halls disposed daily of huge quantities of garbage. It set him thinking.

One morning Colonel Hassell called me into his office. He was very gruff and businesslike.

"Willie," he said, "I have in mind a project to make use of certain materials now being wasted on this base. We shall, thereby, improve the quality of the diet of our personnel.

"You know as well as I that there have been complaints about the high proportion of canned food we've been forced to serve the troops.

"What I'm planning, Willie"—and he looked at me sternly, though I could tell he was hoping very much that what he was about to say would be well received—"is to raise pigs."

I was suddenly attacked by a coughing spell. I had to cover my mouth. When I recovered composure, all I could find to say was, "Yes, sir!"

Hurrying into the breach, Fish pressed on:

"Your manning table allows for an extra officer. He shall be in charge of the pigs."

My relief was short-lived.

"Meanwhile, until we find someone suitable, I'm giving you the job as an added duty."

I saluted and left the colonel's office as quickly as was polite, carrying with me the dignity of my new position as "C. O. of the Pig Squadron."

The arrival of the pigs, a whole planeload

U. S. Air Force, Official

Training for Arctic Duty, Men and Dogs Mush Along a Winter Trail in Maine

Nine dogs are ideal for sled travel. An experienced bitch usually is the best lead dog. These teams pull to a center trace; other harnesses spread dogs fanlike or arrange them in tandem. Nearest driver is Lt. Col. Norman D. Vaughan, who directed Air Transport Command wartime rescue operations in the North Atlantic.

of them, was the occasion for much picture taking. I helped unload five sows and 25 piglets. I'm sure that plane's crew would have found a much better use for clothespins on that flight than to hang up clothes!

Proper pens were built, and I went into action as male nurse to Fish Hassell's pigs. The situation was so amusing, and brought such notoriety, if not fame, to Goose Bay, that I didn't find the work too distasteful.

I Dreamed About Pigs

The trouble was I used to dream about pigs. I recall one dream in which I reviewed a line-up of scrubbed porkers. They were all primly at attention, and I was pinning medals on their chests and new stripes on those that had just made corporal.

The venture did help to improve the soldiers' grub. I often wondered how the animals did so well without skim milk, usually a staple of pig diet.

I didn't dare breathe that to Colonel Hassell. He would have brought in a herd of cows—and made me C. O. of Bovines!

At last the war came to an end and I returned to the United States. Settling with my family near Rockport, Massachusetts, I set up as a painter and sculptor.

But still I hankered after the Arctic.

"What is it that sends you back, time and again, to the far north?" friends ask me.

It's a hard question to answer.

There are sights and sounds and smells in the Arctic that you accept quite casually while you're there, but hunger for fiercely when you're far from them.

A stately iceberg cut with blue-green caves makes a stunning foreground to brown mountains splashed with wild poppies. It's fine to see a herd of shaggy musk oxen grazing on lush Arctic prairies.

The howl of dogs under the moon, the walrus's snort, and the hiss-hiss of sled runners on dry snow—memory of these sounds makes me homesick for the North.

There's an indefinable joy in watching geese and ducks fly north in spring. The faint track of the lemming and the tail mark of the Arctic fox are friendly evidences that it's not really an empty land.

The eternal struggle for survival seems a grim business when you see the wolf haul down the caribou calf. But it seems less grim as you, in turn, feast on juicy haunch of musk ox!

The short summer spreads a springy quilt of moss and multihued flowers; yet the frosty bite of a winter morning and the howl of the blizzard are welcome, too.

Perhaps deeper than these physical appeals is the sense of absolute independence and self-reliance that goes with travel on the Arctic trail. Spiritual exaltation is a nearly constant companion, not just a chance experience.

You are alone with whatever God you praise, and you find it good and true.

A surprising, and impressive, fact about the Canadian and United States personnel manning the new chain of Arctic weather stations is that 90 percent of the boys won't accept assignment to the *same* spot for a second tour of duty. But, almost to a man, they are ready, willing, and eager to go to a *new* station.

Then there's comradeship, comradeship intensified by isolation and mutual dependence. When you find and enjoy friendship under the exacting conditions of Arctic living, you cherish the memory forever.

Some men, of course, have more down-to-earth reasons for their Arctic-philia. The Norwegian hunter and archeologist Sören Richter, prodded to tell what he liked about the northland, said: "Up there, plenty of musk oxen. I can eat all I want. There's no one there to tell me I'm too fat."

Two years after I left the Air Forces a new opportunity to go north came my way.

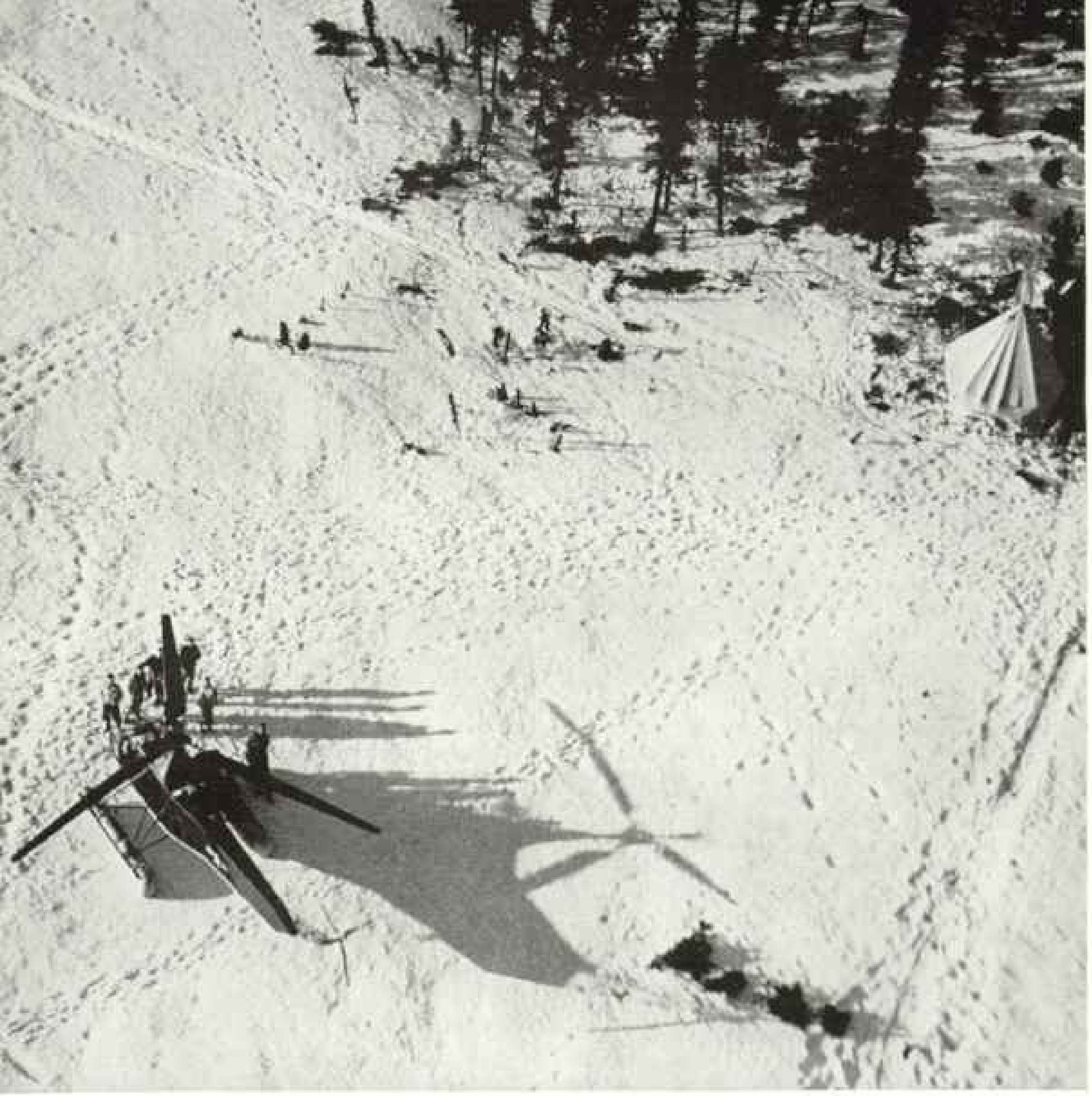
Charles J. Hubbard, Chief of Arctic Operations Project of the United States Weather Bureau, had been my friend for a long time. With his encouragement I applied for assignment as a civilian officer at one of the new Canadian-United States weather stations in Arctic Canada.

Filling Gaps in Weather Maps

After the recent war, the U. S. Weather Bureau and the Department of State worked out with Canada an agreement for erecting a number of Arctic weather observation stations. They would be scattered through an area that was one of the biggest blanks in the world as far as weather-report coverage was concerned.

War-built weather stations in Greenland, Iceland, Baffin Island, and mainland Canada had given inestimable aid to forecasts for flights in the North Atlantic area. Their success was the best reason in the world for extending this far-north coverage to the Arctic archipelago of North America (pages 556, 562, 563).

