Quebec Labrador

IRON ORE COMPANY OF CANADA

Potentially one of the richest mineral-producing areas in the world, the Quebec-Labrador frontier has now been opened to civilization.

Ungava Bay
FORT CHIMO
NEWFOUNDLAND
GOOSE BAY
LABRADOR
Q.N.S.&L. RLY.
SEPT ILES
Gulf of St. Lawrence
QUEBEC
MONT JOLI
QUEBEC
HALIFAX
MONTREAL
OTTAWA
TORONTO
BUFFALO
NEW YORK
CLEVELAND
PHILADELPHIA
PITTSBURGH
BALTIMORE

Quebec-Labrador

THE LAND

The Quebec-Labrador frontier area has been known for centuries. Now the region is coming into its own as one of the world's great mineral storehouses.

THE TASK

Development of Quebec-Labrador iron ore turned out to be one of the most far-reaching construction projects ever undertaken. It has changed forever the face of a land that had not changed since the last glacier.

THE PEOPLE

Canadians built the project which has opened up a formerly isolated and inaccessible part of their country—and which promises to lead the way to greater development in the future.

THE ORE

Proved direct-shipping, high-grade, open-pit reserves total 417 million tons. By 1957 Quebec-Labrador ranges can be capable of supplying at least 10 million tons a year to support the economic expansion and military defense of North America.

THE LAND

Stark and forbidding, the ancient plateau of the Quebec-Labrador frontier is vital to the North American future

The first white men who were able to get a look at the seacoast of northeast Canada called it "the land God gave to Cain." For the four centuries since, the world has been content to leave it at that.

But now, one of the greatest private mining undertakings in history is working to develop the Quebec-Labrador wilderness for civilization. The task has been the creation of an industry, a community, and a mass transportation system deep in the sub-Arctic north, more than 200 miles from the nearest established settlement. The goal is iron ore, in deposits which rank with the great mineral discoveries of this generation.

The Quebec-Labrador frontier has, until very recently, been far from the center of the world stage and completely unimportant to most people. For 300 years after the time of Jacques Cartier in the 1530's, visitors to the country were few and far between. Roman Catholic missionaries, whose tireless efforts put the first lines across so many blank charts of the wilderness, touched frequently around the rim of the long seacoast that runs from the Gulf of St. Lawrence to Ungava Bay and penetrated into the interior. Montagnais Indians, living around Sept Iles as they do today, mapped the way through the Laurentian Highlands and into the northern lake country with considerable accuracy. Traders gathered hearsay reports of the vast hinterland as they bartered for furs.

By the middle of the 19th century, accounts of explorations into the interior were beginning to appear in print. Reverend Louis Babel O.M.I., a surveyor-missionary, made a long traverse through the region in the years 1866-70. But not until 1900 did any large part of the outside world have a hint of what this northeast corner of Canada might mean to the North American future. In that year, Albert Peter Low, a Montreal-born geologist in the service of the Canadian government, had at his disposal enough accurate information to start an article for the authoritative *Engineering Magazine* with this sentence: "The present high value of iron and steel, and the consequent activity in the search for and development of new sources of iron ore make this a fitting time to call attention to the iron-bearing deposits of the Labrador Peninsula."

And A. P. Low was the man to do the calling. What he knew he had learned the hard way—by seeing it at the end of a three months' canoe trip. For nearly a decade, from 1892 through 1899, he had ranged the country east of Hudson Bay on through to Ungava Bay and the Quebec-Labrador frontier as a geologist for the Canadian Geological Survey. Later to

The country of the Quebec-Labrador frontier looks now much as it did when the first explorers saw it. The few roads wandering through the brush between the ore bodies do little to soften its forbidding loneliness.

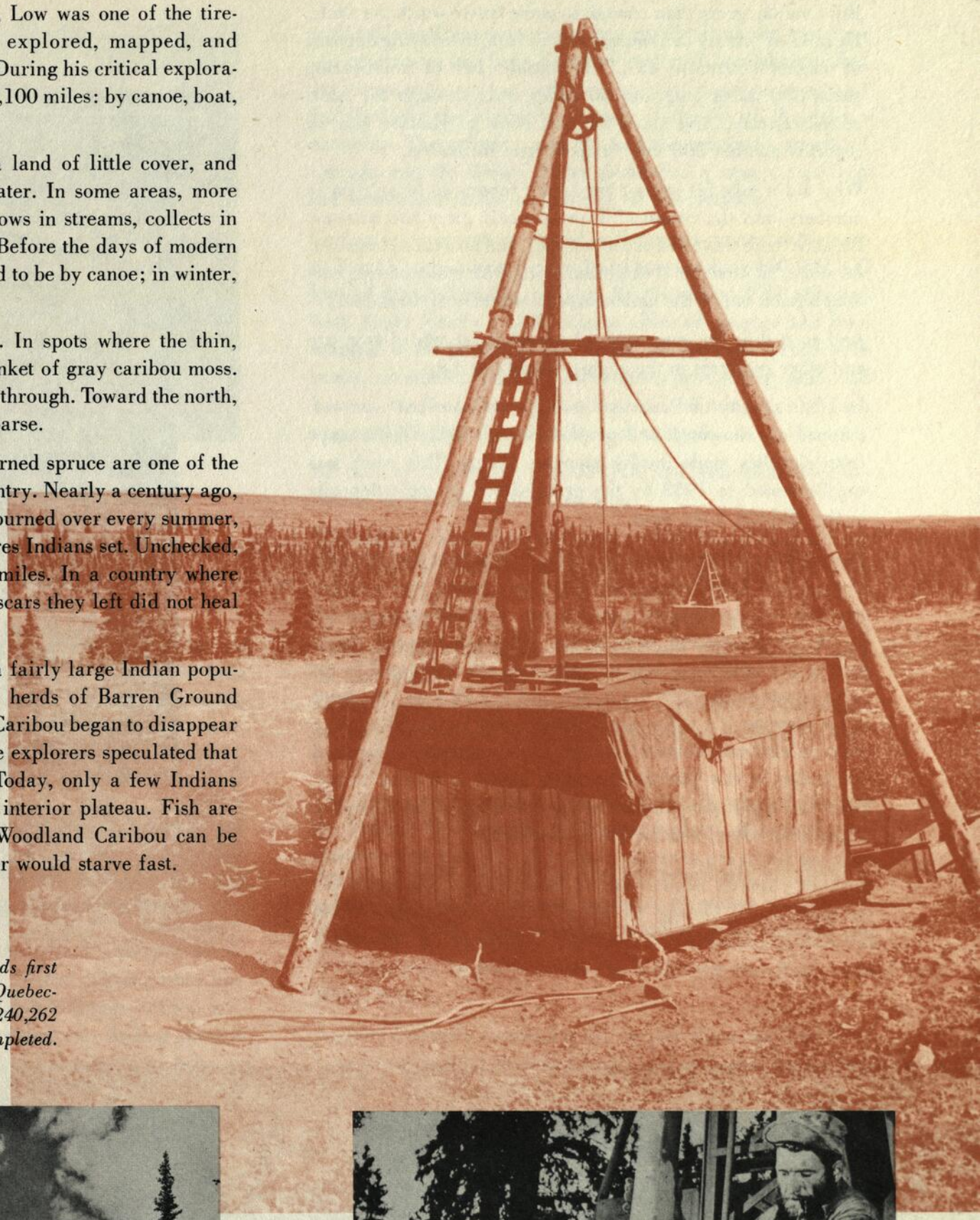
become Deputy Minister of Mines, Low was one of the tireless, devoted, brilliant men who explored, mapped, and recorded the face of this continent. During his critical explorations of 1892-95 he traveled some 7,100 miles: by canoe, boat, dog sled and foot.

The central Labrador Plateau is a land of little cover, and quantities of water—everywhere water. In some areas, more than half the surface is water. It flows in streams, collects in lakes, and lies in muskeg swamps. Before the days of modern equipment, travel in the summer had to be by canoe; in winter, by dogsled.

It is a world where little is green. In spots where the thin, infertile soil permits, there is a blanket of gray caribou moss. In other places the bare rocks break through. Toward the north, the timber becomes increasingly sparse.

The gaunt, silvered skeletons of burned spruce are one of the ever-present trade-marks of the country. Nearly a century ago, travelers reported that the country burned over every summer, probably as a result of the signal fires Indians set. Unchecked, the flames raged for hundreds of miles. In a country where recovery and growth are slow, the scars they left did not heal for generations.

At one time, the region supported a fairly large Indian population, which based its life on the herds of Barren Ground Caribou. Nearly a century ago, the Caribou began to disappear —no one knows why, although some explorers speculated that the constant fires drove them off. Today, only a few Indians try to live the year around on the interior plateau. Fish are plentiful, and herds of 20 to 30 Woodland Caribou can be found, but a man lost in the interior would starve fast.



Drills supported by spruce-pole tripods first probed the depth and extent of the rich Quebec-Labrador iron ore deposits. To date, 240,262 feet of exploratory drilling has been completed.

Portable drills mounted on modified trucks were used for exploration where the terrain permitted. The first drill like this was used in 1947. Three more followed in 1948.

Removing a sample from a drill hole. Careful mapping made it possible to concentrate on likely areas; more than 2,700 tons of ore were indicated with each foot of drilling.

But Low saw more than enough to make travel worth the while. He talks of "cherty carbonates, rich in iron, overlaying deposits of magnetite-hematite ores." He traced a belt of iron-bearing rocks 300 miles long and 50 miles wide through the heart of the country. And along the east coast of Hudson Bay he reported another 300 mile strip of iron formation.

Why did it take 50 years after Low's reports to bring men in numbers into the country? Low himself gave the answer. Because there was no railroad, no fuel, and no available power, he wrote, "it seems as if this area, along with many others, may long remain one of the undeveloped resources of the country."

And so it did. But memories of repeated reports of iron ore and other minerals in the region would not die.

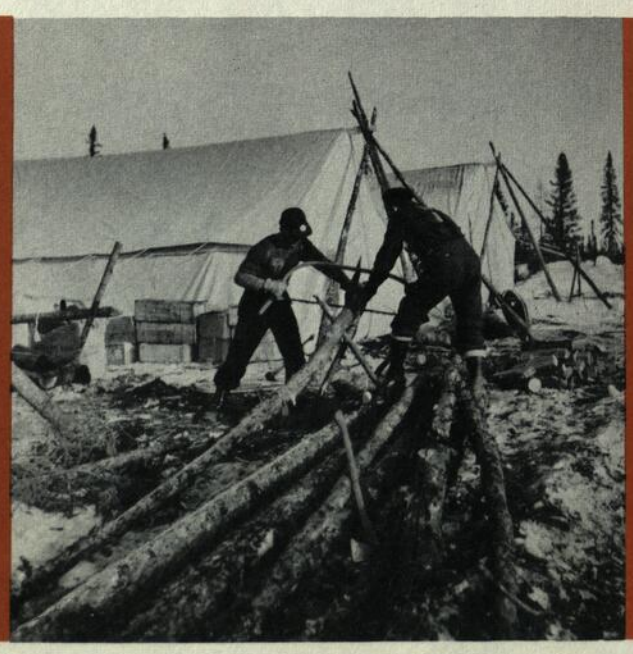
In 1929 a party of Canadian geologists discovered iron ore, mapped ore showings, and prepared rough topographic maps from sketches made during airplane flights. This work was supplemented in 1933 by the examination of some deposits in the Wabush Lake area.

That's where things rested until 1936. In that year the Labrador Mining and Exploration Company was formed by Canadian interests and was granted a concession of 20,000 square miles by the Newfoundland government. Although the only background information it had to work with was contained in the private reports of 1929 and 1933—and in Low's own accounts of his monumental treks—great strides were made. After three years of hard and constant work, six of the currently recognized ore bodies in the Quebec-Labrador region had been found. Then the economic difficulties of operating in so remote a region intervened, and work was suspended.

In 1942 the Hollinger Consolidated Gold Mines, Limited, obtained an option to purchase control of Labrador Mining and Exploration. In addition, a new company—Hollinger North

Glass jars full of ore samples stored in Burnt Creek constitute the physical record of three years of drilling and more than a decade of intensive exploration. Survey and exploration work cost approximately $10,000,000.

Float planes were indispensable to successful exploration. As many as fifty two-man teams a year have prospected Quebec-Labrador since 1942.



Winter chores were frequently tiresome, but brought fewer complaints than the blackflies of summer—the region's worst hazard.

Burnt Creek, the early exploration base, sits on 10 million tons of high-grade iron ore and will soon be torn down.

A survey crew marks the line a railroad spur will take past Burnt Creek to the Gagnon deposits and other ore bodies to the north.

Shore Exploration Company, Limited—was formed to hold concession rights on 3900 square miles in Quebec adjoining the Labrador border.

In 1942-43 the M. A. Hanna Company, experienced iron ore operators, joined forces with the Hollinger interests in both exploration companies, and through their combined efforts the way was paved for the rapid developments that have come in the last decade, under the leadership of Jules R. Timmins of Hollinger and George M. Humphrey of Hanna.

