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Canada North of 60 Degrees

CANADA'S NORTHLAND makes up more than forty per cent of the total area of Canada. It includes the Northwest Territories, the Yukon Territory, and 45,000 square miles of Quebec, all lying above the 60th parallel of latitude.

This came to be the dividing line in 1905, when the provinces of Alberta and Saskatchewan were created, with their northern boundaries fixed at the 60th parallel. From there to the North Pole is one of the last large under-developed pieces of real estate in the world, embracing 1,557,000 square miles.

It was in 1870 that Canada took over this vast territory from Great Britain and with sovereignty it assumed immense responsibilities. One of the responsibilities attaching to sovereignty is occupation, and the mass of the Arctic and its islands cannot continue to lie dormant under the protection of a mere assertion of ownership.

Four hundred miles north of the beginning of Canada's Northland is the Arctic Circle, a line on the map marking the southern limits of the area around the Pole where for at least one day every year the sun doesn't rise, and for another day the sun doesn't set. When you straddle the Arctic Circle you are still 1,600 miles from the Pole.

It is not to be thought that you pass in one step over an invisible boundary line from a southern climate to the Arctic. The effective boundary is the tree line, which at the Mackenzie River is far north of the Arctic Circle and at Churchill, Manitoba, is hundreds of miles south of it. Generally trees will not grow where the average temperature of the warmest month of the year is lower than fifty degrees Fahrenheit.

The Arctic Archipelago, a remarkable accumulation of islands of vast extent, just now beginning to be explored, has mountains as high as 10,000 feet. Northern Canada has more lakes than all the rest of the world combined. Lake Hazen, which is about as far north as you can go in Canada, is the largest body of fresh water in the world so near the North Pole. It is 45 miles long and 900 feet deep.

The North

Having determined where the North is, it remains to tell what it is. Is the Northland as foully dangerous as we have been brought up to believe?

Vilhjalmur Stefansson, Manitoba-born explorer, who wrote 24 books and more than 400 articles about the Far North and its people, believed the Arctic to be a friendly, habitable place with tremendous untapped resources. Major L. T. Burwash, F.R.G.S., of Cobourg, Ontario, who explored Canada's Northland between 1925 and 1930, said: "The Arctic climate is generally kindly, but when it shows its teeth anyone caught unprepared is in more than ordinary danger." And Mrs. Martha Louise Black, F.R.G.S., who was swept over the Chilkoot Pass in the gold rush of 1898 to make her home in Dawson City, Yukon, wrote about "the gorgeous glory of the myriads of Yukon wild flowers." She said in the Foreword to her book called *Yukon Wild Flowers*: "Within twenty minutes walk of the heart of Dawson even a fairly careless observer of Nature's handiwork may gather at least a hundred varieties of flowers, ferns and mosses."

The North is cold, but not constantly and intensely. We know that since about 1900 the frigid top of the world has been warming up at about the rate of one degree Fahrenheit in ten years. Walrus and white whales are not travelling so far south as in the old days, while halibut and other fish are moving farther north. Glaciers are slowly melting: a few of the smaller ones have almost disappeared.

It is still necessary to dress warmly, as Irene Baird warns in the magazine *North* published by the Northern Administration Branch of the Department of Northern Affairs and National Resources. "Some of us," she said in describing an arctic field trip last summer, "recently working in 93 degrees heat in Ottawa, were a bit casual about bringing along parkas. But not, fortunately, to the point of leaving them home. Forget everything else if you have to." The North is a land of simple pleasures, it has been said, and one of them is being warm when you have been cold.

Spring comes with a rush, and long before the last

drifts of snow have disappeared the first flowers appear. In the long nightless days of summer, growth is practically uninterrupted. There may be as much growing time in one day as in two ordinary days in the tropics. But growth is compressed into a few short weeks, so that plant life is too sparse and too poorly developed to make any significant contribution to the food supply of man. Reindeer lichen grows less than half an inch a year. But scientists are busy on the problem of adapting plants to the Arctic. When Sir Charles Saunders developed Marquis wheat he carried the arable area of Canada two hundred miles farther north.