This boldly planned chain of weather stations now has been constructed. Some of them are supplied and manned entirely by air. They cling to remote islands that cost explorers like Stefansson, Sverdrup, MacMillan, Peary, Greely, and others months of



U. S. Coast Guard, Official

This Two-passenger Helicopter Flew Out 11 Stranded Airmen, One at a Time

Like a fly on cake frosting, a helicopter of the U. S. Coast Guard rests on the snow deep in Labrador. When attempts to rescue the Canadian flyers by plane failed, the "flying windmill" was dismantled in New York and flown to Goose Bay, Labrador, in an Air Force plane. Reassembled, it made 11 flights to the crash scene, each time ferrying out a man to a weather station 32 miles away. Tents that sheltered the men from the bitter winter cold stand at the edge of the straggly forest.

slogging on the trail and not a few lives.

Thule, on the northwest tip of Greenland, was built first. It's manned jointly by Danes and Americans. Installations at Eureka Sound, Cornwallis Island, Prince Patrick Island, and Isachsen Peninsula have followed. These four are shared by Canada and the United States. A fifth station, Alert, is now being planned for a site northwest of Cape Sheridan, on Ellesmere Island.

The success of these daring ventures has been due in a most important degree to the intense interest and wholehearted support of the Canadian and Danish Governments. Without their coöperation, naturally, none of this could have been achieved.

The Weather Bureau approved my application. Hubbard told me I was to go north as United States executive officer at the then-projected Prince Patrick Island station. A Canadian would be officer in charge. Our tour of duty was to be 13 months.

In mid-March we "staged" at Resolute Bay on Cornwallis Island, after a long flight the length of Baffin Island. Cornwallis and Thule, Greenland, are supply points for meteorologi-

U. S. Air Force, official

Men Push Ice Away So a PBY Can Take Off with a Sick GI

A radio appeal brought the flying boat to Clyde, Baffin Island, to take a patient to the hospital. It landed in a lane of open water between drifting ice floes, but big cakes soon blew in around it, preventing take-off. After seven hours of hard rowing, the crew towed the PBY to open water. The Clyde weather station is now operated by Canada.

cal centers in the Arctic (page 562).

Thule and Cornwallis are not too hard to reach by ship. The U. S. Navy and Coast Guard annually send an icebreaker-led convoy to these places, bringing tons of new supplies for the coming year.

Helicopters, dubbed "egg beaters" by crews of ships they fly from, are the new eyes of the fleet in ice-choked northern waters. Taking off from icebreakers' decks, they search ahead for strips of open water, called leads.

A dramatic instance of the usefulness of copters in navigation and reconnaissance in polar waters was provided last year (1948). A Navy-Coast Guard task force penetrated Kennedy and Robeson Channels between Greenland and Ellesmere Island and cruised far out in the Arctic Ocean.

A helicopter bearing Charles Hubbard of the U. S. Weather Bureau reached Cape Sheridan, less than 525 miles south of the North Pole. There the little egg beater alighted, an anomaly in that crudely mapped area.

In a rock cairn Mr. Hubbard found a sealed bottle containing handwritten records left there by Comdr. Robert E. Peary 43 years ago, three years before his triumphant dash to the Pole.

Helicopters spotted routes for the ships through the ice. With their help, two of the task force's three ships pushed past 82° north.

At Cornwallis Island I made my final plans for moving into Prince Patrick. On March 29 we took off in a C-47 cargo plane on skis for a reconnaissance of the island. On the way we spanned the full length of rugged, rumpled Melville Island.

We selected Mould Bay for the permanent camp. On April 12, making our major landing, we slid to a smooth stop there.

Our first job was to improve the ice landing area. From a big timber we brought in by air (this district is hundreds of miles north of the tree limit) we made a drag scraper. Pulling it with an air-borne tractor, we skimmed the loose snow off the drifted end of the runway. Soon we had a very respectable landing strip cleared and packed.

Then began the "Prince Patrick Airlift." A procession of C-54's, buttressed with one C-82 ("Flying Boxcar"), poured supplies into Prince Patrick so fast we could hardly keep them classified and the perishables and instruments under cover.

What a mass of stuff! There were dogs, sleds, and trail gear, cases of food and clothing, radios, medical stores, and a Diesel generator to make electricity.

There were several kinds of fuel and oil; there were lumber, wallboard, weather instruments; there were stoves, nails, tools, dynamite, and a generator to make hydrogen for filling meteorological balloons.

We unpacked ice-cutting saws and an ice cream mixer. There was a library of books.

Erecting the James huts and storing all this huge inventory of essential supplies taxed the strength of the station personnel to the limit. After all, there were only seven of us.

But I managed to find a few hours to look around this new country.

Fighting Wolves with a Searchlight

On Prince Patrick caribou and musk oxen were fairly numerous. Their chief enemy, the Arctic wolf, seemed to be scarce there.

At the station on Eureka Sound, by contrast, wolves are so abundant that the frightened musk oxen stick close to the Canadian-U. S. camp during the long winter night.

At Eureka musk oxen prefer men to wolves —a hard choice! When the wolves followed the big animals right into camp, the station crew rigged a Navy searchlight.

Before the observer steps out to take his observation at the instrument shelter, the men sweep the area around camp with the high-candlepower beam. It's the only way they can make the bold wolves keep their distance.

After all the good-luck years I'd had in the North, bad luck, long overdue, hit me.

We were moving a cookstove into the main hut. Two of the boys took one end. Feeling strong as any two men, I foolishly lifted the other end myself.

Misfortune Has Its Day

When I took the weight on my arms, the thrust down on my feet drove my left leg instantly down through the crust, right to the ground. I knew I'd strained my left side badly.

Paul Chorney, the Canadian leader, knew I was hurt, but none of the others seemed to notice it.

"Don't tell the other boys," I told him.

That happened on April 19. When I did not improve, the boys radioed for a plane to come in and take me out for medical treatment. I protested, but knew they were doing the right thing.

On May 29 a ski plane from Greenland glided in and took me away. I nearly wept, being forced to leave so many months before my contract time was up.

On the flight to southern Greenland by way of Thule and Søndre Strømfjord, we soared over regions in the northern Parry Islands and southern Ellesmere Island I'd never seen before.

We passed the Findlay Group, including Grosvenor Island, named by Stefansson in 1916 for Gilbert Grosvenor, President of the National Geographic Society, and Cornwall Island.

At the United States base at Narsarssuak, southern Greenland, I entered the military hospital for a checkup. I learned I'd strained myself severely, but that with care and rest I'd be ready to go north again within a year.

American soldiers who were stationed at Narsarssuak during the war would hardly recognize the place today.

The barracks are painted white. Many of them have been converted to married quarters. Wives and children of military personnel stroll laughing up and down the roads of the base.

A school bus stops at every corner to pick up Young America Overseas and deliver him to the gentle mercies of the teacher. Family laundry hangs on clotheslines just as it does in Winnetka or Sacramento.

I returned unwillingly to the United States in June, 1948.

How the North has changed! Yet in the vast reaches between the few places where men have brought their civilized skills to bear, the North actually hasn't changed at all.

NATIONAL GEOGRAPHIC SOCIETY

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To carry out the purposes for which it was founded sixty-one years ago, the National Geographic Society publishes this Magazine monthly. All receipts are invested in The Magazine itself or expended directly to promote geographic knowledge.

Articles and photographs are desired. For material The Magazine uses, generous remuneration is made.

In addition to the editorial and photographic surveys constantly being made, The Society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period nearly eight centuries before Columbus crossed the Atlantic. By dating the ruins of the vast communal dwellings in that region, The Society's researches solved secrets that had puzzled historians for three hundred years.

In Mexico, The Society and the Smithsonian Institution, January 15, 1930, discovered the oldest work of man in the Americas for which we have a date. This slab of stone is engraved in Mayan characters with a date which means November 4, 291 B. C. (Spinden Correlation). It antedates by 300 years anything heretofore dated in America, and reveals a great center of early American culture, previously unknown.

On November 11, 1935, in a flight sponsored jointly by the National Geographic Society and the U. S. Army Air Corps, the world's largest balloon, *Explorer II*, ascended to the world altitude record of 72,395 feet. Capt. Albert W. Stevens and Capt. Orvil A. Anderson took aloft in the gondola nearly a ton of scientific instruments, and obtained results of extraordinary value.

The National Geographic Society–U. S. Army Air Forces Expedition, from a camp in southern Brazil, photographed and observed the solar eclipse of 1947. This was the seventh expedition of The Society to observe a total eclipse of the sun.

The Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda, during which a world record depth of 3,028 feet was attained.

The Society granted $25,000, and in addition $75,000 was given by individual members, to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees in the Giant Forest of Sequoia National Park of California were thereby saved for the American people.

One of the world's largest icefields and glacial systems outside the polar regions was discovered in Alaska and Yukon by Bradford Washburn while exploring for The Society and the Harvard Institute of Exploration, 1938.