For three years after the first Hollinger-controlled exploration parties went out, prospectors spent most of their time looking for both iron ore and non-ferrous base metals. A great deal of effort was also spent on reconnaissance of the region.

In 1945, however, the evidence backing Low's early observations was becoming overwhelming. Twelve deposits were discovered containing more than 160,000,000 tons of iron ore, and the decision was made to concentrate on finding ferrous ores instead of base metals. Two world wars within a generation had been fought and won by the allied nations, armed with tools and weapons made principally from the vast iron ore reserves of the Lake Superior region. It was obvious that even these great ranges could not, unaided, continue to support indefinitely the expanded needs of the North American economy. The military security and the economic growth of Canada and the United States demanded a new, major iron ore source preferably somewhere on the continent.

Geological exploration—based in the newly created settlement of Burnt Creek—was given the job of proving some 400,000,000 tons of direct-shipping iron ore. By the end of 1950 this had been done. Nearly 15,000 square miles of country had been mapped in the effort; 40,000 aerial photographic prints were made, examined, and filed; 50 two-man prospecting teams had been in the field since 1942; thousands of test pits had been dug and 231,000 feet of drilling completed.

All told, approximately $10,000,000 had been spent on exploration. And it only paved the way.

The ore was there. No question of it. But "there" was 320 air miles north of tidewater on the Gulf of St. Lawrence, 250 miles south of Ungava Bay, and approximately equidistant between the shores of Hudson Bay and the Atlantic Ocean. In a sub-Arctic wilderness, largely uncharted and little changed since the last glacier melted, there would have to be created the tools of modern production, and the amenities of civilization so that people would be willing to live and work on the Quebec-Labrador frontier.

The three governments involved: Quebec, Newfoundland and the Federal Government of Canada, realized at once the tremendous task and did all in their power to aid in the development and accomplishment of the project so that this large undeveloped area would finally be opened for commercial expansion. All recognized that iron ore is necessary to progress in peace and security in war to maintain our steel-built 20th Century.

Andrew Carnegie summed it all up just about the time A. P. Low was traveling through the Labrador bush. "Gold," said the old steelmaster, "is precious. Iron ore is priceless."

Jules R. Timmins of Hollinger Consolidated (left) *and George M. Humphrey of Hanna* (right) *took the risk of opening the remote Quebec-Labrador ore country, and have provided the leadership that has led to the project's successful conclusion.*

THE TASK

Towns, power developments, a railroad, and terminal facilities had to be built in a $250,000,000 project . . . all to get out remote Quebec-Labrador ore

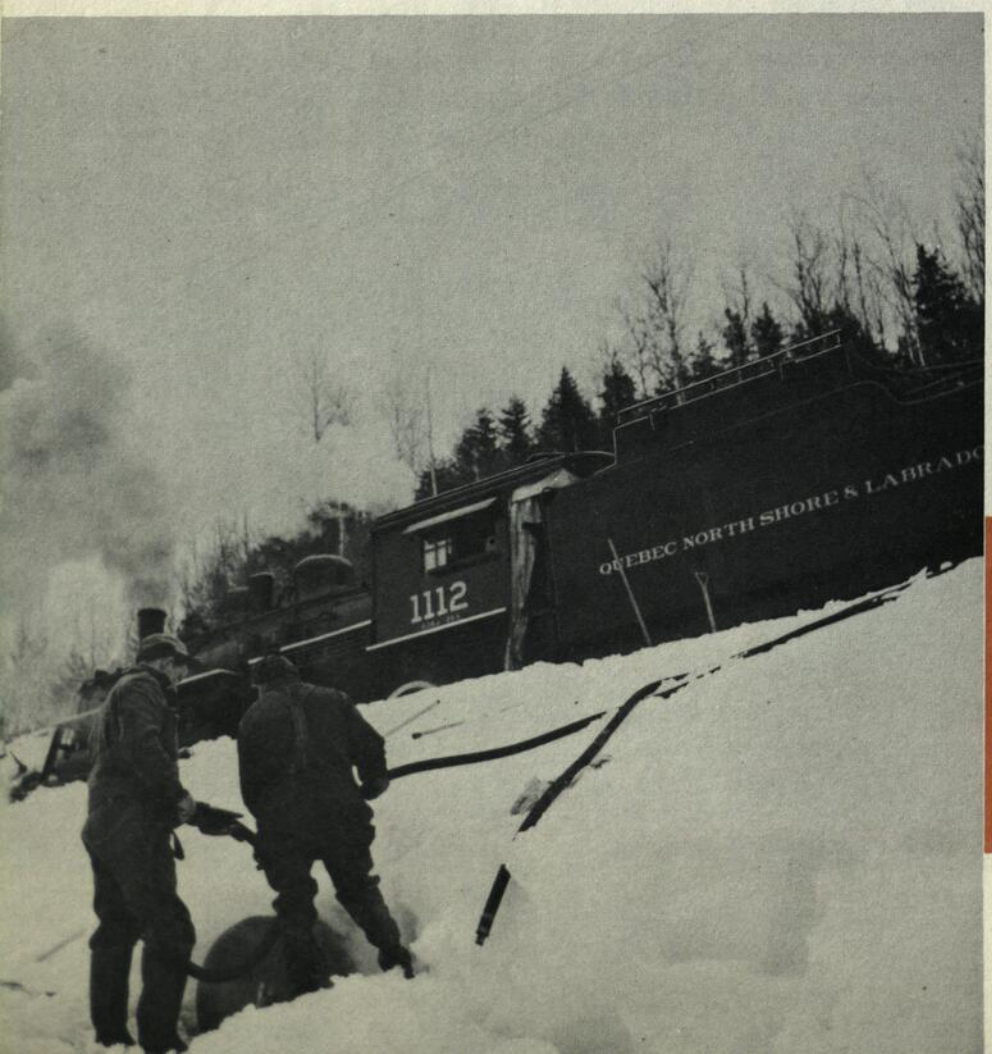
"This may not be the toughest job in the world," said the big man in the gray jacket, "but it sure is the longest toughest."

He was looking down at a single-track railroad stretching across the muskeg of the Quebec-Labrador frontier. It had been his job to lay steel for that road in 40 below zero weather—lay it at the rate of nearly two miles a day. And his job was only one of hundreds that, in the final sum, must be added together to explain one of the world's great ore developments.

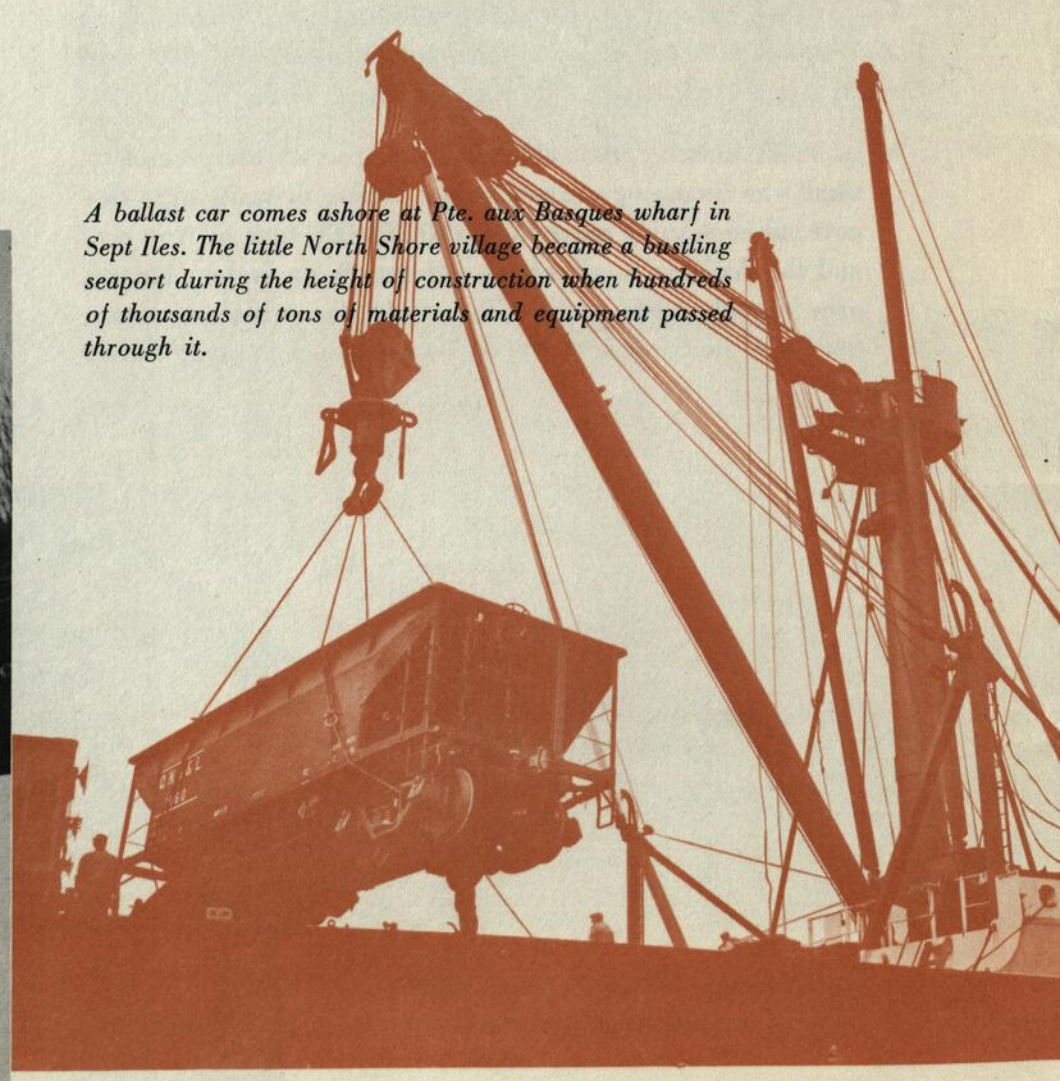
You can board a DC-3 on the shores of the Gulf of St. Lawrence, fly north for two hours, and still look down on the same development. Or, you can climb on a train in Sept Iles at dawn, and still be traveling steadily north at dark—and you will never have left the project. From one end to the other construction covers some 365 miles. That's more than the distance of a round trip from Quebec to Montreal, or the equivalent of a journey between Cleveland and Chicago. The project cost some $250,000,000 to build, and as many as 6900 men worked on it at one time.

By the late 1940's, it was evident that there was iron ore enough in Quebec-Labrador to justify large-scale operations. It was also evident that the costs of development would over-tax the resources of any one company.

To raise the large amount of capital needed and to assure a market for the large tonnages of ore that must be produced to support the project, the original Canadian concession companies and Hollinger Consolidated Gold Mines, Limited, under the leadership of Jules R. Timmins, joined with Republic, National, Armco, Youngstown, Wheeling and Hanna to form



A ballast car comes ashore at Pte. aux Basques wharf in Sept Iles. The little North Shore village became a bustling seaport during the height of construction when hundreds of thousands of tons of materials and equipment passed through it.



Two steam locomotives do an important job on the dieselized Quebec North Shore and Labrador. They serve as portable heating plants to thaw the more than 16.5 miles of culvert that pierces the fill from Sept Iles to Knob Lake.

the Iron Ore Company of Canada. The two Canadian concession companies subleased to IOC a portion of the iron ore located in their concession areas, retaining ample reserves of ore to meet all present and future Canadian requirements. Iron Ore Company of Canada, under the leadership of George M. Humphrey, took over the task of raising the money, opening the country, and developing the ore.

Besides the financing provided by the partners, 19 American and Canadian insurance companies agreed to lend $150,000,000. The project represents one of the largest mining undertakings ever attempted by private capital.

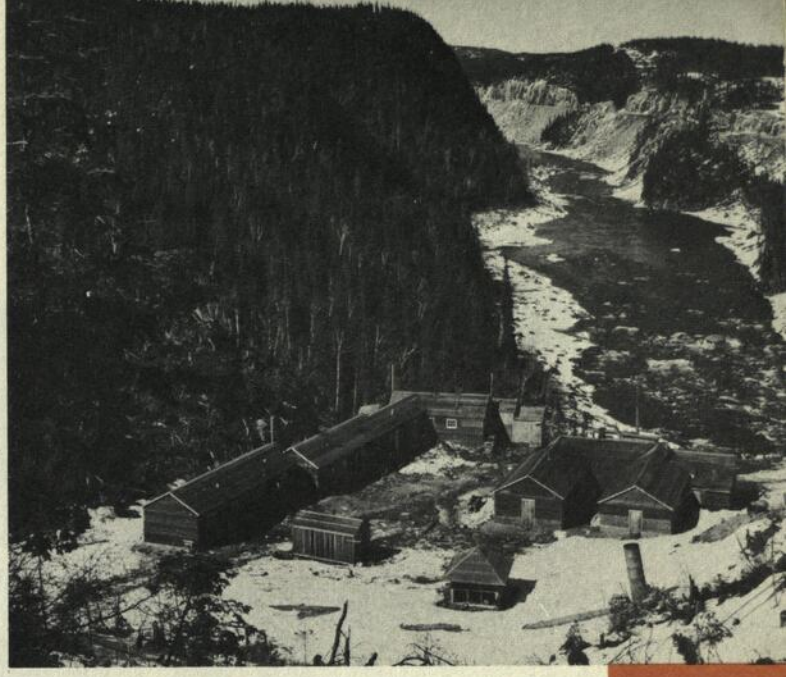
Four contracting companies—Cartier Construction, Limited; McNamara Construction Company, Limited; Mannix, Limited; and Morrison-Knudson Company of Canada, Limited—joined to form a new company which submitted bids on the construction of the railway, terminal, and two power projects, and was awarded the contracts.