The Russians are far ahead of Canadians in development of the north, but basic conditions are different. Thousands of square miles of Canada's Northland were scraped bare by the ice age glaciers, whereas the Russian Arctic has plenty of soil. The tree line in Russia is about 500 miles north of Canada's; the Gulf Stream pours warm Atlantic water into the Polar Basin and along the shores of Norway and north Russia, providing a year-round route to the western part of the Russian Arctic; northern Russia has a whole series of navigable rivers flowing north, whereas in Canada there are only two well-marked natural transportation routes, Hudson Bay and the Mackenzie River. As a consequence of these favourable conditions the native races of northern Russia number 800,000 compared with northern Canada's 19,000 Eskimos and Indians.

Wartime and post-war defence activities brought a spurt of life to the Canadian north. The Alaska and Mackenzie Highways were constructed, airports and radar stations were established, and these improved communications gave an impetus to mining exploration. As a result, Canada has become conscious of her Northland, and its potential economic value.

Living in the North

Citizens of well-settled towns like Yellowknife, N.W.T., and Whitehorse, Yukon, live in frame houses with central heating, indoor plumbing, and electric refrigerators. In some of the newer sub-divisions the houses are identical to those in southern Canada and the living conditions almost the same. In the Fort Smith district, just north of 60 degrees in the Northwest Territories, there are more than 500 motor vehicles.

Pine Point, on the south shore of Great Slave Lake, is a completely planned community. Its town plan has been arranged to make the best possible use of the land, and essential services have been provided for. Inuvik is a model town 150 miles inside the Arctic Circle, with city comforts. Frobisher Bay, far to the east on Baffin Island, has schools, a hospital, a branch of The Royal Bank of Canada, stores, an hotel, taxi and bus services, and modern homes. It has a Canadian Broadcasting Corporation radio station and telephone communication with southern Canada. There is another branch of the Royal Bank in Elsa, thirty miles from Mayo in the Yukon, a silver mining centre.

In these communities men of south and north live side by side and benefit by the experience. R. Gordon Robertson wrote in *The Unbelievable Land*: "I venture the prediction that the North will prove to be the first part of Canada in which we really drop our colour line. Communities are now growing up where people of white race, of mixed blood, and of Indian or Eskimo race live side by side in the same type of house, with their children playing together and going to the same school."

Building a settlement in Canada's Far North is not the simple project it is in the more temperate areas. Where the surface of the ground is not solid rock, it is underlain by permafrost. The ground is frozen, sometimes to a depth of a thousand feet, and only the top few inches thaw in summer. What appears to be a solid foundation may turn to mud when a heated building is erected on it. Water supply and sewage disposal are difficult. In some places, water, steam and sewage lines are connected to buildings through conduit boxes laid on the surface of the ground. The boxes are lined with heavy building paper, the pipes are wrapped in paper, and the boxes are filled with wood shavings.

Even permafrost has some advantages. Very little rain or snow falls in the north, and water might become scarce in summer if the permafrost did not prevent it from seeping away. If it were not for this conservation of water at the roots, plants would not grow, and the high Arctic would be a lifeless desert.

The weather in all parts of Canada is dominated to a large extent by the coming and going of Arctic air, so for many years observation stations have been operated north of 60 degrees. As far back as 1882, eight nations co-operated in setting up fourteen polar stations, of which three were in Canada, one of them in northern Ellesmere Island. In 1957 the Defence Research Board chose the Lake Hazen area, about a thousand miles north of the Arctic Circle, as a field of operation during the International Geophysical Year. Since 1961 an automatic weather station on Axel Heiberg Island has transmitted every three hours information on temperature, wind direction, wind speed, and barometric pressure. Other observatories are within 450 miles of the North Pole.

Yukon Territory

Yukon Territory takes in the extreme northwestern part of the mainland of Canada, 207,076 square miles. It is generally mountainous, with many stretches of rolling country, with wide flats in the river valleys.

Fur trading brought the Hudson's Bay Company into the country in the mid-1800's. Then in the 1870's and '80's a few adventurous prospectors began to infiltrate the Yukon valley in search of gold. On August 17th, 1896, the strike that was to make the Klondike region of the Yukon world-famous was made on Bonanza Creek, a tributary of the Klondike River.

It was the most fantastic gold stampede the world has ever known. Pacific coast ships landed thousands at the Alaskan ports, and from there the fortune seekers climbed the forbidding Chilkoot and White Passes, pressed on to the headwaters of what is now the Yukon River, constructed primitive rafts, and journeyed more than 500 miles to the mouth of the Klondike.