Remember

how he looked on your very first date?

Remember his expression when he saw you in your new evening dress . . . and when he handed you the corsage?

Remember his eyes the night he told you all about his future plans . . . and the way they lit up when he realized that you were really interested?

Remember how serious he looked when he asked you to marry him . . . and how relieved, a moment later, when you said "Yes"?

Remember his face when he signed the hotel register on your honeymoon . . . and when he carried you over the threshold of your first home?

Remember the look on his face the first time he brought you breakfast in bed . . . and the night he announced his first big raise?

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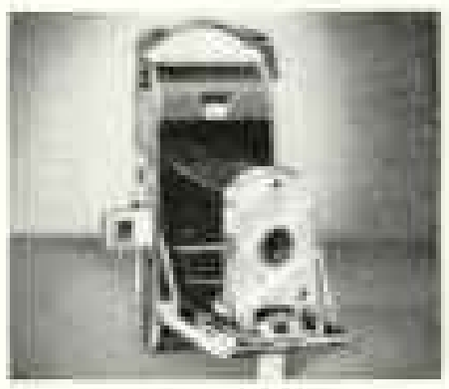

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*Named for its inventor, Dr. Edwin H. Land.
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Just drop the film in your Polaroid "picture-in-a-minute" Camera and you're ready to shoot the best pictures you've ever taken.

Almost everything is automatic. Sixty seconds after you snap the shutter you see the picture — a big, beautiful print in salon quality sepia. Polaroid prints pass life tests used to check conventional snapshots.

You'll enjoy thrills you never dreamed of with your Polaroid Camera, indoors or out. Mail vacation pictures to friends while they're still news. Make sure you've got those once-in-a-lifetime baby, wedding and graduation pictures.

Professionals, amateurs and novices are amazed by the life-like quality and sharpness of their Polaroid pictures. See this new miracle of photography in action today.

For free booklet that answers your questions about picture-in-a-minute photography, write Polaroid, Dept. N-2, Cambridge, Mass.

Lifetime Guarantee

The Polaroid *Land* Camera is a precision instrument, guaranteed to give you years of pleasurable picture-taking. Any defects in workmanship or material will be remedied free during the life of the camera (except for transportation charges).

See a demonstration of the new

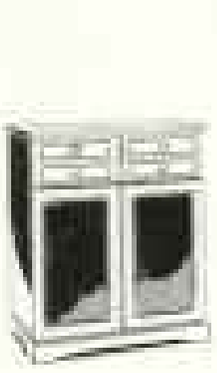
POLAROID *Land* CAMERA

at camera stores everywhere

Life-size television

The largest direct-view screen made. A picture unsurpassed in clarity and brilliance. New sensitivity and freedom from interference. Cabinets of distinguished design. See Du Mont—

and see television at its finest.



The Du Mont Bradford — Life-Size direct-view screen, 203 square inches, on a 19-inch Du Mont tube. FM radio. Record player for the new 45 RPM records. One of a complete line of television receivers.

DUMONT *First with the finest in Television*

Allen B. Du Mont Laboratories, Inc. • General Sales Offices and The Du Mont Television Network, 515 Madison Avenue, New York 22, N. Y. • Home Offices and Plants, Passaic, N. J.

This is NEW MEXICO ... THE LAND OF ENCHANTMENT

Here in this Land of Enchantment you'll find individuality—springing from a curious combination of legend and custom, of the unbelievably old beside the very new. Its quaint mountain villages where Spanish is still the native tongue are untouched with the passing of time. Its picturesque Indian *pueblos,* where the throbbing rhythm of the tom-tom heralds the beginning of age-old ceremonial dances, are unchanged since the days of the conquering *Conquistadores.* You'll thrill to its romance and color... to its vast distances hemmed in only by timbered mountain ranges towering into turquoise skies. You'll long remember its many sites of scenic grandeur and historical interest, including eight National Monuments and Carlsbad Caverns National Park.

And here, you'll discover why New Mexico is called The Land of Enchantment. Once you have shared it, you'll never forget it!

Mail This Coupon

AND WE'LL SEND YOU OUR FREE MAPS AND BOOKLET PRONTO!

EXAMINATION: Professional examination for possible pathological eye conditions.

REFRACTION: *Scientific measurement of your ability to see.*

PRESCRIPTION: *Carefully prepared professional conclusions and the instructions necessary to correct your vision.*

INTERPRETATION: Careful technical and scientific compounding of the exact materials of your prescription.

Whatever you pay for these services, ...$25...$35...$50, the cost is low the value high

RE-EVALUATION: Verification of the refraction and the prescription.

FITTING: Scientific, minute adjustment of your prescription to *your* eyes.

SERVICING: Assurance that the requirements of your prescription are being constantly maintained.

The services that give you better vision are worth a lot to you. But actually, in most cases, the cost of these services is surprisingly low. Whether you pay $25 or less, $35, $50 or more, depends upon:

The professional and technical services you receive.

Your own special seeing problem.

The quality and style of glasses your prescription calls for.

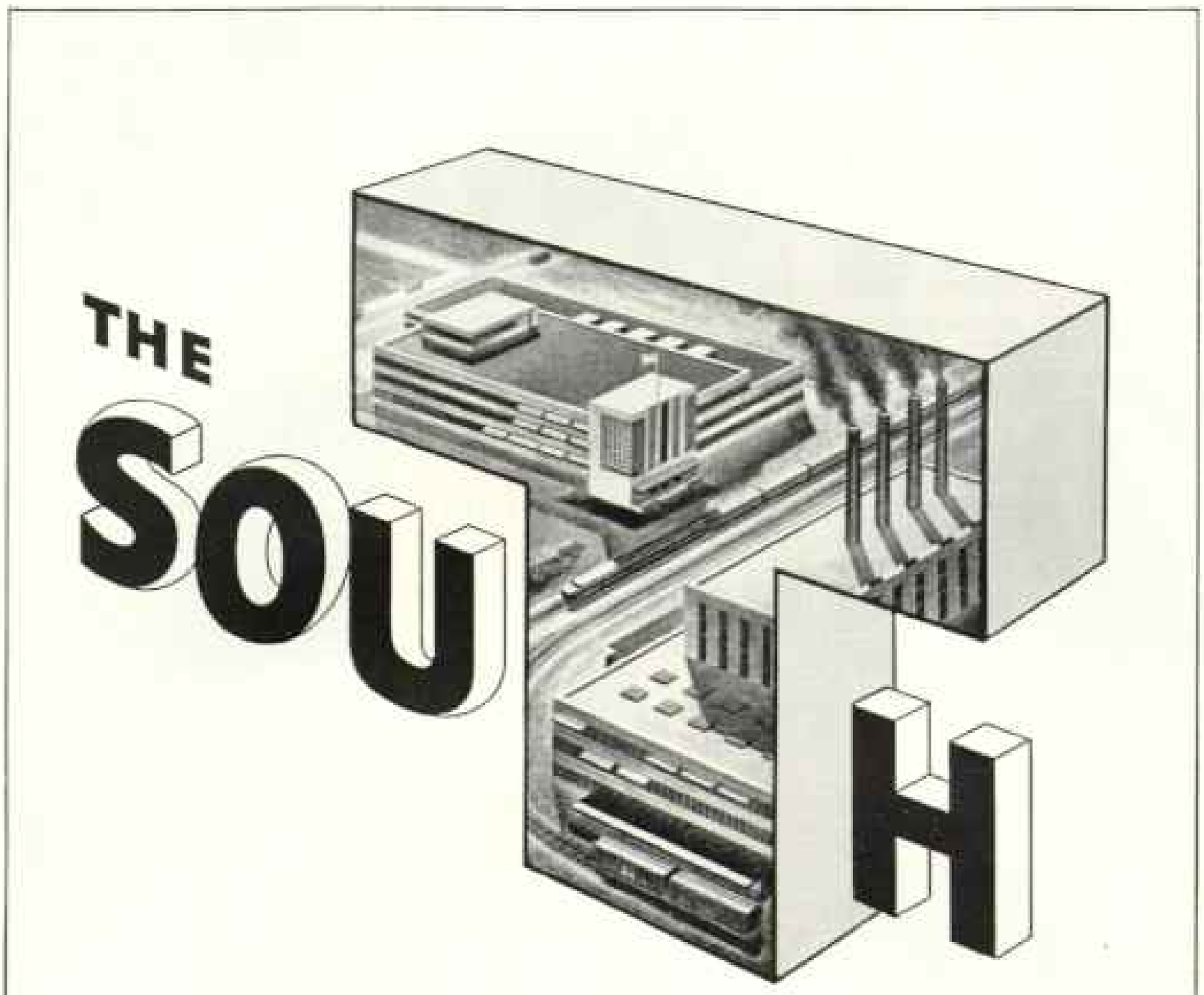
When your vision fails to be all it should be, you'll need the aid of professional and technical services. Some of the services essential to good vision are illustrated. Helping you to see well involves much more than just a pair of glasses.