On October 2, 1950, a small steamer in the coastal trade slipped in behind the seven St. Lawrence islands that have named the town and bay of Sept Iles, tied up at the old village pier, and put ashore the first construction equipment. A few hours later bulldozers were snorting and puffing to clear the brush for the first construction camp, just back of the harbor.

The builders had a deadline to meet. In four years they had to:

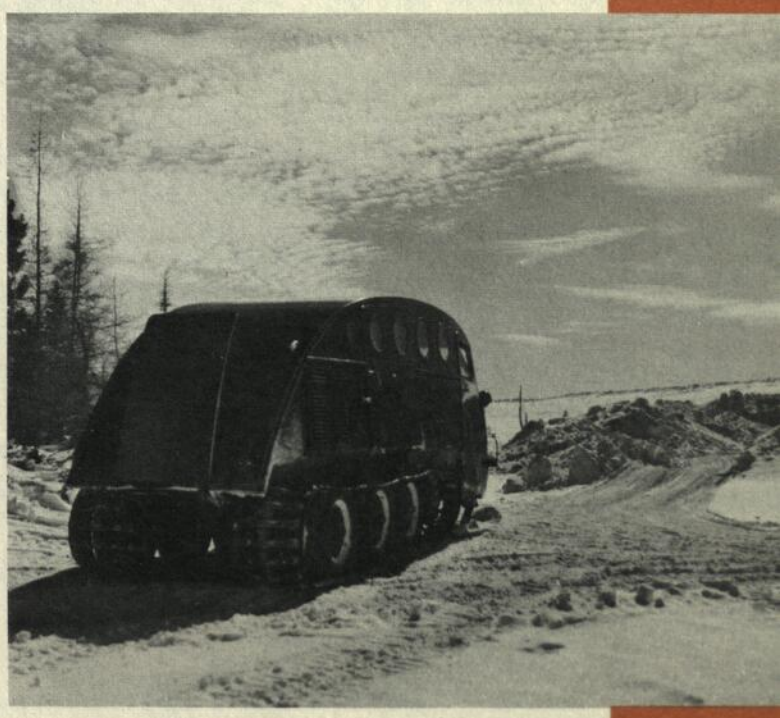
- build 357 miles of mainline railroad and terminal yards through a wilderness;
- operate and maintain over this same wilderness the largest civilian airlift in history;
- build and maintain base camps and way stations to house and feed 6900 men;
- construct dock facilities large enough to receive raw materials as they arrived, and to ship at least 10,000,000 tons of ore a year when the project got into operation;
- plan for and start construction of two new townsites to house permanent employees;
- build two hydro-electric plants and necessary transmission lines;
- prepare open-pit mines for operation, construct crushing, screening and loading facilities; and continue exploration of ore bodies.

And everything had to be done at once. All work had to be in progress at the same time and finished at the same time. But, like all big jobs, it can be broken into many smaller ones. The town of Sept Iles on the north shore of the Gulf of St. Lawrence is the southern terminal for the railroad and the shipping point for the ores of both Quebec and Labrador. Here were constructed a new 1600-foot dock to handle ore carriers,



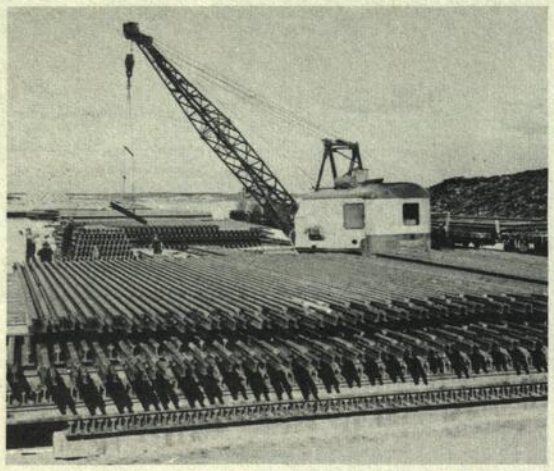
The Moisie River brawls its way through this canyon above the camp at Mile 12. Railroad bed cut into solid rock can be seen clinging to cliff wall at right.

Hollinger-Ungava Transport flew from 35 to 40 thousand gallons of gasoline a day up the line in 1953, accounting for many of the thousands of flights it made that year.



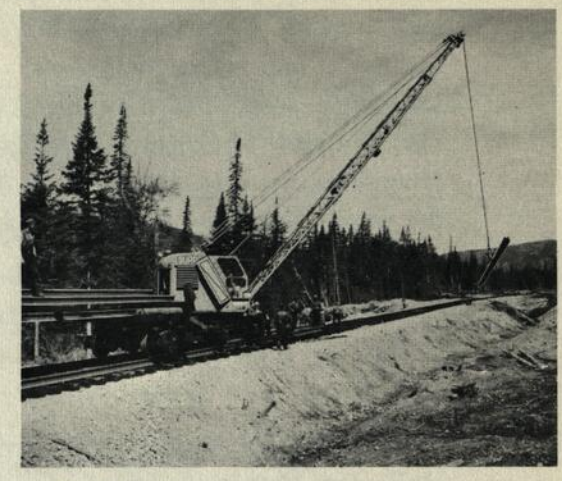
Snowmobiles proved an efficient and relatively rapid means of moving men and materials in the winter when other transportation was less effective.

NEW TECHNIQUE SPEEDED TRACK LAYING

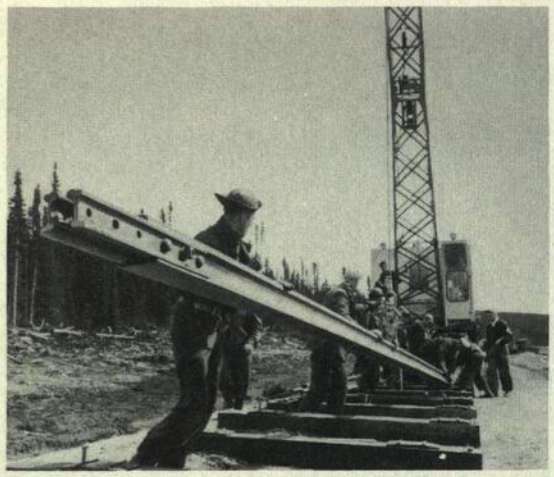


Up to 80 rails were loaded onto each of several skeleton cars which were pushed to the end of steel.

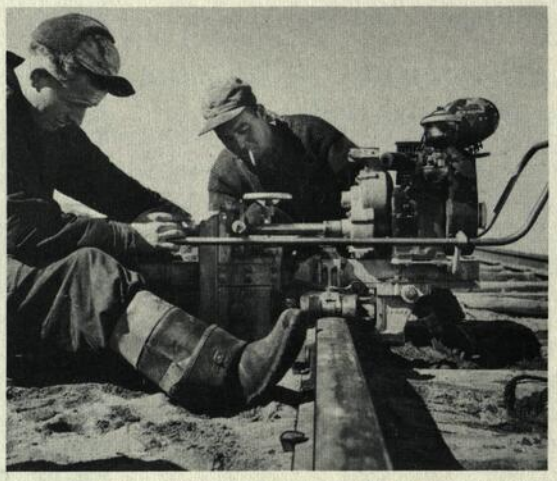
At the head of rail, a crane lifted off individual 132-pound rails as they were needed.



Track-laying crew was ready to receive rail as crane swung it into position. Crane placed a rail every 60 seconds.



Ties had been placed by the night crew to clear the way for track laying.



Gasoline-powered drill bores hole for bolt installation at joint.

Ballasting, track raising, and tamping complete the operation. Mechanical ballaster tamps a tie in 7-8 seconds.

as well as classification yards, a complete ore handling system, and railway maintenance facilities.

In addition to dormitory housing for construction crews, private homes were built, and more are under construction. Twenty-four miles away across Sept Iles Bay, Iron Ore Company of Canada joined with the Gulf Pulp and Paper Company to form the Gulf Power Company, which has constructed a 25,000 horsepower hydro-electric plant to furnish power for the railway and terminal facilities in the area, for the Gulf Pulp and Paper Company, and for the town of Sept Iles.

The Quebec North Shore and Labrador Railway, a common carrier and an Iron Ore Company of Canada affiliate, heads north out of Sept Iles, 357 miles to the Silver Lake yards in the heart of the ore mining district. It is one of the longest stretches of railroad construction on this continent in this century and the only one in history built by air. For the first time there is a break in the wall of distance and terrain that has kept the Quebec-Labrador frontier as isolated as any place in North America. Now it is possible to open up a vast new land of great mineral wealth.

The function of the QNS & L is to haul iron ore economically and efficiently. That was the abiding theme that lay behind the selection of a route after five years of surveys, it determined the ruling grades that are nowhere more than 0.4% against a loaded train, and it dictated selection of locomotive power and rolling stock. This same theme applies to all the rest of the project. Although there were many problems to solve and decisions to make, the answer to them all roots in the same basic consideration: the need to move iron ore.

Jules R. Timmins prepares to drive the Golden Spike, symbolizing completion of the Quebec North Shore and Labrador Railway, one of the greatest private construction jobs in Canadian history, on February 13, 1954. Railroad promises to be instrumental in opening up vast undeveloped areas in Northeastern Canada.

The biggest headaches the railroad builders had to face can be summed up in two words: rock and mud. The first 10 miles of the railway runs across the flat Champlain Plain, but at Mile 10 it starts to climb a series of low marine terraces, and by Mile 12 it is at the front door of the rugged Laurentian Uplands. It was necessary to tunnel 2206 feet at Mile 12 to make entry into the Laurentian region at all. This tunnel, in turn, comes out on a hillside 155 feet above the brawling, Moisie River, making necessary a 705-foot bridge to the north bank, the longest bridge on the project.

For the next 138 miles, the grade follows the valleys of the Moisie, Nipissis, and Wacouno rivers through the rough Laurentian country. Here cuts through solid rock were common.

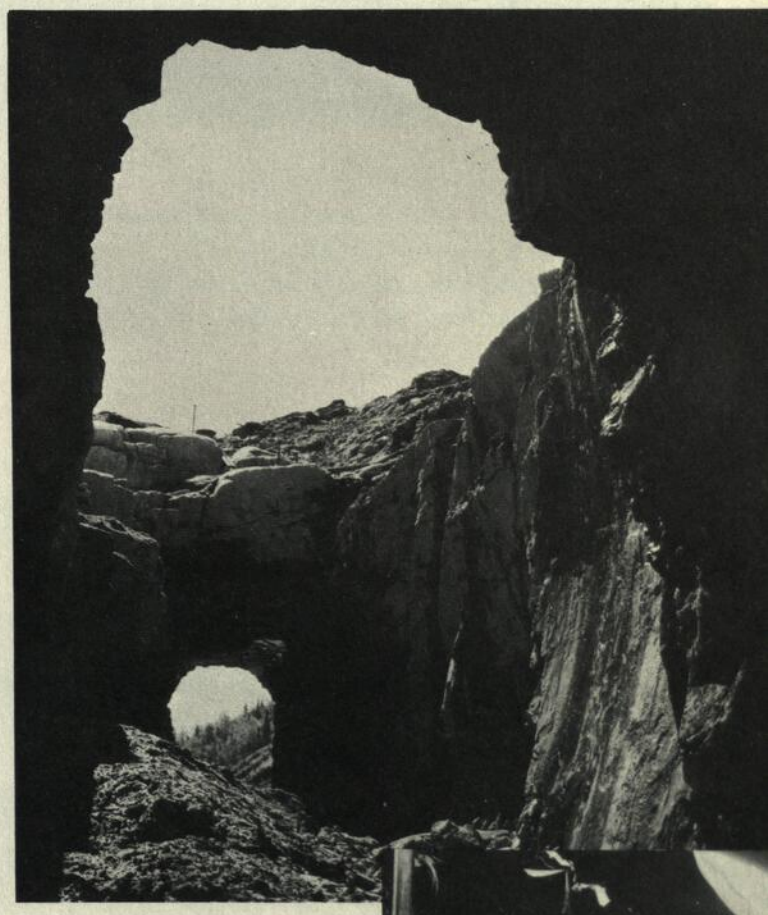
At Mile 150 the road crosses the height of land at 2056 feet, and starts across the Labrador Plateau beside the Ashuanipi and Menihek lakes until about Mile 330, where it turns across the grain of the country to the Silver Lake yard. In the stretch from Mile 150 to Mile 345 low, wet ground was the problem.