Dawson, which sprang up where the rivers joined, mushroomed to a city of 25,000. In 1900 it was three times the size of Edmonton. Between 1897 and 1904 more than \$100 million in gold was obtained from the placers of the Klondike creeks. Many hill claims, taken up after the stream-beds had been staked, turned out to be immensely rich, and made fortunes for their owners.

The Yukon's arable land is estimated at 250,000 to 500,000 acres, the wide disparity being due to lack of organized soil surveys. Only 1,000 acres are under cultivation in scattered ranches and in vegetable gardens. The average frost-free days number 78 at Whitehorse and 64 at Mayo, contrasting with 112 at Saskatoon. Summer is short, but pleasantly warm, with an average daily temperature at Mayo in July of 58 degrees.

The federal agricultural experimental station on the Alaska Highway has successfully raised barley, oats, spring-wheat, alfalfa, potatoes, beets, cauliflower, cabbage, lettuce, tomatoes and other vegetables.

Yukon forest resources have been estimated to include 45,000 square miles of forest of normal productivity, of which ten per cent is composed of merchantable timber. White and black spruce and jack pine are the principal tree species.

It is a mistake to think of all the placer gold deposits in the Yukon as having been worked out. The value of gold produced is running at more than \$2 million a year. The cumulative total from 1886 to 1963 was \$259 million. Other minerals include silver, lead, zinc, cadmium, copper, coal, tungsten, platinum and antimony.

Fur trapping continues to be a mainstay of the Indian population. Trappers received \$168,227 for 86,082 pelts in the season 1963-64. The principal furs are marten, beaver, muskrat, mink and squirrel.

The Northwest Territories

The Northwest Territories, divided for administrative purposes into Mackenzie, Keewatin and Franklin, contain the mainland portion of Canada lying north of the 60th parallel of latitude between Hudson Bay on the east and Yukon Territory on the west, together with the islands lying between the mainland and the North Pole. The area is 1,304,903 square miles. This is the last of North America's great frontiers.

These territories are sparsely populated. All the population of Mackenzie could squeeze into a down-south football stadium. The people are scattered from the

southern boundary to the shadow of the Pole. They are trappers, miners, missionaries, police, traders, storekeepers, or government employees. Some Eskimos live a primitive and hard life in isolated trapping and fishing camps, while some Eskimos, Indians and Euro-Canadians work for mining companies and live in settlements where almost "normal" life is enjoyed.

There are eighty communities in the Northwest Territories, ranging from a few buildings clustered around a trading post or a weather station to Yellowknife, with a population of 3,500. Hay River is the centre of a multi-million dollar commercial fishing industry, producing whitefish for markets in southern Canada and the United States. Fort Smith is the administrative centre for the Western part of the territories. Eastward from Inuvik the Arctic tundra stretches for twelve hundred miles to the shores of Hudson Bay.

During this century, cultivation has pushed farther and farther north into high latitudes, though small-scale farming and gardening have been carried on in Mackenzie District since the earliest days of settlement. Experimental stations operated by the Department of Agriculture at Fort Simpson and Yellowknife conduct tests designed to improve the quality and variety of the vegetables grown.

Summers range in length from a scant two weeks on northern Ellesmere Island to two and a half months around Great Slave Lake. In the northeastern region the average temperature of the warmest month is lower than 50 degrees and the average winter temperatures are all below 32 degrees. Precipitation is low. In the Mackenzie Valley it includes 40 to 50 inches of snow, which is only about half the snowfall of the Great Lakes, St. Lawrence and northern New England regions.

Trapping is the oldest industry, and in terms of income to Eskimo and Indian residents it is still the most important. In many settlements furs sold at the trading post provide almost the entire income for men who prefer to continue their life on the land. The subsistence value of fish and game taken in the N.W.T. runs to about two million dollars annually.

There is no forest industry, but such forest growth as there is should be sufficient to meet the needs of the residents in perpetuity. The timber stands in the Mackenzie District are of value chiefly as a source of building materials and fuel, and as favourable environment for fur-bearing and game animals.

Minerals in the North

There is a treasure of mineral wealth north of 60 degrees, but it is not to be easily obtained. It demands keen prospecting, hard work, and adequate venture capital, in an area where risks are great and stakes are high. As Phillips and Parsons say in *This is the Arctic*: "There may come a day when some of Canada's biggest mines will be among the igloos."