Services provided by Optometrists, Ophthalmologists, Ophthalmic Dispensers are widely available and within the reach of all. They are worth a lot. But their cost, including glasses, when you need them, is low — only a few pennies a day during the life of the average prescription.

American Optical

COMPANY

Founded in 1833 — the world's largest supplier to the ophthalmic professions.



Suits to a "T"

WHY has an average of one new factory a day located along the lines of the Southern Railway System during the past three years?

Because industries are discovering that the South served by the Southern is a "gold mine of opportunity"! With a wealth of natural resources and advantages, expanding consumer markets, skilled and willing workers . . . and a bright future . . . the South suits all industries—to a "T".

"Look Ahead—Look South!"

Ernest E. Norris

President

LOOK SOUTH. LOOK AHEAD

SOUTHERN RAILWAY SYSTEM

The Southern Serves the South

Cars For Proud Trains

Without exception, the stainless steel railway passenger cars built by The Budd Company go into their owners' finest trains. On the Pennsylvania, for example, you may ride in them on the Broadway Limited, The General, The Red Arrow, the "Spirit of St. Louis" and others of its blue ribbon fleet.

Where quality is a consideration, either in appeal to the public or in dependable, economical operation, the things Budd makes have achieved a unique and strengthening position.

In 1934 Budd built its first train, the Pioneer Zephyr, first lightweight streamliner of all. It revolutionized railway car construction. Budd is now the world's second largest builder of railway passenger cars.

In 1912 Budd invented the steel automobile body. Today Budd is the world's largest independent builder of automobile body components.

In 1919 Budd introduced the steel disc automobile wheel. During the past twenty-seven years, in addition to producing millions of automobile wheels, Budd has placed more wheels on trucks, buses and highway trailers than all other makes in the world combined.

The great complex of Budd industrial facilities, producing a quarter of a billion dollars worth of goods annually, has sprung from one basic philosophy—build better products through the use of superior materials and challenging design.

The Budd Company, Phila., Detroit.

Budd

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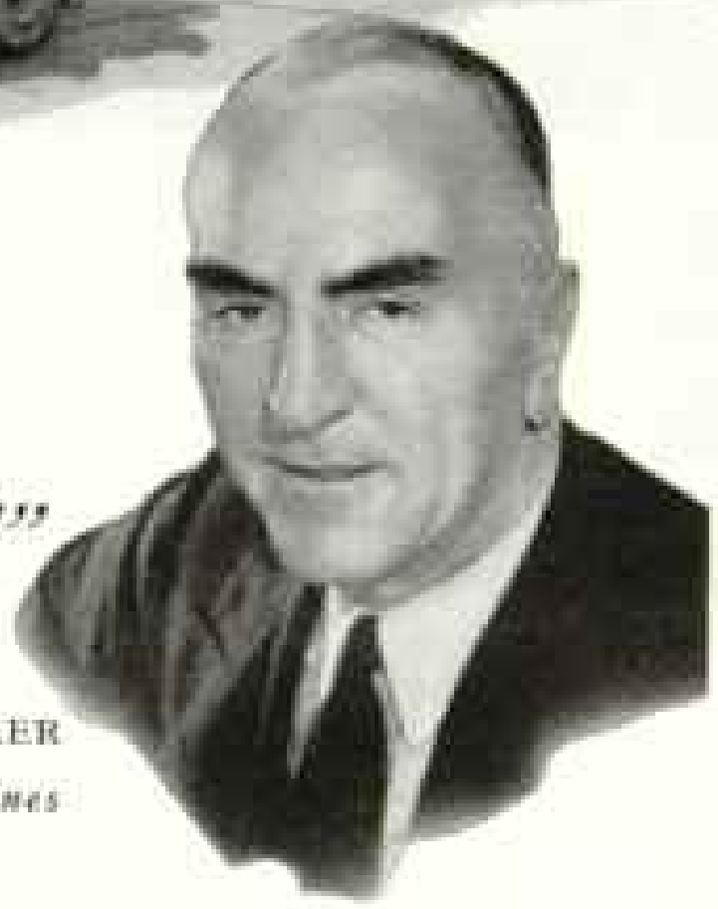
—A Great Name in Oil

"Alibis Don't Fly—

So for lubrication we look to the leaders!"



Says CAPTAIN EDDIE V. RICKENBACKER
President and General Manager, Eastern Air Lines

Eastern Air Lines' notable operating record is due in large part to its strict standards of aircraft maintenance. Only the finest lubricating oils and greases can meet Eastern's exacting requirements.

Eastern Air Lines uses Sinclair aircraft engine oil exclusively. Its confidence is based on Sinclair's detailed knowledge of every phase of aviation lubrication.

Another reason why... **SINCLAIR**
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THE *Low-Pressure* TIRE THAT'S FIRST WITH *Big Mileage*

The New
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Super **SQUEEGEE**

WITH JET-C-M (COLD-MIX) RUBBER

Here is the new tire whose owners get an entirely new conception of how much uninterrupted mileage a tire can give. It's the distinctive new General Super Squeegee . . . made with Jet•C•M•—Cold Mix—Rubber. This exclusive new rubber is tougher, yet more pliant. It gives a naturally softer, smoother ride at low pressure. It's safer, every cushioned mile . . . quieter running . . . easier to steer and park.

20,000 MILES
30,000 MILES
50,000 MILES

NO MORE FLATS from punctures! X-ray photos prove the General Puncture-Sealing Safety Tube can take more than 300 nails without the loss of a single pound of air!

always "at Ease" on El Capitan

Easy dress • Easy comfort • Easy cost

"Come as you are!" on this famous Santa Fe all-chair-car streamliner. Just 39¾ easy hours between Chicago and California. Restful club lounge car "just for fun!" Fred Harvey meals... Coach fare plus a small extra fare... Same route as The Chief and Super Chief.

Santa Fe

R. T. Anderson, General Passenger Traffic Manager, Santa Fe System Lines, Chicago 4, Illinois

Only Wallace Sterling ... like Sculpture ... is lovely from every angle

FIGURINE, CONTEMPORARY AMERICAN

Only Wallace Sterling ... like Sculpture ... has

Third Dimension Beauty

Brides are making Wallace Sterling the most sought-after silver in America. All over the country they're asking to see the sterling that has the "Third Dimension Beauty" of sculpture ... beauty in front, beauty in profile, beauty in back. Only Wallace Sterling ... created by William S. Warren, famous designer ... fits that description. Before you select your sterling, be sure to see the five Wallace "Third Dimension Beauty" designs. Left to right: Grande Baroque, Sir Christopher, Grand Colonial, Stradivari, Rose Point. Six-piece place settings from $27 to $33, according to pattern.

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MORE SUN, MORE FUN — Come play this winter in the enchanted desert around Tucson. More sun than any other resort city. The exhilarating air makes you feel younger . . . walk with a lighter step. You'll want to go on chuck-wagon picnics, fishing trips — visit missions, cactus forests, national parks, Old Mexico next door — ride, swim, golf, square dance!

Make the SUN your all-winter companion

IN WARM, DRY TUCSON !

MORE TO SEE AND DO — Live at one of the luxurious resort hotels, western guest ranches, ultra-modern motels and apartments, desert cottages. Extensive building activity has made accommodations plentiful at sensible rates. Excellent private schools. U. of Arizona. Mail coupon *now . . . come early!*

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I am interested in: Type of accommodation_____;
type of school_____; information on

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WITH REMINGTON *Contour Shaving*

- 240 cutting blades, *Diamond-Honed* for super-sharpness.
- More than *twice as many* cutting blades as other shavers.
- Blue Streak heads that trim long and short hairs . . . get whiskers in the hard-to-shave places.
- Cleaner, more comfortable shaves because the Remington Contour Shaver fits your face.

SHAVES DRY
NO LATHER
NO BLADES

These exclusive features—the *extras* you get with a Remington Shaver—tell why more Remington Shavers are sold than any other make. Try a Remington today at your dealer's . . . you'll prefer Remington, too.

Remington Rand Inc., Electric Shaver Division, Bridgeport, Connecticut—with Shaver Branches in 106 cities. See your telephone directory. A PRODUCT OF *Remington Rand*

NO INCREASE IN PRICE! For post-war quality and improvements at pre-war price, see the famous

Remington FOURSOME $19.50

with *Diamond-Honed* cutting blades — *more powerful motor.* **Pre-war price**

White sidewall tires and wheel discs available on all models at extra cost

Presenting the "next look" in cars

NEW 1950 STUDEBAKER

Success breeds success! The car that led in modern design now moves still more spectacularly out ahead!

The new 1950 Studebaker is here—and you can see at a glance that it's America's "next look" in cars.

Here's the dramatic and unexpected sequel to the tremendously popular "new look" in cars that Studebaker originated three years ago.