This stretch contains muskeg country—a compound of unstable earth and stringy fibers, where scarcity of suitable fill material made construction difficult. And where there isn't muskeg there is fine, glacial silt. Spring will see four feet of snow run off the surface in a short period, creating a drainage problem of major proportions. And when the run-off is gone, from 18 inches to four feet of frost leaves the ground soon after, making a new morass as bad as the old. In many ways, spring is a worse time than the sub-Arctic winter. In the winter men and machines can move, however slowly; in the spring they sometimes can hardly move at all.

Not that winter does not have its problems. Work had to continue in temperatures so low that even equipment was strained to the utmost. Last winter men were laying rails in temperatures that reached 50 below. It was an operation without parallel in construction history.

Mud and rock plagued builders constantly. (above) *Crane works to clear a slide of silty clay, 75 yards long, 20 feet deep, off track at Mile 11.* (right) *Wreck crew clears derailment caused by rock slide.*

Muskeg along the line. In many places roadbed was built right over it. This muskeg will compress to 3 inches for every foot of depth. (left) *Drainage ditch opened by propagation blasting.* (right) *Dragline muskeg.*



Break through near south portal of the 2206-foot tunnel at Mile 12; 100 thousand cubic yards of material flowed through this hole. Damage was repaired (right) *by capping with concrete.*

Longest bridge on the QNS & L, the 705-foot span at Mile 12 over the Moisie River has its south end at the mouth of a half-mile tunnel and its north end on a shelf of solid rock which had to be blasted to make room for the roadbed.

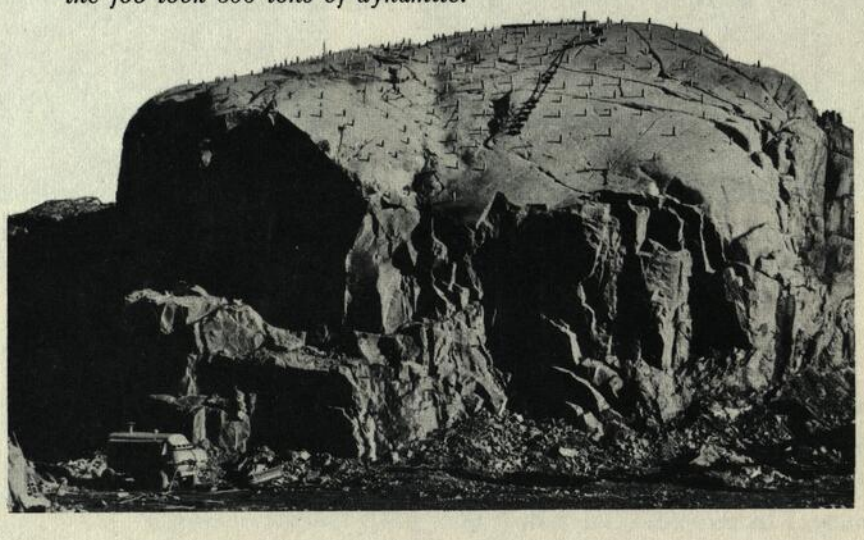
In December, 1953, working out of the ultimate railroad mid-point known as Oreway, track-laying crews made more than two miles a day for 10 straight days in 30 below zero weather.

Track-laying into the new town of Schefferville was officially finished on February 13, 1954, when Jules R. Timmins drove the symbolic Golden Spike. It was 56 below that morning, but warmed up to a springlike -20 for the ceremonies. The last day steel was laid going into Silver Yard the crews made 9700 feet.

At the same time the track-laying crews were working, other men were shattering all precedent by successfully dumping ballast at temperatures in the -40 range. In many places, the gravel they hauled and spread last winter has helped keep track serviceable during the spring break-up.

Already names are changing on a land where, until recently, there have been few names at all. Some are even disappearing as circumstances and convention remake the map. Burnt Creek

Bristling like a porcupine, with every peg marking a loaded blasting hole, a knob of Laurentian granite awaits its fate. More than a million cubic yards of solid rock were excavated between Mile 12 and Mile 17; the job took 600 tons of dynamite.



DRAINAGE WAS A CONSTANT CONSTRUCTION PROBLEM

Eighty-three thousand feet of culvert, from 24 to 120 inches, were used for drainage openings along the railroad grade. Smaller diameters were rolled on location with a portable corrugating mill. Multiplate culverts were used in larger sizes (as above); *sheets forming segments of the circumference of the pipe were bolted together in the field. There were no accurate rainfall and run-off records for much of the country through which the railroad was built, making necessary great care in planning.*

Modern snow-fighting equipment was used against storms severe enough to interfere with winter construction. Rails would drift over in a few minutes (below).

There was a sudden ice break-up and exceptionally heavy run-off in the spring of 1952 at the Menihek power project. Huge ice rafts swept down on the coffer-dam bridge, causing extensive damage. Peak flow was estimated at 71 thousand cubic feet per second.

Welding teeth on a shovel bucket. Facilities for major repair jobs were maintained at Sept Iles and up the line at Miles 224 and 290. Heavy equipment airlifted north was frequently cut apart for shipment and welded back together in the field.

and Knob Lake Camp are examples. They are the names around which the early history of the project was written, and they will soon be little more than memories.

Burnt Creek was the base for the first extensive geological exploration of the iron ore country. It housed geological and drill crews, as well as machine shops and other facilities to service the operation. It had been picked, too, as the site of the permanent town. But that quickly changed one day when a crew from a machine shop tested a churn drill behind their shed. After three feet, the drill was in ore. At 357 feet, it was still in ore. Then they quit. Later investigation proved that the settlement was sitting on top of more than 10,000,000 tons of 63% iron ore. Now Burnt Creek is languishing, and the camp will soon be torn down to make way for the mining shovels.

With Burnt Creek's end in sight, Knob Lake—another early camp three miles away—was chosen as the place for the permanent town, and its name was changed to Schefferville, in honor of the Bishop of Labrador. Eventually Schefferville will be a modern well-planned community of houses, stores, schools, and churches. There are 24 occupied housing units in the town now, and 100 more will be under construction this summer.

Every form of transportation from dogsled to aircraft was used to survey and build the railroad. There are a score of stories to be told:

- about the first 38 dogs bought for survey teams from Eskimos and North Shore trappers;
- about canoemen stranded for days on northern lakes waiting for adverse winds to blow themselves out;
- about the 44-foot boats built at Sept Iles to carry four tons of material at a time for 100 miles and more up northern lakes to make construction beachheads;
- about truck and tractor trains crawling for weeks across the frozen bush to move heavy equipment north so it would be ready for the spring.

But the greatest story of all is the airlift—the largest civilian operation of its kind in history and one of the most amazing demonstrations of efficient aircraft use ever put on record.

Almost without major exception, every man, machine, part, or pound of food on the project first went up the line by air. There was literally no other way to reach much of the interior. The airlift was operated by Hollinger-Ungava Transport, an IOC affiliate based at Mont Joli, which is on the railroad that traverses the South Shore of the Gulf of the St. Lawrence, 141 air miles from Sept Iles.

From October 1950, until December 1953, HUT carried a total of 138,700 passengers and flew 170,343,000 pounds of freight for a total of 15,263,190 ton miles. All this was done without so much as scratching a crewman or passenger, although HUT as a matter of course had to fly into single landing strips at the bottom of canyons, in cross winds, and through some of the world's most exasperating weather.

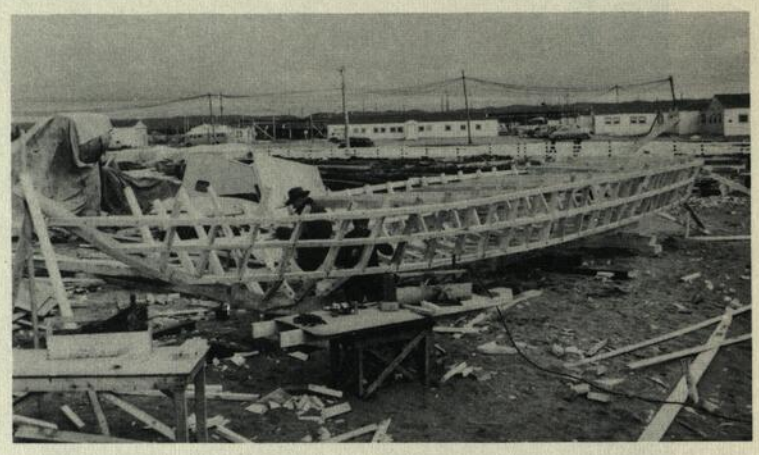
Fleet of tractors, just unloaded at Sept Iles, awaits shipment north; 180 tractors were used in constructing the QNS & L.

Hollinger-Ungava Transport flew around the clock, around the calendar. The airline missed only 11 days in three years (not counting Christmas and New Year's Day) when an aircraft did not fly somewhere over the area from Montreal to Mont Joli to Knob Lake. From 1950 to 1953, HUT flew 138,700 passengers and 170,343,000 pounds of freight for a total of 15,263,190 ton miles. Ground crews would load a DC-3 and get it back in the air in less than 15 minutes; mechanics could change an engine in the field and have an aircraft flying again in 4 hours.

Christmas and New Year's Day were the only holidays the line knew. Not counting them, HUT missed only one day in 1951 when one of its aircraft did not fly somewhere, six days in 1952, and four days in 1953. The longest single stretch without a flight of some kind was 48 hours.

Railroad construction leapfrogged north—and HUT carried it over the humps. While regular construction crews kept building ahead from the end of steel, bulldozers would push tote roads through the bush a score of miles or so to the next level spot. Here they would clear a landing strip so that cargo aircraft carrying more equipment could land. Frequently machinery flown up this way had been cut apart so it could be carried; it would be welded back together in the field and put to work on the railroad right-of-way.

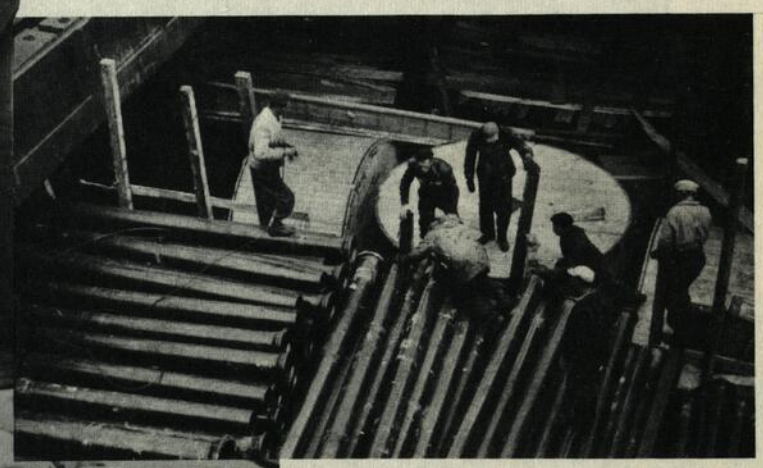
The line operated ten twin-motored and five single-motored aircraft, and two helicopters. In addition, it chartered seven other ships from time to time.



Forty-four foot pointers, built on the project carried 165,527 tons of freight up the Ashuanipi, Whitman, Molson, and Menihek lakes in 1953.

In 1952 and 1953 winter convoys moved hundreds of tons of heavy equipment north. Trips took more than two months of hard travel.

Some of the 190 thousand bags of cement used to build Menihek dam and power plant are loaded for shipment to the head of rail; from there they will be airlifted to the site of construction.