The federal government is doing its part to encourage and assist private enterprise by legislation favourable to mineral exploration, construction of development roads and airstrips, and by geological surveys and aerial mapping. The indications are that mineral resources are sufficiently rich to offset any disadvantages of northern operations. There are vast reserves of water power awaiting harness. The headwaters of the Yukon River are estimated to have a potential of four and a half million horsepower, and a large water power potential around Great Slave Lake should have tremendous value in developing mineral resources.

Of course it will cost more to develop northern minerals and to send them to market than in the case of similar but more accessible resources farther south. To meet this the resources must be of exceptional quality. To attract people to go to the north to work, wage rates must be higher than in the south.

The chief problem is transportation. Even where the facilities exist, the great distances from markets and sources of supply, and the small, unbalanced volume of traffic, make transportation the largest single cost item in mining and other industrial operations.

Gold mines have been able to operate in remote places because the cost of incoming freight is not a critical factor and the cost of shipping out the gold is negligible, but base metal mines have a bulky product demanding the provision of cheap transportation.

There is, say some, the prospect of underwater carriage from the northern coast. United States submarines have demonstrated the feasibility of passage under Arctic ice, and a speaker at a northern development conference pictured submersible tanker barges towed by atomic submarines to carry oil from Canada's Northland to southern markets and to Europe.

That is still in the future, and the great mineral discoveries of the past few years remain earthbound. In 1962 very large iron deposits were found in the eastern part of the Yukon Territory. In 1964 it was announced by the Minister of Northern Affairs and National Resources that a tremendous deposit of some of the richest iron ore in the world had been found on Baffin Island. The strike is estimated to contain 180 million tons of ore, with 69 per cent iron. "It is so pure," said the Minister, "and of such quality it can be fed directly into furnaces." Milne Inlet, a good ore-loading site, is being connected to the mining location by road and two airstrips are being built. But Milne Inlet is free of ice only about six weeks. Ice-breaker service might lengthen this to twelve weeks.

There is oil in the Arctic. The first report came from Alexander Mackenzie in 1789, when he saw oil seepage on the bank of the Mackenzie River at what is now Norman Wells. Private interests have spent about \$75 million in oil exploration and drilling in the north in the past five years.

This is the Arctic reports the belief of geologists in a great north-south belt of oil-bearing rock formation which may extend from southern Alberta through the

Mackenzie Basin to the most northerly islands of Canada's Arctic Archipelago, and adds: "If this is true, the Far North may become a new Middle East in terms of oil production."

The problem of moving oil offers three solutions: rail, pipeline and tanker. As developers see it, the answer in the North may be to get the oil to the coast, presumably by pipeline, and move it to market by sea. Construction of pipelines offers no insurmountable impediment.

The future of the North

There are two ways of accommodating to the North, which seems singularly forbidding in its determination not to accommodate itself to southerners. One is that of the Eskimos, seeking only subsistence; the other depends upon lifelines to the south, supplying the wants of people accustomed to the trappings of southern life. This second way has become possible because of advances in technology.

Research will provide answers to many problems — of cost, of living conditions, of transportation. There is much yet to learn about Canada North of 60 degrees. We neglected it from the time it was handed over to us in 1870 until a few years ago. Today we are using new geophysical instruments to list its resources, where they are, what their quality is. Tomorrow we must move on to ascertain if there are markets for them, what it will cost to make them available, and how to get them out. We need to be imaginative, so as to take into consideration the submarine tugboats and the applications of hovercraft, which can move over water, land, and ice, and can operate during break-up and freeze-up as well as in summer and winter. Scientists and engineers at the Alberta Research Council have found that they can move solid metal up to 500 pounds in weight through a pipeline.

Many question marks hang over the Arctic, but no one will suggest that if we have the urge and the energy we cannot find the answers.

There are many publications about Canada's Arctic available from the Department of Northern Affairs and National Resources, Ottawa. A list will be sent by the Department upon request.

This is the Arctic, by R. A. J. Phillips and G. F. Parsons, is a good summary. It was revised in 1958, and reprinted almost yearly since then. Queen's Printer, Ottawa, 54 pages, 35 cents.

The Unbelievable Land, edited by I. Norman Smith, has 26 chapters by competent writers dealing with many aspects of life in northern Canada. Queen's Printer, Ottawa, 140 pages, \$2.50.

A bi-monthly magazine *North*, published by the Northern Administration Branch of the Department of Northern Affairs and National Resources, is available from the Queen's Printer, Ottawa, for \$3 a year.