Here's a truly inspired 1950 Studebaker—dynamically new in form and substance—America's most advanced new car—styled ahead and engineered ahead for years to come. Paced by a breath-taking new Studebaker Champion in the low-price field, this is a complete line of completely new 1950 Studebakers.

Each one is increased in wheelbase length and over all length—thrill-packed with the new performance of higher compression power—comfort-cushioned with self-stabilizing new Studebaker coil springs.

Discriminating America is giving the 1950 Studebaker an enthusiastic welcome. Stop in at a nearby Studebaker showroom the first chance you have. See the 1950 Studebaker—the "next look" in cars!

SOME MEN WILL WAIT TEN YEARS TO ANSWER THIS ADVERTISEMENT

The Years That Might Have Given Them So Much Will Pass On Forever, Casting Back a Look of Scorn

OUR files bulge with letters from men of great promise in business whose natural talents have been wasted on routine tasks.

Business, for them, has become a squirrel cage—they work harder every year but progress no faster.

Of the thousands of men who will read this message, only the ambitious few will send in the coupon which may mean the difference between success and failure. But ten years from now, many will write letters asking for a chance to "catch up" on the years they have let slip by.

"Years ago I should have thought about my business future."

"What a world of difference it would have made if I had written this letter ten years ago."

"I put it off—just put it off."

These are the lost and discouraged men who were content to *wait* for success; men who had no definite, well-defined program which would carry them a little closer, each day, to their chosen goal. Delay stamps its footstep on the pages of time and always leaves regret.

Send for "FORGING AHEAD IN BUSINESS"

For men who want to do something about where they are going to be five, ten, twenty years from now, the Institute has published a 64-page booklet titled "Forging Ahead in Business."

This little book has been a source of inspiration and help to thousands of ambitious men. It is sent free and without obligation—other than the obligation to read it, absorb its contents and decide for yourself whether or not you wish to follow the program it describes.

ALEXANDER HAMILTON INSTITUTE
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In Canada: 54 Wellington Street, West, Toronto 1, Ont.

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Please mail me without cost, a copy of the 64-page book—"FORGING AHEAD IN BUSINESS"

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Firm Name .....
Business Address .....
Position .....
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Visit our attractive bedroom and dining room displays. You'll see styling, quality and workmanship far in excess of price. Purchases arranged through authorized R-WAY dealers.

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for years known as NORTHERN FURNITURE

Boston : Chicago : Cincinnati
Cleveland : Dallas : Detroit
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How Red should a red rose be?

Only as red as correct exposure can make it; not darkened by too little, or washed out by too much. The WESTON Exposure Meter assures you of color-true pictures every time. Instantly gives correct exposure for any picture in or out-of-doors. See the WESTON at leading photo dealers everywhere.

Master II

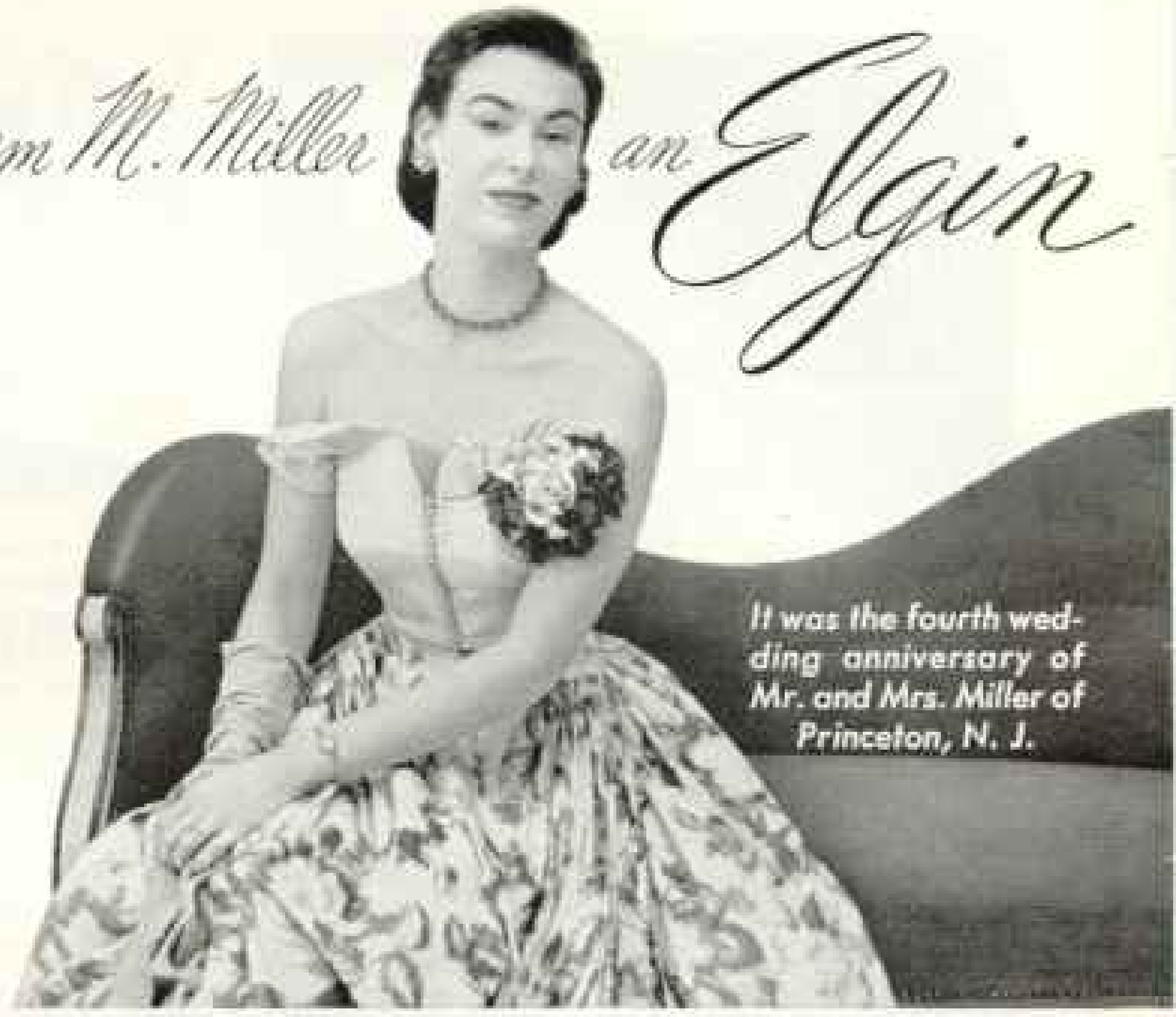
WESTON *Exposure Meters*

The meter most photographers use!

Anniversary present for *Mrs. William M. Miller* an Elgin

"I ADORE ITS DISTINCTIVE STYLING," *says Mrs. Miller. "My new Elgin is the most wonderful of all anniversary presents."*

"THAT DURAPOWER MAINSPRING FORETELLS A HAPPIER FUTURE," *says Mr. Miller. "Elgin's accuracy will surely be more lasting."*



It was the fourth wedding anniversary of Mr. and Mrs. Miller of Princeton, N. J.

THE DuraPower Mainspring* ELIMINATES 99% OF ALL REPAIRS DUE TO STEEL MAINSPRING FAILURES!

Styled by Hemsley

Lord and Lady Elgins are priced from $67.50 to $5,000. Elgin De Luxe from $47.50 to $67.50. Other Elgins as low as $29.75, with Federal Tax

*Patent pending. Made of "Elgiloy" metal

Elgin won the 1949 Fashion Academy Gold Medal Award!

An Elgin Watch is a most beautiful and lasting way to remember the great occasions of life. Here is a possession to stir the owner's pride for all the years ahead . . . a practical accessory endowed with exquisite charm. So outstandingly styled are the new Elgins that they won the Fashion Academy Gold Medal Award!

And no other watch in the world has such dependable power for accurate timekeeping. Only in an Elgin can you get the miracle DuraPower Mainspring. To own yourself, or as an exciting gift for someone you love, count on it . . . there's *more happiness* with an Elgin. See your jeweler now and choose from his fine array of beautiful new Elgins.

ELGIN

TIMED TO THE STARS

The genius of America to wear on your wrist

The Royalty of Television

Only Zenith Giant-Picture Television Gives You All This!

165 sq. in. Giant Circle Picture

Television's largest direct-view picture in relation to screen size . . . up to 30% larger than in ordinary receivers with the same size tube! Also, Zenith's new Picture Control Switch gives you a *choice* of circular or rectangular type pictures!

New Glare-ban "Black" Tube

This amazing picture tube relieves eyestrain by reducing glare and providing a darker background for the picture. This increases clarity 60% in lighted rooms. Medical authorities recommend this way to view television.

One-Knob Simplified Automatic Tuning

One twist brings in station—picture—sound, all pre-adjusted! Automatically does what in many sets requires up to 5 or 6 manual tuning operations! See Zenith's Giant-Picture Television at your dealer's now!