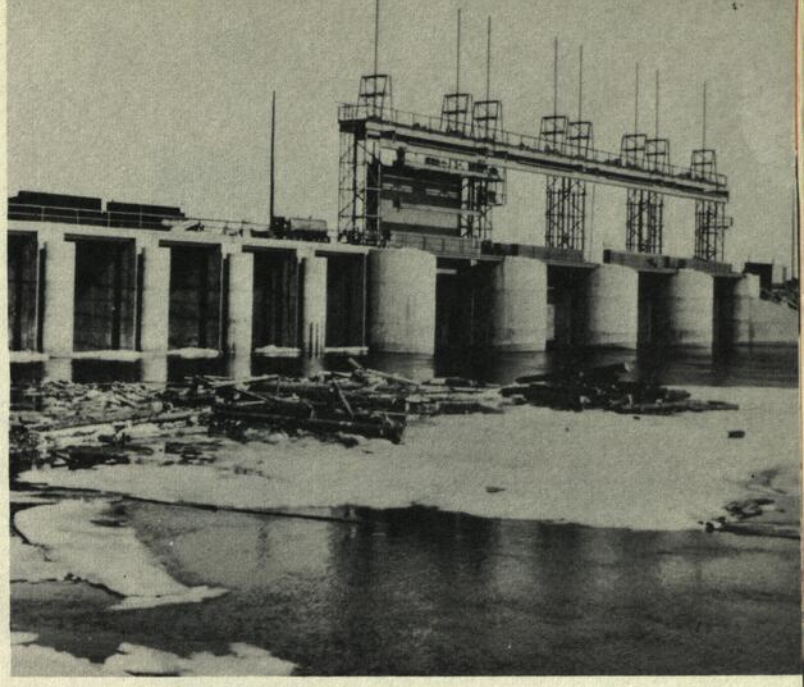


Unloading pipe at Sept Iles. Iron Ore Company purchased its own 2500-ton vessel, the S.S. Easton, *to facilitate freight movement from Montreal.*

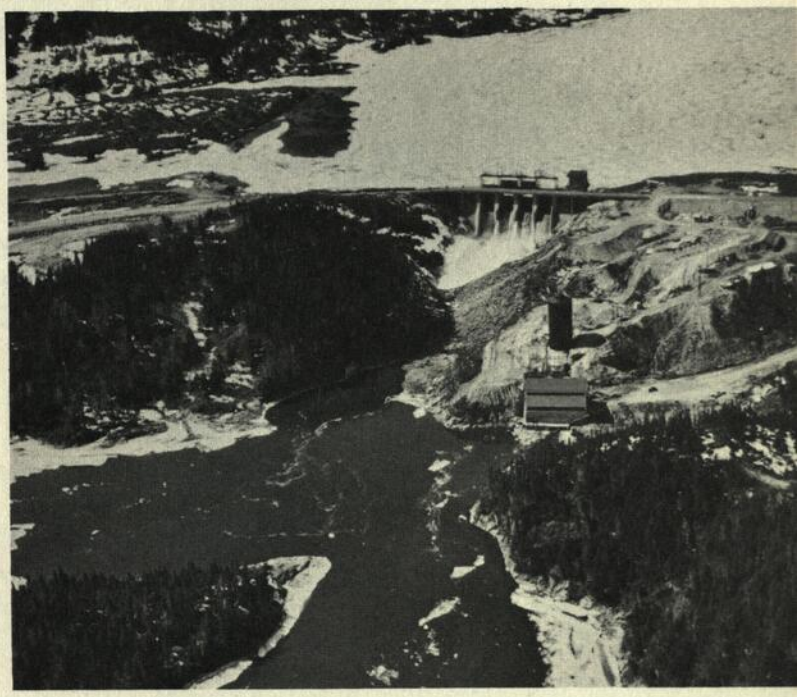
In all, 14 landing strips were built along the line, and, at peak operations, 82 pilots and co-pilots were flying an average of 60 to 70 flights a day. Greatest number of flights in any one day from any airport was 96 from the strip at Mile 224.

The construction of the Menihek Dam—a hydro-electric project at Mile 330 designed to furnish power for the mining operations and townsite—is a typical example of the job the airlift did. There it flew in all the material needed except for some 1450 tons moved overland during the winters of 1952 and 1953. Loadings reached a peak of some 1,200,000 pounds of supplies and equipment a week during 1953, including the 7,000 gallons of gasoline and fuel required daily to power machinery, and the total 190,000 bags of cement which went into the dam.

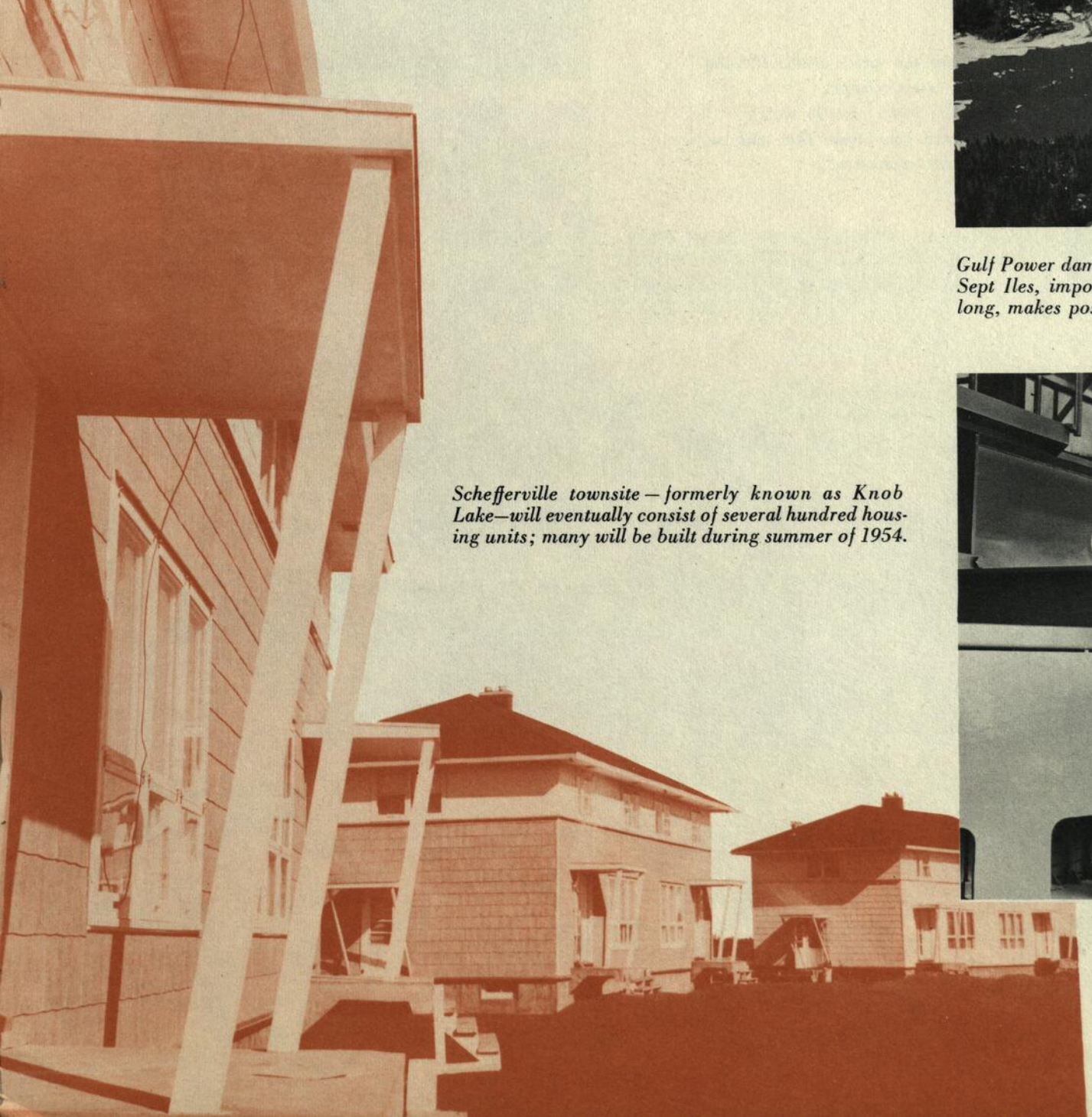
The Quebec-Labrador project may not have been the toughest job in history. But describe it as you will, one thing is certain; the face of the North Country, which hadn't changed since the last glacier, has been changed now. History has moved in on the Quebec-Labrador frontier, and the land God gave to Cain is now a bulwark of the free world.



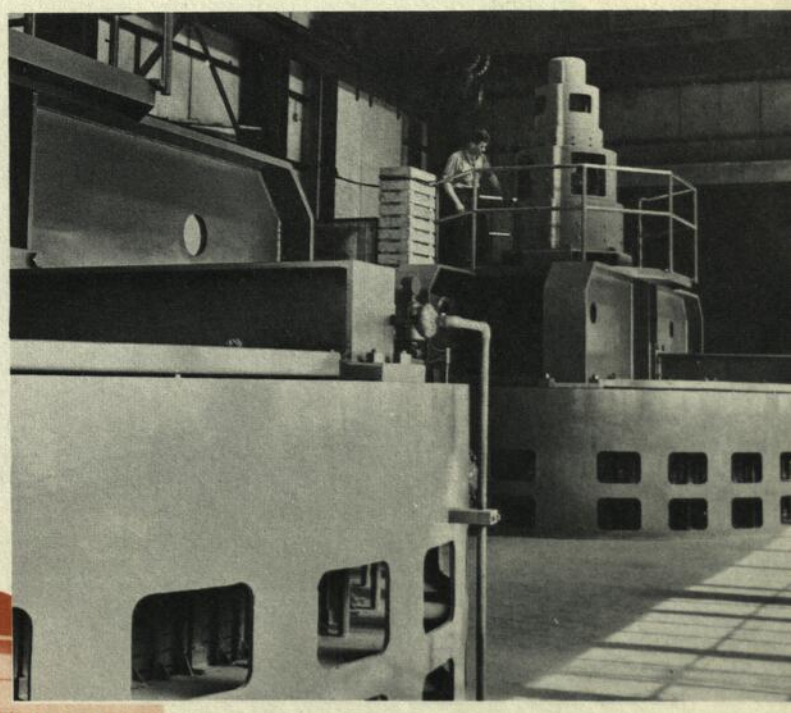
Menihek dam, which also serves as bridge for the railroad, generates 12,000 horsepower with 34-foot head. Initial construction provides for easy expansion as required.



Gulf Power dam on Marguerite River, 24 miles from Sept Iles, impounds 53-mile lake. Dam is 450 feet long, makes possible head of 115 feet.



Schefferville townsite — formerly known as Knob Lake—will eventually consist of several hundred housing units; many will be built during summer of 1954.



Each unit in Gulf Power house can generate 12,500 horsepower for use in Sept Iles terminal and townsite. Project can be doubled, if necessary.

THE PEOPLE

They came from all over Canada to build the project which has opened new economic frontiers for the nation

A great deal has been said and written about the part machines have played in shaping the modern world. But behind every machine there is always a man—just as there were tough and able men at work from Sept Iles up the line to Knob Lake.

At the peak of construction there were 6900 of them. During this summer some 4000 men will be at work completing the terminal, the QNS & L Railway, and the mining facilities; opening new ore bodies; mining and shipping enough ore to test the facilities and gain experience for the commencement of commercial operations in the summer of 1955. This much new employment in a land that was, five years ago, an unproductive wilderness represents in itself a major boost to the economy of all Canada.

From the first, most of the men on the project have been Canadians. While all the provinces in the country have been represented, the bulk of the men up the line have come from the relatively near-by areas of Quebec and Newfoundland.

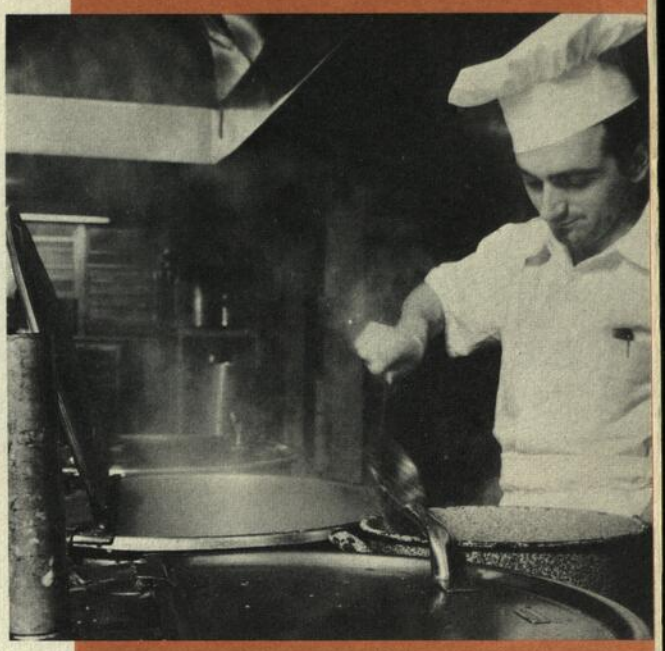
Fisherman in from his morning's work symbolizes the quiet, stable life the North Shore has known for centuries, with little basic change. The handsome young lad who hurried down to the waterfront to watch the fisherman clean his herring, however, is of the generation that will see—and help shape—changes which will result in great expansion and development for all Northeastern Canada.

Turning their backs on civilization, summer crews board supply train at Sept Iles for trip north.

Up the line, a truckload of the men who have built the railroad pause in transit between jobs.

Speeders carry section hands from point-to-point along railroad as they put finishing touches on the track.

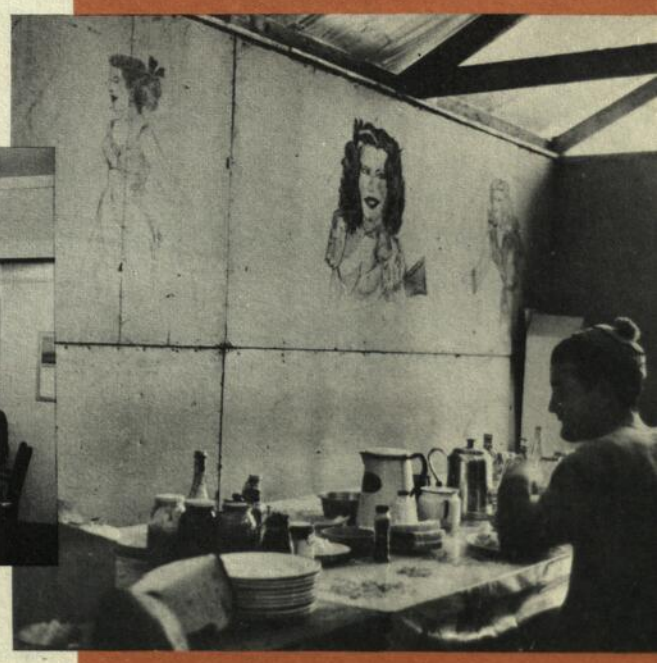
From snowshoes to light bulbs, loaded sled in Knob Lake storehouse shows diversity of material needed by a single line camp.



Cook looks at supper's soup. Good food was o of major attractions for workmen on the proje

Knob Lake bakers make 2100 loaves of brea a week; project as a whole consumes more tha two thousand loaves a day.

Clerk keeps track of kitchen crews required to feed four thousand men on the project this summer.



Men up the line eat 3 pounds of food a da half the total is meat. Project uses 35 thousa pounds of fresh fruits and vegetables a wee in season.

Project surveys are tied in to reference point embedded in steps of the village church at Sept Iles.

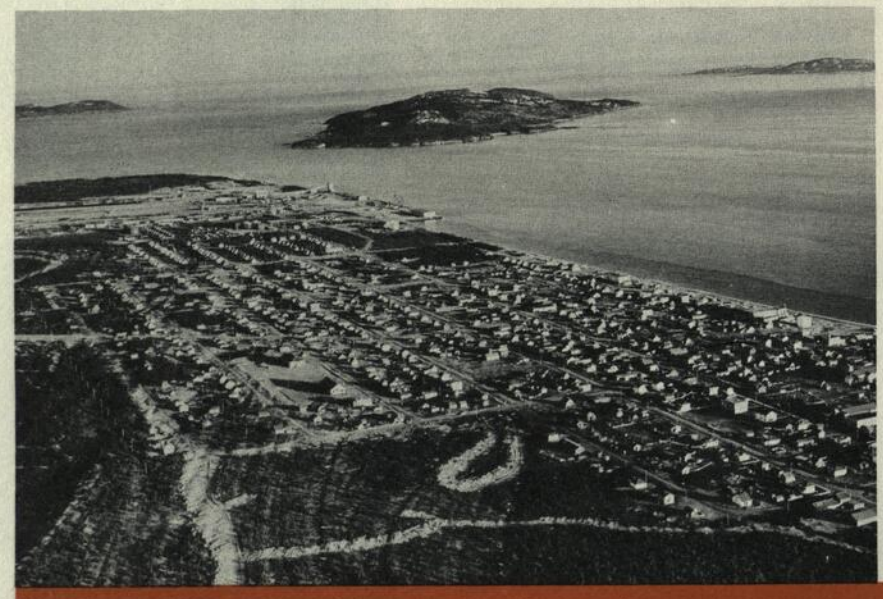
The place most immediately affected by the Iron Ore Company of Canada's development has been the village of Sept Iles—and Sept Iles has absorbed everything that has happened in the last five years with hardly a break in its stride.

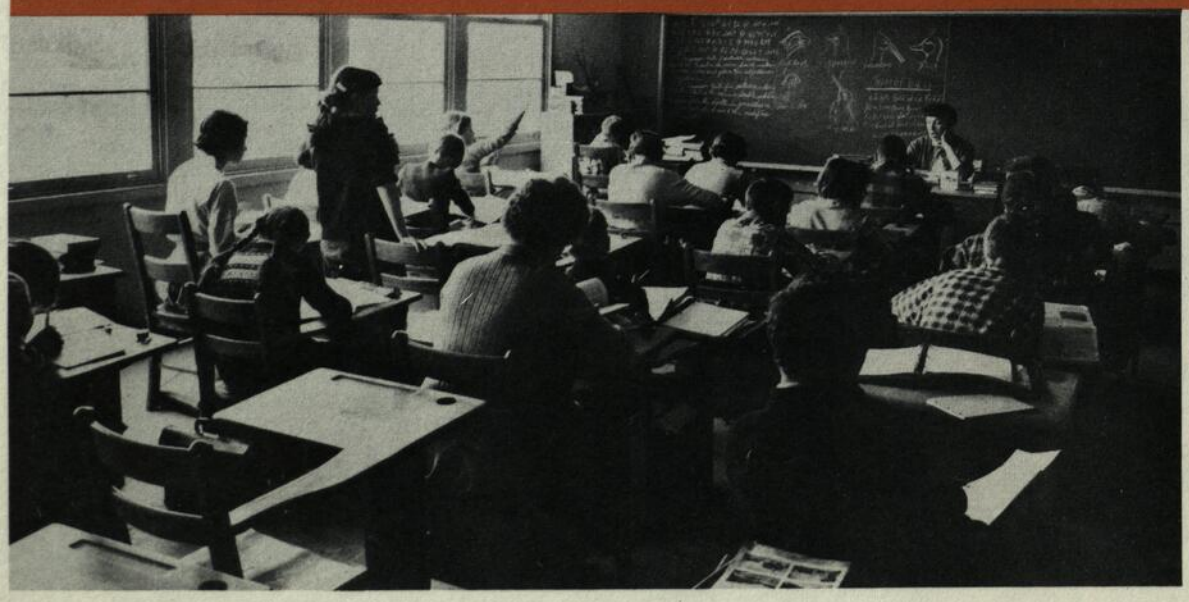
The North Shore of the Gulf of St. Lawrence has been known for centuries; Cartier explored it more than 400 years ago and spent one winter moored at the Hay River which runs into Sept Iles Bay, not far from the present village. But, in all those years, there was little to attract settlement, and little development took place. Until late in the 19th century, the present village was no more than a handful of trappers and a Hudson's Company Bay post.

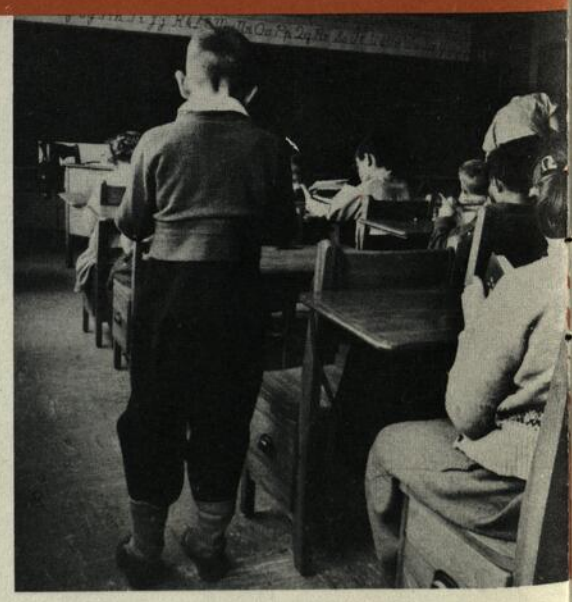
The economy of the region was built on trapping, trading with the Indians, fishing, and—in later years—cutting pulp wood. In 1942 Sept Iles itself numbered less than 1000 persons. In 1950 that had grown to an estimated 1500, and on Christmas, 1953, an exact census found 5100 residents. By some standards, a place that grew this fast, particularly one serving as a

Private individuals have built 200 new homes to contribute to Sept Iles' expansion since 1950.

Sept Iles waterfront retains much of quiet picturesqueness which has been traditional on North Shore.







Nature study lesson occupies class in new Sept Iles school built by Iron Ore Company of Canada. Little boys in baggy pants, struggling with arithmetic, typify schoolrooms around the world.

The face of the land is reflected in the composite face of the men who built the Quebec-Labrador project. They boast a wide range of skills, come from astonishingly diverse backgrounds, and have worked together to create a force which will help shape the future of Canada, and of all North America, for generations to come.

gateway to an area in which $250,000,000 was being invested, would qualify as a boom town. Perhaps Sept Iles was, but it showed few of the outward signs.

There was an expansion of business activity. New stores came in. The standard of living for many people went up as economic horizons broadened. Two hundred new homes were built in the town by private individuals. But the wide-open, roaring activity traditionally associated with a boom town were conspicuously absent. Instead, Sept Iles took advantage of new opportunities to build itself a future which promises to be steady, secure, and prosperous.

The vast area north of Sept Iles, dormant from the first days of settlement, is being opened up. All indications are that it contains mineral treasures great enough to dwarf anything now understood. It may be a score of years—or a century—before the extent of the wealth in the vast pre-Cambrian shield that covers Northeastern Canada is fully known. Whenever the day comes, it will have been speeded by the fact that there is now a major seaport on the North Shore and a modern railway to the interior.

In the meantime, the governments of Quebec and Newfoundland, and the Canadian government, have most effectively encouraged the development of known iron ore resources and other minerals. The large capital expenditures required have brought great amounts of revenue into the country and will continue to do so; future payrolls and taxes will continue to strengthen the economic base of the whole region. The annual shipment of large tonnages of iron ore and the many auxiliary business and services it creates will bring in annual revenue in the millions of dollars.

Where there is a will to risk, and to expand and grow, there will always be new jobs, new opportunities, and new horizons. The will is here, the risk has been taken. The rest is already coming to pass. A new era of opportunity is in the making.

THE ORE

A vast, new resource is approaching production, to safeguard the military security and peace-time expansion of North America

Between August and November, 1954, some of the finest iron ore furnace masters have seen in more than a generation will roll down off the Quebec-Labrador frontier. A vast, new resource will be available for use by the North American democracies and consumers in other lands.

Steel is the foundation on which North American civilization is built; on it rest all hopes for future economic growth and, if necessary, military strength. To make steel, there must first be iron ore in abundant supply, safe from outside control or attack, and easy to transport. That is what Quebec-Labrador offers. By the late summer of 1955, the project will be in commercial production, and by 1957 it should be capable of supplying at least 10,000,000 tons a year of such ore, and production can be swiftly expanded whenever the needs of the consumers require it.

The full extent of the Quebec-Labrador deposits is not known yet and will not be known for years. Forty-four proved ore bodies, however, are known to contain at least 417,000,000

Ruth Lake No. 3, nearly 20 million tons of iron ore averaging 60% iron, is stripped and ready for the shovels. Dark line on left indicates bench cut into solid ore.

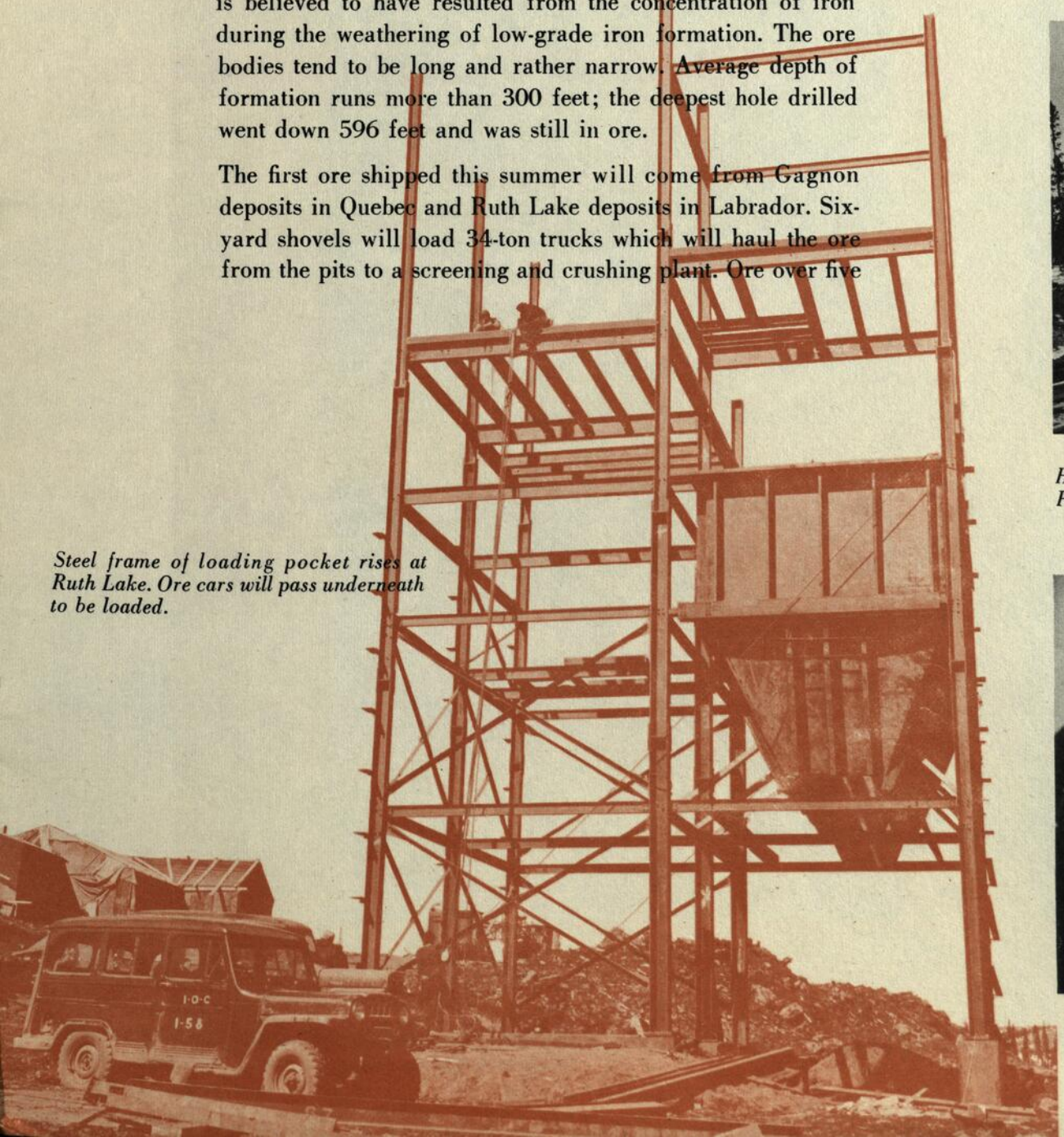
Surveyor works over iron country— Quebec-Labrador style. These barren hills hold one of the world's great treasures.

long tons of ore. Average iron content is 59.53% (dry analysis). Many other known ore bodies have not been drilled. Deposits averaging less than 50% iron were not included in ore reserves, although tremendous quantities of this lower grade ore are known to be available and subject to beneficiation.