• • •

New Zenith† "St. Regis"—Giant-Picture television console with 165 sq. in. screen, new Glare-ban "Black" picture tube, new Picture Control Switch. Cabinet in genuine Mahogany veneers . . . **$399.95***

Slightly higher on West Coast

See Zenith's Great New Radio Values, too!

New Zenith "Major"—most sensitive FM set ever offered the public! Works even in fringe areas where others miss. Static-free even in worst storms. Lowest price ever for Genuine Armstrong Circuit FM. Plays on AC or DC. Only **$39.95***

†® ZENITH RADIO and TELEVISION THE ROYALTY OF RADIO AND TELEVISION ®

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**Price subject to change without notice.*

Zenith Radio Corporation, Chicago 39, Ill. • *Also makers of America's Finest Hearing Aids*

IT'S A FACT

"Deepfreeze Really Opened My Eyes!"

I'm in the market for a home freezer. "I've seen them *all* and it's a *Deepfreeze* home freezer for me! My husband and I saw the five new Deepfreeze models and he agrees with me, you can't go wrong with *more* for your money! Larger capacities at new low prices!"

We Must Have the Right Home Freezer! "We want the best. We *know* a Deepfreeze home freezer pays for itself with the money it saves. The Deepfreeze dealer *proved* this!

"Why . . . I can shop just twice a month when quality and price are right. I can cook and bake ahead. I'll have *whole meals* ready in *minutes*, instead of the long kitchen hours we all dislike.

"I'll save work, time and money with my Deepfreeze home freezer. Ask your neighborhood dealer today for the 'pays-for-itself' story."

LARGER CAPACITIES! LOWER PRICES!

Compare

FEATURE for FEATURE BEFORE YOU BUY

SEPARATE FREEZING COMPARTMENT • COUNTER-BALANCED LID
TEMPERATURE CONTROL • STORAGE BASKETS
STORAGE DIVIDERS • INTERIOR LIGHTS AND LID LOCK
ICE CUBE TRAYS • SERVING TRAY

DE LUXE MODEL C-12
12.3 Cu. Ft. Holds more than 430 lbs. of assorted foods.

$424.50

Retail Price Delivered and Installed.

Other Models to Fit the Needs of Every Family. From

$229.95 TO $549.50

The Name of the World's FIRST and FINEST Home Freezer

Deepfreeze

TRADE-MARK REG. U. S. PAT. OFF.

Of Course, It's Electric! **HOME FREEZER**

SEND FOR THIS VALUABLE BOOKLET... *"Homemaker's Manual"*

36-page book . . . with suggestions on homemaking, better living. Send 10¢, name, address, to Dept. G-109. Deepfreeze Division, Motor Products Corporation, North Chicago, Illinois

Now!

Beat the Winter Crowds to SUNSHINE LAND!

Direct—

CHICAGO to LOS ANGELES

Serving El Paso, Douglas, Tucson, Phoenix and Palm Springs

A perfect travel combination for your winter holiday—luxurious Golden State streamliner via the low-altitude Golden State Route!

Here's smooth Diesel Speed; finest of private room and sectional Pullman accommodations; latest type reclining-seat Chair Cars. Coffee-Shop-Lounge, Dining Car, Lounge Car. Through Sleeping Cars from New York and St. Louis. Extra fare—and worth it!

Rock Island

THE IMPERIAL... Chair Cars and Pullmans to San Diego-Los Angeles; Tourist Sleepers to Los Angeles. Dining and Lounge Cars. No extra fare.

A. D. Martin, General Passenger Traffic Manager
Rock Island Lines, Chicago 5, Illinois 118

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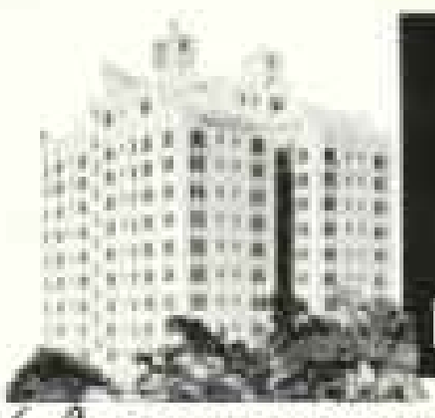

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Fully equipped, one to four-rooms. Steam heat. Air conditioned grill, cocktail lounge. Quiet residential section. Overlooking Biscayne Bay. Spacious hotel rooms—daily or seasonal rates. Large penthouses.

OPEN ALL YEAR

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MICHAEL D. WHELAN, *Manager*

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Come and rejuvenate at America's most popular Spa. Complete bathhouse facilities. Curative hot waters, owned and recommended by the U. S. Government for arthritis, high blood pressure, heart disorders, etc. Golf, riding horses, scenic highways. Restful climate of the pine clad Ozark foothills. Cuisine for epicures. For illustrated folder, address:

W. E. CHESTER, General Manager

NO OTHER SPA OFFERS SO MUCH

RCA scientists develop new *direct-reading* Loran instrument which simplifies problems of navigation.

The **homing pigeon** goes to sea

Now science gives the navigator an improved "homing pigeon instinct," a way in which —without checking sun or stars —he can head directly home.

Already thoroughly proved, *Loran equipment* has been simplified through RCA research and engineering, so that almost anyone can learn to use it in a few minutes. Free of human error, readings appear *directly* on the instrument. A quick check gives the ship's position.

Brain of the new Loran is a circuit developed at RCA Laboratories which splits seconds into millions of parts—accurately measures the difference in the time it takes a pair of radio signals to travel from shore to ship.

Given this information, the Loran navigator, hundreds of miles from shore, can determine his position quickly and accurately. Loran's simplicity adapts it to every type of vessel from merchant ship to yacht. Manufactured by Radiomarine Corporation of America, a service of RCA, it is already being installed in U. S. Coast Guard rescue ships.

The meaning of RCA research

RCA's contribution to the development of the new direct-reading Loran is another example of the continued leadership in science and engineering which adds *value beyond price to* any product or service of RCA.

* * *

The newest developments in television, radio, and electronics can be seen in action at RCA Exhibition Hall, 36 West 49th St., N. Y. Admission is free. Radio Corporation of America, RCA Building, Radio City, N. Y. 20.

RADIO CORPORATION of AMERICA

World Leader in Radio — First in Television

Luxurious comfort at money-saving fares in new VISTA-DOME chair coaches.

Feminine as a boudoir is the women's lounge. Men's lounges equally complete.

Enjoy Delicious Meals and personalized service in the California Zephyr's beautiful dining car.

"SCENIC-WAY" TO CALIFORNIA
TAKE THE VISTA-DOME *California Zephyr*

Extra Pleasure • Extra Comfort • No Extra Fare

"Scenic way" is *right!* Only the amazing new California Zephyr gives you the *double* thrill of riding the most wonderful train in the world right *through* America's most wonderful scenery. And *what* a way to see it! The new VISTA-DOME way! *Now* you can look ahead . . . look up . . . look down . . . look *everywhere* . . . while you glide in luxurious comfort through the magnificent Colorado Rockies and Feather River Canyon in daylight hours . . . Utah and Nevada by starlight or moonlight. Your choice of low cost VISTA-DOME reclining chair coaches or new type Pullman accommodations, drawing rooms, bedrooms, roomettes and sections. Through sleeper daily between New York and San Francisco.

NEW, FASTER DAILY SCHEDULES

WESTBOUND (Read Down)		EASTBOUND (Read Up)
3:30 PM Lv	Chicago	Ar 1:30 PM
11:59 PM Lv	Omaha	Ar 4:55 AM
1:19 AM Lv	Lincoln	Ar 3:40 AM
8:40 AM Lv	Denver	Ar 7:00 PM
	Colorado Rockies	
1:53 PM Lv	Glenwood Springs	Lv 1:35 PM
10:25 PM Lv	Salt Lake City	Lv 5:40 AM
	Feather River	
7:00-11:00 AM	**Canyon**	2:00-6:00 PM
12:28 PM Lv	Sacramento	Lv 12:50 PM
1:34 PM Ar	Stockton	Lv 11:53 AM
4:00 PM Ar	Oakland	Lv 9:44 AM
4:50 PM Ar	San Francisco	Lv 9:00 AM

BURLINGTON • RIO GRANDE • WESTERN PACIFIC

Progress in fighting DIABETES

One of the final steps in the extraction of purified insulin from pancreas glands. Here a solution of insulin is being filtered. It is later adjusted to meet dosage requirements of individual patients.

What medical science is doing . . .

Great advances have been made in controlling diabetes. The discovery of insulin in 1921 has led to a much greater life expectancy for the average diabetic today. For example, at age 40, the expectancy is more than twice what it was before insulin was developed.

Medical science is still on the march. It has developed different types of insulin. Some are quick acting with a short term of effectiveness, while others are slower acting but longer lasting.

In addition, it has been discovered that diabetes can be produced experimentally with a substance called *alloxan*, as well as by other means. This may shed new light on how and why the disease develops. Various studies, including research with radioactive isotopes, also offer hope for important advances in the treatment, and perhaps the prevention, of diabetes.