The main ore zone is approximately 80 miles long and 6 miles wide; this lies in a larger belt of iron formation which is approximately 225 miles long and 30 miles wide. Geologists anticipate the discovery of new workable iron ore deposits in this region.

The sedimentary rocks containing the ore have, at some time in their long geologic history, been compressed, tilted on edge, and, much later, beveled by erosion. As a result, the distinguishing surface feature of the iron country is a series of parallel ridges looking like the furrows from a farmer's plow. The iron ore of the main ore bodies is relatively shallow and is believed to have resulted from the concentration of iron during the weathering of low-grade iron formation. The ore bodies tend to be long and rather narrow. Average depth of formation runs more than 300 feet; the deepest hole drilled went down 596 feet and was still in ore.

The first ore shipped this summer will come from Gagnon deposits in Quebec and Ruth Lake deposits in Labrador. Six-yard shovels will load 34-ton trucks which will haul the ore from the pits to a screening and crushing plant. Ore over five

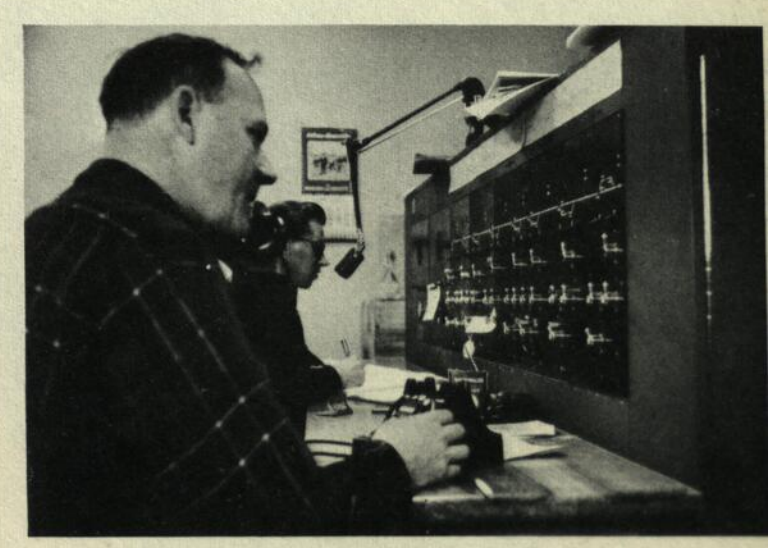


Steel frame of loading pocket rises at Ruth Lake. Ore cars will pass underneath to be loaded.

Shovel loads ore into a waiting truck; some of the first ore shipped will come from here.

This train carries gravel for ballast, over route ore trains will travel.

Hand switches like this lead to temporary pit spurs. Power-operated switches are used on main line sidings.



Dispatcher at Centralized Traffic Control panel directs trains, operates power switches and signals.

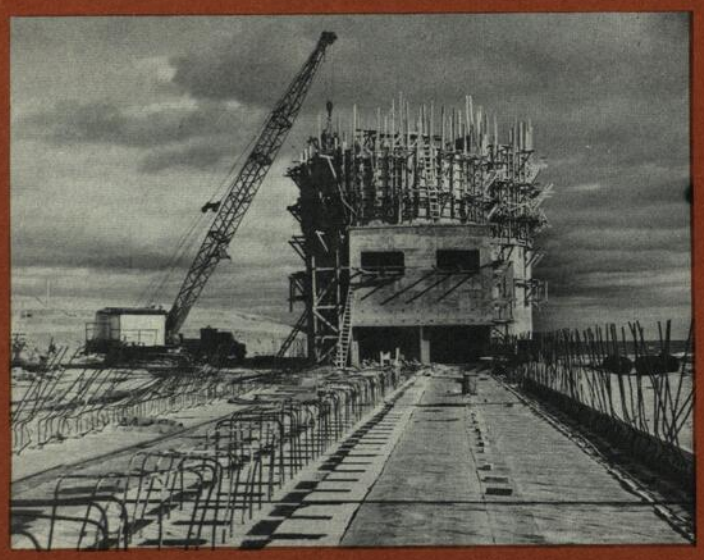
inches will be crushed. Conveyors will carry the ore from this plant to a loading pocket which will empty directly into cars. The roller-bearing equipped cars are owned by the Iron Ore Company of Canada.

Each train will be made up of 100-115 cars, each car carrying 85 long tons* of ore. Movement will be accomplished by four 1500-1750 horsepower diesel-electric units over 132 pounds rails, the heaviest ever rolled in Canada. Seven to nine trains a day during a 165-day mining season will be required to move 10,000,000 tons.

There are 23 passing sidings along the single-track main line of the railroad so that north-bound empties can pull aside for south-bound trains. All signals and power switches will be controlled from a Centralized Traffic Control system operated from Sept Iles. Estimated running time: 15-16 hours south-bound, 12-13 hours northbound.

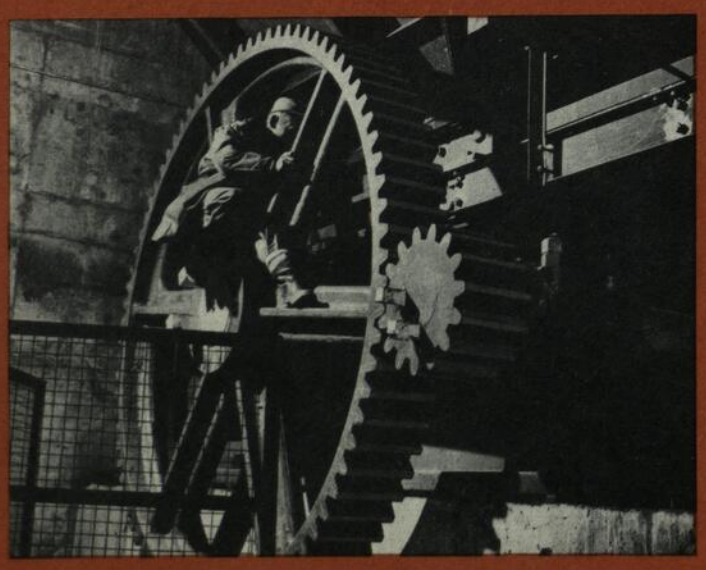
When ore trains reach Sept Iles the cars are classified into groups according to the chemical analysis of the ore they contain. This permits them to be placed on tracks for dumping in

**A long ton weighs 2240 pounds.*

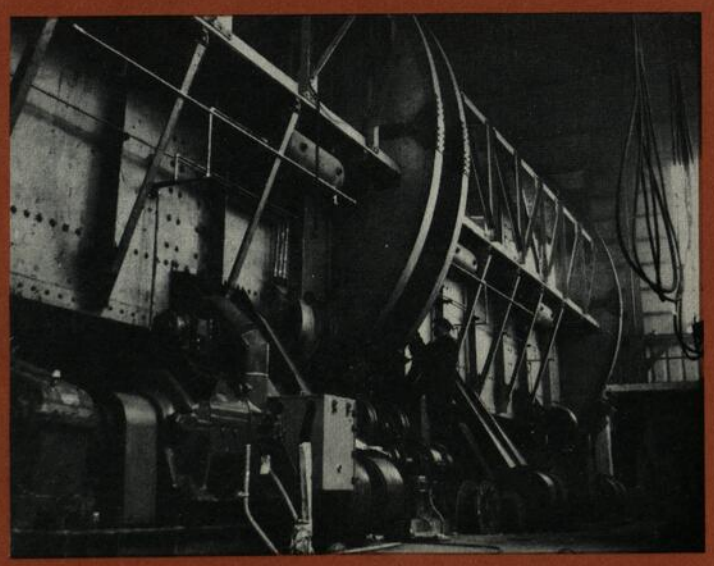


Mixing bins at Sept Iles under construction.

Splicing 60-inch belt under dumper at Sept Iles.



Inspecting crusher bull gear at the terminal.



Tandem car dumpers handle two cars every 65 seconds.

the sequence necessary to make a mixture which meets the selling specifications. Side-arm pushers running on narrow-gauge tracks between regular tracks move cars to a barney pit; from there a barney hoist pushes them two at a time into a two-car rotary dumper. The dumper turns the cars over, and dumps the ore much as you would dump sand out of a slipper. Empty cars return by gravity to a yard where they are made up into trains and sent north. The whole two-car cycle can be completed in 65 seconds.

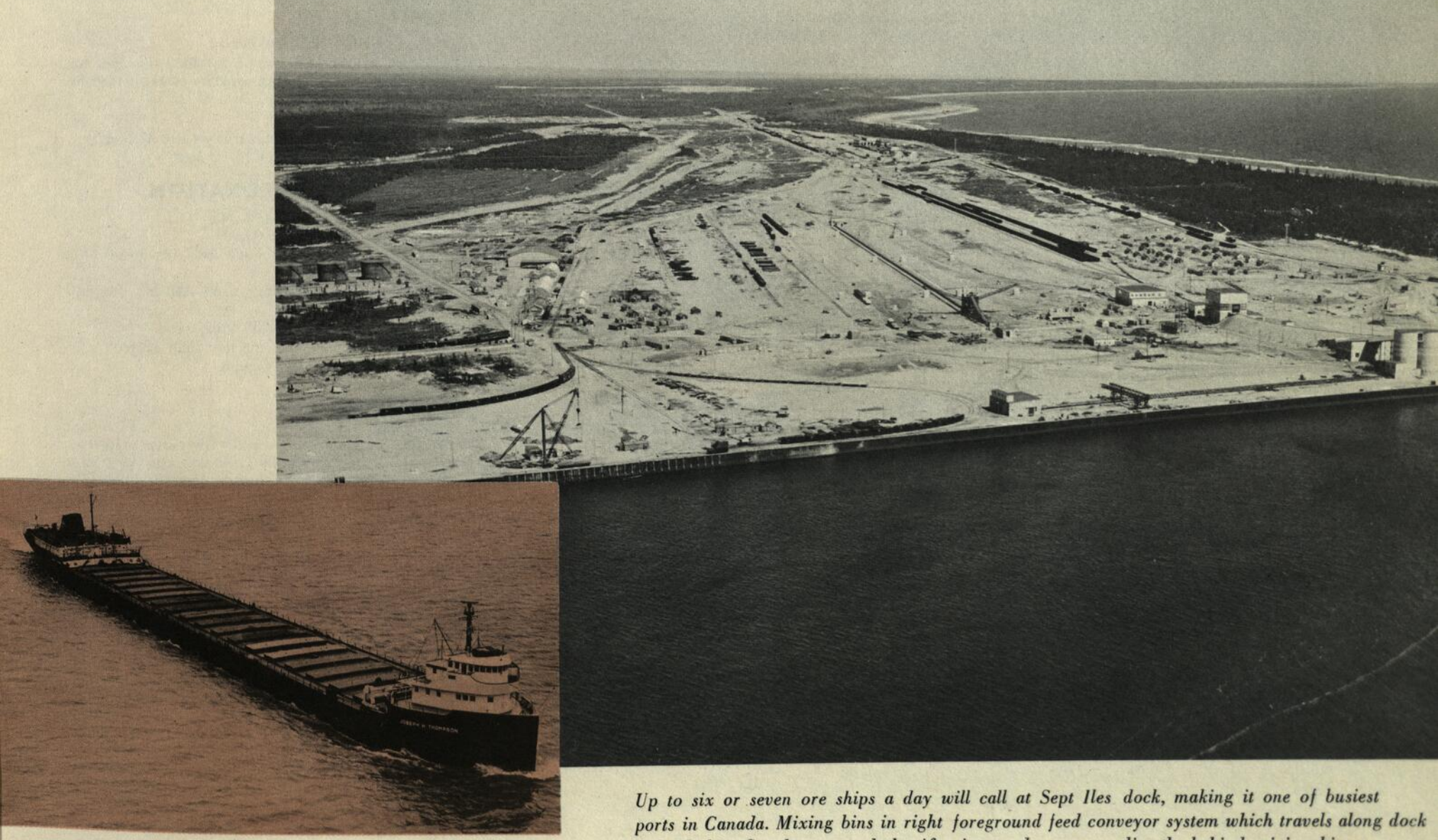
Once dumped, the ore falls onto a belt conveyor system which can move it either to a ship lying at an 800-foot loading dock at a capacity rate of 8000 tons an hour (estimated to average: 6400 tons), or transfer it to stockpile.