What you can do . . .

Recent surveys indicate that in addition to the million *known* diabetics, another million people in our country have diabetes and are unaware of it. So it is wise for everyone to keep alert for these warning signals—excessive thirst, hunger, or urination, continual fatigue, or loss of weight. It is important to see a doctor at once if any of these conditions appear.

Doctors recommend that everyone have an annual physical examination, *including tests for diabetes*. These tests are especially important for those who have diabetes in the family, those who are overweight, and those past 40.

While there is as yet no cure, modern medicine can generally control diabetes through insulin, diet, and exercise. By following the doctor's advice about keeping these three factors in proper balance, it is usually possible for the diabetic to live a practically normal life.

Making one of the tests for diabetes. Chemicals are added to a sample of blood. The resulting changes in color help to indicate the level of sugar in the blood. A high level may signify diabetes.

To learn more about diabetes, send for Metropolitan's free booklet, 109N, entitled "Diabetes."

Name_____

Address_____

City_____ State_____

At night, the riverbanks shouted a warning

TO THE PIONEER FAMILIES floating westward on the Ohio during the late 1700's, the wilderness along the river presented a constant threat.

Indians, eager for a scalping party, lurked in the canebrakes. Long stretches of the forested banks were literally alive with river pirates.

Once the flatboat families shoved off downriver, they landed no more often than was necessary—and then preferably by day. Drifting at night—with no moon to see by—the family man turned flatboat pilot used a navigating trick taught him by old rivermen, one calculated to keep his craft from swinging too close to shore.

He whacked the side of the boat with an ax—listened for the echo. The time it took for the banks to bounce the warning sound back told him which way to steer to keep in midstream.

This method of dodging danger is typical of the special skills the pioneer had to learn to keep his family safe. And today, although pioneering in this sense is as dead as Daniel Boone (except perhaps in Alaska), the quest for security is still the most important pursuit of a family man.

And it's our good luck that—as family men—we don't need to develop a lot of special skills to enjoy the security every family needs.

Handy to you there's a man whose study and experience qualify him as a family-security expert—your Travelers agent or broker. He can show you how, through the modern miracle of insurance, you can in one fell swoop create family security that it took the pioneer years to achieve.

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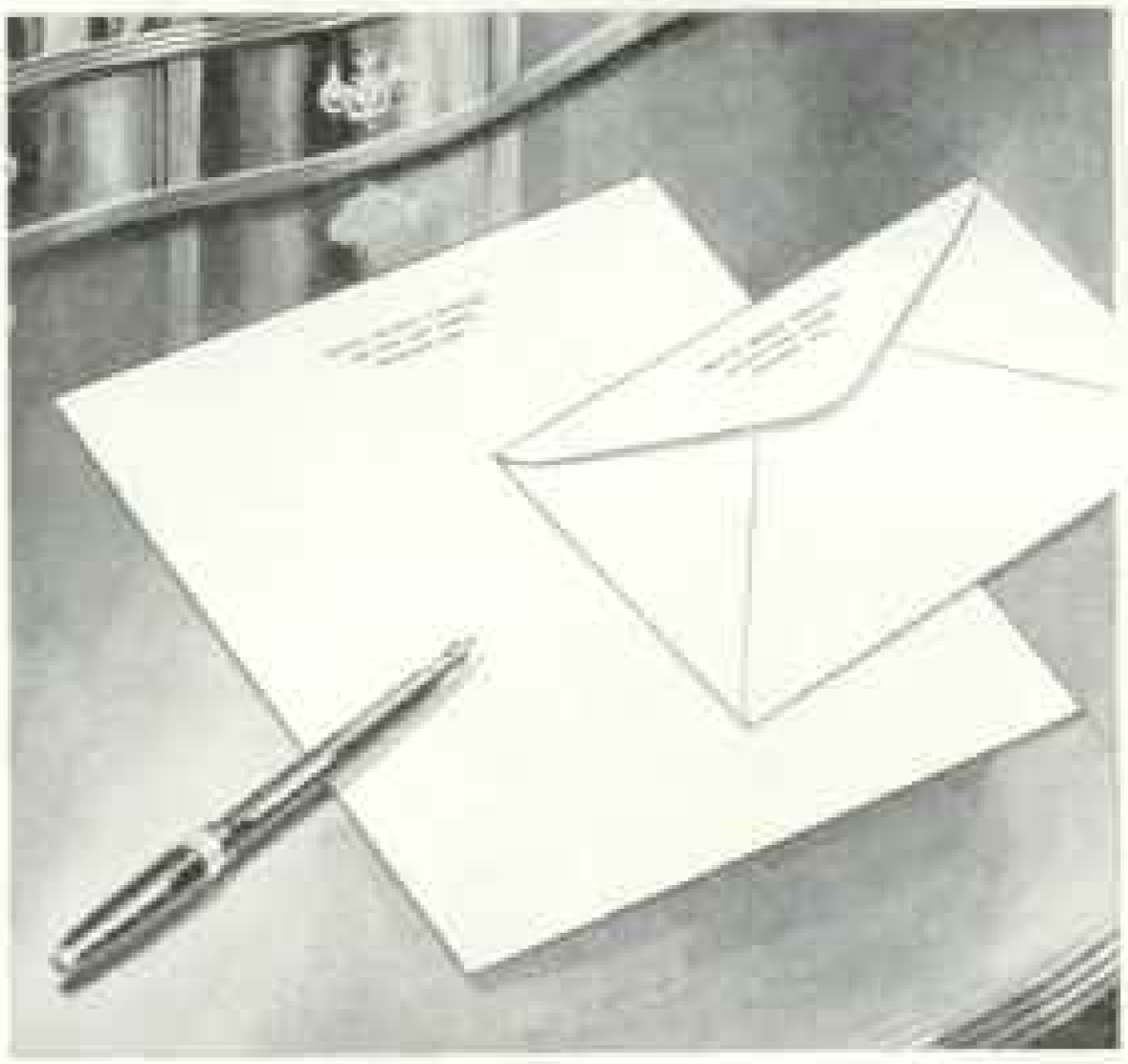

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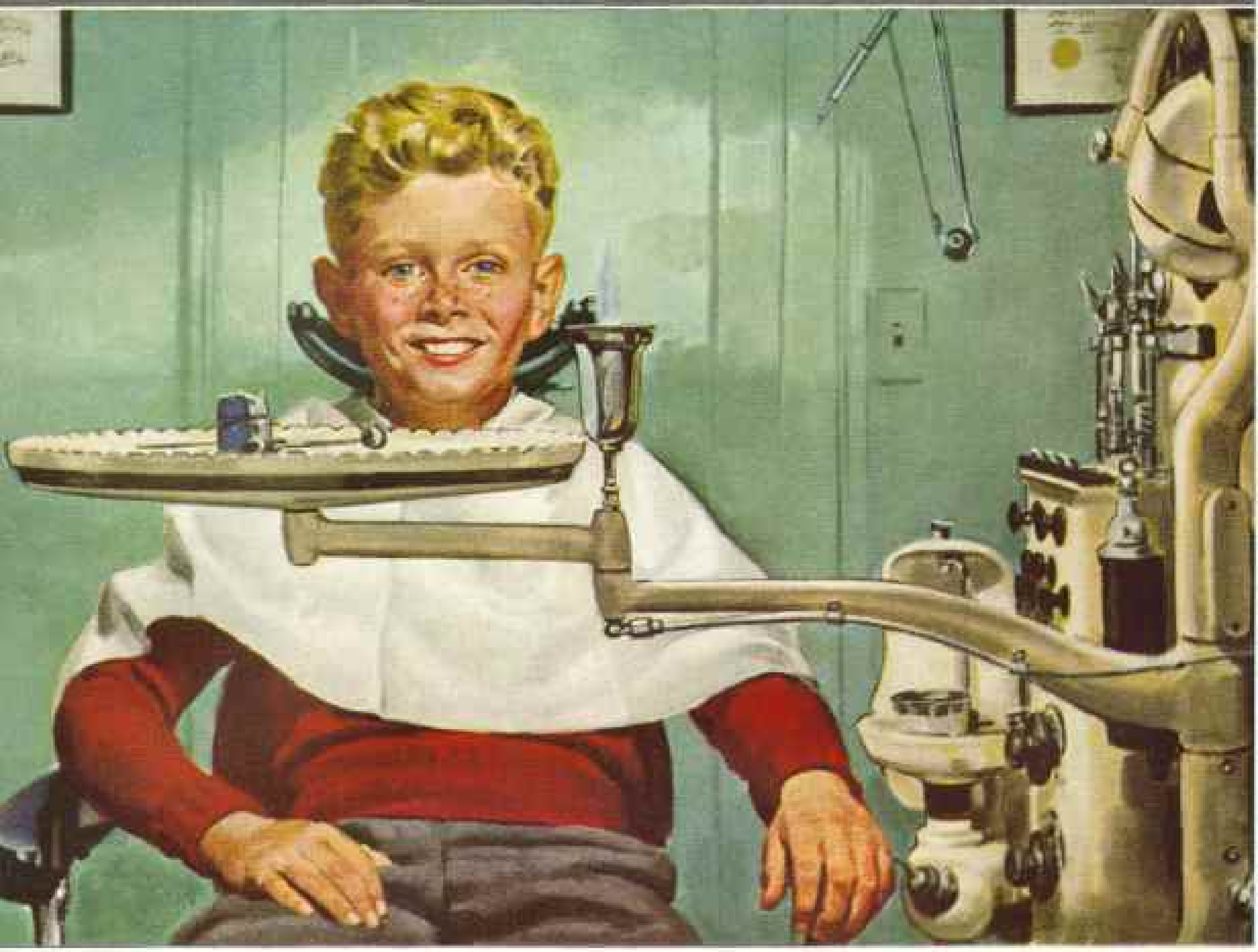