Sept Iles will soon be one of the busiest ports in Canada. In a shipping season running from 200 to 240 days, it will see as many as six or seven ore ships a day and several supply ships each week.

Between seven and eight million tons a year of the projected 10,000,000 tons production will go by deep-water routes to Atlantic Coast ports. The bulk of the remainder will travel in large vessels to Montreal and there be transshipped to Great Lakes ports in carriers small enough to negotiate present canals along the St. Lawrence.

One of the great benefits of an open-pit operation such as the one in Quebec-Labrador is that it can quickly and easily be expanded to meet increased peace-time demands, or the emergency requirements of war. Completion of the Seaway will make it possible to take full advantage of this inherent flexibility. It will be possible to ship, speedily and economically, enormous tonnages of iron ore over a well-protected inland waterway to the Great Lakes steel-making centers which have more than 75% of the blast furnace capacity of Canada and the United States. Without the Seaway, shipments would either have to run the risk of attack while traveling in exposed sea-lanes or they would have to be limited to the quantities that can be moved over existing rail and canal facilities.

While less dramatic, the peace-time need for freely available iron ore is no less important. There is every reason to believe that the two large countries of North America, Canada and the United States, working side by side will continue to expand their economy in the future as they have in the past, and the ore from the gray-green hills of the Quebec-Labrador frontier will play a major part in this expansion.



Up to six or seven ore ships a day will call at Sept Iles dock, making it one of busiest ports in Canada. Mixing bins in right foreground feed conveyor system which travels along dock to load ship. Car dumper and classification yards are seen directly behind mixing bins; stacker for stockpile is at left of dumper.

With completion of St. Lawrence Seaway, existing Great Lakes carriers can come to Sept Iles to help deep-water vessels move iron ore.

STATISTICAL SUMMARY OF THE QUEBEC-LABRADOR VENTURE

DISTANCES

Sept Iles to Knob Lake: 320 air miles.
Sept Iles to Mont Joli: 141 air miles.
Sept Iles to Quebec City: 340 air miles.
Sept Iles to Montreal: 484 air miles.
Sept Iles to Baltimore: 1550 water miles.
Knob Lake to Montreal: 715 air miles.
Knob Lake to Ungava Bay: 250 air miles.
Sept Iles to Ashtabula: 952 water miles.
Duluth to Ashtabula: 876 water miles.

RAILWAY CONSTRUCTION

Contract awarded: September 21, 1950.

construction details

Total bridges: 17.
Total length bridges: 4180 feet.
Total length all culvert: 83,189 linear feet.
Sizes culvert: 24 to 120 inches in diameter.

rail

Weight, main line: 132 pounds per yard.
Total ties: 1,500,000; 14-inch tie plates.
Number of passing sidings: 23.

track laying

Total miles laid (including main line spurs and sidings Seven Islands Terminal and Mine spurs): 440.
Most miles laid in one year: 223 in 1953.
Most track laid in one 10-hour day: 12,200 feet.

equipment

57 diesel shovels and draglines; 84 tractors, dozers, and scrapers; 160 dump trucks; and miscellaneous equipment.

earth movement

Total yards moved for railroad: 15,000,000.
Total yards moved for tote roads, airports, etc.: 6,000,000.

tunnels

One of 2206 feet at Mile 12; one of 761 feet at Mile 65.

RAILWAY OPERATION

Trains per day: 7-9 (to handle 10,000,000 tons of iron ore).
Cars per train: 100-115.
Tons of iron ore per car: 85 long tons.
Curvature: approximately 700 total curves.
Ruling grade southbound: 0.4%, compensated for curvature.
Ruling grade northbound: 1.3%.
Top speeds: 40 m.p.h. loaded, 50 m.p.h. light.
Running time southbound: 15-16 hours (ultimate est.)
Running time northbound: 12-13 hours (ultimate est.)

rolling stock

Locomotives: 1500-1750 h.p. diesel-electric general purpose type; multiple unit control; dynamic braking.
Number needed: approximately 50 units.
Cars: 85 long ton capacity.
Number needed: 2000 Iron Ore Company-owned ore cars, 175 ballast cars, 77 dump cars, and 517 work cars and maintenance units.

centralized traffic control

20 poles to mile carrying 2 wires on top for power transmission; 2 similar wires 14 feet below carry signal code and telephone circuit, plus 12-channel carrier for telephone and teletype.

operating seasons

Mining: 150-180 days.
Shipping: 200-240 days.

HOLLINGER-UNGAVA TRANSPORT

Total passengers hauled October 1950—December 31, 1953: 138,700.
Total freight, 1950-1953: 170,343,000 pounds.
Total ton miles, 1950-1953: 15,263,190.

Peak personnel: 82 pilots and co-pilots, 8 engineers, 100 mechanics.
Most flights in one day: 96 out of Mile 224.
Longest period without a flight: 48 hours.
Aircraft operated: 10 twin-motored and 5-single-motored aircraft, and 2 helicopters.

PERSONNEL

Peak employment: 6900.
Food requirement: 7 pounds per man per day (including packaging); 1½ pounds of meat per man per day. 100 men consume 1400 pounds of flour, 600 pounds of cake flour a month.

POWER PROJECTS

Menihek

Will generate initial installed capacity of 12,000 h.p. at 34-foot head; expandable to 24,000 h.p. and by another 50,000 with additional construction.
Dam 12,000 feet long, 40 feet high.
Earth moved: 900,000 cu. yds.
Concrete poured: 31,000 cu. yds.
Drainage area: 9,000 sq. mi.
Transmission voltage: 66,000 volts.

Marguerite

Will generate initial installed capacity of 25,000 h.p. at 115-foot head; concrete dam 517 feet long, 128 feet high; earth dam 2680 feet long.
Earth fill in dam: 268,00 cu. yds.
Earth moved: 306,000 cu. yds.
Concrete poured: 52,000 cu. yds.
Drainage area: 3500 sq. mi.
Transmission voltage: 13,800 volts to Clarke City, 44,000 volts to Sept Iles.

TERMINAL

Dumper capacity: 100 cars per hr.
2 60-inch conveyor belts: capacity 4000 tons per hr. each—average vessel loading capacity 6400 tons per hr.
Loading dock: 800 feet.
Mooring dock: 800 feet.
Dredged depth at dock at mean low tide: 37 feet.
Maximum tide variation: 11 to 12 feet.

MINES AND EXPLORATION

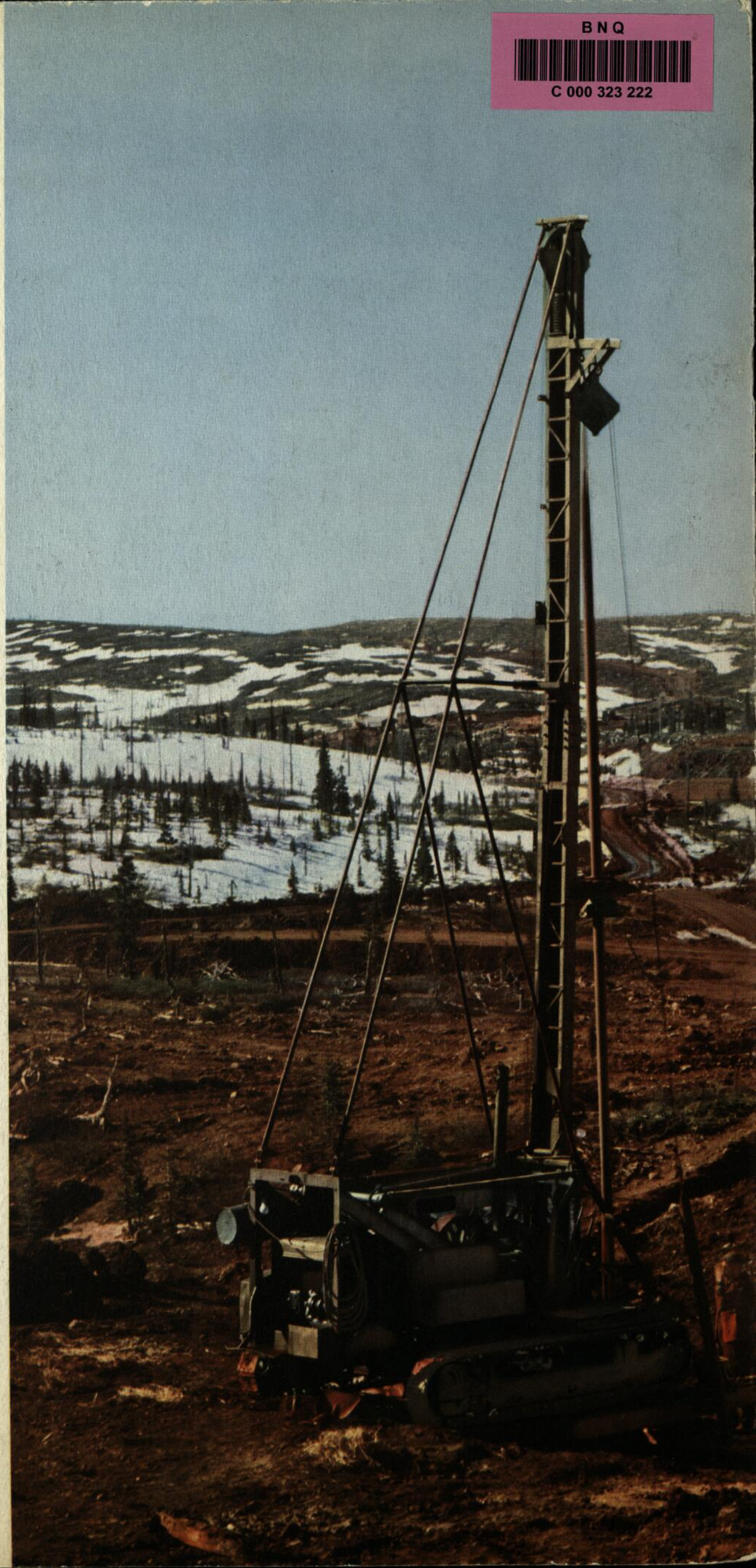
Total area mapped: 14,920 sq. mi.
Aerial photographs made: 40,000.
Prospecting teams in field since 1942: up to 50 of 2 men each per year.
Feet of exploratory drilling: total 240,262 (to end of 1953).
Total ore proved: 417,000,000 long tons.
Average depth of overburden: less than 15 feet.
Shovels: 6-yard electric powered.
Truck: 34-ton diesel.

FINANCING

In addition to capital furnished by the partners of Iron Ore Company of Canada, 19 Canadian and American insurance companies agreed to lend $150,000,000 toward the construction of the project. They are:

Aetna Life Insurance Company, Connecticut General Life Insurance Company, Connecticut Mutual Life Insurance Company, The Crown Life Insurance Company, The Equitable Life Assurance Society of the United States, The Fidelity Mutual Life Insurance Company, Independent Order of Foresters, John Hancock Mutual Life Insurance Company, The Manufacturers Life Insurance Company, Massachusetts Mutual Life Insurance Company, Metropolitan Life Insurance Company, The Mutual Life Insurance Company of New York, New England Mutual Life Insurance Company, New York Life Insurance Company, North American Life Assurance Company, The Northwestern Mutual Life Insurance Company, Penn Mutual Life Insurance Company, Provident Mutual Life Insurance Co. of Philadelphia, The Travelers Life Insurance Company.

For more than 100 miles north of Sept Iles, the Quebec North Shore & Labrador Railway runs through narrow canyons beside the turbulent rivers of the Laurentian Highlands. The country provides breath-taking scenery—and myriads of construction problems.



Churn drills peck away at the side of a solid hill of iron ore on the Quebec-Labrador frontier.

LITHOGRAPHED IN CANADA 1954