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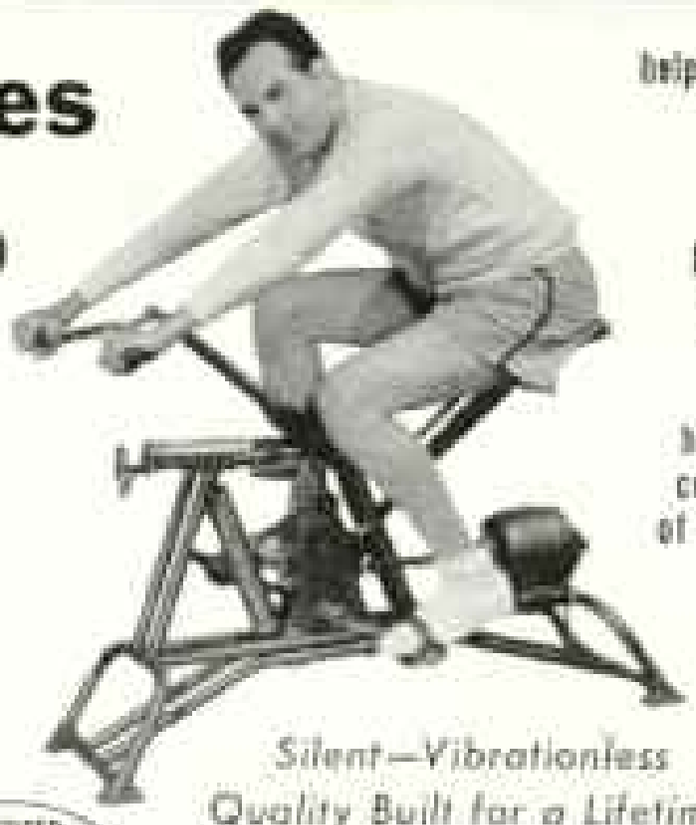

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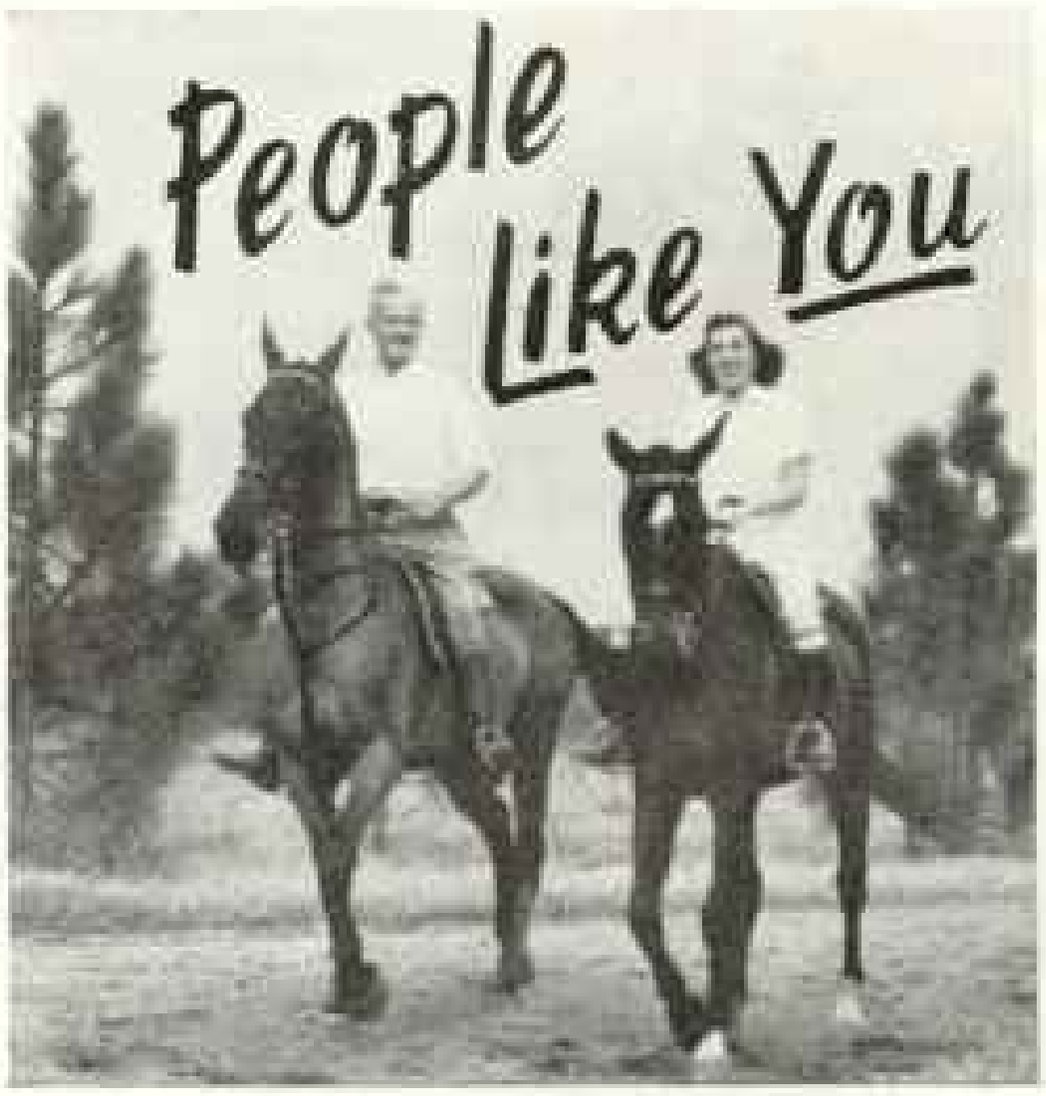

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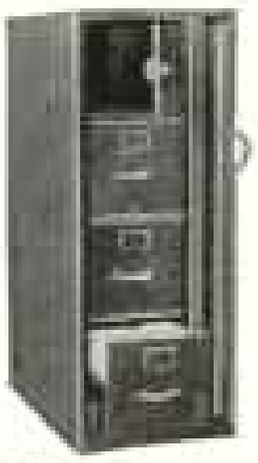

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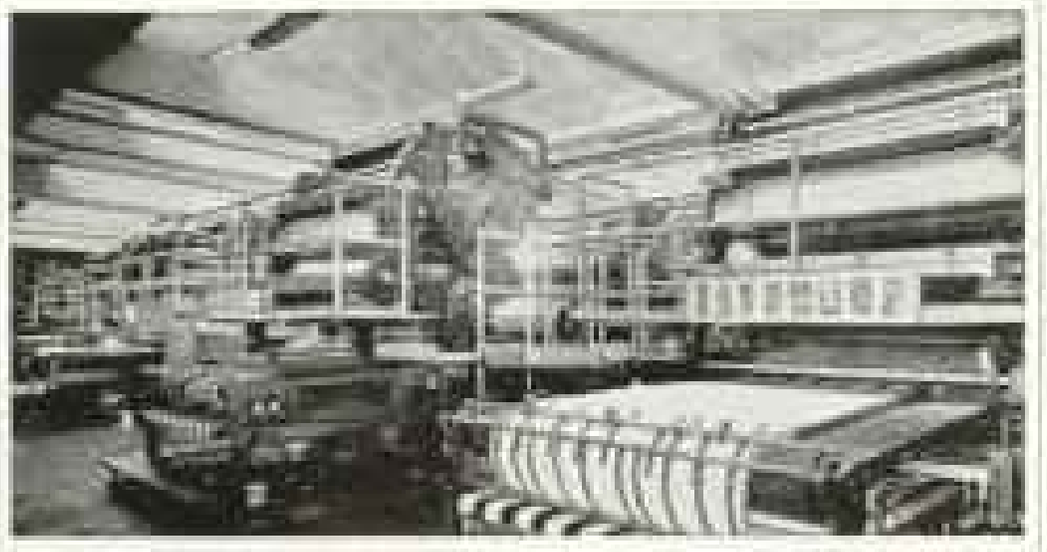

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